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## Marketing and Visitor's Satisfaction

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### Abstract:

*The aim of the paper is to describe regional marketing as its own applied discipline of regional economics and to illustrate the method of visitors' satisfaction measurement in the field of regional marketing and tourism. Firstly, there are presented term regional marketing, various theoretical approaches, differences between company marketing and regional marketing, history of regional marketing and its applications. There are also demonstrated satisfaction measurement methods with focus on satisfaction pyramid method and Customer Satisfaction Index. In the field part, successful Czech experience with satisfaction measurement in the tourism and key outcomes from satisfaction research are introduced. The main research output is setting factors with the highest level of satisfaction and sinking trend of visitors' satisfaction in last three years. The project was ordered by Moravian-Silesian region to detect information about visitors of region for changing a marketing strategy in tourism.*

**Keywords:** regional marketing, tourism, marketing research, satisfaction measurement.

**JEL Classification:** M31, R10.

### 1. Introduction

Regional marketing has in last couple of years increasing importance in theory as well in practice. Although people did not know regional marketing as a concept in past, they intuitively used some basic rules. Various locations strived to address potential investors, inhabitants or tourist. The theory of regional marketing has appeared 30 years ago as a systematic approach to manage certain localities (cities, counties, countries and regions) and there is customer orientation. Regional marketing uses many methods and tools common for company marketing (or profit organizations marketing). There are used situation analysis, SWOT analysis, positioning, branding, marketing research methods, marketing communication and other. One of the marketing research methods, which are suddenly still not very frequent in the Czech Republic, is satisfaction measurement.

The structure of this study is divided in several parts. First paragraph called "Regional marketing" presents theoretical approaches, history and application of regional marketing and define its differences to business marketing. Next paragraph is about customer satisfaction in regional marketing, where some approaches to customer satisfaction are described. In the fourth part, "Results and discussions", methodological framework, with research questions and information about samples are presented and then outputs from national research on tourist visitors' satisfaction support previous theories. The goal of the research is to present, how is regional marketing and measurement of visitors' satisfaction in the Czech Republic used. Research question of the study are: (1) How intensive is utilization of visitors' satisfaction in regional marketing? (2) What are the main factors which visitors evaluate by highest satisfaction? and (3) How CSI (Customer Satisfaction Index) has been developed since 2010 till 2014. The results of the survey are discussed and its implications for public authorities.

### 2. Main text

We can understand classical marketing as achieving company goals due to satisfying customer needs. Regional marketing focuses on achieving cities' and regions' goals due to satisfying inhabitants', visitors' or potential investors' goals, thus regional marketing is a branch of classical marketing, where regions are described as very complex product. Regional marketing has been constituted and developed between 1970 and 1980. Another definition of regional marketing is a form of non-profit marketing, a variant of company marketing, or as a new one's own marketing discipline (Meyer 1999). As a form of non-profit marketing, the regional marketing conception is based on general non-profit marketing (Fortenberry 2012). We can use a concept of non-profit marketing in regional marketing, only if the authorities in public government (mayors, regional council presidents etc.) respect marketing approaches in their management styles (Braun/Töpfe in Meyer 1999). Non-profit marketing is understood as marketing in non-commercial organizations. It means, to generate a profit, is not a primary goal, but the organization also gains public benefits.

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There are only moving company marketing approaches and general principles into field of regional marketing with importance on marketing philosophy. The parts of the philosophy are using marketing management in companies, repeatedly marketing planning and research, using different marketing tools, concept of strategic and operations actions and principle of coordination of all marketing activities (Spieß in Meyer, 1999).

Authors of regional marketing concept as a one's own new marketing discipline think, that regional marketing is independent at company marketing or non-profit marketing, even though regional marketing is proceeding from these two marketing fields. This approach to regional marketing is also preferred in Meyer (1999). Very important part of regional marketing is communication, which is not meant as a marketing communication, but communication between marketing actors together (internal) and between marketing actors and potential customers (external). Some differences between company marketing and regional marketing are described in Table 1. (Ježek 2010)

Table 1 - Some differences between company marketing and regional marketing

CRITERIA	COMPANY	CITY
Place character	Mobile	Immobile
Place of sale	Independent on region	Dependant on region
Main goal	Profit maximization	Public demand satisfying and achieving set goals
Time period	Middle-termed and shot-termed	Long-termed
Transaction relations' complexity	Small (comparing with city)	Bigger, complex
Supplied products amount	Smaller amount	Big amount
Participant	Marketing department's employees (few)	Many participant (Participative management needed)
Customers	Smaller amount, bigger homogeneity	Bigger amount, needs', wishes' and interests' differences
Decision making Plurality	Not necessary	Necessary
Entrepreneurial risks	Relatively high	Relatively low
Flexibility and adaptability possibility against external environment	Relatively high	Relatively low

Source: Own elaboration according to Ježek (2010)

Regional marketing in the Czech Republic has some significant differences, like administrative-territorial centralization in terms of competences and financial resources, distrust between public and private sectors, dominance of strategic planning to the detriment of marketing concepts, lack of finance for the accomplishment of regional marketing, shortage of transparency in the strategies of regional development, overall immaturity of institutions and sceptical attitude to the innovations on the one hand, non-critical acceptance of vogue conceptions on the other hand.

Some interesting examples of usage regional marketing such settlement branding presents Kadár (2014), or place branding by Petrea (2013), or image of tourist brand described by Stăncioiu (2011).

### History of regional marketing

With development of company marketing in last 50 years is also spread its utilization out of entrepreneurial sphere to non-profit organizations, but also to villages and cities, then we are speaking about city marketing, and to bigger spatial areas like micro regions, counties, states, where is described as regional or regional marketing. The first facts about regional marketing could be founded between 1970 and 1980 in high developed west European countries.

It is apparent that wide utilization of regional marketing did not appear as a bolt from the blue. Regional and municipal marketing constitute one of the consequences of immense social and economic transformations that took place between 1970 and 1980 in virtually all developed countries and are succinctly describable as the move from fordist paradigm of societal development towards post-fordist one. Emphasis on individual responsibility and activity, limitation of the state interventions into the functioning of market mechanisms or the creation of stimulating milieu for the activities of private subjects became the main principles of these times. (Sucháček 2008)



In the Czech Republic regional marketing developed after Velvet Revolution in 1989. Pioneers of city and regional marketing were in the Czech Republic consulting companies like Berman Group, DHV and regional development agencies as well. With Czech borders opening there is very intensive transaction of information and sharing good practise from states, which are more experienced with regional marketing utilization for a long time, like Great Britain, Germany or the Netherlands.

### Regional marketing theory

In the regional marketing we are using parts of strategic marketing management, which are situation analysis, vision and goal setting, strategy, action, controlling and organization. (Ježek 2010)

The task of situation analysis is to describe nowadays starting position of region. For making a description, is used regional marketing mix of 7 Ps, SWOT Analysis or other methods. The information for situation analysis is reached from primary (marketing research) as well as secondary sources (statistics, public databases) or by experts. The situation analysis is almost provided by external consulting companies.

During vision and goal setting there is important orientation to real goals that are corresponding with managerial principles of setting goals. The well-known is SMART methodology. It is very often situation that regions want to support all its areas, instead of setting basic priority and focusing on them. In past there were only a lack of care on strategy, but today setting strategy is obviously providing by external companies, which are constructing them with reflex to groups of interest wants. Interesting groups often cannot agree with one strategy. In the marketing campaign there is set, which are the focus groups within the strategy

Actions are in the regional marketing implemented with communication tools to affect goal group. To make a successful action, it is important to find an agreement of as high number of participants participating on marketing campaign as possible. Forgotten part of marketing strategy implementation is often controlling. Process of controlling is consisted of three steps, which are standards' setting, performance measurement according to standards and standard deviations' corrections. Effective controlling only can present, if our financial expenditures were invested effectively for the campaign or not.

Organization in regional marketing is not every time full-institutionalized, but nowadays there is in the Czech Republic marketing campaign leader is almost regional development department or tourism department at Regional Office. The controlling during the campaign is also in its competence.

### Application of regional marketing

Process of regional marketing implementation has (Sucháček 2008) four basic phases: for entering phase (Initiation and motivation) are typical examples like: Initiatives come from interesting groups, city or regional government, inhabitants or external consulting company. Obviously, there is a circumstance of unsolved problems and a consequence of experienced imperfections and unsolved problems. It is important to motivate partners for cooperation. We can organize introducing conference or present elementary networking. There is important to provoke an interest of partners and motivate them to collaboration.

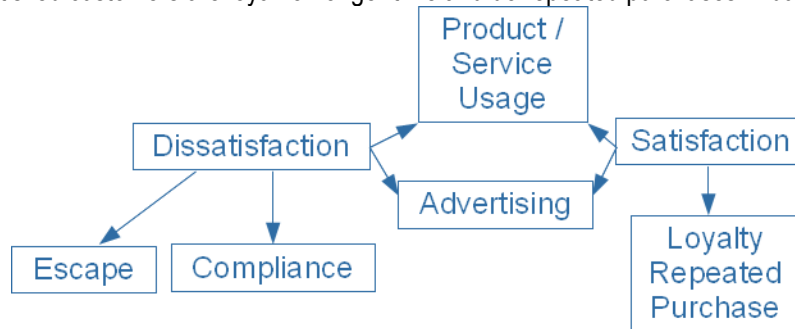
Analytical phase consists in collecting of finished documentation (spatial plans, strategic plans, spatial data etc.) and complex spatial analysis (obviously made by external consulting company. Another step is to collect facts should be transferred into SWOT analysis. The outcome is competitive advantages analysis and seeking for market position on the one hand and missing to external area on the other hand.

In conception phase are defined visions, goals and preparing of suitable strategies for realization. We have to focus on participative priority selection in the communication and creativity processes. There is cooperation between public and private sector subjects. Realization phase is a finishing of our preparations. Working groups of professionals (experts, government employees, entrepreneurs, public initiatives) participate at transforming goals and strategies are into concrete marketing actions. There are some rules: to prefer our own actions instead of actions, where are coordinated with more participants, a principle "rather now, than later", cheaper actions instead of more expensive, actions and projects with regional marketing utilization for a long time, like Great Britain, Germany or the Netherlands.

### Customer satisfaction in regional marketing

Utilization of Customer Satisfaction Measurement in the field of regional marketing is almost never mentioned in the books dealing with regional marketing. Key definition of customer satisfactions could be this: Satisfaction is a tool for retention of customers. This is a customer's agreement between expected and gained value. We can define satisfaction as a subjective feeling of customer about saturating his or her needs and wishes. These are determined by experiences, expectations as well as personality and environment.

The basic idea why to measure customer satisfaction is described in enclosed figure, where we can see two possibilities of dissatisfy customers: some of them escape our business and never come back and the rest of them try to comply our staff but also to them relatives and friends, which makes a bed promotion for our business. On the other hand, satisfied customers are loyal for longer time and do repeated purchases in business.



Source: Own elaboration according to Homburg (1999)

Figure 1 - Possible customers' reactions at their satisfaction or dissatisfaction

If we shall really understand customer satisfaction and its reflection in potential company profit, we have to penetrate deeper to issues of customer satisfaction and to discover, the share of completely satisfied customers, substantially satisfied, rather satisfied, rather dissatisfied, substantially dissatisfied and completely dissatisfied. Different level of customer satisfaction has an impact on their loyalty to company and company economic outcomes. (Lošťáková 2009)

We have to notify, that dissatisfied customers are for the enterprise also important, because cost of gaining new customers are much higher, than retention of current customers. If there is a dissatisfied customer, who we left, there is a lot of economic consequences for business, firstly of all lower company profits (Lošťáková, 2009).

There are many tools for satisfaction measurement, almost using scales to mark the satisfaction like Customer Satisfaction Index, European Customer Satisfaction Model, Importance-Satisfaction Matrix, SERVQUAL Concept KANO Model, semantic differential scale or Likert scale. Alternative ways to customer satisfaction presents also. (Zamazalová 2008)

Very efficient one is a called Satisfaction Pyramid, which based in two main approaches (models), how to explore customer satisfaction. (Sadílek 2012)

*First model* measures two things: customer satisfaction on the one hand, and customer's declared importance of each asked factor on the other hand. This method was more often in past. The biggest problem is respondents do not know how to evaluate the importance of factor on his/her own, and during personal interview to ask every respondent for telling satisfaction as well as importance is time consuming. The positive of the method is less complicated elaboration and presenting of outcomes. This is also called "declared importance". *The second model* does not investigate both variables (satisfaction and importance), but only satisfaction with each factor. For detecting an importance of factors we use correlation analysis. Second approach can reveal incongruity between respondent's declared significance of partial factors and their real significance. The incongruity can be intentional (respondents claim something different, then they are really thinking), or they cannot notify their attitudes. Correlation analysis uses Pearson correlation coefficient (R) giving a value between -1 and 1, which measures strength of linear dependence between two variables. If the value of Pearson correlation coefficient goes to -1 (negative correlation, negative linear dependence), it means, while values of the first variable sink, values of the second variable grow. Positive correlation (positive linear dependence) comes when value of R goes to 1 and then values of both variables are growing. If the value of R moves around 0, both variables are variables linear independent and they do not influence mutually. The way how to describe outcomes from satisfaction pyramid method or other methods is to count the data into Customer Satisfaction Index. For calculating the level of satisfaction of each factor, there were used generally accepted pattern of Customer Satisfaction Index (CSI) with these variables (Fornel 1996):

$$\varepsilon_j = \frac{\sum_{i=1}^n v_{ij} \cdot x_{ij}}{\sum_{i=1}^n v_{ij}} \tag{1}$$

where:  $e_j$  - Customer Satisfaction Index of  $j$  customer;  $v_{ij}$  - weight of  $i$ - measurable variable for  $j$ -value;  $x_{ij}$  - value of measurable variable;  $z$  - number of levels used in the scale;  $n$  - number of measurable variables.

First experiences with Customer Satisfaction Index have come from Sweden, where it is called Customer Satisfaction Barometer (author is prof. Fornel) since 1989. Since 1992, in Germany has been Customer Satisfaction Barometer used and after 1994 have been developed American Customer Satisfaction Index, which followed countries like Israel, Taiwan and New Zealand. France started with measurement in 1996 and afterwards European Commission launched a study to make an index based on experiences from national experiment. The outcome was a recommendation for European countries (Ryglová 2010).

### **3. Results and discussion**

To support theoretical findings about regional marketing and satisfaction measurement, let's present an example of satisfaction measurement application. Using the technique of satisfaction measurement is quite frequent abroad, but in the Czech Republic is not used so often, but this series of researches were successful.

#### *Methodological framework*

Using the technique of satisfaction measurement is quite frequent abroad, but in the Czech Republic is not used so often. The example of successful applications could be this project. In 2010 there were started an extensive project in order to detect visitors' satisfaction in particular regions of the Czech Republic. The research carried out Ipsos Tambor to order of Czech Tourism agency with the financial support of European Union Programs: IOP no.01358 and IOP no.01360. (More information is available at: <http://monitoringczechtourism.cz/CzechTourism/uvod.html>)

The research maps turnout in particular tourist areas and regions in the Czech Republic and focuses on discovering of visitors' structure, their satisfaction with tourism, ways of spending free time, area equipment, services quality and interest of future visiting the region. The survey has been realized since 2010 to 2014 twice every year in winter and summer. Up to now there are at disposal outcomes from winters and summers from 2010 and 2014.

There is used a method of random sample of only domestic visitors. The technique is a standardized questionnaire consisting of 23 questions, number of respondents oscillated from 25,200 to 26,500 (further information is available at: <http://monitoring.czechtourism.cz/CzechTourism/res/Metodika.pdf>). From these outputs are calculated statistics presented in the article. So this is type of secondary data research.

The goal of the research is to present, how is regional marketing and measurement of visitors' satisfaction in the Czech Republic used. Research question of the study are:

- How intensive is utilization of visitors' satisfaction in regional marketing?
- What are the main factors which visitors evaluate by highest satisfaction?
- How CSI (Customer Satisfaction Index) has been developed since 2010 till 2014?

#### *Customer satisfaction and loyalty in Moravian-Silesian region*

Moravian-Silesian region let made long-termed marketing research on visitors' behaviour, preferences, satisfaction, loyalty and a feedback of successfulness of realized marketing techniques. The outcomes from the research are also used at defining changed marketing strategy for further years. This marketing research has been ordered at Ipsos Tambor research agency.

The method of collecting data was CATI (Computer Assisted Telephone Interviewing); the tool was structured questionnaire and the sample were above 2200 customers visited Moravian-Silesian region in last 12 months. The responding was every time in autumn after ending winter and summer season between years 2010 and 2014. The part of structured questionnaire used at doing phone interviews consists of 29 questions related with satisfaction measurement, which are factors affecting total satisfaction.



Source: Own elaboration

Figure 2 - Location of Moravian-Silesian region within the Czech Republic

Very positive finding of the research is really high level of satisfied visitors. In 2010 there were 92% satisfied, in 2011 was 98% of respondents were satisfied, in 2012 the number of satisfied visitors was 98%, in 2013 was 96% and in 2014 was 98%. This is a positive finding, which proves, that almost every visitor was satisfied with his or her stay in Moravian-Silesian region.

Table 2 - Distribution of total satisfaction

(%)	SHARE				
	2010	2011	2012	2013	2014
Very satisfied	53	56	53	51	72
Rather satisfied	39	42	45	45	26
Rather dissatisfied	7	2	2	4	2
Very dissatisfied	1	0	0	0	0

Source: Own elaboration according to research outputs

In the 29 factors affecting total satisfaction were factors like landscape attractiveness, information about region and tourist and cyclist signage evaluated with the highest values of satisfaction in all years. The reason is clear – visitors are looking for attractive landscape, which is in Moravian-Silesian region represented by Jeseníky and Beskydy mountains and there are also (with Ostrava city) the most visited parts of the region. Information about region is needed one condition to attract potential visitors and offer them wide range of services. The importance of information about region is after visitors' arrival when they have to change their planned program\*(e.g. because of weather) and find other solution.

Tourist and cyclist signage has in the Czech Republic long tradition and achieve a high quality level. In every year research respondents indicate highest importance with factors declared highest satisfaction.

In 2013 and 2014 were factors with the highest level of satisfaction staff friendliness and cleanness of public area. Visitors evaluated very positively dining and buying options as well as staff willingness in accommodation, restaurants and information services.

Table 3 - Main factors with the highest satisfaction

2010	2011	2012	2013	2014
Landscape attractiveness	Landscape attractiveness	Safety	Friendliness	Cleanness
Health environment	Information about region	Landscape attractiveness	Tourist and cyclist signage	Dining options
Information about region	Tourist and cyclist signage	Friendliness	Safety	Tourist and cyclist signage
Attractive tourist paths	Friendliness	Information about region	Buying options	Buying options
Tourist and cyclist signage	Safety	Tourist and cyclist signage	Cleanness	Staff willingness

Source: Own elaboration according to research outputs

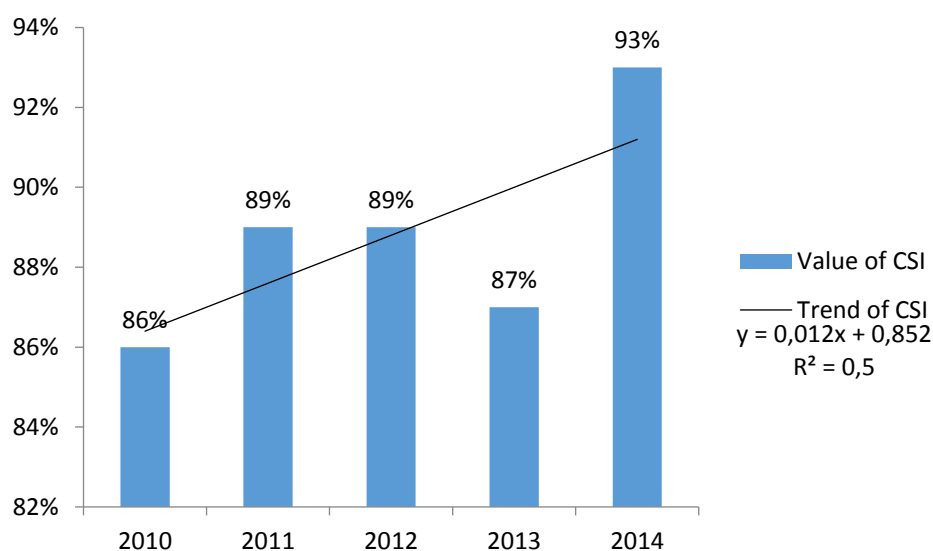
Trend of Customer Satisfaction Index growth since 2010 till 2014 is described by Figure 3, where we can see increasing trend in the value of CSI in Moravian-Silesian region, when in four years raised 86% in 2010 to 92.5% in 2014, which is in total upswing of 6.5%. And in comparison with other Czech regions in 2010 the value was a bit upper-average, but in 2014 satisfaction was under-average. Council of Moravian-Silesian region reflects on this situation by changing strategy of tourism and supports it by new marketing techniques.

Table 4 - Customer Satisfaction Index (CSI)

(%)	2010	2011	2012	2013	2014	Average
Moravian-Silesian region	86	88.5	88.76	86.75	92.5	86.0
Change	0	2.5	-0.75	-1.0	5.75	1.3

Source: Own elaboration according to research outputs

This trend is also described by linear regression line with its equation, which expresses positive growing trend since 2010 till 2014. In only two years, 2010 and 2013 were values of CSI very close to average value of 86%.



Source: Own elaboration according to research outputs

Figure 3 - Trend of Customer Satisfaction Index

All these findings mean, that visitors in Moravian-Silesian region were very satisfied with their visits and during interviewing they appraised by high evaluation. Further step would be to discover, if their satisfaction influences repeated visit of the region.

## Discussion

In the discussion part, evaluation of research questions has been done with following outcomes: First research question was “How intensive is utilization of visitors’ satisfaction in regional marketing?” In the Czech Republic in last 10 years was rising number of examples of utilization of visitors’ satisfaction in case of tourist satisfaction and also measurement of inhabitants’ satisfaction. Some other cases were used in Czech cities such Ostrava or Český Těšín.

Answer for research question “What are the main factors which visitors evaluate by highest satisfaction?” means, that these factors are safety, friendliness, landscape attractiveness and tourist and cyclist signage, which plays very significant role in the Czech Republic, because Czech is famous for high quality of its tourist and cyclist signage. For public policy makers is important to improve factors with lower level of satisfaction and take care of factors with high importance. Third question “How CSI (Customer Satisfaction Index) has been developed since 2010 till 2014?” is proved by Figure 2, where rising trend since 2010 till 2014 is visible. This is described by regression function and comparing years 2010 and 2014, average value of Customer Satisfaction Index ascended from 86% to 93%.

Public authorities can use these finding in formulation strategies for further period and based on these outputs they can do deeper analysis, what are areas which they have to focus on. Besides presented methods of



customer satisfaction measurement, exists other methods which are more or less used such Balanced Scorecard or benchmarking. More detailed information about these methods is in Půček (2014a) and Půček (2014b).

## Conclusion

The main contribution of the article is a description and utilization satisfaction measurement as a one of marketing techniques in the field of regional marketing, which is until now not very used in the Czech Republic. There are presented contemporary information about regional marketing, its theory, history and applications. Presented methods of satisfaction measurement are suitable for practical use and there are also used in the project of visitors' satisfaction measurement in Moravian-Silesian region. Even though, regional marketing has still more important role in the regions and countries, it is not implemented as a complex approach to managing these spatial areas (like in companies), but almost only same chosen methods and techniques. Very important output or regional marketing is also to set marketing strategy to address potential visitors.

The main findings of presented research example in the field part of article are distribution of total satisfaction, factors with the highest level of satisfaction and also sinking trend of visitors' satisfaction in last three years.

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## Fractal Analysis of Moroccan Dirham Exchange Rate: Theory and Comparative Results

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### Abstract:

*Given the central position occupied by the exchange rate and its important role in terms of equilibrium of the supply of and foreign currency demand, its analysis appears among the most active areas of economic research. In this regard, researchers were developed several parametric and non-parametric approaches to model exchange rate behavior. Among these methods, we are particularly interested to fractional Brownian motion (fBm) to model the complexity of used series. The main step of this model is the estimation of Hurst index, which plays a very important role in the research of processes with self-similarity proprieties.*

*In this paper, we analyze firstly, the evolution of two important series of exchange rates which have a significant impact on the Moroccan economy. In the second, we carry out a comparative analysis of the Hurst exponent statistical properties, using geometrical, temporal, spectral and multi-scale analysis estimation methods. The choice of the efficient method is evaluated in terms of robustness and efficiency.*

**Keywords:** exchange rate, fractal, fractional Brownian motion, Hurst exponent.

**JEL Classification:** C13, C14, C15, C60, E52, F31.

### 1. Introduction

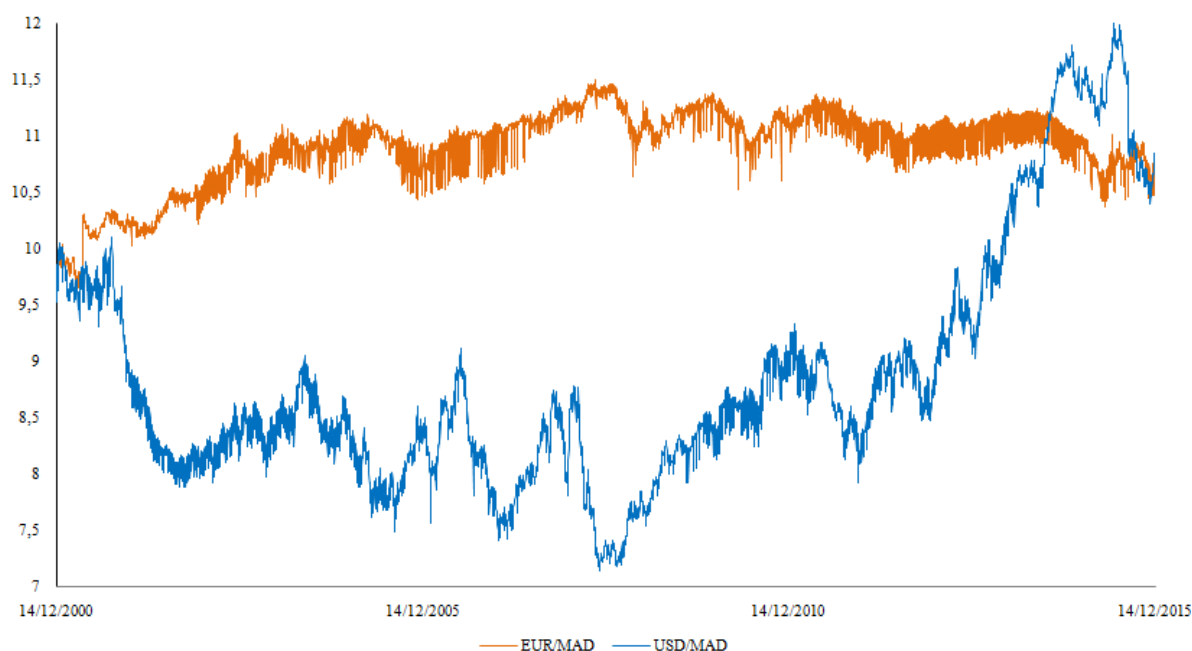
Exchange rate has been one of the most active areas of economic research over the last years. It occupies a central position in monetary policy, where it may serve as a target or a key macroeconomic instrument. This indicator may be actively managed, in conjunction with other components of monetary policy, with the aim of achieving desired objectives in the areas of inflation or balance of payment. To achieve these goals, monetary authorities can adopt diverse exchange rate regimes. Morocco, for example uses a fixed one, since April 25, 2001. Due to the importance of exchange rate, several theoretical and empirical studies were established with aim the monitoring and the high accurate and precise modeling of the exchange rate evolution. In this context, the objective of this paper is twofold: on the one hand, we analyze and examine the evolution of two important series of exchange rate which have a significant impact on the Moroccan economy, namely "Euro/MAD" and "Dollar/MAD". On the other hand, we exploit the concept of fractal analysis for measuring the complexity of those series. To achieve this, we present the daily evolution of exchange rate series (Euro/MAD) and (USD/MAD) in the second section. The third one describes briefly fractional Brownian motion and fractal dimension concepts. The empirical estimates are discussed in section four. The paper ends with results and discussions.

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## 2. Presentation of the Data. Exchange rate Series



Source: OANDA ([www.oanda.com](http://www.oanda.com))

Figure 1 - Daily evolution of exchange rate series (Euro/MAD) and (USD/MAD)

In this paper, we consider the series of daily values of exchange rate (Euro/MAD) from December 14, 2000 to December 14, 2015. This provides us two-time series of 5,479 observations in each one, as shown by Figure 1. The Figure1 exhibits that the behavior of the Dirham vis-à-vis the Dollar and the Euro has mitigated effects. Overall, the exchange rate Dollar/Dirham has an erratic behavior, contrary to a nominal exchange rate of the Dirham against the Euro, which remained relatively stable. Despite the erratic fluctuations of Dollar/MAD and slow fluctuations of Euro/MAD, the inflation, which is economically impacted by exchange rate variations, has been contained below 2% (Ezzahid and Maouhoub 2014). This is thanks to the implementation of prudent monetary policy in one hand, and because secondly, of the support of rising oil prices in part by the State.

In the start of the analyzed period, we remark that the evolution of the national currency (Dirham) was largely influenced by the behavior of the Dollar and Euro given their preponderance in the basket of quotation of the Dirham. Thus, in the end of 2000 the Euro depreciated against the Dollar, the Dirham depreciated against the US Dollar and, conversely, has appreciated against the Euro. In April 2001, the Moroccan Dirham was devalued by 5 percent in nominal terms. Ensuing fixed exchange rate policy, pegging the Dirham to a publicly undisclosed basket where the Euro has a much larger weight than the Dollar. Since 2001, a recurrent feature of the real exchange rate has been shown a small variability and mild depreciation-both in price and in labor cost terms-which has been favorable for exports and growth (World Bank 2006). As a result, exports have gained some dynamism, showing growth rates in double digits, both in 2003 and 2004.

More recently Morocco's currency appreciated relative to its main competitor in Dollar-zone markets. In fact, no less than 10 percent from the real appreciation of the Euro compared with the Dollar in 2005.

According to IMF reports, the analysis of the dynamics of the real exchange rate equilibrium, during the 2006-2011 period (Fadlallah *et al.* 2014), suggests three distinct periods of over or undervaluation. In fact, in 2006, the real effective exchange rate of the Dirham was undervalued, relatively to its equilibrium level. The trend was being reversed and the Dirham was in balance in 2008, despite a marked slowdown as results of outbreak of the financial and economic crisis and also of the risks to macroeconomic stability. In fact, the Moroccan economy seemed to better cope with the so-called crisis. This is thanks to the implemented instruments, adopted by the Moroccan government, notably the fixed exchange rate regime. After that, the trend reversed and the Dirham was undervalued during 2009-2011. In the end of the analyzed period, the Dirham in total, is depreciated against the Euro and appreciated vis-à-vis the Dollar.

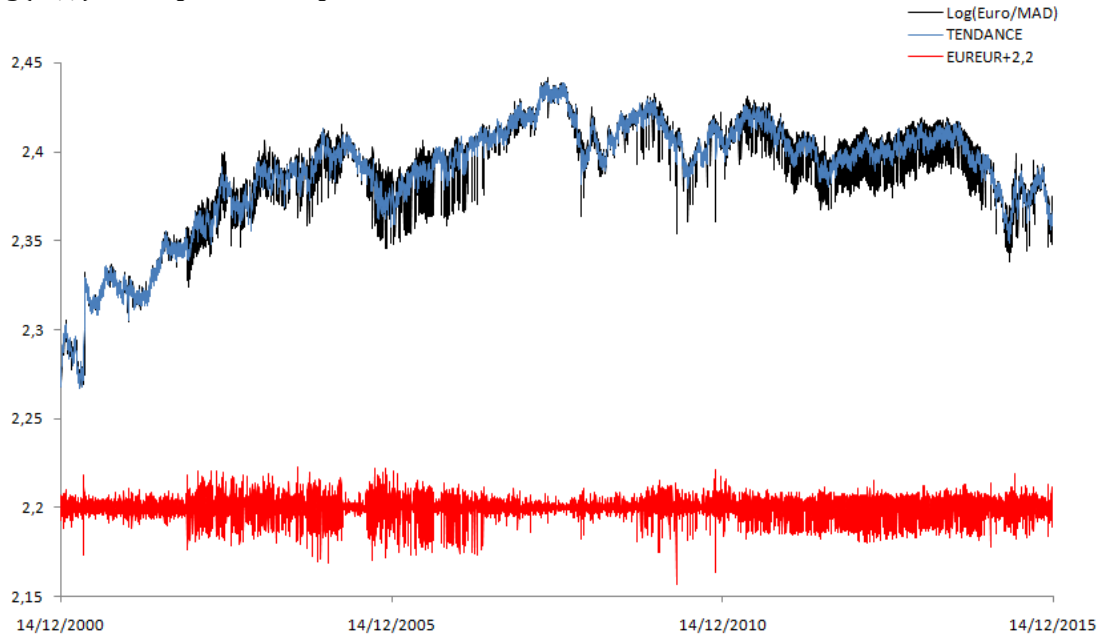
As mention in (Guasoni *et al.* 2008) and (Black and Scholes 1973), prices can be described as exponential of the sum of a regular process and a stochastic process (because they are non-negative).

$$X(t) = \exp(f(t) + Y(t)) \tag{2.1}$$

Equivalently equal:

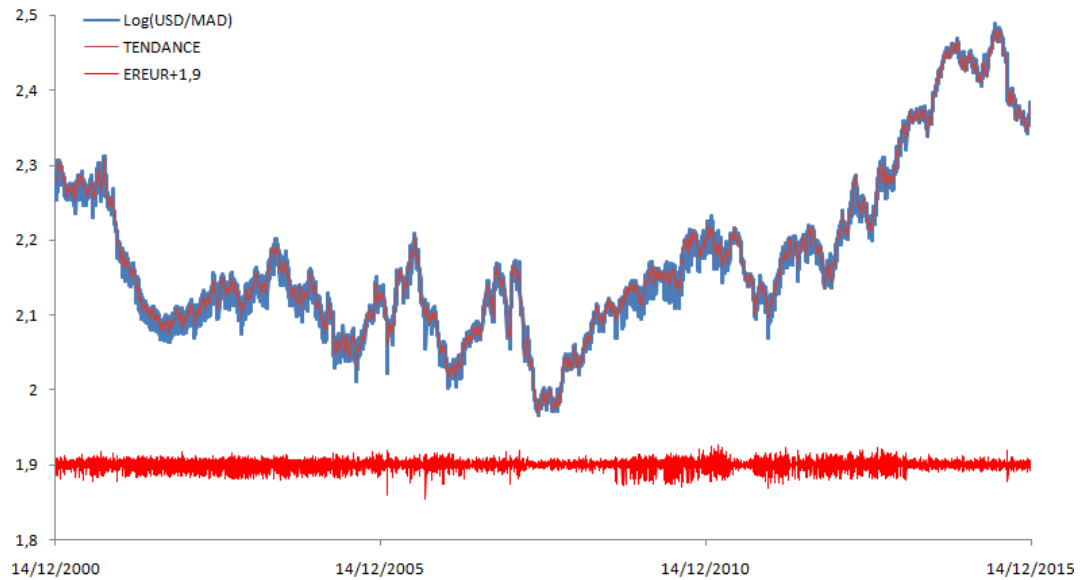
$$\log(X(t)) = f(t) + Y(t) \tag{2.2}$$

Where the function  $f(t)$  corresponds to the regular part and  $Y(t)$  is a stochastic process which can be deduced by estimating  $f(t)$  as the moving average of  $\log(X(t))$  on a centered sliding window and subtracting it to  $\log(X(t))$ , see Figure 2 and Figure 3.



Source: Author's work

Figure 2 - Logarithm of daily observation of “Euro/MAD”, low frequency part “trend” and high frequency part “residual” (plus constant)



Source: Author's work

Figure 3 -Logarithms of daily observation of “Dollar/MAD”, low frequency part “trend” and high frequency part “residual” (plus constant)

### 3. Fractal dimension, fractional Brownian motion and their application in finance

This part contains three sections, the first one, is devoted to the presentation of the fractal process and their properties, namely the self-similarity and fractal dimension. In the second section, we define the fractional Brownian motion, noted fBm and, we'll show how to simulate it and how to estimate the Hurst parameter.

#### 3.1 Fractal dimension

Many natural phenomena are better described using a dimension between two whole numbers, i.e., a fraction. Thus, a fractal curve can have a dimension between one and two in contrast to the straight line that is one dimensional. The fractal dimension measures how much complexity is being repeated at each scale. It can be used also as a measure of roughness, and in opposition to the long memory characterization, it measures the local memory of the series (Kristoufek and Vorvsa 2013) and (Kristoufek and Vorvsa 2014).

According Hausdorff, the fractal dimension is defined to be the unique value:

$$d = \dim_H(X) \text{ in } \mathbb{R}_0^+ \cup \{\infty\} \text{ such that } \mu_{d'}(X) = 0 \text{ if } d' > d \text{ and } \mu_{d'}(X) = \infty \text{ if } d' < d. \quad (3.1)$$

Where:

$$\mu_d(X) = \liminf_{\varepsilon \rightarrow 0} \sum_i (\text{diam}(U_i))^\varepsilon \quad (3.2)$$

Is a d-dimensional Hausdorff measure of a subset X in a metric space? The infimum is taken over all countable covers  $U_i$  of X such that  $\text{diam}(U_i) < \varepsilon$  (Laaroussi *et al.* 2015).

#### 3.2 Self-similarity

A self-similar phenomenon represents a process displaying structural similarities across a wide range of scales of a specific dimension. In other words, the reference structure is repeating itself over a wide range of scales of diverse dimensions (geometrical, statistical or temporal), and the statistics of the process did not depend on scale (Laaroussi *et al.* 2015).

However, these properties do not hold indefinitely for real phenomena and, at some point, this structure breaks down. Self-similarity can therefore be associated with fractals, which are objects with unchanged appearances over different scales. Examples of geometrical fractal processes are the Cantor set, Sierpinski triangle, Koch curve, etc. In the case of statistical fractals, it is the probability density that repeats itself on every scale, like for instance as found in economics (Pareto's law), in linguistics (Zipf's law) and in sociology (Lotka's law). On the other hand, a dynamical fractal is generated by a low-dimensional dynamical system with chaotic solutions, as it happens in biology (Willis law) and in medicine (cardiac spectrum) (Zohuri, 2015).

Statistically, a stochastic processes  $X = (X_t, t \geq 0)$  taking values on  $\mathbb{R}$  is said to be self-similar if for any  $a \geq 0$ , there exist  $b(a) \in \mathbb{R}$  such that

$$(X_{at}, t \geq 0) \equiv (b(a)X_t, t \geq 0) \quad (3.3)$$

With  $(\equiv)$  signifies equality in distribution.

In (Lamperti 1962), it is proved that  $b(a)$  can be expressed as  $b(a) = a^\gamma$ , where  $\gamma \geq 0$ . Hence the definition of self-similar processes becomes:  $X = (X_t, t \geq 0)$  is self similar, if for any  $a \geq 0$ , there exist  $\gamma > 0$  such that:

$$(X_{at}, t \geq 0) \equiv (a^\gamma X_t, t \geq 0) \quad (3.4)$$

#### 3.3. Fractional Brownian motion

##### 3.3.1. Definition and proprieties

In the pioneering work by Mandelbrot and van Ness (Mandelbrot and Van Ness 1968), fractional Brownian motion is defined by its stochastic representation:

$$B^H(t) = \frac{1}{\Gamma(H+\frac{1}{2})} \left( \int_{-\infty}^0 [(t-s)^{H-1/2} - (-s)^{H-1/2}] dB(s) + \int_0^t (t-s)^{H-1/2} dB(s) \right) \quad (3.5)$$

With  $\Gamma$  represents the Gamma function  $\Gamma(\alpha) = \int_0^\infty x^{\alpha-1} \exp(-x) dx$  and  $0.5 < H < 1$  is called the Hurst index from the statistical analysis, developed by the climatologist Hurst (Hurst 1951), of the yearly water run-offs of Nile river. The fractional Brownian motion is completely defined by its covariance function, given by:

$$\text{Cov}(B_t^H, B_s^H) = \frac{1}{2} (|t|^{2H} + |s|^{2H} - |t - s|^{2H}), t, s \in \mathbb{R}. \quad (3.6)$$

And it has the following properties:

- $B_H(t)$  has stationary increments;
- $B_H(0) = 0$ , and  $\mathbb{E}(B_H(t)) = 0, \forall t \geq 0$ ;
- $\mathbb{E}(B_H^2(t)) = t^{2H}$  for  $t \geq 0$ ;
- $B_H(t)$  has a Gaussian distribution for  $t > 0$ .
- $B_H(t)$  is a self similar process, i.e.  $\forall a \geq 0, \exists \gamma > 0$  such that:  $B_H(at) \equiv a^\gamma B_H(t)$ .

From the Eq. (3.6) of the covariance function, we deduce that fractional Brownian motion is characterized by the presence of long-term correlations, when  $H$  is different from 0.5. So we can distinguish three cases, the first one illustrates the short memory (no long memory) when  $H=0.5$  (the fBm is a standard Brownian motion).  $H<0.5$  If the auto-covariance of the increments of fBm is negative, so the increments of fBm have opposite signs. Such fBm is called anti-persistent, i.e. an increase of the variable tends to be followed by a decrease and vice-versa. Conversely, if  $H>0.5$ , this indicates persistence phenomena (long memory), i.e. the evolution of the series tends to follow trends, in the manner that if the series has increased earlier, so there is a high probability that it continues to do so.

### 3.3.2. Simulation of fractional Brownian motion

Since few theoretical results and properties are known about fractional Brownian motion, it is important to know how this process can be simulated. Several simulation methods have been proposed. While some of these methods are fast enough, fastness compromises accuracy in most cases. In fact, it is hard to capture all aspects of fBm numerically due to its fractal character.

The only exact method to simulate an fBm would be to generate a Gaussian vector  $X(t_1), \dots, X(t_n)$  through Cholesky decomposition of its covariance matrix. Clearly, this approach is impractical for large sizes due to its complexity and memory requirement. An approximate, but very fast approach is the random midpoint displacement method (Iau *et al.* 1995). It consists to subdivide an interval recursively and constructs the values of fBm at midpoints from the values at end points. We can evoke also fast Fourier transform (FFT) and Wavelet synthesis of fBmas alternative methods for simulation of fBm (Wornell 1990).

### 3.3.3. Estimation of Hurst index

After simulation of fBm process, estimating of the Hurst exponent for experimental data plays a very important role in the study of this type of processes. In this section, we briefly describe the main parametric methods to estimate the self-similarity parameter which can be classified into four categories:

- Methods based on the properties of the fractal geometry: Box-counting method;
- Time Domain based Analysis: Rescaled range (R/S) method and Generalized Quadratic Variation (GQV) Estimator;
- Frequency based Analysis: log-periodogram, a variant of Lobato and Robinson’s method;
- Methods based on a multi-scale analysis: wavelet decomposition of the fBm.

#### Methods based on the properties of the fractal geometry

Geometrical methods are based on fractal dimension estimation. Many formulas have been developed, principally, box-counting dimension defined as follow:

$$\dim_B(F) = \lim_{\delta \rightarrow 0} \frac{\log N_\delta(F)}{-\log \delta} \quad (3.7)$$

In practice, we use box counting algorithm, which is intuitive and easy to apply. Given a sequence  $(\epsilon_n)$  decreasing and tends to 0 slowly enough (as a geometric sequence, for example). The fractal object (E) is covered with a mesh network square of side  $(\epsilon_n)$ , and includes the number  $(\Omega_n)$  of square meeting point E.

The fractal dimension is then:

$$D(E) = \lim_{n \rightarrow \infty} \left[ \frac{\log(\Omega_n)}{\log(\frac{1}{\epsilon_n})} \right] \quad (3.8)$$

The corresponding log-log diagram is defined as:

$$\left( \log\left(\frac{1}{\varepsilon_n}\right), \log(\Omega_n) \right)$$

For different value of  $\varepsilon_n$ , we find the number  $\Omega_n$ . After this we represent this plot, and we extract the fractal dimension as the opposite of the slope (Laaroussi *et al.* 2015). For a univariate series, it holds that  $1 < D \leq 2$ . In general,  $D = 1.5$  holds for a random series with no local trending or no local anti-correlations. For a low fractal dimension  $D < 1.5$ , the series is locally less rough and thus resembles a local persistence. Reversely, a high fractal dimension  $D > 1.5$  is characteristic for rougher series with local anti-persistence.

### Time Domain based Analysis: Rescaled range (R/S) method and Generalized Quadratic Variation (GQV) Estimator

#### Rescaled range (R/S) method

The Hurst exponent can be calculated by rescaled range analysis (R/S analysis), proposed by Mandelbrot to inspect the long memory for financial time series. It should be noted that the use of R/S analysis is not restricted to finance domain. It is extended to several research fields like earthquake prediction, stock market indices and, runoff time series and stream networks in Agricultural Watersheds. (Cheng *et al.* 2013)

To define R/S statistic, let us consider a time series  $\{X_t\}$  of the sample of length  $T$  which is divided into  $k$  intervals of length  $n$  ( $n * k = T$ ), and the average of  $n$  series observed values is  $\bar{X}_n = \frac{1}{n} \sum_{i=1}^n x_i$ . The range of each subinterval is defined as  $R(n)$  and the standard deviation as  $S(n)$ .

Take the statistical R/S:

$$Q_n = R(n)/S(n) \tag{3.9}$$

The range  $R(n)$  and the standard deviation  $S(n)$  are respectively:

$$R(n) = \max_{1 \leq k \leq n} [\sum_{j=1}^k (x_j - \bar{x}_n)] - \min_{1 \leq k \leq n} [\sum_{j=1}^k (x_j - \bar{x}_n)] \tag{3.10}$$

$$S(n) = \left[ \frac{1}{n} \max_{1 \leq k \leq n} [\sum_{j=1}^k (x_j - \bar{x}_n)^2] \right]^{1/2} \tag{3.11}$$

We can prove that  $\lim_{n \rightarrow \infty} (n^{-H} Q_n) = C$ ,  $C$  is a constant and  $H$  is Hurst exponent. So can get approximate estimate  $H$ ,  $H = \ln(Q_n) / \ln(n)$ .

In general, the R/S analysis method is described as follows:

$$(R/S)_n = C \cdot n^H \tag{3.12}$$

Where  $R$  is rescaled range and  $S$  is a standard deviation. We introduce logarithm on Eq. (3.12):

$$\log\left(\frac{R}{S}\right)_n = \log(C) + H \cdot \log(n) \tag{3.13}$$

The Hurst exponent  $H$  is the slope obtained after a linear regression of  $\ln(Q_n)$  on  $\ln(n)$

#### Generalized Quadratic Variation (GQV) Estimator

Considering one path of the process  $X$  at  $N$  regularly spaced times  $k/N$  for  $k = 0, \dots, N - 1$ . For convenience, we assume that  $N$  is even. Since the Hurst index corresponds to the roughness of the path, a first idea is to measure it through quadratic variation (Bertrand *et al.* 2010).

$$V_N^{(1)} = \sum_{k=1}^N \left| X\left(\frac{k+1}{N}\right) - X\left(\frac{k}{N}\right) \right|^2 \tag{3.14}$$

Which, implies that

$$\mathbb{E} \left( \left| X\left(\frac{k+1}{N}\right) - X\left(\frac{k}{N}\right) \right|^2 \right) = C * \left(\frac{1}{N}\right)^{2H} \tag{3.15}$$

To sum up, the mean quadratic variation corresponds to the empirical variance of the increments and by using stationary of the increments, one can deduce that  $V_N^{(1)}$  is equivalent to  $C * (1/N)^{2H-1}$  when  $N$  goes to infinity. And after that the estimator  $\hat{H}_N$  defined by:

$$\hat{H}_N = \frac{1}{2} \left( 1 + \log_2 \frac{V_{N/2}^{(1)}}{V_N^{(1)}} \right) \tag{3.16}$$

converges as to  $H$  (Benassi *et al.* 1998). Moreover when  $H \in [0, \frac{3}{4}]$ , the quadratic variation satisfies a Central Limit Theorem (CLT) with rate of convergence  $N^{-1/2}$  (Guyon and Leon 1989) and after  $\hat{H}_N$  with the same rate of convergence (Coeurjolly 2005).

When  $H \in [\frac{3}{4}, 1]$ , the quadratic variation does no more satisfy CLT (Guyon and Leon 1989). For this reason, it has been replaced by the generalized quadratic variations (GQV):

$$V_N^{(2)} = \sum_{k=1}^N \left| X\left(\frac{k+1}{N}\right) - 2X\left(\frac{k}{N}\right) + X\left(\frac{k-1}{N}\right) \right|^2 \tag{3.17}$$

which satisfies CLT with rate  $N^{-1/2}$  (Istas and Lang, 1997) like the estimator  $\hat{H}_N$  given by Eq. (3.16) after having replaced quadratic variation by generalized quadratic variation. Let us stress that in Eq. (3.16), the quantity  $(2\hat{H}_N - 1)$  corresponds to the slope of the log empirical variance computed with the two meshes  $1/N$  and  $2/N$ . Actually, the variance of the Hurst estimator can be reduced by using linear regression of the log empirical variance onto log of a family of  $p$  meshes  $j/N$   $j = 1, \dots, p$ . (Coeurjolly 2005)

Frequency basis analysis

The log-period gram approach

According (Coeurjolly 2000), this approach consists in exploiting, on the one hand, the spectral signature of the fGn (fractional Gaussian Noise)

$$f(\lambda) \sim c_f |\lambda|^{1-2H} \text{ as } |\lambda| \rightarrow 0,$$

And on the other hand the fact that the period gram defined by:

$$I_N(\lambda) = \frac{1}{2\pi N} \left| \sum_{t=0}^{N-1} X(t) e^{-it\lambda} \right|^2, \quad \lambda = \lambda_{k,N} = \frac{2\pi k}{N} \tag{3.18}$$

It should be noted that:

$$\log \mathbb{E}(I_N(\lambda)) \simeq \log c_f + (1 - 2H) \log(|\lambda|) \tag{3.19}$$

Pointing out, the linearity in Hof  $\log \mathbb{E}(I_N(\lambda))$  in a neighborhood of 0. Let  $1 \leq m_1 < m_2 \leq N^* = [N - 1/2]$  and define  $\hat{\alpha}_N$  as the estimator deduced from the linear regression of  $\{\log(I_N(\lambda_k))\}_{m_1 \leq k \leq m_2}$  on  $\{\log(\lambda_k)\}_{m_1 \leq k \leq m_2}$ . Thus, the estimator of the self-similarity parameter is done by:

$$\hat{H}_N(m_1, m_2) = \frac{1}{2} (1 - \hat{\alpha}_N) \tag{3.20}$$

Geweke and Porter-Hudak (Geweke and Porter-Hudak, 1983) prove the asymptotic normality for  $\hat{H}_N(m_1, m_2)$ :

$$\frac{\sqrt{m_2}}{\log(N)} (\hat{H}_N(m_1, m_2) - H) \rightarrow N(0, \frac{\pi^2}{6}) \tag{3.21}$$

(if  $m_1$  and  $m_2$  satisfy  $\sqrt{m_2} \log(m_2)/m_1 + m_1 \log^2(N)/m_2 \rightarrow 0$ )

Variant of Lobato and Robinson

By denoting  $F(\lambda) = \int_0^\lambda f(\theta) d\theta$ , Lobato and Robinson (Lobato and Robinson 1996) remark that there exists, in a neighborhood of 0, a log-linear relation between two values of  $F(\lambda)$ .

Let  $q \in ]0, 1[$ , one gets immediately,  $\frac{F(q\lambda)}{F(\lambda)} \sim q^{2-2H}$ , as  $|\lambda| \rightarrow 0$ . By estimating  $F(\lambda_k)$  by:



$$\hat{F}(\lambda_k) = \frac{2\pi}{N} \sum_{j=1}^{\lfloor \lambda_{k,N} / \lambda_{k,N} \rfloor} I(\lambda_j) \quad \text{for } k = m_1, \dots, m_2 \quad (3.22)$$

one deduces an estimator of H:

$$\hat{H}_N(q, m_1, m_2) = 1 - \frac{1}{2 \log(q)} \log \left\{ \frac{\hat{F}(q\lambda_{m_2})}{\hat{F}(q\lambda_{m_1})} \right\} \quad (3.23)$$

For  $1/2 < H < 3/4$ , Lobato and Robinson exhibit the optimal value of  $q$  via simulations. Let us mention that if one chooses  $m_1$  and  $m_2$  as previously, one may obtain an asymptotic normality result similar to Eq. (3.21) (Coeurjolly 2000).

### Methods based on a multi-scale analysis

The multiresolution wavelet analysis considered as an effective tool for a time series analysis, for which the main idea consists in the expansion of a time series on an orthogonal base, formed by shifts and the multiresolution copies of the wavelet function. The Base functions  $\psi(t)$  are named wavelets, if they satisfy a number of conditions, in particular they should be defined in place of complex-valued functions with restricted energy, which oscillate around an abscissa axis, converging rapidly to zero and having a vanishing moment of the first order. Discrete wavelet-transform (DWT) is a continuous and discrete form of wavelet-transformation consisting of a two decomposition researched series: approximating and detailing, with their successive separation for the purpose of increasing the decomposition level. Discrete wavelets are used, as a rule, together with scaling-functions connected to them. Scaling-functions with wavelets have the general definitional domain and a determined relation between values (Kristoufek *et al.* 2011).

For a given mother wavelet  $\psi$  and corresponding scaling-function  $\varphi$ , the approximate coefficients  $a(j, k)$  and detailing coefficients  $d(j, k)$  are defined as follows:

$$d(j, k) = \int_{-\infty}^{+\infty} X(t)\psi_{j,k}(t)dt, a(j, k) = \int_{-\infty}^{+\infty} X(t)\varphi_{j,k}(t)dt \quad (3.24)$$

where:

$$\varphi_{j,k} = 2^{-j/2}\varphi(2^{-j}t - k) \text{ and } \psi_{j,k} = 2^{-j/2}\psi(2^{-j}t - k) \quad (3.25)$$

According to the DWT, the time series is represented as the sum of detailing and approximating components:

$$X(t) = \text{approx}_j(t) + \sum_{j=1}^J \text{detail}_j(t) = \sum_k a(j, k)\varphi_{j,k} + \sum_{j=1}^J d(j, k)\psi_{j,k}(t) \quad (3.26)$$

For estimation of the Hurst exponent in applied research, the method described in (Abry 1998) is the commonly used. The mentioned method is based on the statement that the averaged squared values of the wavelet coefficients  $E_j = \frac{1}{n_j} \sum_{k=1}^{n_j} |d(j, k)|^2$  obey the scaling law:  $E_j \sim 2^{(2H-1)j}$  where  $H$  is the Hurst exponent. The following equation represents the practicable method of the estimation of the Hurst exponent:

$$\log_2(E_j) = \log_2 \left( \frac{1}{n_j} \sum_{k=1}^{n_j} |d(j, k)|^2 \right) \sim (2H - 1)j + \text{const} \quad (3.27)$$

### Results and discussion

Exchange rate processes are always non negative and are better fitted by a log normal process. Thus, in this section, we have extracted residual part from the logarithm of (USD/MAD) and (Euro/MAD) series using the mobile average method. Then we have computed the Hurst index of the logarithm of raw series and their residuals. Thus, we have in sum multiple estimations for four resulted series. The different estimations of the Hurst index are associated to the four families of approaches:

- Geometrical Methods: Box-counting method;
- Temporal methods: Rescaled range (R/S) method and Generalized Quadratic Variation (GQV) Estimator;
- Frequency methods: Log-periodogram, a variant of Lobato and Robinson's method;
- Multi-scale analysis: Wavelet decomposition of the fBm.

The implementation of the previous mentioned methods are realized in Matlab and R (Jennane *et al.* 2001). The Table 1 below, shows the different values of estimations

**Table 1** - Estimation of Hurst exponent

	Geometrical Methods	Temporal methods		Frequency methods		Multi-scale analysis
	Box-Counting Method	R/S Analysis	GQV Estimator	log-periodogram	Variant of Lobato and Robinson	Wavelet analysis
Log (USD/MAD)	0.4029	0.8853	0.4896	0.5024004	0.4707199	0.5123
Residuals (USD/MAD)	0.4029	0.2761	0.4964	0.5021212	0.4604807	0.4982
Log (Euro/MAD)	0.4029	0.8749	0.4570	0.4990937	0.4681777	0.4848
Residuals (Euro /MAD)	0.4029	0.2688	0.4557	0.4968101	0.4614190	0.4592

Source: Provided by authors

Based on these results, we can remark first, that subtracting the regular part has no effect on the value of Hurst index. This explains that the roughness is not affected by adding or subtracting a regular function, thus, Hurst index which corresponds to roughness of the path is similar both for the studied series and their irregular parts.

Secondly, we denote that the used methods give different values of H index with remarkable differences comparatively to R/S analysis and the geometrical approach. In fact, these methods suffer from several problems; in one hand, (Lo 1991) showed that the statistic "R/S" has two major disadvantages:

- It is sensitive to short memories: "R/S" statistic cannot distinguish the short-term characteristics and long-term properties of the series (in the case of finite sample).
- It does not constitute a statistical test, because of its unknown asymptotic distribution.

In the other hand, the box counting method suffers from many problems related, essentially to sampling (Jennane *et al.* 2001). Various authors have compared the different estimation techniques. Theoretically, even if the asymptotic efficiency results are demonstrated for some estimators, there is no reason to confirm their behavior in all circumstances (reduced length of signals, noise sensitivity ...). It is therefore necessary to conduct experimental studies to better understand the potential of estimators. These studies consist to generate asynthetic fBm signal based on theoretically accurate simulations. Each technique will be evaluated in terms of bias (robustness) and variance (efficiency) (Taqqu *et al.* 1995) and (Jennane *et al.* 2001).

To determine the best fitted value of Hurst index, we referred to (Jennane *et al.* 2001) and (Kirichenko *et al.* 2011) which mention the performance of Maximum Likelihood Estimation and Wavelets analysis in terms of bias minimization. Nevertheless, it must be noted that, the results obtained in (Jennane *et al.* 2001) showed that the maximum likelihood estimation (MLE) is efficient only for short length signals. By contrast, (Kirichenko *et al.* 2011) confirm that the wavelet analysis has minimal bias. In addition, they demonstrate that the standard deviations of the estimates depend on the estimation method and decrease while the length of series increases. Basing on this ascertainment and using simulations, they found that the minimal standard deviation is obtained for wavelet estimator.

Following these considerations, we favor the wavelet analysis among the other methods and we adopt it, in our case, as the best estimator of H index for LOG(USD/MAD), LOG(Euro/MAD) and their residuals series.

Recall that, Hurst exponent (H) close to 0.5 would represent a self-determining process, in which the current value of the series would not dependent of past values of the series. According to this proposition, results for our case indicate that Hurst Exponent for LOG(USD/MAD) and LOG(Euro/MAD) are measured 0.5123 and 0.4848 respectively, which are approximately equal to 0.5.

Hence, the considered exchange markets exhibit Brownian motion of the exchange rates time series. In simple words, the both series indicate the performance of Random walk, which means that there is a no correlation between the present and future values. However, we can evoke that that the exchange rate Euro/MAD exhibit more erratic behavior than USD/MAD exchange rate. This can be explained by the monetary policies adopted by Morocco, concerning the choice of the exchange rate regime, which is characterized by a fixed regime instead the flexible one.

The characteristic demonstrated in this paper, in regard to exchange rate behavior, has a negative fallout vis à vis the competitiveness of Morocco economy. As mentioned in (Ezzahid *et al.* 2014), the loss-function values



of monetary authorities under flexible exchange rate regime, remain below the values under the fixed exchange rate regime for a degree of openness above 40%. Thus, the flexible regime is an optimal choice in this context. However, in terms of the general price level, the flexibility of the exchange rate will undermine price stability.

## Conclusion

The dynamic of exchange rate, considered as a key macroeconomic indicator, is entirely determined by a wide range of economic, financial, political and social factors. This fact has not been without effect on the stability of the banking system, prices and competitiveness. Consequently, the study of exchange rate behavior appears to be of great importance. In this regard, many researchers tried to adjust several models and among them we find a Fractional Brownian motion (fBm), which requires the estimation of the so-called Hurst exponent.

In this paper, we conduct a comparative analyze of different estimators of this index using geometrical, temporal, spectral approaches and methods based on a multi-scale analysis. The comparison is based on a simulation of a synthetic fBm signal with a specific Hurst index values. The estimation of this index will be evaluated in terms of bias (robustness) and variance (efficiency).

The retained value in our study consecrated to analyze the (USD/MAD) and (Euro/MAD) series, exhibits Brownian motion (fBm with  $H$  very close to 0.5) of the exchange rates time series. In simple words, the both series indicate the performance of Random walk, which means that there is no correlation between the present and future values. This fact is partially due to the fixed adopted regime of exchange rate in Morocco which was chosen by monetary authorities to ensure the stability of MAD in terms of nominal effective exchange rate and to reduce the fluctuation effect of international currencies.

Thus, our main contribution in this paper is to prove the behavior of Random walk of exchange rate, which is attributed to the adopted regime. This choice has a direct negative effect in terms of competitiveness and a positive effect on price stability, hence the importance of studying the fixity-flexibility choice, which represents a real dilemma for monetary authorities, in terms of benefits and risks.

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## The Major Role of the Small and Medium-Sized Enterprises in the Market Economy

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### Abstract:

*The small and medium-sized enterprises (SMEs) have always played a special role in the economic and social life of the countries based on a market economy, being at the basis of revival of many economies. The dynamism, the flexibility, the mobility, the innovative potential means the characteristic of SMEs, being considered essential for the cohesion of the economic structure, for the economic growth and for the creation of the new jobs. The present paper aims to highlight the importance and necessity of the creation and development of the small and medium-sized businesses in the countries which are based on the market economy, starting from the definition of the concept in the various authors' vision in the field, continuing with the presentation of specific features of the small and medium-sized businesses and with the presentation of the main classification criteria of these. At the end of the paper we highlight the role and importance of the small and medium-sized businesses, as generators of the biggest part of the Gross Domestic Product of every country and by providing the jobs for the majority of the occupied population.*

**Keywords:** micro-entreprises, small enterprises, medium-sized enterprises, turnover, number of employees, total assets.

**JEL classification:** M13, M21.

### 1. Introduction

In the recent decades SMEs have an experienced spectacular development, occupying an important place in the economic structures of the most countries of the world, gaining the appreciable proportion as number, the employees and turnover in all the companies. We can say that one of the characteristic features of the current stage of evolution and of the modern economies is the spectacular development of SMEs. Basing on these affirmations the paper presents the SMEs which are in the forefront of the economic development.

The largest part of the gross domestic product (GDP) occurs within the small and medium-sized enterprises, the majority of the occupied labour force works in SMEs, the most dynamic companies in the top fields-computer science, genetics, biotechnology, management consulting, engineering, etc.-are or were SMEs until a few years ago, and a big part of the recent inventions and innovations was generated by SMEs.

In the first part of the paper we begin to items of a general nature concerning the definition of SMEs. The acronym "SMEs" entered in the current language to refer to small and medium-sized enterprises, a category of the big companies. The main reason for which it is necessary to have a definition of small and medium-sized enterprises is that in the last period, at the level of very many countries, there is wanted the implementation of the industrial (preferential) policy regarding this type of companies. The rigorous analysis of definitions relating to small and medium-sized enterprises leads to a division of them into two subcategories: on the one hand the definitions using the quality criteria, being named the sociological and analytical criteria and, on the other hand, those use quantitative criteria.

From the category of the quantitative definitions there is the most important definition from the European Union level which is also adopted and in the Romanian legislation.

Thus in the European Commission Recommendation there is stated: "the category of the micro enterprises, small and medium-sized enterprises (SMEs) is made from enterprises which employ fewer than 250 persons and which have an annual net turnover of up to 50 million euro and/or hold total assets until 43 million euro." In the second paragraph, we present the distinctive features of them according to the various specialists' opinion in the field. Brief characteristics of SMEs are: small size or relative reduced size; specialization; extremely dynamic demographics; difficulties that they meet at the entrance or exit on/from the market; high innovative potential; flexibility; workers' polyvalence; insufficiency of available capital. The penultimate paragraph will describe the most relevant criteria for the classification of small and medium-sized enterprises as: property type, type of market and operating space, growth rate and rate of innovation. In the last paragraph we will insist on the role of SMEs in the economy: it generates the biggest part of GDP of each country, it provides the jobs for the majority of the occupied

population, it generates in a large proportion the technical innovations of the economy, it increases the competitive nature of the markets, etc.

## 2. Defining the small and medium-sized enterprises (SMEs)

The first aspect to be addressed relates to the definition of SMEs. There is no widely recognized definition of SMEs. The definition of SMEs, considering the following aspects:

- the size of the business: turnover, share capital, number of staff, profit (the most important/frequently used criterion is that of the number of staff).
- management unit: General Confederation of small and medium-sized enterprises (Confederation General PME) asserts that SMEs is an enterprise owned and led by 1 person. Statistics show that 45% were created and led by one and the same person.

There is a multitude of approaches, ranging from partially different philosophies regarding about the company size and the ways of expression and quantification. The authors (Nicolescu and Nicolescu 2008) say that the different approaches of the definition of SMEs can be summarized in Table 1.

Table 1 - The main types of approaches of the definition of SMEs

No.	CATEGORIES OF APPROACHES		
	CRITERIA	NAME	THE DOMINANT FEATURE
1	The coverage of the economy	Summarizing	They establish the same criterion or the same criteria for the definition of SMEs for all the branches of the economy
		Differentiated	They establish the different criteria for defining SMEs, depending on their field of activity (industry, trade, transport, etc.)
2	The number of the used indicators	One-dimensional	They define the dimensioning of SMEs based on a single indicator, the number of employees
		Multidimensional	They define the dimensioning of SMEs on the basis of several indicators; the most commonly used indicators are : the number of employees, turnover and share capital

Source: Nicolescu O., Nicolescu C., *Entrepreneurship and Management of the small and medium-sized enterprises*, Economic Publishing House, Bucharest, 2008, page 60

The various approaches from the literature are due to the quota and the diversity of the phenomenon. According to Julien, (1986) the diversity is the first feature for the universe of SMEs. The generic name of "small and medium-sized enterprises" can retrieve the entities of very different sizes. SME is a company with five employees, but it is one with 200 employees. After some authors (or certain public bodies) a small or medium - sized enterprises can even have up to 500 employees. A wide range can be ascertained with regard to the legal status adopted by the small and medium-sized enterprises, i.e. the natural person authorized to a limited liability company or even joint-stock company.

Faced with this economic and legal heterogeneity the specialists throughout the world turned his attention on the definition of small and medium-sized enterprises. As a result of the contribution of these authors there have been appeared many definitions, but they did not reach at a universally accepted definition.

The rigorous analysis of definitions relating to small and medium-sized enterprises could lead to a division of them into two subcategories: on the one hand the definitions using quality criteria, named as sociological or analytical criteria, and, on the other hand, those uses quantitative criteria.

### Qualitative approaches

The qualitative approach more accurately captures the socioeconomic reality represented by small and medium-sized enterprises. The various qualitative definitions, in their quasi-totality, but in a different way, emphasize the distinctive elements and the characteristics of small or medium-sized enterprises.

#### Unicriterial approach - human dimension

A fundamental element returns in a constant way, although with different intensity, in the definitions concerning small and medium-sized enterprises (SME): the human face. Thus, of a general manner the SME can be defined as an "entity under a manager's authority, responsible for all aspects of the enterprise, which is often the owner and who has a life strictly connected with this enterprise". The leader (the owner) of the enterprise is omnipresent in undertaking qualitative approaches. His role is considered crucial in small and medium-sized enterprises

### *Small business act (1953)*

On this line, in 1953, SUA, Small Business Act, the main act governing the activity of the small and medium-sized enterprises, in force today, presents the fact that the important criteria are: an enterprise be considered small, being managed in an independent manner, belonging to a independent contractor and not to be in a dominant position on the market. The first two criteria are therefore localized at the level of the enterprise; the third refers to the market structure, exogenous to the enterprise.

### *Bolton report*

In 1971, the United Kingdom, there has been drafted a paper that took as aim the conceptualizing, the definition of a small enterprises as socio-economic entity. Due to a reduction in the number of newly established enterprises, established during the 1950s-1960s, British authorities set up a Committee under Professor J.E. Bolton's chairmanship, for the analysis of the problems of small and medium-sized enterprises. The results of this analysis are contained in a report which remained known in the literature under the name of the President of the Commission. The definition of small and medium-sized enterprises, entered by this report, takes into account three criteria: fact that the organisation should be led by the owner, in a personalized manner, enterprise has a relatively narrow part of the market, enterprise is independent.

In addressing the phenomenon of small and medium-sized enterprises, the report Bolton insists on the related elements of the owner's personality. According to this analysis, the small or medium-sized enterprises is led by its owners in a personalized manner and not based on a formalized management structure.

### *Multicriterial approach*

In addition to qualitative approaches which establish as focus of the definitions relating to SMEs of the leader/owner of the company, there was developed a range of multi-criteria approaches which adds, at the human element, a number of other descriptive elements. An initial multicriterial approach was Woitrin's (1966), in a study devoted to the analysis of the SMEs sector in the European Community. Along with the entrepreneur, there are highlighted the features of SMEs:

- a little specialized leading staff;
- personal relationships between management bodies and employees, customers, suppliers and owners
- lack of forceful positions for negotiating supply and sales;
- the strong bond with the local community of which the owners are part and a big dependence of markets and sources of supply in the vicinity;
- difficulty purchasing the capital from the external sources.

Wynarczyk (1993) has also developed a qualitative multicriterial definition of SMEs. According to this author, the following three aspects are crucial to highlight the difference between SMEs and the large companies: uncertainty, innovation, evolution. Wynarczyk's definition highlights the clear differences between SMEs and the large companies. Hirigoyen (1984) proposes three criteria for defining SMEs: responsibility, the property, objective of yield.

### *Quantitative approaches*

The qualitative criteria which are used in defining SMEs should often be based on some empirical studies, the fact which makes quite the control process of framing of an enterprise in the category of small and medium-sized enterprises. For the sake of simplification there were developed the quantitative approaches for the definition of SMEs. Within these approaches the size of enterprises is assessed using the indicators such as: the number of employees, turnover, balance sheet total etc.

### *The American approach to quantitative standards*

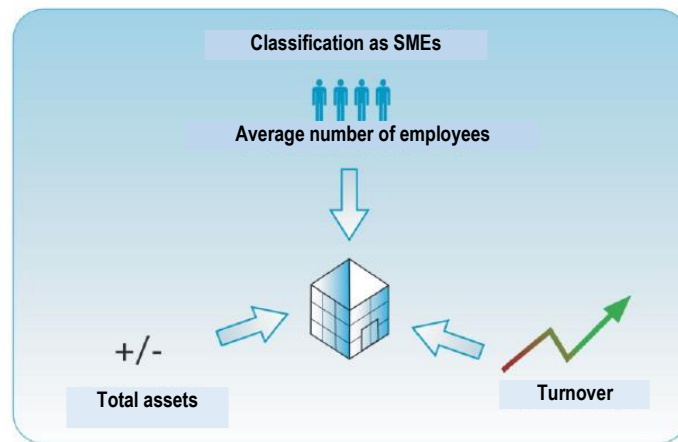
The Small Business Act, the document to which we made reference, in addition to some elements of quality order, there are specified, in a different way on economic sectors, the certain quantitative standards. Small Business Act establishes the limits for the two indicators (turnover and number of employees), limits in terms of which an enterprise may be regarded as small.

### *The European approach concerning the definition of small and medium-sized enterprises*

In 1996, there was adopted by the European Commission a recommendation that established the first definition of SMEs. This definition was applied throughout the European Union. On the 6<sup>th</sup> of May 2003 the Commission adopted a new recommendation. This recommendation entered into force on the 1<sup>st</sup> of January 2005 and applied to all policies, programmes and measures which were initiated by the Commission for SMEs. For the



Member States using the definition is optional, but the Commission recommends that both their and the European Investment Bank and European Investment Fund use widely this definition. The European definition of the small and medium-sized enterprises is based on three criteria: the average number of employees, total assets, and turnover. The three criteria are presented in Figure 1.



Source: <http://www.mie.ro/euroimm/docs/Ghid%20ANIMMC.pdf>

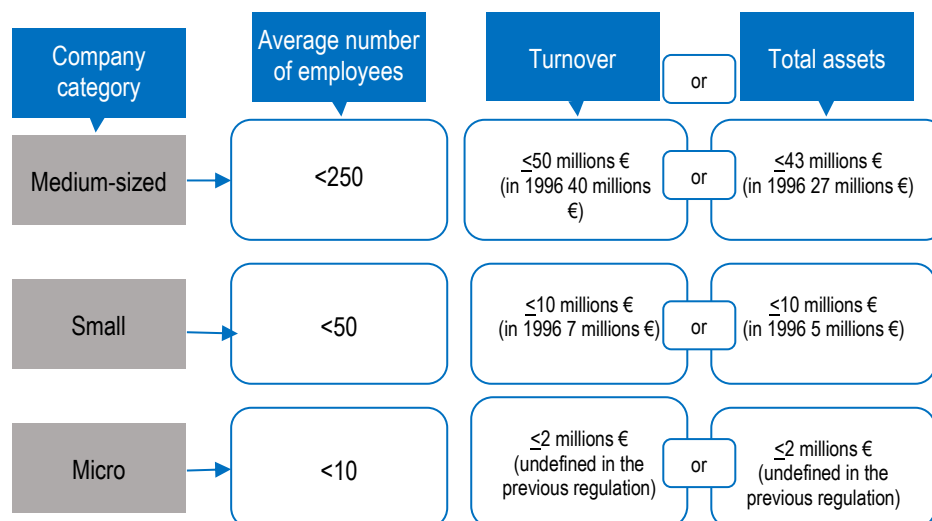
Figure 1 - The European Commission's criteria for defining small and medium-sized enterprises

In the European Commission recommendation there is presented the fact: "The micro enterprises category, the category of small and medium-sized enterprises (SMEs) are made up of businesses which employ fewer than 250 persons and which have an annual net turnover of up to 50 million euro and/or hold total assets of up to 43 million euro." (Fragment from Article 2 of the annex from the Recommendation 2003/361/EC). In relation to this definition, there are made several clarifications and distinctions. The first clarification is aimed at sharpening the term "enterprise". In accordance with the terminology which is used by the European Court of Justice in its decisions, means enterprise "any entity engaged in an economic activity, regardless of its legal form". Therefore, persons, family associations, partnerships and associations engaged in an economic activity can be regarded as enterprises. There are still required some details concerning the three criteria: average number of employees, annual net turnover and total assets.

Firstly, it should be noted that, while respecting the limit relating to the average number of employees is mandatory, an SME may opt to meet either the limit relating to the turnover per year, either to the total assets. It is not necessary to satisfy both criteria and one of them can be exceeded without losing the status of SMEs. The new definition gives the opportunity of choosing between this criterion and the total assets criterion indicating an enterprise bonus to ensure an equal treatment to SMEs engaged in different types of economic activities.

In Romania, the definition of small and medium-sized enterprises is provided in the "Law 346/2004 on the establishment and development stimulation of the small and medium-sized enterprises", with subsequent amendments and additions. SMEs are defined as businesses which meet the following cumulative conditions: average annual number of employees less than 250, net annual turnover of up to 50 million euro, equivalent in lei, or hold total assets not exceeding the equivalent in lei of 43 million euro, according to the last approved financial situations. Total assets mean fixed assets plus current assets plus expenses in advance. Depending on the size of the three indicators there are distinguished three types of enterprises (Figure 2):

- medium-sized enterprises are defined as enterprises which have up to 250 employees and achieved a net annual turnover up to 50 million euro or hold total assets of up to 43 million euro;
- small enterprises are defined as enterprises which have up to 49 employees and achieved a net annual turnover or hold total assets of up to 10 million euro;
- micro-enterprises are defined as enterprises which have up to 9 employees and achieved a net annual turnover or hold total assets of up to 2 million euro.



Source: <http://www.mie.ro/euroimm/docs/Ghid%20ANIMMC.pdf>

Figure 2 - Classification of SMEs according to the European recommendations

### Number of employees

The definition of SMEs by number of employees, the same for all fields of activity, was generalized by the European Union and in other European countries inclusive in Romania. This criterion is essential to determine in which category fits each SME and covers the permanent staff, part-time and at temporary staff, including: employees, persons working for the enterprise being subordinated to it and who are considered as employed by national legislation, owners-managers, partners who are engaged in the usual activities of the enterprise and benefiting from financial advantages from the enterprise.

The disciples or pupils and students who are involved in professional training programs, having contracts of apprenticeship or vocational training are not included in the number of employees. There are not also included the employees who are in the maternity or parental leave. The average number of employees is expressed in annual work units. Anyone who worked full-time in the enterprise or as representative of it during the entire year will be measured as a unit. Part time staff, seasonal workers and those who worked all year are considered as fractions of the unit.

The advantages of using this criterion resides in: ease of expression and understanding of its size; its periodic reporting in official statistics; avoiding the apparent modification of the company size under the impact of financial factors, especially inflation and the exchange rate; easy comparability of the size of companies, even if they are from different countries or branches.

### Turnover and total assets

Net annual turnover is determined by calculating the incomes that the enterprise carried out in the course of a year from sales and services after all debts were paid. It should not include VAT or other indirect taxes. Total assets refer to the value of the company assets (fixed assets, current assets, prepaid expenses). If an enterprise exceeds the financial limits which are established for turnover and total assets and the limits for the average number of employees during the year, this will not affect the enterprise situation. This will keep the status of SME (small and medium-sized enterprises) with which started the year.

However, it will lose this status if the limit will be exceeded during the second annual consecutive financial exercises. In the same way, it will gain the status of SME if in the previous period it was a great company, but then it came under these limits over two consecutive financial exercises. To work with the data of an enterprise, there must be established if the enterprise is autonomous-the most common category- partner or linked.

An enterprise is autonomous if: it is totally independent, *i.e.* not holding the share capital or voting rights in any other enterprise and any other enterprise does not have share capital or voting rights; it holds less than 25% of the share capital or of the voting rights (which ever is greater) in one or more enterprises and/or another enterprise does not have more than 25% of its share capital or of the voting rights.

An enterprise is a partner if: share capital and/or voting rights held at another company are equal to or greater than 25%, and/or another company holds more than 25% of the share capital or voting rights of the

company; it is not linked to another enterprise, it means among other things that the held voting rights in another enterprise must not be greater than 50% (and vice versa).

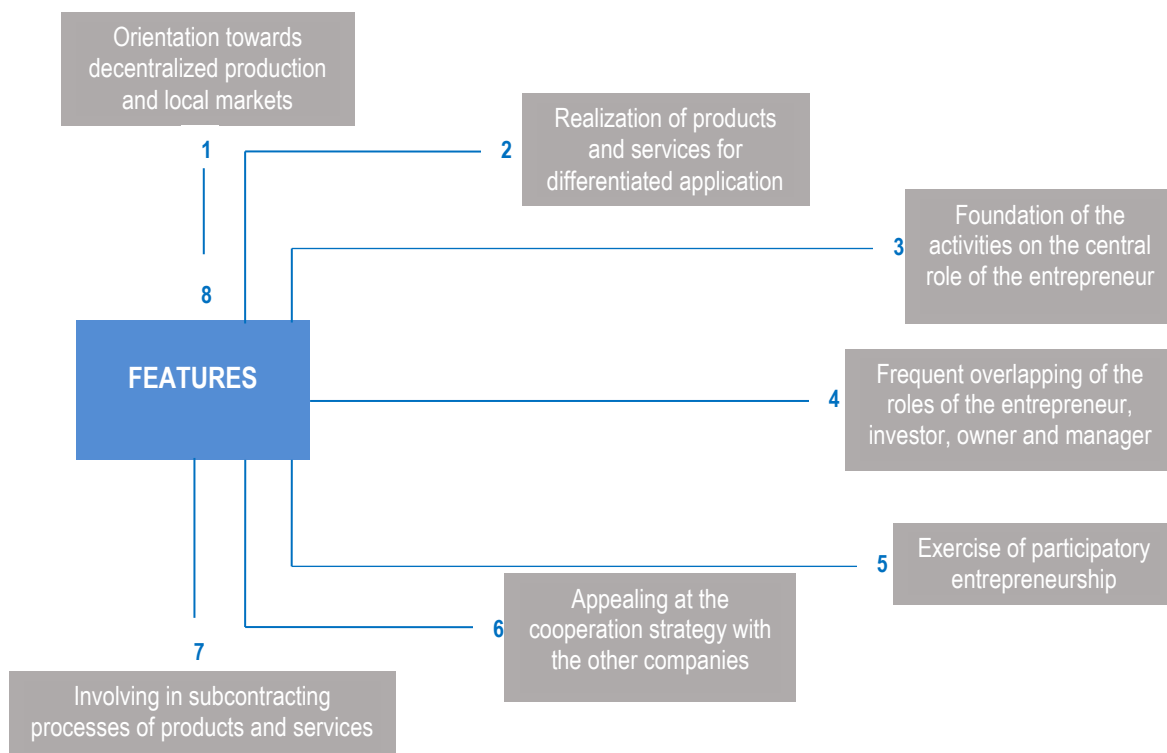
When determining the status of SMEs, whether an enterprise is a partner, at its data there must be added a part of financial data and the data concerning the number of employees of the partner enterprise. This proportion will reflect the percentage of share capital held and/or of the voting rights. Two or more enterprises are linked when they are characterized by the following types of connections:

- an enterprise has a majority of the shares or of the voting rights in another enterprise;
- an enterprise has the right to appoint or dismiss a majority of the people from the Board of Directors, enterprise management or supervisory bodies enterprise of another enterprise;
- the contract between the enterprises or a clause of the Act of incorporation or the status of one of the businesses, allows one of them to exercise a dominant influence over the other;
- an enterprise can by agreement to exert control over a majority of the shares or voting rights of the other enterprise.

When determining the status of SMEs, 100% data of the enterprise should be added to those of enterprise analyzed in order to determine compliance with the reports concerning the number of employees and financial statements referred in the definition. In Romania the definition of small and medium-sized enterprises in Recommendation No. 2003/361/EC was introduced by Government Ordinance No. 27/2006 modifying and completing law No. 346/ 2004 are concerning the stimulation of foundation and development of small and medium-sized enterprises.

### 3. Specific features of Small and Medium Size Enterprises

SMEs have a number of defining traits that make them be more than just a "thumbnail" of large enterprises, they reflect their reduced size and its consequences in the design plan of the activities: In the literature there is a diversity of views concerning the main features of SMEs. According to prestigious specialists Frohlich, Hawraken, Lettmayr, Pichler 1994) the defining features of SMEs are those rendered in Figure 3.



Source: Frohlich E.A., Hawraken P.M., Lettmayr C.F., Pichler J.H., *Manual for Small Industrial Business-Project Design and Appraisal*, UNIDO, Viena, 1994

Figure 3 - The prevailing characteristics of small enterprises



Russu (1999) believes that SMEs present the following features:

- *Reduced or relative reduced size* with these following main implications:
  - it determines a reduced productive potential of goods and/or services, which limits the part which is individually owned on the market by these enterprises to an account of insignificant rule;
  - it determines the inability to achieve economies of scale and benefit of effects which happen in the costs of production and profits;
  - it obliges the SMEs play, on these markets, most of the time, the role of price taker;
  - it determines that SMEs adopt, in the most cases, a dependency strategy towards one or more large enterprises.
- *The relative reduced size of SMEs* is a determinant factor of their specialisation. SMEs, because of their size and relatively limited production potential, cannot carry out an extensive range of products or services, and they are obliged to focus the activities in the production of homogenous goods or services, in a restricted classification.
- *The highly dynamic Demographics*, determined by high birth rates and mortality of SMEs during the representative periods (usually a year);
- Another feature of SMEs relates to the difficulties that they encounter at the entrance or exit on /from a market, these difficulties being incomparably wider than those of the large companies;
- *High Innovational Potential* also characterizes SMEs despite the restricted financial resources which are allocated to the research-development;
- SMEs are flexible, able to quickly modify the products and offered services, according to the changing conditions of the market and they are able to adapt to dealing with their application in the field of business;
- SMEs Employees are multiqualified;
- *The insufficiency of available capital*, own or attracted, which significantly restricts the management possibilities concerning the maintainance at or close to the level of specific technologies and equipment of the large enterprises.

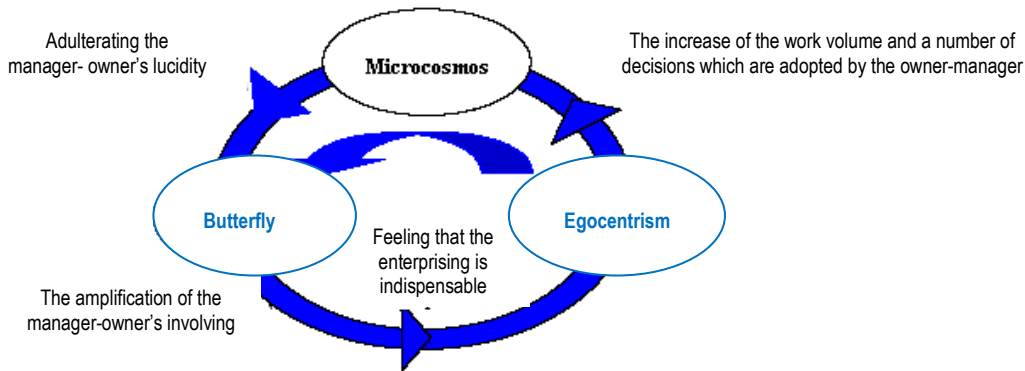
In addition to these features, being identified in the biggest part of the speciality literature as specific for SMEs, there are also in the sense provided by authors Gibson and Van der Vart (2008) the other disparate found elements:

- they do not have important contacts with the governmental and financial sector;
- they are, unlike big enterprises, less involved in the actions of government corruption;
- they are less active in the social projects of the community in which they operate.

Torres, W.O. (1999) proposes three features for SMEs:

- "Butterfly effect" which means that any apparently minor problem can lead to a series of consequences in a SME, thanks to their economic vulnerability.
- "the microcosmos effect" in accordance with which the entrepreneur deals mostly with short-term implications, strictly related to the company micro-environment.
- "the effect of egocentrism" stresses the hipertofiere effect of the ego developer. Being very concerned about him, the entrepreneur cannot delegate (correctly) the decision taking.

A vicious circle linking these three features (Figure 4): "the effect of egocentrism" and "microcosmos" adulterates the owner-manager's lucidity. This fact increases the vulnerability of the enterprise and triggers/emphasizes "Butterfly effect", wishing the owner-manager be involved in the operation of the enterprise (amplifying "effect of egocentrism"). By increasing the volume of work, the owner-manager takes, obviously, more and more decisions (which may lead to a "microcosmos effect").



Source: Torres O., *Les PME, Dominos*. Evreux: Flammarion, 1999.

Figure 4 - The vicious cycle of the features of SMEs

We believe that each of the above traits, are specific to SMEs, the difference being in the focus of the authors only on some of them.

#### 4. Tipology of Small and Medium sized Enterprises

Both theoretically and pragmatically, the typology of SMEs is a very important element. The variety of typologies is high because of the multitude of involved variables. There are several criteria for the classification of SMEs. The specialists as Birley and Westhead (1990) outlined eight criteria after what there can be classified SMEs, namely: company age, type of ownership; nature of the practised management, the organizational structure, achieved production, industry belonging to the company, location of the company, profile relationship product/market. In the following, we present those classifications that we consider representative for more accurate understanding of the characteristics of SMEs and entrepreneurs. Author Julien (1994) undertook the most comprehensive study concerning the classification of SMEs. Below we describe some of the most important criteria, with the appropriate typology. The first criterion by which we can differentiate SMEs is the property structure. A family enterprise has different growth prospectuses of small and medium-sized enterprises whose capital is owned by a large company.

Julien (1994), quoting other authors, subscribes two possible classifications of SMEs depending on the type of property, described in Table 2.

Table 2 - Typology of SMEs after the type of property

Authors	Type of property		
Deeks, J. (1973)	Monocratic (one owner)	Patrician (property of a family )	Oligarchic (more owners)
Barry, B. (1978)		Personal (the founder has the control)	Family (transmitted to a family member)

Source: Julien P.A., *Les PME: Bilan et perspectives*, Less Presses Inter Universitaires, Cap-Rouge, Quebec, 1994

The same author also proposes other classification criteria for SMEs, such as: gross size, activity sector, market, control and organization, strategy, used technology.

**Gross size.** Depending on the number of employees, assets and turnover there are three types of SMEs: very small enterprises, small enterprises, medium-sized enterprises.

**Activity sector.** The small enterprises can be developed in all the economic sectors. Every sector offers to SMEs certain advantages, but also poses certain problems, such as: production field, trade field, services field.

**Market.** The typologies which are identified in this case focus on the opportunities and types of markets evolving SMEs. The different angles of approach are: type of market, offered products.

**Control and organization.** In report of the degree of autonomy there are distinguished as extreme, independent SMEs and satellite (linked) SMEs. Between these two extreme points there can be identified several types of SMEs which are linked through various partnerships of large enterprises. In terms of organization there can be

distinguished the centralized enterprises (with a limited number of hierarchical levels) and the decentralized enterprises (with several hierarchical levels).

**Strategy.** SMBs can opt for an intuitive survival strategy, less risky, or for a formalized strategy, of growth, riskier. Between these extremes an SME (small and medium-sized enterprises) can opt for a strategy which is in the middle of maintaining, of stabilizing on a market. In relation to the objectives of the owners, SMEs can be: handmade, classic entrepreneurial, managerial.

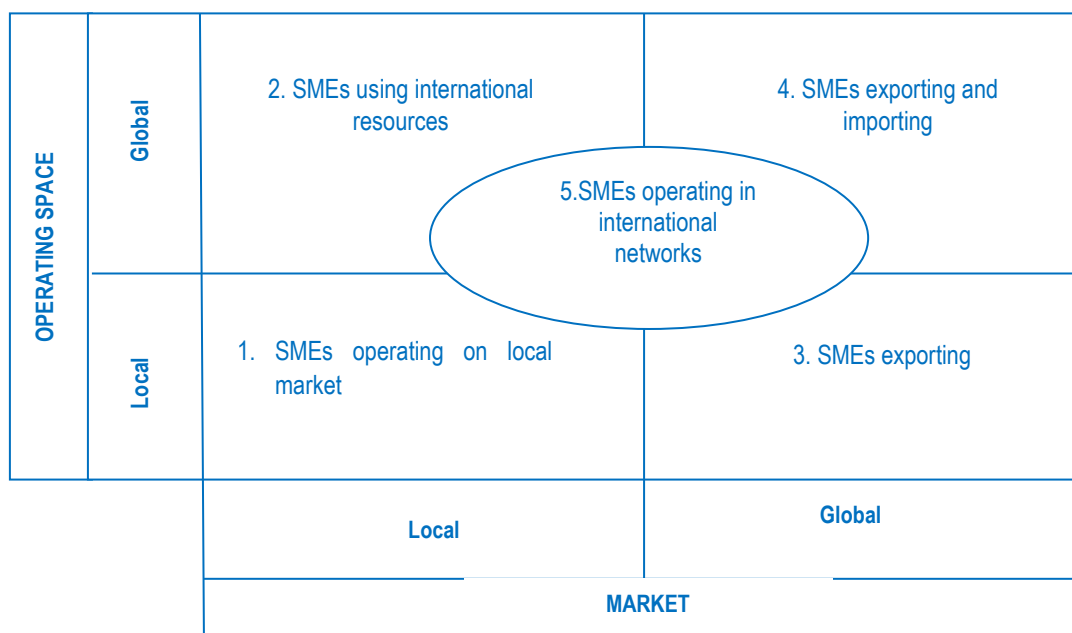
**Used technology.** There may be SMEs which use the traditional technologies, within the innovation activity is not very intense, but of incremental nature, or conversely SMEs can use a highly specialized technology, where the innovation is radical, of top. Lately, a particular attention is given to SMEs from the branches of top, high-tech.

Thus, in a recent study of the European Union (EU) SMEs from the top technique zone are divided into three categories: SMEs from the sectors of high-tech and media, new SMEs founded by free entrepreneurs, SMEs integrated in the big companies that generate innovations and market the products under the pressure of the main clients.

These three types of SMEs are vital for the functionality and performance of EU, being the germs of the information society and of the knowledge economy that will be "set up" in the coming decades. At the beginning of the millennium III century there is outlined a new type of SME (small and medium-sized enterprises), SME focused on knowledge that has the following characteristics:

- predominance of intangible assets;
- incorporation of activities involving a strong density of knowledge;
- use of a pronounced specialized workforce;
- intensive development of the activities of research and development, highly innovative products and services;
- use of high technologies;
- offer of products and services likely to be exported;
- short-lived products and services.

In another paper Julien and Morin (1996) propose a classification of SMEs in the globalized world conditions. Figure 5 reflects two criteria: operating space (local and global) and market nature on which they act (local and global) in terms of which there will be distinguished five types of SMEs.



Source: Julien P.A. and Morin M., *Mondialisation de l' Economie et PME Quebecoises*, Sainte Foy: Presses, Universitaires du Quebec, 1996

Figure 5 – SMEs classification by type of market and operating space

Another specialist Kirchoff (1998) establishes a classification of entrepreneurial companies considering the growth rate and rate of innovation in these companies. Kirchoff's matrix shown in Figure 5 identifies, basing on these criteria, four types of companies:

- *The common companies* are the most ordinary SMEs. They are characterised through a reduced level of the innovation rate and of the economic growth rate. These companies primarily satisfy the desire for the entrepreneur – owner's independence. The companies from this category may initially have some increase, but when the size corresponds to the entrepreneurs – owners' needs, the growth is stopped.
- *Constrained companies*. The growth of these companies is restricted by lack of resources. They are characterized by a high rate of innovation, but a lack of adequate resources blocks their growth. They are usually taken over by other large or small companies which have the appropriate resources, being attractive for their innovative potential.
- *Ambitious companies* can reach a high level of development with a limited number of innovations. One successful product or service can sustain a strong growth over several years. If the market is not stable, however an ambitious company quickly falls into decline if it does not introduce the new products and services.
- *Star Companies*. The high rate of growth can be sustained over time only by a high rate of innovation. Kirchoff calls these "star" companies because they attract the media attention and receive national and local awards for their success.

THE RATE OF INNOVATION	High	Constrained Companies	Star Companies
	Low	Common Companies	Ambitious Companies
		Low	High
		GROWING RATE	

Source: Kirchoff, 1998

Figure 5 – Classification of SMEs depending on the rate of growth and innovation rate

According to the authors Frank and Lejer (1997) "regardless of the type and characteristics, SMEs present the triple dimension: instrumental; politico-social; cultural - reflexive".

### 5. The role and importance of Small and Medium sized Enterprises

The main catalyst of the economic growth is represented by small enterprises. These small enterprises contribute largely to the achievement of the fundamental objectives of any national economy. SMEs have an essential contribution to the economic and social development; their role can be summarized as follows:

- SMEs can be set up quickly in large numbers and in all parts of the country, whereas it requires financial resources and relative reduced technical material;
- they generate a significant proportion of GDP of each country typically between 55-95% and they represent one of the main sources of revenue of the State budget (taxes, VAT, etc.);
- SMEs provide the jobs for the majority of the occupied population, thus they contribute to social stability of the zone in which they operate;
- SMEs responding to the desire of the most competent and active part of the population to achieve economically in the present context;
- they generate in a big proportion the technical innovations which can be applied in the economy;
- they achieve the products and services at lower costs than the large companies, the main factors that determine this difference being lower fixed costs, lower volume and higher intensity of work under the

conditions proposed in the company developer's presence and, as a rule, the more intense motivation of the staff.

Kocak and Edwards studied the importance of entrepreneurial behavior and inter-firm co-operation for small companies seeking growth in a volatile, recession-hit environment. Inter-firm co-operation includes both horizontal and vertical relationships (Kocak and Edwards 2005). Kambil has examined how managers could respond to recessions and navigate their companies to success (Kambil 2008). He observed that the organizations that sustained their focus on revenue growth and market share were most likely to succeed. Petrakis and Kostis explore the role of interpersonal trust and knowledge in the number of small and medium-sized enterprises (Petrakis and Kostis 2012). They conclude that knowledge positively affects the number of SMEs, which in turn, positively affects interpersonal trust. Note that the empirical results indicate that interpersonal trust does not affect the number of SMEs. Therefore, although knowledge development can reinforce SMEs, trust becomes widespread in a society when the number of SMEs is greater. Borza A. reported that "according to a study which was carried out in US the small and medium-sized enterprises have a profit of 4 times higher per \$ 1 invested towards the large companies (Borza 2009). Pointing all the major importance of SMEs in the contemporary economy does not mean the underestimating of the role of the large companies. The economy of each country for being of performance, supposes a strong component of the large companies, especially in the industry and transport fields. The economic realities demonstrate the existence of the strong relationships of complementarity with the large companies, on the one hand, and SMEs, on the other hand. An economy is more "healthy" and more efficient if it presents a balanced structure not only in an industry way, but also in a dimensional way, obtaining the higher synergy effects.

## Conclusions

In Romania, after 1990, there was produced a veritable explosion in the field of creation and development of SMEs, which determined their strong affirmation in the national economy, the high growth of their contribution to the achievement of GDP, at the increase of the exports and at the creation of new jobs. In spite of the inherent difficulties the transition process of the Romanian economy to the market economy and in spite of the insufficient attention granted to the problems of SMEs, in the first years of transition there was emerged a distinct sector of this category of businesses, whose institutional framework developed and strengthened continuously, thus occupying a definite place in the configuration of the economy assembly.

In the present paper we started defining SMEs, stressing that there is not a widely recognized definition of SMEs, in the literature being many approaches, leaving from the different philosophies regarding on the size of the company and of the expression and quantification ways. The analysis of definitions relating to SMEs determined the division into two subcategories: on the one hand the definitions using quality criteria and on the other hand, the definitions are using the quantitative criteria. We presented the three criteria of the European Commission for the definition of SMEs, namely: average number of employees, total assets and turnover.

We also presented, with the help of a figure, a ranking of SMEs according to European recommendations, depending on the size of the three indicators, distinguishing three types of companies: medium-sized enterprises, small enterprises and micro-enterprises. In the next paragraph we showed the distinctive features of SMEs according to many authors. Dynamism, flexibility and adaptability, resistance in the crisis conditions represent the characteristic features of SMEs, which are regarded as essential for the creation of new jobs. It explains that the trend of concentration of the economic activity are reversed in favor of often the small-sized units, whose role becomes major in the restructuring the economies, in achieving a balance of the activities on the national territory and thus in the economic growth.

Finally, SMEs, although by definition are relatively reduced in size, present a remarkable complexity and variety, characteristics and specific functionality, whose knowledge and taking into account are compulsory in order to amplify their economic and social performances.

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\*\*\* Recommendation 361/2003/CE.

\*\*\* Law 346/2004 regarding the establishment and development of small and medium-sized enterprises, with subsequent amendments.

\*\*\* Government Ordinance no. 27/2006 amending and supplementing Law no. 346/2004 is regarding the establishment and development of small and medium-sized enterprises.

## Organizational and Financial Mechanism of New Russian Industrial Policy: Systemic Approach

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### Abstract

*Under the conditions of global uncertainty and unbalance of domestic economic policy, organizational and financial mechanism of new Russian industrial policy should ensure possibility for realization of risk-oriented strategies for Russian companies, i.e., it should include topological strategies of transforming investment, institutional modeling, increase of the quality of business environment, projecting and realization of financial tools, implementation of interactive technologies of monitoring and control, evaluation of initial and final effectiveness of projects, and possibility for correction of parameters of program documents on the basis of data on modification of external environment, transformed technologies of artificial neuron networks and processes means of financial diagnostics for achievement of high-precision financial engineering for the purpose of resource provision of development of Russian non-financial companies.*

**Keywords:** industrial policy, clusters, management, investment and financial mechanism, corporate finances, risks, development management, infrastructural projects.

**JEL Classification:** G63, L52.

### 1. Infrastructural development and incorporation as organizational outline of new Russian industrial policy

Experts with liberal views criticize domination of companies with state participation in Russia – but it should be acknowledging that, for the purpose of anti-crisis regulation and in view of global geopolitical risks, use of possibilities of large state corporations for provision of realization of economic goals is well reasoned. This is caused by the fact that private investors cannot be quickly and effectively integrated into projects which are to some extent related to provision of economic security: private capital is oriented at self-preservation and reproduction, that's why it is unlikely that private investors will be able to be good intermediaries in long and expensive projects under the conditions of unstable external environment.

It should be noted that development of startups in Russian economy is not excluded – quite on the contrary, it is welcomed, but direction of innovational business should correspond to strategic interests of Russia, but not popularize technologies oriented at forced development of consuming society. The thesis on “a priori ineffectiveness of state companies”, declared by liberal expert society, is not justified: contemporary economic history showed that effectiveness of business is determined not by structure of owners.

Firstly, the very definition “effectiveness” does not have generally accepted treatment and metrics. Secondly, index indicators of profitability (which are often used as effectiveness metrics) are often determined by the level of informational perturbations in market. Thirdly, financial results of companies' activities are influenced by quality of business environment which depends on many economic and – more often – non-economic factors. A vivid example of illegality of a priori statements on effectiveness is growth of Gazprom, which – under the difficult geo-economic conditions – exceeded the index MSCI World Energy Sector Index (*Bershidsky 2015*). Rosneft's results are worse, but it is still in the growth area. Index PMI (Project Management Institute) in Russia exceeded 50, which shows recovery of business activities.

It should be taken into account that tendencies for incorporation are preserved in economy of Western countries: thus, large private investors lobbied the Agreement in free trade between the European Union and the USA, or Transatlantic Trade and Investment Partnership (TTIP). Large Western investors are interested in attempt of changing institutional norms of regulation of rules of business, crating precedents of presumption of investors' interests over sovereign interests of countries-members of the future agreement, thus ensuring barriers of entering the market for Eurasian and Asian companies. This example is indicative for understanding modern tendencies of

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doing business under the conditions of high uncertainty: only those who create business environment can make it predictable, controllable, and certain.

In our opinion, this is a reason for preservation of tendency for incorporation and enlargement of business: large corporations have a possibility for provision of necessary terms of functioning, and small and medium business not has such possibility, as this option contradicts fundamental basis of competition.

Modeling of parameters of local business environment by large corporations gives them a possibility for reduction of force majeure expenditures, i.e., expenditures which lead to bankruptcy and further sanitation of market during negative phase of economic cycle. Transnational companies work in business environment by the same principles as large corporations with state participation. The only difference is that the latter can be involved by country's government into realization of projects which are strategically important for national economy.

Large corporations, regardless of property structure, can form and model local business environment for conduct of their own business, i.e., internalize their transaction costs in their topological strategies in order to control them. In Russian practice, local level of executive power shows low effectiveness in part of provision of institutional conditions for doing business, which makes corporate structures look for methods, mechanisms, and tools of using administrative resource for overcoming institutional destructions. Official state's entering the structure of owners reduces risks of shadow business and development of corruption schemes. It is wrong to think that opportunistic behavior and rental schemes during cooperation of business and government are an end in itself for large investors. In present Russian reality, there are a lot of examples in which positive cooperation of business and the state led to the positive result (projects in Ulyanovsk and Rostov Oblasts, Krasnodar Krai; at the federal level, there is an example of realization of large projects by the Federal road agency Rosavtodor within public-private partnership).

For Russia, large corporations with state participation are, as a matter of fact, drivers of neo-industrial growth. Their task is to provide basic production infrastructure for further attraction of private investors within public-private partnership. Thus, one of the vivid examples of that is construction of transfer hubs for railroad, car, and air travels. Construction of multimodal complexes in the suburbs of large cities ensures investment attractiveness of residential areas and development in the sphere of trade and entertainment services and solved the problem of de-urbanization. This is one of the few examples of positive cooperation of state and private capital, realized within the model of transforming investment, which is a trend in investment activities for developing countries.

Large geopolitical risks, negative dynamics of energy markets, and significant risks caused by global threat of extremism makes transnational infrastructural projects in Asian-Pacific region of top-priority nature for provision of anti-crisis possibilities of the global economy.

Thus, the research "World Energy Outlook 2015" (International Energy Agency 2015), published on June, gives 2 scenarios of development of energy market. Basic scenario is oriented at recovery of market due to increased demand from India, China, countries of Africa, Middle East, and South-Eastern Asia, by means of joining the energy infrastructure of previously uncovered regions. According to the basic scenario, IEA forecasts the equilibrium price of \$80/barrel by 2020. The second scenario supposes longer period of low oil prices: by the end of the decade, there should be equilibrium price of \$50/barrel, and by 2045 – growth to \$85/barrel. The basic scenario is built on idea of reduction of oil offer due to reduction of oil production and further disappearance of certain players from the market due to low break-even point; low prices scenario is built on the idea of preservation of current volumes of oil production. It should be noted that India and China are distinguished in the IEA research: China, being the largest consumer of energy resources, focuses at further development of energy effectiveness strategy, which shows preservation of trend for change of structure and volume of demand for energy resources. In its turn, India is the most perspective market as 1/5 of the country's population does not have access to electric supply.

Satisfaction of new needs requires combined development of energy and transport infrastructure, including pipeline transport. According to the Turkish newspaper "Aksam" (Aksam, 2015), at the G20 Summit in Antalya, Turkey, the EU supported three critically important infrastructural projects which will make Turkey the energy port of Europe: gas pipeline Tesla, which will go from Greece to Austria, Trans-Anatolian gas pipeline (TANAP), which will transport Caspian natural gas to Europe, and Trans-Caspian gas pipeline (TCP), which will supply Azerbaijani and Turkmen natural gas to Turkey.

These facts show the growth of significance of energy security under the conditions of increase of the global crisis tendencies, and this problem opens new perspectives for regionalization, as a growing tendency of the global economy. Provision of energy security requires diversification of energy sources and their types, which leads to significant costs of switching and necessity for technological modernization of energy consuming equipment.

On the threshold of expected third wave of global crisis, investments into modernization and diversification of own energy infrastructure could be allowed only by certain countries. Energy sources will be a dominating factor

of development by the time of transfer to the fifth and sixth technological modes in most developed and developing countries.

Issue of export substitution in the energy market for Russia is being solved: a large portfolio of joint projects with Asian partners is initiated – they suppose not only export of energy sources but development of basic infrastructure necessary for industrial production. Negotiations between Russia and Germany on construction of Nord Stream 2 along the bottom of the Baltic Sea were renewed – together with the Turkish pipeline, it will replace the previously used branch of the pipeline through Ukraine, which will lead to increase of economic decline in this country, which became a trigger of geopolitical tension between Russia, the EU, and the USA.

Experts state that quotas from the EU to Ukraine – even under the condition of their full use – will not allow replacing shortfalls in income due to embargo, implemented by Russia as part of counter-sanctions (Blinov 2015).

This means aggravation of difficult socio-economic state of Ukraine, which will lead to migration of population to the EU – which is a negative factor for European economy which has faced force majeure expenditures due to migrants from Middle East, including “financial refugees”.

At the threshold of the third wave of global economic crisis, transnational infrastructural projects are capable of enlivening business activities and providing sources of economic growth of whole regions in the global economic environment. However, order of business should include the issue of provision of security of large infrastructural objects against diversion attacks, as the region of realization is subject to risks of extremism. At present, it is possible to state that large transnational infrastructural projects should be realized with participation of such countries as Russia, which proved its capability of protecting civilization from extremism (Forsyth 2015). We focus attention on the fact that in new reality, capability of provision of military security of specific territory is a factor of its investment attractiveness, which should be taken into account by companies of corporate sector of economy in their investment programs.

## **2. Debating issues of the role of priorities of Russian economic policy in provision of recovery growth**

Under the conditions of financial economy and risk of start of third stage of the global financial crisis, state monetary policy is not just an inseparable part of budget process but a key mechanism of regulation of level of liquidity of resources which are accessible in the financial market. Financial globalization took financial resources to the rank of dominating ones due to low transaction costs of their turnover and self-growing attribute. However, at the modern stage, there is a range of methodological contradictions and paradoxes in the theory of finance which lead to violations of reproduction processes: investors impose high requirements to profitability and reduce threshold values of allowable risk, thus preferring complex security derivative financial tools, currency speculations, and “skimming” strategies to clean investment mechanisms, which takes financial capital from real sector to virtual one.

Under the modern conditions of development of the global economy, financial resources changed from providing growth factors into essential factor, which puts economic dynamics of actors' development into direct dependence on the level of liquidity in the market and quality of business environment (Andreeva 2014).

Deficit of liquid financial resources puts economies of developing countries into state of collapse. In recent years, Russian economy faces huge volumes of capital outflow, which led to violation of functionality of monetary mechanism of reproduction needs provision. Situation in the Russian economy was aggravated by economic sanctions which cut Russian companies and banks from liquid loan resources in Western market. Introduction of sectorial sanctions led to reduction of profitability of activities of Russian companies and growth of interest rate for business loans.

According to analytical report by the Central Bank of the Russian Federation “Financial state of the largest enterprises in I half of 2015” (Central Bank of the RF 2015), published on the official web-site of the mega-regulator, borrowed assets, as source of financing of activities, were used in 2014 by 95.8% of the Russian enterprises, in 2015 – 94%. With such scale of use of credit tools, the problem of configuring of monetary policy within the framework of provision of liquidity of Russian bank institutes and enterprises is actualized. It should be noted that reduction of key rate and monetization of economy could ensure the growth of value of financial leverage, but expansion of money offer leads to risks of reduction of population's buying capacity.

Urgent problem of balance of interests of social and production spheres is reflected in conservative variant, which Russian monetary policy prefers. In 2015, it was oriented to adaptation of Russian economy to new conditions, determined by reduction of oil prices and closing of external financial markets. The Central Bank's forecasts are based on thesis on end of oil super cycle which causes domination of strategies of leadership in price among members of oil market, lack of growth of oil prices, and, as a consequence, reduction of budget revenues which are formed from export of energy sources.

The head of the Central Bank, E. Nabiullina, states that the main task of Russian economy for the next three years is provision of recovery growth regardless of external conditions, which requires three key components: firstly, conservative budget policy which stimulates growth of revenues; secondly, monetary policy which takes into account balance of economic growth and inflation risks; thirdly, structural transformations aimed at diversification of economy and increase of labor efficiency. The Central Bank of the RF does not expect growth of Russian economy in 2016, stating that recovery of positive dynamics will be possible in 2017, under the condition of absence of new threats. The head of the Central Bank, E. Nabiullina, sees limited possibilities of monetary policy in activation of economic dynamics, with the main goal being inflation harassment and evening-out of fluctuations in the currency market. Based on this, it is possible to suppose that it is impossible to count on significant reduction of credit products rates.

It should be noted that forecasts of the Central Bank of the Russian Federation regarding inflation rate, taken into account on the project of perspective concept of development of monetary policy, differ from the forecast of the Ministry of Trade and Economic Development (*State Duma of the RF 2015*), which shows disagreement of state institutes during formation of vector and parameters of economic policy.

The problem of selection of correct type of monetary policy and determination of its place in provision of recovery growth of economy is the most debatable in the Russian expert society.

According to S. Glazyev, recovery of investment dynamics requires expansion of money offer, which is absent due to instability of rate of ruble and outflow of money assets into currency assets. At that, deficit of money offer is manmade: interesants and insiders do not allow changing the vector of monetary policy, which led to inflation growth, loss of control over financial market, reduction of investment and business activity, and loss of control over macro-economic indicators. In his research, Glazyev (2015) substantiates necessary for systemic approach to monetary policy with the use of complex of managing parameters which corresponds to complexity of money turnover.

Relevant point of view is supported by the dean of Faculty of Economic of M.V. Lomonosov Moscow State University, Professor A. Auzan (2015), who emphasizes on institutional destructions in the Russian economic policy, focused on technologies of rent extractions instead of inclusive technologies of development. According to Professor A. Auzan, economic policy should be built with focus on activation of resources, necessary for innovational modernization, with accent on development of institutional environment and human capital. Ulyukaev, Minister of economic development of the RF, considers the main obstacle to recovery of investment dynamics to be not key rate and parameters of monetary policy but institutional destructions, high threshold of investment risks, crisis of trust, and imbalance of budget in part of its correspondence to strategic socio-economic interests of the RF.

According to scientific director of Institute of Economics of the Russian Academy of Sciences, R. Grinberg, mistakes in the Russian economic policy doom the country's economy for long period of stagnation, as for 2 years no effective steps were taken for expansion of revenue or expenditure parts, i.e., there are not obvious measures of stimulation of demand and no volume of investments, required for expansion of offer (Zubov 2015). Perspective budget policy of the RF aims for increase of effectiveness of budget expenditures, which should be achieved by means of financing only the projects that have design estimate documentation simultaneous with the budget project. In our opinion, this actualizes problematics of provision of the system of decision making at the state level with modern forecast and analytical tools which are capable of providing authentic evaluations of effectiveness of the planned projects and ensuring coordination of interest groups. It is obvious that projects which are not subject to effectiveness evaluation won't be considered.

This strengthens risks of economic agents related to uncertainty of economy development. It should be noted that under the unstable conditions of development, mechanism of provision of guarantees for preservation of effectiveness of state sponsored projects during the whole life cycle of investment project is not known.

During expansion of money offer due to credit emission, risk of inflation growth increases, but lack of money offer and credit emission even for the purposes of project financing negates investment capabilities of Russian enterprises, forming dependence of Russian economy on state and foreign investments. Uncoordinated economic policy with current institutional downfalls and disfunctions becomes insurmountable obstacle for provision of economic security of Russia: financial and technological sovereignty cannot be achieved under the current conditions. Due to the depreciation, which due a range of reasons – will not lead to the expected effect – growth of inflation expectations and toughening of monetary policy only increase negative tendencies in economy and extend investment pause, thus eliminating the very possibility for structural transformations in economy.

In our opinion, there's a necessity for transition from total credit restriction to targeted credit expansion with simultaneous moderation of risk environment for the purpose of creation of wave effect and improvement of

investment climate. According to Shelepov (2012), institutional modernization should be conducted in the directions that are identified during detailed analysis of business environment with attraction of innovational technologies – e.g., artificial neuron networks which are capable of conducting exploratory data analysis and data clustering for the purpose of determination of dominating events of business environment. Such approach will allow determining non-typical risk events and will provide basis for transition from retrospective institutional design to perspective one. Under the conditions of deficit of liquidity, risk load and effectiveness of instituted determine investment dynamics: turning into currency assets instead of activation of investment processes, demonstrated by Russian companies in 2014-2015, means crisis of trust and Russian companies' selecting conservative type of corporate financial policy. In this situation, overcoming of investment pause should be built on provision of institutional and legal foundations of cooperation of state and private investors, which is possible in short-term and mid-term within public-private partnership.

Thus, under the conditions of financial economy, state monetary policy must ensure achievement of strategic tasks in the sphere of socio-economic development. In case of non-establishment of quick measures of correction of directions and priorities of monetary policy in the Russian economy, replacement of liquidity deficit will be performed by means of state's activation at Russian stock market or by means of purchase of Russian companies' shares by foreign investors, which leads to significant risk of loss of financial sovereignty by Russian corporate sector, or by means of Russian companies' finding internal sources of financing. Capability for self-financing is a fundamental attribute of financial soundness, the level of which determined investment attractiveness.

### **3. Evaluation of financial potential and financial risks of Russian companies in the framework of their investment attractiveness**

Russian economy goes through the stage of unstable stabilization. This is marked by Russian and foreign analysts and experts. Under these conditions, a range of structural problems and institutional gaps, which require correction, are actualized. Unstable state of external environment makes economic subjects change their strategies for short-term periods, while tasks of modernization and import substitution require mid-term and long-term strategies. Financial tools of provision of realization of programs of strategic development cannot be replaced by total succession of tools of short-term financing: such solution will raise the bar of effectiveness of performed projects to unreachable height. Expansion of money offer is required for activation of investments, but monetary policy, conducted by the Central Bank of the Russian Federation, does not suppose tools of replacement of liquidity sources, which are unavailable due to sanctions. It is possible to forecast that the rate of yearly growth of GDP will be 6-7% only with increase of investments into fixed capital by 1.5 times – therefore, investments into non-financial assets should reach at least 30% of GDP.

Risks of economic collapse in Russian led to outflow of capital equal to 4150 billion in 2014, ruble lost 40% of its value, and profitability of bonds grew significantly. Despite the fact that foreign analysts and portfolio investors do not evaluate Russian economy positively, Russian market is still considered to be high-yielding and it provides positive premia for risk, while the level of national debt is one of the lowest in the global economy. Foreign investors, who realize portfolio strategies, consider that Russia has the best combination of price-profitability ratio of shares among all developing markets (Rao and Bush 2015). First of all, there was no "domino effect" with corporate defaults: being cut from debt markets, companies of corporate sector were able to pay or restructure debts by means of their own resources or re-financing.

Foreign investments are one of the variants of replacement of liquid debt resources. Cooperation with Asian partners for attraction of financial resources is especially update for Russia: around 90% of foreign investments, attracted into Russia in 2015, are resources of Asian market (Rapoza 2015). And this despite the fact that during last study of dynamics of risks in the APEC, performed by Price Waterhouse Coopers on the basis of analysis of capital movement, credibility, inflation level, and currency rates fluctuations, provided by experts from Oxford Economics, Russia is at the top of list of countries with the highest risk level, ahead of Australia, Canada, Japan, and Chile (Figure 1).



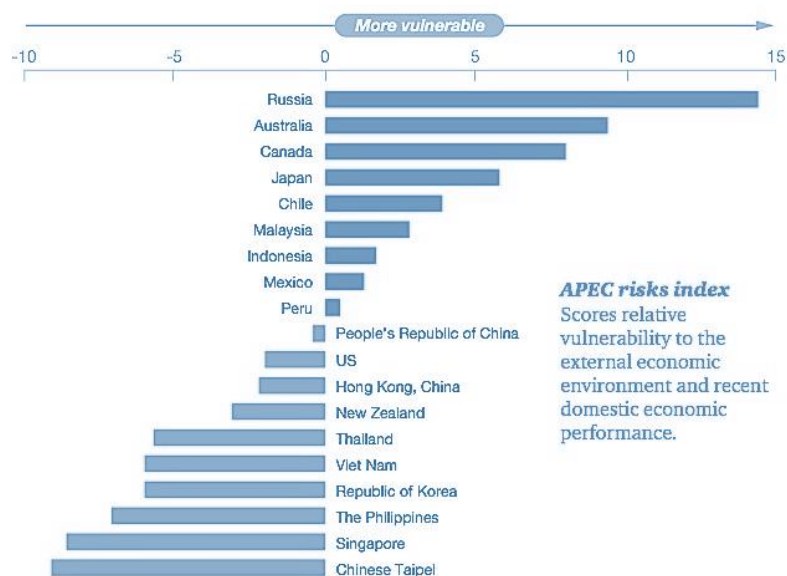


Figure 1 – Dynamics of risks in the APEC countries on the basis of comparison of key indicators (12 months, 2014-2015 (Evolution of APEC risks 2015)

Evaluation of factors which limit production growth, allowed determining dominating problems: uncertainty of economic situation, insufficient demand in internal market, high tax load, and lack of own financial resources (FSSS of the RF 2015a).

Lack of own financial resources is aggravated by decrease of profitability: with depreciatory effect, balanced financial result of Russian companies in was lower than expected by 38% in January-August, 2015 (FSSS of the RF 2015c). Dynamics of direct investments in the Russian Federation in 2015 clearly shows downward trend (Figure 2).

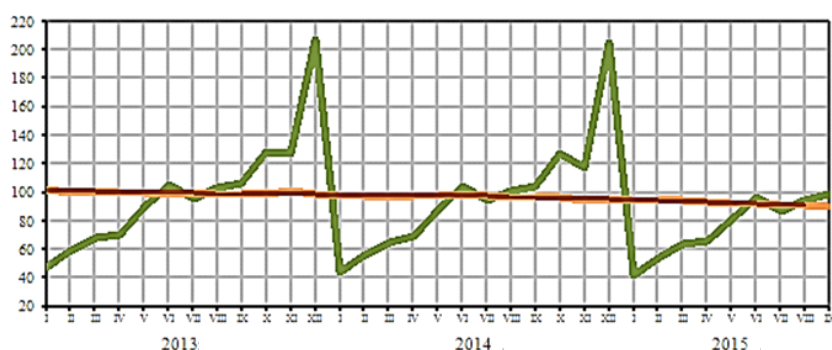


Figure 2 – Dynamics of investments into fixed capital in Russia in comparable prices as to average monthly value of 2012, 2013-2015 (FSSS of the RF, 2015b)

Investment mechanism is closely connected to the demand structure: investments will be made only into enterprises, production of which is in stable demand in the market. Therefore, if company can provide the necessary level of production profitability, it possesses investment attractiveness of market agents. It should be noted that strategy of import substitution, realized in Russia, requires financial mechanism of activization of demand from market agents. Russian operators cannot offer configurations of financial products to market which are capable of ensuring growth of production consumption in internal market. In our opinion, this circumstance is the most significant limitation during realization of strategy of import substitution and activization of positive economic dynamics.

In practice, complex financial products which are capable of providing a certain level of profitability of detail of Russian enterprises are not so popular: lease programs have a range of significant limitations, credit financing is offered with high interests, and project financing is given in limited volumes. Without development of the system of financial tools of activization of internal demand, Russian industry might fact the effect of “bottleneck”, when volume of demand does not correspond to volumes of manufactured products, which leads to dysfunctionality of market signals and unbalance of mechanisms of demand and offer.

It should be noted that production capacity utilization of most of Russian companies rarely reaches 80%, and labor efficiency is by 2 times lower than average European: according to the OECD, coefficient GDP/working constitutes \$25.9 in Russia, average European level – \$50, American – \$65. This means low resource productivity of Russian companies, which, together with high level of interest to be paid under the conditions of ruble depreciation, is a key factor of investment attractiveness reduction.

It is necessary to acknowledge the fact that quality of financial management of Russian corporate structures is low: financial top management of most companies cannot form effective configuration of financial resources and perform its modification depending on the phase of economic cycle. Research by PWC showed that companies which use risk-oriented models of management have higher financial results as compared to companies which do not use risk assessment and stress testing as tools of determination of financial tactics. The latter often attract credits for replenishment of current capital, which confirms lack of risk oriented management and, as a consequence, predetermines appearance of cash deficiency. Companies of small and medium business are more inclined to emergence of such financial risks.

In their turn, Russian banking institutions face the necessity for transformation of the model of their activities due to reorganization of banking system and license revocation. Problem of banking assets quality is caused by low quality of assessment of credit risks at the stage of explosive development of Russian credit market and inclination of banking institutions to rent-oriented models of behavior, conduct of illegitimate trans-border operations, and speculative strategies at currency markets. Such strategies pre-determined high risk load, which, under the conditions of conservative monetary policy, led to significant growth of interest rate with further reduction of volumes of crediting, especially in the segment of crediting of small and medium enterprises.

According to the National Bureau of Credit Histories (NBCH 2015), number of loans taken by small and medium enterprises for development of business and purchase of equipment, grew by 27% from the beginning of 2015, constituting 49% of total volume of given credits, thus reaching the level of 2014 - 56%. Stable small and medium enterprises with experience of anti-crisis regulation, which are conscientious credit users, receive access to credit resources for financing of production modernization.

Unstable enterprises are excluded by Russian banks from client portfolios. This is caused by the fact that nowadays the Ministry of Economic Development of the RF prepares a draft law “On failure (bankruptcy)”, which is often called in expert society a “draft law on financial recovery”. The planned changes in the system of regulation of relations between banks and their borrowers will allow credit users to restructure the past due debt through converting the debt sum into borrower’s shares, i.e., through the mechanism of acquisition.

This draft law caused discussion among scientists and practitioners, but one should agree that, firstly, borrowers that lost creditworthiness objectively need financial recovery; secondly, commercial banks are not obliged to take and accumulate risks of bad borrowers (increase of rate of “bad debts” leads to reduction of bank assets); thirdly, mechanism of acquisition will, most probably, ensure reduction of transaction costs in the process of financial recovery of company-borrower.

In view of the fact that as of November 1, 2015, 46% of corporate credits of Russian companies were given by Sberbank and VTB, this draft law will allow conducting management of over-indebted companies in the interests of main shareholder of the above banks – the state. Such mechanism of financial recovery will also optimize load on the “bad debts bank”, which is formed on the basis of Roskapital. Activization of work on this draft law shows that the state takes up risks of ineffective companies and that the share of state ownership will increase accordingly.

Large Russian non-financial enterprises, with assets of more than RUB 10 billion, are peculiar for higher financial potential and credit discipline, as compared to small and medium enterprises. As a result of analysis of activities of large enterprises for 1st half of 2015, conducted by the Central Bank of the RF, quality of financial state of 81.1% of enterprises was determined as “good” and “medium”. Growth rates of assets slowed down, constituting RUB 61.8 trillion. New worth increased by 3.5%, which is caused by growth of retained profit by 4.6%. Level of self-financing of large enterprises reduced, as compared to the same period of 2014, but, on the whole, stayed at the high level – 52.2% (Central Bank of the RF 2015).

Borrowed assets, as a source of financing of their activities, were used in the studied period by 94.0% enterprises; total debt for borrowed assets constituted RUB 19.2 trillion – at that, credit debt grew by 5.3% to RUB 7.0 trillion. Share of long-term part of debt for borrowed assets increased by 1.1%, constituting 72.8%, which was achieved only due to change of time structure of debt of the largest enterprises.

Share of bank credits in borrowed assets of the largest enterprises constituted 52.3%, in liabilities – 34.5%. Low debt load (less than 1 ruble of liabilities for 1 ruble of own capital) was peculiar for 34.5% of enterprises, as compared to 38.5% in 2014. Against the background of reduction of share of enterprises with low debt load, share of enterprises with moderate debt load grew (1-2 rubles of liabilities for 1 ruble of own capital). Share of enterprises

with high debt load (more than 2 rubles of liabilities for 1 ruble of own capital) dominates in the category of enterprises with bad financial state – 88.1%. At that, distribution of enterprises as to level of debt load varies a lot depending on the type of economic activities: from 75.0 % of enterprises with high debt load in construction sphere to 9.8% of enterprises in the sphere of production and distribution of electric energy.

Growth of enterprises' revenue slowed down; at that, level of production capacities utilization of enterprises on the whole constituted 74.8%. The lowest level of production capacities utilization was peculiar for enterprises with low financial sustainability – 64.7%.

Investment activity of enterprises in the 1<sup>st</sup> half of 2015 was low: capital assets increased by 1.1% due to growth of long-term financial investments by 2.3%, volume of fixed remained at the level of the end of 2014. Share of enterprises which conduct investment activities under the conditions of sufficiency of investment resources reduced from 71.3% in the 1<sup>st</sup> half of 2014 to 68.6% in the 1<sup>st</sup> half of 2015. Deficit of investment resources grew by 27.3%, constituting RUB 1.3 trillion.

At the conclusion of the 1<sup>st</sup> half of 2015, 76.0% of enterprises were profitable – which is more than in the same period of 2014 (73.1%). The level of profitability of assets grew, as compared to 2014, up to 4.3%. Unprofitability of enterprises increased from 2.0% in the 1<sup>st</sup> half of 2014 to 2.5% in the 1<sup>st</sup> half of 2015. Earnings before tax on the whole also grew by 41.1% in the 1<sup>st</sup> half of 2015, as compared to the same period of the previous year, constituting RUB 2.4 trillion. (Central Bank of the RF 2015)

Thus, it is possible to conclude that recovery of investment dynamics is determined not only by the level of accessible liquidity in the market but by the very investment attractiveness of Russian enterprises: companies with low resource productivity, which is lower than growth rates of yearly nominal inflations values, cannot be attractive for investing for foreign or Russian investors. The most probable vector for provision of investment attractiveness of Russian enterprises – increase of own effectiveness by modernization through attracted financing, and then – attraction of direct investments. In its turn, this trajectory requires modification of financial mechanism of corporate and new industrial policy.

#### **4. Organizational and financial mechanism of new industrial policy**

Adjustment of reproduction mechanism should include design and realization of sales channels under the conditions of import substitution. Contemporary experience of Russian economic history shows that direct subsidies does not provide long-term effect: with termination of programs of state support, positive effects also end. For example, experience of support for Russian car industry is very illustrative: it was possible to avoid market reduction by more than 50% (by the end of 2015, reduction by 30% is expected), but market strategies were not transformed. At that, use of mechanisms of public private partnership in transport sphere allowed achieving sevenfold growth of EBT (Earnings before Taxes) indicators for certain types of main and additional transport activities. (Central Bank of the RF 2015)

Russian heavy industry requires development of internal market of financial tools of industrial products consumers – otherwise, enterprises do not have motifs for expansion of their activities: lack of financial tools for buyers reduces total volume of consumption. Due to this, decisive role in provision of financial growth belongs to credit and financial institutes and financial management of industrial companies and their readiness to provide demand by financial tools: effective programs of lease, factoring, and liquid credit tools.

At present, official publications mention the necessity for support for sectors, but it is necessary to support not the sectors but intersectorial clusters. This process should be moderated by the state: determination of transformation vector and correction of institutional disfunctions under the conditions of actual economic dynamics is possible only with participation of state institutes.

It is necessary to make transition from conceptual vision of strategy of socio-economic development to specific projects with attraction of state institutes of development. It seems faire to see them as large vertically oriented state corporations which are to control development of industrial clusters. Under the conditions of modern economy and high significance of foreign economic stimuli and mechanisms, demonstrated by the global economy, institutional modeling and improvement of investment climate for the purpose of attraction of foreign investments are not enough for activation of positive economic dynamics.

Modeling tools and technologies of development of industrial complexes and clusters should be performed with attraction of representatives of business and credit & financial institutes: it is necessary to overcome crisis of trust and recover functionality of transmission mechanism of financial system through identification of risks and development of the system of preventive tools of their management. This step will allow providing the possibility for targeted credit emission for satisfaction of resource needs of new and modernized industrial clusters.



An important condition is the use of mechanisms of public-private partnership with equal division of risks and profits from projects. This, in its turn, requires thorough selection of private investors for participation in large projects, as it supposes the use of mechanism of investment crediting for long-term.

An obligatory element of financial mechanism of activation of development of industrial clusters within the project approach is implementation of mechanisms of financial controlling. This element is necessary for provision of transparent system of pricing within vertical and horizontal integration of industrial clusters, as large corporate structures produce risk of costs inflation which is quickly distributed into the whole reproduction system. Pricing policy of industrial enterprises should be built within the existing legal base – in particular, it should conform to the principles of formation of economically reasoned costs. Unreasoned price rent – when not used for provision of investment needs – should be collected through taxation of profit. Therefore, it is advisable to use the mechanism of tax monitoring and rulings for key enterprises of industrial cluster, which allows achieving a range of sought effects: verification of intermediary's conscientiousness, transparency of pricing mechanism, tax discipline, and "wave" effect for the similar enterprises.

Financial tools of activation of industrial clusters require inclusion into their structure of consulting and forecast components – like new banking products, which were introduced in the market by the largest banks after 2008. Financial engineering and financial diagnostics should be the basis of development of mid-term program documents which regulate development of key sectors and clusters. Structure of these documents should correspond to structure of business plan, with systemic analysis of risks and perspectives of undertaken projects. The instrumentarium provision should include modern methods of diagnostics of sustainability and credit worthiness of intermediaries, as well as instrumentarium for investment design, built not on the basis of methods of probability theory and mathematical statistics but on the basis of methods of fuzzy set theory with attraction of functions of artificial self-teaching neuron networks for receipt of authentic parameters of analyzed projects.

Organizational and financial mechanism of new Russian industrial policy should provide a possibility for realization of risk-oriented strategies for Russian companies, i.e., it should include topological strategies of transforming investment, institutional modeling, increase of quality of business environment, design and realization of financial tools, implementation of interactive technologies of monitoring and control, evaluation of initial and final effectiveness of projects, and possibility for correction of parameters of program documents on the basis of data on modification of external environment by transformed technologies of artificial neuron networks and processes means of financial diagnostics for the purpose of high-precision financial engineering and resource provision of development of Russian non-financial companies.

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## An Examination of the Relationship between Procrastination and Self-Efficacy: An Empirical Study

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### Abstract

*Procrastination is used in a broad sense to postpone or defer the things until tomorrow. Many variables such as task avoidance, uncertainty, fear of failure, low self-esteem can be mentioned as the antecedents of procrastination in the literature; in addition, low self-efficacy is also considered one of the antecedents of procrastination. Self-efficacy refers to individuals' belief in fulfilling the specific tasks successively through needed behavior patterns and cognitive processes. In this respect, the primary objective of this study is to examine the relationship between self-efficacy and procrastination. The study uses a structural equation model (SEM) to produce causal relationship and analyze the data from 281 employees in Nevşehir Hacı Bektaş Veli University, in Turkey. The results showed that there was a negative relationship between self-efficacy and procrastination; besides, self-efficacy had low rate to account for procrastination*

**Keywords:** Procrastination, self-efficacy, structural equation modelling.

**JEL Classification:** M10, M12, M19.

### 1. Introduction

Procrastination derives from Latin word *procrastinare* which means "defer till the morning" (Neenan 2008). There is no common definition among the researchers for identifying the concept of procrastination. (Ferrari and Özer 2009) Ajayi and Osiki (2008) define procrastination as avoidance of completing the necessary tasks or postponing them. Van Eerde (2003), however, identifies procrastination as behavioral tendencies or characteristics to delay or defer fulfilling a task or making decisions. Ferrari *et al.* (2005) defines procrastination as frequent delays for starting or completing a task till deadline. Procrastination may be linked to task avoidance, uncertainty, a fear of failure (Zarick and Stonebraker 2009), laziness, fear of not performing well, fear of making mistakes, and hesitation (Ajayi and Osiki 2008), lack of motivation, deficient self-regulation, external focus of control, perfectionism, trait and state anxiety, a fear of failure, low self-confident, low self-efficacy, and low self-esteem (Ackermann and Gross 2005, Steel 2007). Self-efficacy, one of the antecedents aforementioned above, can be defined as individuals' belief in performing the specific tasks successively through needed behavior patterns and cognitive processes. (Luthans and Peterson 2002)

The relationship between self-efficacy and procrastination was firstly introduced by Bandura (1986). Bandura states that as long as adequate levels of ability and motivation exist, self-efficacy belief will influence an individual's task initiation and continuation (Chu and Choi 2005). Reviewing the literature, academic procrastination has predominantly been handled. However, few studies concerning general procrastination have been discussed in the literature. The study conducted by Klassen *et al.* (2008) showed the impact of academic self-efficacy and self-esteem on academic procrastination.

The study revealed that individuals who had high level of self-efficacy showed less procrastination and procrastination was related to low-self esteem. Another study carried out by Wolters (2003) stated that students with high level of self-efficacy and mastery orientation tend to show less procrastination when getting to work on academic tasks. In accordance with the results of the study, academic procrastination was negatively associated with mastery orientation and self-efficacy. Lowinger *et al.* (2014) researched the relationship between academic procrastination and self-efficacy on Chinese international students. They concluded that there was a negative relationship between academic procrastination and self-efficacy. The study fulfilled by Seo (2008) revealed that there was a negative relationship between academic procrastination and self-efficacy. Unlike academic

procrastination, one of the limited numbers of studies with regard to general procrastination was carried out by Haycock *et al.* (1998). The study inferred that procrastination was significantly associated with self-efficacy and anxiety.

There was a negative relationship between procrastination and self-efficacy and there was a positive relationship between procrastination and anxiety. Another study was performed by Tuckman (1991). The research conducted on college students manifested that there was a negative relationship between procrastination and self-efficacy. Students who described themselves as time wasters, deadline avoiders, pleasure seekers doubted their own capability and performed less effort in a voluntary task. In this framework, the aim of the study is to examine the relationship between self-efficacy and procrastination. On the basis of the literature mentioned above, it is alleged that the increase in employees' self-efficacy has a reducing effect on procrastination. In this respect, the hypothesis of the study is summarized as follows: "self-efficacy beliefs of employees working in a university will affect negatively procrastination behavior".

## 2. Method

### 2.1. The aim and importance of the study and the sample

This study investigates the relationship between self-efficacy and procrastination. In the literature, it has been emphasized that self-efficacy is considered as one of the antecedents of procrastination, however, components that caused procrastination has not been undertaken in practice. From this perspective, the study aims to reveal the relationship between self-efficacy and procrastination empirically and to contribute and enrich the literature particularly. The study's universe comprised of totally 723 employees. Out of 723, 495 were academic staff, 228 were administrative staff.

A complete census was made by reaching the study's universe mentioned above, but 293 questionnaires returned; 281 of them have been taken into account in the study. This represented an overall response rate of 0.38. 281 employees participated in this study, of which 161 (57.3%) were male respondents and 120 (42.7%) of the sample was represented by female respondents. In terms of marital status, 110 (39.1%) were single, 171 (60.9%) were married. Concerning the age of respondents, 224 employees (approximately 80%) were between 20 and 40 years old and relatively young part of the study, namely 183 employees (65%) were academic staff and 98 employees were (35%) administrative staff.

### 2.2. Instruments

Questionnaires were used as a data collection. Self-efficacy was measured using Schwarzer and Jerusalem (1995) instrument with 10 items. On the other hand, procrastination scale consisting of 16 items with one dimensional was developed by Tuckman (1991). Firstly, self-efficacy scale with 10 items developed by Schwarzer and Jerusalem (1995) has been validated in Turkish. In accordance with the relevant scale validation processes, the pilot study was conducted by qualified researchers in English-Turkish and Turkish-English translations; moreover, exploratory and confirmatory factor analysis concerning the original sample was performed. The scale showed adequate reliability. The Cronbach's alpha coefficient was 0.86.

Exploratory factor analysis was first conducted to determine the construct validity of the scale developed by Schwarzer and Jerusalem (1995). The result of the analysis confirmed that the data corresponded to one dimensional structure of the scale and factor loadings of the scale with 10 items ranged from 0.55 to 0.79. The result of KMO analysis was 0.90 and Barlett's test was identified as significant ( $p=0,000$ ). Following the analyses, confirmatory factor analysis was conducted with LISREL.

Depending on the result of the factor analysis, the data corresponded to single factor of the scale and factor loadings were between 0.50 and 0.79. Exploratory factor analysis was administered to determine the construct validity of the procrastination scale with one dimensional developed by Tuckman (1991). The result of the analysis showed that factor loadings of the scale with 16 items were between 0.51 and 0.74. The result of KMO analysis was 0.89 and Barlett's test was identified as significant ( $p=0,000$ ). It has been concluded that the result of confirmatory factor analysis through LISREL was compatible with one dimensional scale and factor loadings were between 0.52 and 0.89. The Cronbach's alpha coefficient was 0.87.

### 2.3. Analysis and findings

To analyze the gathered data and test the relationships, structural equation modeling (SEM) and SPSS packaged software were conducted. According to the results of the study, the participation level of university staff in positive statements about self-efficacy was found to be quite familiar with the statement "agree" with the average

values (4.03). In other words, the self-efficacy level of academic and administrative staff was high. On the other hand, the procrastination level was familiar with the statement "disagree" with the average values (2.28). That is to say, university staff responded to mainly "disagree" as regarding scale items of procrastination. In this respect, university staff is prone to procrastinate tough decisions, or jobs that are difficult to cope with.

In the study, the casual relationship between variables to test the effect of self-efficacy level of university staff on procrastination has been analyzed through structural equation modeling and LISREL packaged software. SEM is effectively more complicated form of regression models and factor analysis that can simultaneously measure various modes of relationships (Brewerton and Millward 2001, Hair *et al.* 2006). SEM assumes that the casual relationship exists between latent variables and these variables can be measured via observed variables. In accordance with the study, self-efficacy as independent variable and procrastination as dependent variable were also defined as latent variables; on the other hand, scale items were termed as observed variables. Figure 1 revealed the results of standardized path analysis showing the interaction between variables. Path analysis uses regression analysis and correlation coefficient for modeling more complex relationships between observed variables. Path analysis builds models based on cause-effect relationships between variables. (Yılmaz and Çelik 2009)

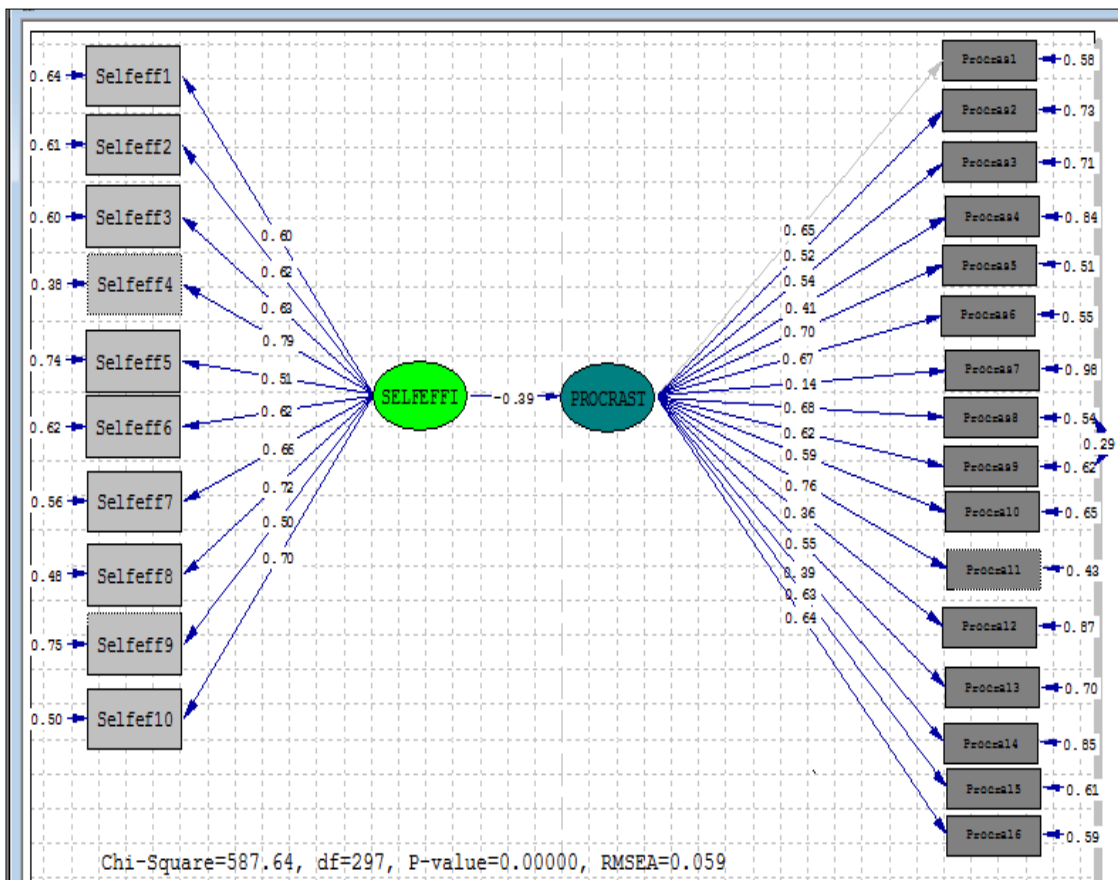


Figure 1 - Path analysis results with standardized values

Considering the relationship between latent variables, namely self-efficacy and procrastination in Figure 1, it was figured out that the relationship between standardized values and variables was -0.39. This result indicated that one point increases in the self-efficacy level of university staff brought about 0.39 decreases in procrastination. When investigating the results of structural equations in the output file, the mentioned values were said to be estimated values.

Table 1 - Variance extracted values between latent variables

	Estimated Values	Error Variance	R <sup>2</sup>
Procrastination =	-0,40*Self-Efficacy	0,89	0,15



Estimated values aforementioned above were pointed out in Table 1 (-0.40). Referring to Figure 1, according to the results in the Lisrel output, it was made modification between the relevant procrastination scale items "I'm an incurable time waster" the item 8th, and "I'm a time waster now but I can't seem to do anything about it" the item 9th due to covariance. Besides, it was seen a substantial decrease in chi-square value.

In accordance with the results in Table 1, the explanatory power of self-efficacy on procrastination remained at the level (0.15). This value produced that the change in self-efficacy had low rate to account for procrastination. As a result, the hypothesis "self-efficacy belief of university staff will affect negatively procrastination behavior" was supported. This finding shared similarity with some studies pertaining to the relationship between self-efficacy and procrastination at academic level. These studies carried out by Klassen *et al.* (2008), Wolters (2003) and Seo (2008), Lowinger *et al.* (2014) inferred that there was an inverse relationship between self-efficacy and procrastination. This result was similar with the finding of this research. Furthermore, the studies conducted by Haycock *et al.* (1998) and Tuckman (1991) concluded that there was an inverse relationship between self-efficacy and procrastination. These results in the literature overlapped with the finding of this study.

To assess the research model as a whole, the values of goodness of fit were taken into account. Researchers have not reached an agreement about which of the goodness of fit will be used in the studies. However, goodness of fit indices such as  $X^2/df$ , GFI, AGFI, RMSEA, NFI and CFI are among the most frequently referred.

In this study,  $X^2/df = 587.64 / 297$  was 1.97. As this value was two and below two, this model showed a very good fits. RMSEA was 0.059. The mentioned value ranged from 0.05 to 0.08; as a consequence, the model indicated an acceptable fit. NFI concerning the research model was  $0.92 > 0.90$  thus it is an acceptable value. CFI regarding the model, however, demonstrated an excellent goodness of fit since it was greater than 0.90 with the value 0.96. GFI with 0.86 and AGFI with 0.84 were close to the value 0.90 which is an acceptable value. In the literature, even if GFI is 0.85 and above, AGFI is 0.80 and above, RMR and RMSEA are below 0.10, these fit indices are also stated as acceptable values. (Çokluk *et al.* 2010) In conclusion, the model yielded acceptable values in terms of all goodness of fit indice.

## Conclusion

The causal relationship between procrastination and self-efficacy, one of the antecedents of procrastination were discussed. Models and hypothesis defining the causal relationship were analyzed as a means of structural equation modeling and the mentioned relationship was studied. Therefore, the hypothesis of the research was stated as "self-efficacy belief of university staff will affect negatively procrastination behavior". Data gathered from 281 academic and administrative staff working in Nevsehir University were tested using statistical analysis. The results of the study are as follows.

According to the results of the study, there was a negative relationship between self-efficacy and procrastination. In addition to this, self-efficacy had low rate to account for procrastination. This conclusion demonstrated that one point increases in self-efficacy level of employees resulted in 0.39 decrease in procrastination. Considering the average values about variables, it was found out that employees had higher level of self-efficacy and lower level of procrastination. Another result was related to the explanatory power of self-efficacy on procrastination. Accordingly, the explanatory power of self-efficacy on procrastination remained at (0.15) level and was relatively low. When considered with other antecedents that influence procrastination, this result can be regarded as a reasonable rate.

The results derived from the research are limited to employees working in Nevsehir. Based on the analysis using totally 281 available data, it is not expected to reach powerful generalisations. In particular, as employees had relatively high level of education and culture, self-efficacy level of employees was turned out to be high, procrastination level low. For this reason, the results obtained from the research should be assessed with both limitations and constraints. Future research should examine reasons and outcomes of procrastination and its relationship with other concepts in detail. Besides, procrastination should be treated with different and larger sampling. Such research will not only enrich our theoretical understanding of procrastination, but also shed important light on literature.

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## Variation of Regional Trade Agreement Impact across Member Countries: The Case of Southeast Asia

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### Abstract:

*This paper investigates whether the impact of a Regional Trade Agreement (RTA) may vary across members. We use several specification of gravity model using panel-bilateral manufacturing trade data during 1990-2012, and comparing the trade creation and trade diversion effects across countries in Southeast Asia due to the implementation of an RTA. Additionally, this paper also investigates the changes of the relative effects before and since the Asian financial crisis.*

*The estimation results suggest heterogeneity of RTA impact across members. In particular, one country has the lowest trade creation impact and significant trade diversion compare to three other members, while there are several countries did not show trade diversion. Further investigation indicates that the trade diversion arise after the Asian financial crisis. Moreover, the crisis also lowers intra-regional trade bias in some countries, but vary in magnitude and significance.*

**Keywords:** international trade, ASEAN, AFTA, regional trade agreement, gravity, economic integration.

**JEL Classification:** F10, F14, F15.

### 1. Introduction

In general, a regional trade agreement (RTA) lowers trade barriers between member countries. It promotes trade creation between member countries, but to some extent may also create trade diversion, which is against efficiency (Viner 1950). This paper focuses on the case of Association of South East Asian Nations (ASEAN) which has a regional trade agreement named ASEAN Free Trade Area (AFTA) since 1992. Previous literatures indicate that AFTA has relatively strong trade creation effect but no trade diversion effect (*for example*, Elliott and Ikemoto 2004, Kien 2009). Further, Bary (2015) provides some indication that the trade creation and trade diversion effect might be time-variant.

As AFTA is a relatively old agreement, the observations are sufficient for a more specific investigation. This paper extends the discussion into cross-sectional variation, i.e. whether the impact of AFTA varies between countries. Moreover, this paper considers the effect of Asian financial crisis, as the observations focus on ASEAN countries and the crisis had triggered a substantial change on the relative prices and a permanent current account reversal in ASEAN countries (Moreno 2008), and hence potentially altering trade flows structurally.

The main contribution of this paper is that the RTA impacts are investigated on two extended contexts: First, to assess possible variations on RTA impacts between member countries, and second, to investigate whether AFTA impacts are different before and since the Asian financial crisis across member countries.

### 2. Trade agreement and Southeast Asian economies

A Regional Trade Agreement (RTA) is an agreement among several countries for trade liberalization that usually implies tariff elimination, and may also include a reduction of non-tariff barriers. RTA within members of Association of Southeast Asian Nations (ASEAN) is ASEAN Free Trade Area (AFTA). AFTA is established in 1992 to enhance regional trade liberalization which includes a significant tariff reduction to most of traded commodities (Soesastro 2002). At that time, ASEAN have six members, namely Brunei, Singapore, Malaysia, Indonesia, Philippines and Thailand. Vietnam, Lao PDR, Myanmar and Cambodia joined several years after.

As RTA eliminates trade barriers, it will generally increase trade flows between member countries. However, Clausing (2001) states that the effect on welfare depends on the source of the increased trade, whether it is from trade creation or trade diversion. Trade creation, which is a replacement of inefficient domestic production with more efficient import goods from another member country, raises welfare. On the other hand, trade diversion, which

is a diversion of trade from a more efficient extra-regional country to a less efficient RTA member country, decreases welfare (Viner 1950). Trade diversion leads to “regionalization” instead of global free-trade.

ASEAN countries have heterogeneous economic indicators. Economic growth in 2014 is ranged between - 2.3 to 8.7% and inflation is ranged between 0.2 to 8.4%. All countries have ratio of exports to GDP and ratio of imports to GDP above 20%, where Singapore has the highest figure. Moreover, each country in ASEAN uses different currency, which highly varies in denomination.

Trade activities are dominant in ASEAN economies, with ratio of exports to GDP and ratio of imports to GDP of 50.2% and 48.0% in 2014, respectively. Intra ASEAN trade accounts 24.1%, which relatively high as ASEAN only consist of 10 countries, while extra-ASEAN trade accounts for 75.9% of total ASEAN trade. Across countries, the figure varies: Vietnam has the lowest proportion of intra-ASEAN trade of 13.9%, while Lao PDR has the highest (64.9%). In general, similar figures also occur in both export and import side.

### 3. Methodology

The empirical version of theoretical-motivated gravity model as in Anderson and Van Wincoop (2003) is further modified by:

- adding time-dimension and moving GDP to the right hand side, as in Baier and Bergstrand (2007);
- assuming dyadic trade cost between exporter and importer to justify the use of import variable, as in Bary (2015);
- replacing “trade costs other than distance” with two log-linearly related dummy variables to represents trade cost changes during implementation of an RTA (Baier and Bergstrand 2007, Bary 2015). The resulting empirical specification is as follows:

$$\ln M_{ijt} = k + c_1 \ln Y_{it} + c_2 \ln Y_{jt} + c_3 \ln Dist_{ij} + c_4 TEx_{ijt} + c_5 TDiv_{ijt} - \ln P_{it}^{1-\sigma} - \ln P_{jt}^{1-\sigma} + u_{ijt} \quad (1)$$

$M_{ijt}$  is export between country  $i$  and  $j$  at time  $t$ ,  $Y_{it}$  ( $Y_{jt}$ ) is GDP of exporter (importer  $j$ ) at time  $t$ ,  $Dist_{ij}$  is distance between  $i$  and  $j$ .  $k$  is a constant,  $P_{it}^{1-\sigma}$  and  $P_{jt}^{1-\sigma}$  are multilateral resistance terms, and  $u_{ijt}$  is an error term. RTA can be seen as an elimination of some of trade costs among countries, and possibly increasing the trade costs *relatively* to the rest of the world.  $TEx$  is a dummy that equals 1 if both countries are members of AFTA, and 0 otherwise. This is to measure internal relative trade cost subtraction, which has a positive effect on trade flows.  $TDiv$  is dummy variable with value 1 if either home or foreign country is a member of AFTA, and 0 otherwise. This is to measure external relative trade cost addition (possibly negative effect on trade). Therefore,  $TDiv$  parameter implies *trade diversion* effect, whereas the *trade creation* effect is indicated by the sum of  $TEx$  and  $TDiv$  parameters.  $TEx$  parameter itself implies *trade expansion* between members of RTA (intra-regional bias of RTA), where still include trade diversion.

Next, as this paper aims to do estimates specifically on each country, the specification is needed to be modified to allow different parameter across  $i$ . In the meantime, we assume the multilateral resistance terms are time-invariant, equal across partners, but may vary across home countries.<sup>4</sup> The specification for country becomes as follows:

$$\ln M_{ijt} = c_{i0} + c_{i1} \ln Y_{it} + c_{i2} \ln Y_{jt} + c_{i3} \ln Dist_{ij} + c_{i4} TEx_{ijt} + c_{i5} TDiv_{ijt} + u_{ijt} \quad (2)$$

To account for Asian financial crisis and unobserved heterogeneity across time-series, we introduce two dummies,  $DCris_t$  and  $D1995_t$ . The simplification is based on statistical significance where there is an indication of ‘structural’ effect since Asian financial crisis in 1998 and temporary jump of trade flows in 1995 based on parameter values and its statistical significance. Therefore,  $DCris_t$  is 1 during 1998 - 2012 and 0 otherwise, while  $D1995_t$  is 1 in 1995 and 0 in other periods. The strategy is also useful to capture Asian financial crisis impact on trade flows. Implicitly, this specification allows changes of multilateral resistance terms between 3 major time frame, so it is more unrestrictive. The specification for country  $i$  therefore become as follows:

$$\ln M_{ijt} = c_{i0} + c_{i1} \ln Y_{it} + c_{i2} \ln Y_{jt} + c_{i3} \ln Dist_{ij} + c_{i4} TEx_{ijt} + c_{i5} TDiv_{ijt} + c_{i6} DCris_t + c_{i7} D1995_t + u_{ijt} \quad (3)$$

Further, we investigate whether the indication of trade diversion is related to the crisis, by introducing  $DCris_t * TEx_{ijt}$  and  $DCris_t * TDiv_{ijt}$ , which translated to the addition of intra-AFTA and extra-AFTA trade bias since the crisis, respectively. The specification for country  $i$  will be as follows:

<sup>4</sup> Hence, let  $\rho_i = -\ln P_{it}^{1-\sigma}$  and  $\theta = -\ln P_{jt}^{1-\sigma}$ , then it implies  $c_{i0} = k + \rho_i + \theta$  in eq. (2).

$$\ln M_{ijt} = c_{i0} + c_{i1} \ln Y_{it} + c_{i2} \ln Y_{jt} + c_{i3} \ln Dist_{ij} + c_{i4} TEx_{ijt} + c_{i5} TDiv_{ijt} + c_{i6} DCris_t * TEx_{ijt} + c_{i7} DCris_t * TDiv_{ijt} + u_{ijt} \quad (4)$$

Regressions of eq. (2), eq. (3), and eq. (4) are performed across, or 4 home countries, namely Singapore, Indonesia, Malaysia, and Thailand. These four countries accounts for 80% of ASEAN trade in 2014<sup>5</sup>. All regressions are conducted using *robust* standard errors. The data was collected from OECD (STAN Database)<sup>6</sup> for bilateral trade flows, World Development Indicators (World Bank) for GDP, exchange rates and consumer price index (CPI), and the data used by Santos Silva and Tenreyro (2006)<sup>7</sup> for distance. Moreover, information regarding AFTA status, economic indicators and several trade measures were collected from ASEAN Secretariat and WTO. Observations consists of 4 *home* countries in South East Asia, namely Indonesia, Malaysia, Singapore and Thailand. Other ASEAN countries are not included as the observation of those countries is not sufficient for our country-specific analysis. *Partner* countries are consisting of about 120 countries. Time series observations are from 1990-2012. The number of observations for each country-specific equation exceeds 2,000.

Regarding the choice of trade flow data, Koo, Kennedy and Skripnitchenko (2006) states that import data are more consistent compare to export data. Therefore, all reported estimations are using import data as dependent variable. However, export data also had been estimated on several specifications, where not reported, and generally result in similar indications regarding impact of AFTA.<sup>8</sup>

#### 4. Results and discussions

This section discusses the estimation results on specifications explained on previous section. Note that as we use pooled estimates, RTA parameters shall be interpreted only in relative sense, i.e. for a cross-country comparison of the impact.

As reported in Table 1, parameters of gravity models for all countries observations are consistent with the standard predictions of gravity model, with R<sup>2</sup> between 67-71%. The similarities between countries' estimation are that the effect of home economic size are less than partner's economic size. This may be caused by a higher competitiveness of tradable products that produced in countries with larger economic size. The results are generally consistent with Feenstra, Markusen and Rose (2001). For distance parameters, estimation results in all countries suggesting negative effect on distance and therefore consistent with the standard prediction of gravity model. However, Indonesia has the largest distance effect compare to other countries, indicating a relatively higher transportation cost.

The effects of trade creation are varying in magnitude among countries. The trade creation effect in Indonesia is the smallest compare to the three other ASEAN countries, where the parameter only about half of Malaysia, Thailand and Singapore. Moreover, trade diversion effect in Indonesia and Singapore are significant although much smaller than the trade creation effect, but the trade diversion appears insignificant in Malaysia and Thailand.

The relatively low trade creation in Indonesia can be caused by inadequate trade facilitation in Indonesia that makes trade flows enhancement suboptimal, especially trade creation. Shepherd and Wilson (2009) shows that quality of port and air infrastructure, as well as irregular trade payments, in Indonesia is the worst among those of four countries assessed. On the other hand, they show that Singapore is the best regarding indicators of trade facilitation. This can be an indication, but a weak one, that the magnitude of expansionary impact of AFTA's intra-regional trade (or possibly RTA) in each members depends on trade facilitation, which is an idiosyncratic factor.

Table 1 - Estimation results of AFTA impact

	INDONESIA	MALAYSIA	SINGAPORE	THAILAND
Log home GDP	0.819*** (0.183)	1.025*** (0.171)	0.691*** (0.141)	0.622*** (0.214)
Log partner GDP	1.443*** (0.017)	1.498*** (0.017)	1.390*** (0.019)	1.381*** (0.020)

<sup>5</sup>The data is from ASEAN Secretariat.

<sup>6</sup> Bilateral Trade Database by Industry and End-Use Category (BTDiXE), which is derived from the OECD's International Trade by Commodities Statistics (ITCS) and the UN Comtrade. The dataset is available on: <http://stats.oecd.org/Index.aspx?DataSetCode=STANI4>

<sup>7</sup> The distance data were measured using great circle formula algorithm (Santos Silva and Tenreyro2006). The dataset is available on: <http://personal.lse.ac.uk/tenreyro/regressors.zip>

<sup>8</sup> The result is available upon request.

	INDONESIA	MALAYSIA	SINGAPORE	THAILAND
Log distance	-0.796*** (0.069)	-0.439*** (0.061)	-0.224*** (0.065)	-0.131* (0.056)
Trade expansion	1.535*** (0.229)	3.074*** (0.224)	3.284*** (0.207)	2.939*** (0.230)
Trade diversion	-0.514*** (0.175)	-0.142 (0.201)	-0.611*** (0.188)	-0.009 (0.182)
Constant	-24.873*** (3.549)	-32.528*** (3.176)	-24.724*** (2.621)	-25.605*** (3.972)
Observations	2397	2477	2252	2575
R-squared	0.709	0.707	0.685	0.678

Notes: Method: Pooled Least Squares. Tobit Estimations censoring zero trade flows provide very similar parameters. \*\*\*, \*\*, \* denote significance at 1%, 5%, and 10% critical level, respectively. Standard errors are in parentheses.

Table 2 - Estimation results of AFTA impact using crisis dummy

	INDONESIA	MALAYSIA	SINGAPORE	THAILAND
Log home GDP	1.700*** (0.214)	1.508*** (0.233)	1.272*** (0.196)	1.075*** (0.257)
Log partner GDP	1.443*** (0.017)	1.499*** (0.017)	1.387*** (0.019)	1.382*** (0.020)
Log distance	-0.794*** (0.067)	-0.439*** (0.061)	-0.231*** (0.065)	-0.131** (0.056)
Trade expansion	1.783*** (0.223)	2.975*** (0.231)	3.306*** (0.215)	2.968*** (0.236)
Trade diversion	-0.308* (0.182)	-0.247 (0.210)	-0.594*** (0.197)	-0.009 (0.189)
After-crisis dummy	-0.885*** (0.125)	-0.347** (0.162)	-0.592*** (0.166)	-0.339** (0.135)
Dummy 1995	0.417** (0.200)	0.484** (0.221)	0.158 (0.238)	0.200 (0.225)
Constant	-41.531*** (4.109)	-41.202*** (4.292)	-35.010*** (3.581)	-33.930*** (4.745)
Observations	2397	2477	2252	2575
R-squared	0.717	0.708	0.687	0.679

Notes: Method: Pooled Least Squares. Tobit Estimations censoring zero trade flows provide very similar parameters. \*\*\*, \*\*, \* denote significance at 1%, 5%, and 10% critical level, respectively. Standard errors are in parentheses.

By introducing time dummies, especially dummy representing period since Asian financial crisis, the indication about trade creation and trade diversion is unchanged (Table 2). Parameter of intra-AFTA trade expansion in Indonesia is only about half of those of three other countries, and trade diversion in Indonesia and Singapore are significant meanwhile it is not significant in Malaysia and Thailand. However, note that trade diversion parameters mostly become smaller in Indonesia and Singapore, and its significance in Indonesia become weaker compare to the results without time dummies (Table 1). This indicates that trade diversion is partially correlated with Asian financial crisis.

Table 3 - Estimation results of AFTA impact before and after crisis

	INDONESIA	MALAYSIA	SINGAPORE	THAILAND
Log home GDP	1.701*** (0.214)	1.510*** (0.233)	1.272*** (0.196)	1.086*** (0.257)
Log partner GDP	1.443*** (0.017)	1.499*** (0.017)	1.387*** (0.019)	1.382*** (0.020)
Log distance	-0.799*** (0.067)	-0.439*** (0.061)	-0.231*** (0.065)	-0.130** (0.056)
Trade expansion	1.600*** (0.299)	3.083*** (0.291)	3.310*** (0.293)	2.572*** (0.422)
Trade diversion	-0.216 (0.177)	-0.148 (0.203)	-0.560*** (0.191)	0.069 (0.185)
Trade expansion*after-crisis dummy	-0.658** (0.286)	-0.461* (0.272)	-0.590*** (0.287)	0.069 (0.185)

	INDONESIA	MALAYSIA	SINGAPORE	THAILAND
Trade diversion*after-crisis dummy	-0.981*** (0.121)	-0.447** (0.157)	-0.627 (0.160)	0.152 (0.421)
Constant	-41.510*** (4.109)	-41.233*** (4.292)	-35.012*** (3.581)	-34.140*** (4.739)
Observations	2397	2477	2252	2575
R-squared	0.717	0.708	0.687	0.680

Notes: Method: Pooled Least Squares. Tobit Estimations censoring zero trade flows provide very similar parameters. \*\*\*, \*\*, \* denote significance at 1%, 5%, and 10% critical level, respectively. Standard errors are in parentheses.

The estimation results on Table 3 indicate that Asian financial crisis creates substantial difference in AFTA impact. Trade creation is indicated to be diminished partially since the crisis, particularly in Malaysia and Singapore, and almost completely diminished in Indonesia. Meanwhile, this phenomenon did not appear significantly in Thailand. Moreover, comparison of trade expansion changes before and since-the-crisis across countries is similar to those of trade creation.

While only Singapore is indicated to divert the trade before the crisis, the impact of trade diversion becomes significant in all four countries since the crisis. The parameter of trade diversion addition in Indonesia is more than twice than those of Malaysia and Thailand.

## Conclusion

We have analysed the AFTA impacts across countries in ASEAN, by allowing variation of the effect across countries as well as their variation before and after the Asian financial crisis. The results suggest that AFTA impacts are heterogeneous across member countries, and the crisis have modified the impact to some extent, in which the impact changes is also varies across member countries.

The results suggest that the effectiveness of an RTA to enhance the trade will not be the same across members, although the agreement itself is generally mutual among members. These suggest that factors that are specific to countries (e.g. trade facilitation, factor conditions, trade promotion) are responsible for this heterogeneity. Implicitly, this results also suggest that measuring trade creation and trade diversion on average basis, as performed on many previous estimates using gravity model, are likely cannot accurately predict the impact on a particular country.

There are several limitations in this study. We notice that as we still use some restriction of how multilateral resistance terms varies across observations, we can only interpret the parameters in relative sense, i.e. to compare across countries or across time, but not the exact number of the trade multiplier due to a regional trade agreement. Second, due to data availability, only several countries can be assessed.

Given the scope of this research, one possible area for further researches is identify factors affecting the heterogeneity of RTA impacts across member countries, which possibly relates to trade facilitation or other idiosyncratic factors.

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## The Impact of Distributive Services on the Productivity Growth: The Case of Italian Industrial Districts

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### Abstract:

*The relationship between tertiary activities and productivity growth has been extensively studied over the past decades. Research has shown that, within tertiary activities, distributive services play a key role in this dynamic. This framework overturns the traditional view of services as unproductive activities, usually responsible for a structural burden that slows down the evolutionary dynamics of the economic system. Given the slow pace with which the process of modernization of services is moving forward, Italy seems to be making an important exception to this general conclusion. It should be noted that empirical research that approached this problem in the past was usually based on data at the national level. Such an approach does not consider the strong heterogeneity that usually exists between territorial clusters within a nation. In order to overcome such limitations, this paper focuses on the impact of distributive services on productivity growth at the local level, using the Italian industrial districts as a unit of analysis.*

*The results show that in industrial districts the growth of the employment share of distributive services is the consequence of a positive integration with the industrial activities. In the industrial districts, in addition, distributive services make a positive contribution to the productivity growth of the whole economy and to the productivity growth of the industrial sector, confirming that no structural burden seems to be at work. On the contrary, non-district manufacturing areas do not show such positive trends, thus confirming the existence of a district effect.*

**Keywords:** tertiarisation, distributive services, industrial districts, total productivity growth, industrial productivity growth.

**JEL Classification:** O14, O47, R10.

### 1. Introduction

It is widely recognized in economic and managerial literature that the growing weight of tertiarisation in modern economies has led to a deep reshaping of the relations between the tertiary sector and industrial activities, with a greater level of synergistic integration, which generates benefits in terms of productivity growth both at the firm and the general economic system level. This positive relationship appears weaker in Italy than in other developed countries. However, the studies conducted on the topic have considered the national average trends, without taking into account the strong territorial heterogeneity of the national economic system, which is the sum of very backward areas and modern and dynamic ones, such as those represented by clusters or industrial districts.

This heterogeneity raises the following issue: if (and how much) the relations between distributive services, industrial productivity and growth behave differently once evaluated at the local labour system (LLSs) level. To answer this question, an econometric model is estimated for the period 2001–2005, the only one for which data on value added of Italian LLSs are available. The paper is organized as follows: section 2 summarizes the literature on the relationship between distributive services and productivity growth and develops the research question; section 3 presents the data and the methodology used, and includes the econometric analysis; a discussion of the results and some concluding remarks are in section 4.

## 2. Distributive services and productivity growth: a positive relationship for the development of Italian industrial districts?

There is broad agreement among researchers that in modern and competitive economic systems a deep reshaping of the relations between industry and services is taking place. Value creation for customers is widely recognized as being increasingly influenced by the strategic integration between industrial and service activities. Distributive services, in particular, play a key role in this process, thanks to the growing contribution they offer to the competitive advantage of leading industrial producers. Managerial literature on this topic has been particularly prolific. For example, many studies have described the shift of market power to downstream services consequent to the growing ability of large distribution companies to influence consumer's choices (Pellegrini 1999, Pine and Gilmore 2000, Castaldo 2001, Varaldo and Dalli 2011). Additionally, there is general agreement on the fact that competitive advantage and brand recognition are strongly related to an effective control of distribution channels and logistic flows, which can be achieved through downstream vertical integration or through strategic relationships based on long-term contractual agreements (Oi 1992, Rullani 2006, Morelli 2008, Pellegrini 2008, Rullani 2012).

Also, economic literature has become interested in the problem. Several empirical studies, for example, have shown that the growth of employment in distributive services has a positive impact on both average labor productivity and TFP of national economies (Van Ark *et al.* 2003, Triplett and Bosworth 2004, Manser 2005, Inklaar and Timmer 2008, Inklaar *et al.* 2008). In addition, some general studies concerning the systemic consequences of tertiarisation have shown that distributive services (along with other special types of services such as KIBS) can sometimes speed up growth dynamics instead of generating a "structural burden", as suggested by the classical literature on tertiarisation (Baumol 1967, Castells 1972, Sylos - Labini 1974, Bacon and Eltis 1978). Most of this literature points out that services are a heterogeneous set, and when studying the implications of the tertiarisation process on productivity growth, distinctions have to be made between its single subsets, because they can sometimes behave very differently (Oulton 2001, Baumol 2002, Pugno 2006, Sasaki 2007, Maroto and Rubalcaba 2008, Maroto-Sanchez and Cuadraro-Roura 2009). In particular, distributive services show a significant growth of employment shares and contain factors such as innovation and human capital that make their productivity growth rates similar to, or even higher than, those of the most dynamic manufacturing industries. (Maroto-Sanchez and Cuadraro-Roura 2009, Maroto-Sanchez 2012, Maroto-Sanchez and Cuadraro-Roura 2013, Mei Ling 2013)

What both economic and management literature conclude, in a nutshell, is that modern and efficient distributive services can have positive effects on industrial competitiveness and on the global productivity growth of economic systems. Compared to this overall picture, the Italian situation has some peculiar features. The relationship between the distributive services and productivity growth appears weaker than in other developed countries for which studies are available (Pellegrini 1985, Pellegrini and Cardani 1993, Gordon 1996, Timmer and Inklaar 2005, Timmer and Ypma 2006, Bella and Mauro 2008). Some authors attributed this poorer performance to the slowness of the process of modernization of distributive services still strongly bound in that country to traditional and poorly dynamic models (a reality that only in recent years is beginning to change). Furthermore, for many years the distributive services have represented a "refuge sector" for unemployment created during the downturns of the economic cycle.

Testing the relationship between distributive services and productivity growth at the national level only, however, can lead to misleading conclusions. As is well known, the Italian productive system is characterized by the coexistence of very backward areas with modern and dynamic ones; the latter often organized in industrial districts of great vitality. This heterogeneity of the production system raises questions on what lies "beneath the national averages", and in particular if (and how much) the relationship between distributive services, industrial productivity and growth behave differently once evaluated at the local-system level.

This research question rests on a sound theoretical basis. Several studies have shown that the interactions between industry and services, and in particular those with distributive services, can be much more effective within local systems, such as industrial districts, where relevant external economies contribute to competitiveness (Spithoven 2000, Peneder 2002, Peneder 2003), and spatial proximity makes the reorganization processes easier (Boschma 2005). The industrial districts play a central role in the Italian development model (Signorini 2000, Bellandi 2002, Sforzi 2002, Signorini and Omiccioli 2005, Becattini and Coltorti 2006, Becattini and Dei Ottati 2006, Quintieri 2006, Corò and Micelli 2007, Becattini *et al.* 2009, Di Giacinto *et al.* 2014). In detail, the consistent body of literature has been accumulating on a large number of specific issues that span from social and cultural aspects (Dei Ottati 2005, Lorenzini 2011) to internationalization (Chiarvesio *et al.* 2010), innovation factors and analysis of new specialization areas (Amighini and Rabellotti 2006, Muscio 2006, Rabellotti *et al.* 2009, De Marchi *et al.* 2014).

However, still there are few empirical studies devoted to the role and the effects of tertiarisation (De Rita and Varaldo 2006, Rullani 2006, Busato and Corò 2011).

In particular, works on the specific role of distributive services seem to be almost completely missing. In order to help overcome this gap, this paper tests whether in Italy, at the local level, the growth of the employment share of distributive services has a positive impact on aggregate productivity growth and on the productivity growth of the industrial sector. For this purpose, data provided by ISTAT (the Italian Institute of Statistics) on the local labor systems (LLSs) for the period 2001–2005 are taken into account. The choice of the unit of analysis allows for overcoming the limitations and distortions related to the use of NUTS 2 or NUTS 3 data, which are based on administrative boundaries, not related with the territorial structure of productive systems. The reference period is the only one for which data on added value are available at the LLSs level.

The following analysis has two main elements of novelty: to the best of our knowledge no studies on the relations between distributive services, industrial productivity and growth, at this level of disaggregation, are available; furthermore, our results show some features of industrial districts not underlined until now by other studies. The first is that during the period under observation, in industrial districts, the growth of the employees in distributive services does not correspond to an occupational loss for industrial activities. Instead, in the rest of the Italian production system, they tend to incorporate workers expelled by the industrial sector without creating additional employment. In this context, the distributive services behave as an “occupational sponge”.

The second is that in industrial districts the increase in the employment share of distributive services does not imply the accumulation of a “structural burden”, thanks to a productivity growth rate higher than average. Moreover, distributive services show a positive impact on industrial productivity growth, confirming the existence of a synergistic integration between the distributive services and industrial activities. Neither trend occurs in manufacturing non-district LLSs.

### **3. Empirical analysis**

#### **3.1. Description of the data and methodology**

In line with the traditional approach used in the empirical literature, the reference economic unit considered in this analysis is the LLS. The data on LLSs have been elaborated according to the Statistical Atlas of Municipalities and considering the ISTAT Census of industry and services for the year 2001. For 2005, data on employees were derived from the archive ASIA (ISTAT). The data on value added for 2001–2005 were taken from the publication on the added value of LLSs provided by ISTAT in 2008. The data for 2001 and 2005 are fully comparable.

LLSs play an important role because they express, on one hand, the territorial organization of economic activities and, on the other hand, the related movements of the population. “The LLS represent the places of everyday life for the people who live there and work there (and who tend to concentrate there most of their social and economic relations). We are talking about territorial units consisting of multiple neighboring municipalities, with the same geographical and statistical characteristics” (ISTAT 2005). They are defined through the ISTAT census, based on daily commuters’ flows; they are represented by a centroid municipality, which is the gravitational center. The LLSs are, therefore, an appropriate instrument of analysis to investigate the socio-economic structure of Italy, according to a local development perspective.

The methodology based on the 2001 ISTAT Census identifies 686 LLSs in the Italian territory. To locate mainly manufacturing LLSs, the first step is to calculate, for each of the LLSs, a coefficient of territorial concentration relative to each of the economic activities included in the productive sectors of industry and services, corresponding to the entire local economy. The LLSs are considered manufacturing when the coefficient of territorial concentration of employees in manufacturing is higher than the national average.

To identify district LLSs, a multi-stage process is applied. This process includes: (a) the identification of the local manufacturing system; (b) the identification of local manufacturing systems that are small and medium sized (SME), such as those in the size class 1–249 employees; (c) the identification of the predominant manufacturing sector in each local system of SMEs; (d) the labeling of the local system of manufacturing SMEs as an ID when its main industry is predominantly made up of SMEs (ISTAT 2001)<sup>9</sup>. The industrial districts defined in the 2001 ISTAT

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<sup>9</sup> The LLSs and industrial districts have been identified by ISTAT by adopting the methodology present in Sforzi and Lorenzini (2002). However, there are other classifications of industrial districts. On one hand, the districts are identified according to administrative criteria, through regional laws 37/1991 and 140/1999, and the districts are “geographical areas characterized by high concentration of small and medium-sized enterprises, with particular reference to the relationship between the presence enterprises and the resident population, as well as the specialized production enterprises”. On the other hand,

Census are 156. In 2005, districts accounted for 27% of total employees and 39% of manufacturing employees (Sforzi 2009).

The ISTAT services classification distinguishes: market services, which include distributive services, services provided by hotels and restaurants, transport services and business services; and non-market services, which include, mainly, public administration activities<sup>10</sup>. In order to identify and investigate the dynamics exclusively related to the production system, only firm employees have been taken into account, discarding employees in public bodies and non-profit entities. Furthermore, the total employees in each LLS is calculated as the sum of industry and services employees<sup>11</sup>, thus excluding classes A (agriculture, hunting and forestry) and B (fishing, fish farming and related services) of the Nace Rev. 1.1 classification, as the data provided by ISTAT do not include labor units and the value added figures for these sectors in 2005. However, this is not an issue, as the aim of this work is to focus on the relationship between distributive services and ID-type manufacturing systems. Lastly, figures concerning hotel and restaurant services have not been taken into account, as these two segments are not relevant for the purpose of the present work.

### 3.2. Early insights form the descriptive analysis of different Local Labour Systems

In this section we show the descriptive statistics referring to the variables considered in the analysis of the 156 industrial districts (ID LLSs). The results are compared with other LLSs to detect the different trends. First, we consider the performance of the 136 manufacturing non-district LLSs (Man.Non-ID LLSs). This allows us to verify if within manufacturing LLSs, districts show more favorable trends than non-districts. Second, we consider the performance of 394 non-manufacturing LLSs (Non-Manuf. LLSs). This allows us to compare the performance of districts with areas traditionally characterized by a greater presence of services. Finally, we consider the 686 total LLSs (total LLSs) to compare the performance of districts with the national average.

Table 1 - Descriptive statistics. Variables

VARIABLE	ID LLSs (156)		Man.Non-ID LLSs (136)		Non-Manuf. LLSs (394)		Total LLSs (686)	
	Mean	Std. Dev	Mean	Std.Dev	Mean	Std. Dev	Mean	Std. Dev
GPUL	0.022	0.021	0.019	0.019	0.009	0.028	0.014	0.026
GPUL_IND	0.033	0.031	0.027	0.034	0.020	0.037	0.024	0.035
PUL	10.942	0.149	11.025	0.144	11.107	0.226	11.053	0.208
WSER	0.417	0.076	0.475	0.091	0.641	0.079	0.557	0.128
GSER	0.025	0.015	0.024	0.019	0.009	0.014	0.016	0.017
WSERM	0.369	0.067	0.418	0.080	0.565	0.074	0.491	0.115
WSERNM	0.048	0.014	0.057	0.023	0.076	0.023	0.066	0.025
GSERM	0.020	0.017	0.017	0.019	0.003	0.016	0.010	0.019
GSERNM	0.059	0.047	0.067	0.053	0.047	0.059	0.054	0.056
WDSB	0.170	0.036	0.189	0.047	0.263	0.057	0.227	0.066
WTRA	0.045	0.017	0.057	0.022	0.070	0.030	0.062	0.028
WBUS	0.108	0.033	0.109	0.034	0.130	0.043	0.121	0.041

there are several sources (Il Sole 24 Ore, the Edison Foundation, Unioncamere) that are methodological assumptions, as well as static data, in field surveys. The ISTAT methodology, however, remains in some respects the most reliable. Among the advantages present, it is worth noting the possibility of adopting a conceptual grid that allows us to compare systematically the different situations and to follow trends over time, in order to make countless studies comparable on this topic (Signorini and Omiccioli 2005).

<sup>10</sup> In line with the classification Nace Rev. 1.1, in industry includes the employees relative to the extraction of minerals (class C), to manufacturing (class D), production and distribution of electricity, gas and water (class E) and construction (class F). In services, they include those employees in the remaining classes (from class G to class Q).

<sup>11</sup> More specifically, market services (from class G to the class K of the Nace Rev. 1.1 classification) are those related to the "wholesale and retail trade, repair of motor vehicles, motorcycles and goods (distributive services); hotels and restaurants (services provided by hotels and restaurants); transport, storage and communication (transport services); financial intermediation; real estate, renting, information technology, research, other professional and business activities (business services)". The non-market services (from class L to class Q of the Nace Rev. 1.1 classification) are those related to "public administration and defense; compulsory social security; education; health and other social services; other community, social and personal services; domestic services at households; extraterritorial organizations and bodies".



VARIABLE	ID LLSs (156)		Man.Non-ID LLSs (136)		Non-Manuf. LLSs (394)		Total LLSs (686)	
	Mean	Std. Dev	Mean	Std.Dev	Mean	Std. Dev	Mean	Std. Dev
GDSB	0.009	0.020	0.006	0.025	-0.009	0.021	-0.002	0.023
GTRA	-0.003	0.035	-0.010	0.048	-0.020	0.054	-0.014	0.050
GBUS	0.028	0.033	0.030	0.037	0.003	0.037	0.015	0.038

Source: Own elaboration. ISTA data

Legend: GPUL (rate of total productivity growth for the years 2001–2005), GPUL\_IND (rate of industry productivity growth for the years 2001–2005), PUL (productivity of the economic system in 2001, resulting from the ratio between added value and the number of labor units), WSER (share of employees in services in 2001), GSER (increase in the share of employees in the services for the years 2001–2005), WSERM (share of employees in market services in 2001), WSERNM (share of employees in non-market services in 2001), GSERM (increase in the share of employees in the market services for the years 2001–2005), GSERNM (increase in the share of employees in non-market services for the years 2001–2005), WDSB (share of employees in distributive services in 2001), WTRA (share of employees in transport services in 2001), WBUS (share of employees in business service in 2001), GDSB (increase in the share of employees in the distributive share for the years 2001–2005), GTRA (increase in the share of employees in the transport services for the years 2001–2005), GBUS (increase in the share of employees in the business services for the years 2001–2005).

Consistently with strong industrial characteristics, ID LLSs showed lower shares of service employees (*WSER*) in 2001 (41.7%) compared to the national average (55.7% for all the 686 LLSs) and the other LLSs. Indeed, the average share of service employees amounts to 47.5% for the 136 manufacturing non-ID LLSs and 64.1% for the 394 non-manufacturing LLSs. Although the increase in the share of service employees over the period 2001–2005 (*GSER*) characterize all the LLSs considered, this figure is higher (+2.5%), and with a lower standard deviation in the ID-type LLSs. For manufacturing non-ID LLSs and non-manufacturing LLSs, the increase in the share of service employees is, respectively, 2.4% and 0.9%, while it is only 1.6% when the total number of LLSs is considered. ID LLSs show a greater increase (2%) in the share of employees in the market service sector (*GSERM*), and a lower growth in the share of employees in the non-market services (*GSERNM*) than manufacturing non-ID LLSs. This performance is likely due to the strong presence of industries within the districts that require services, including market services, to carry out their activities. These trends are associated with more significant increases of the total and industrial productivity in ID-type systems (GPUL 2.2% and GPUL\_IND 3.3%) compared to manufacturing non-ID LLSs (GPUL 1.9% and GPUL\_IND 2.7%), non-manufacturing LLSs (GPUL 0.9% and GPUL\_IND 2.0%) and the whole set of LLSs (GPUL 1.4% and GPUL\_IND 2.4%).

When sub-categories of market services are investigated, the lower initial share of each single service category (*WDSB*, *WTRA*, *WBUS*) in IDs is confirmed, but the share of employees in distributive services shows a more significant growth and a lower variability (*GDSB*) than other LLSs. Conversely, IDs are characterized by an increase in the share of transport (*GTRA*), which is lower than that of other LLSs; the increase in the share of business services (*GBUS*) in ID LLSs is lower than manufacturing non-ID LLSs.

An important feature of the Italian economy to consider is the coexistence of two very different geographic macro-areas - Centre-north and south - in the industrial development of the economic system. The degree of industrialization, calculated as the weight of the industrial employees on the total employees in 2001, is only equal to 14% in the south. This value is much smaller than the degree of industrialization of the Centre-north (26%) and the national average (22.9%). The low level of industrialization of the south is reflected in the presence of manufacturing LLSs and district LLSs: the manufacturing LLSs in the south are in fact only 37.7% of the total LLSs; instead in the Centre-north the manufacturing LLSs represent a large share in the total LLSs (59.3%). In this context, the weight of the industrial districts in the south plays a minor role compared to the other areas of the country. Indeed, the industrial districts only represent 8% of the total LLSs in the south, while industrial districts represent 36% of the total LLSs in the Centre-north (Table 2).

Table 2 - Weight of industrial district on total LLSs, on manufacturing LLSs and degree of industrialization for geographical areas, 2001.

	% ID on Total LLSs	% ID on Manuf. LLSs	Degree of industrialization
Centre-north	36.0	59.3	26.0
North-west	34.1	52.0	29.0
North-east	35.3	61.8	28.0
Centre	38.3	64.5	20.0
South	8.0	37.7	14.0
Italia	22.7	54.2	22.9

Source: Own elaboration. ISTAT data

Delving into the relationships characterizing the dynamics related to the tertiarisation process, a linear correlation analysis is carried out (considering a significance level of 1%) in order to assess the nature and the extent of the link between the growth of the share of service employees and either the growth of the total number of employees (Table 3) or the growth of industry employees (Table 4).

Table 3 shows that for industrial districts, there is a particularly strong relationship between the increase in the number of employees in the service sector and the growth of total employees. The correlation index for the two variables, in fact, is quite high (0.91) compared to manufacturing non-ID LLSs (0.71). Distributive and business services are the service categories more heavily influencing the dynamics of districts.

Table 3 - Correlation index between employee growth in single service categories and total employee growth

	ID LLSs (156)	Man.Non-ID LLSs (136)	Non-Manuf. LLSs (394)	TOTAL LLSs (686)
Distributive services	0.8329*	0.6878*	0.9399*	0.9203*
Transport services	0.5444*	0.0777	0.4954*	0.4654*
Business services	0.8908*	0.5890*	0.9571*	0.9443*
TOTAL services	0.9148*	0.7151*	0.9745*	0.9633*

Source: Own elaboration. ISTAT data

Note: \* Significance 1%

The correlation between the growth of employees in distributive services and the growth of total employees amounts to 0.83 for IDs against 0.68 for manufacturing non-ID LLSs; quite similar is the situation for business services, for which the values of the correlation are 0.89 for IDs and 0.58 for manufacturing non-ID LLSs. As expected, for non-manufacturing LLSs, employee growth in services shows a stronger correlation with the total employees. In these areas, in fact, services have a greater role within the economic system.

Table 4 shows the results of the correlation between employee growth in the service sector and the employee growth in the industry sector. The correlation index between these two variables is negative and statistically significant for the manufacturing non-ID LLSs under study, while there is no such correlation in the ID LLSs. In detail, the correlation index is -0.53 for manufacturing non-ID LLSs. These figures suggest the existence of a "substitution effect" between industry and service employees in manufacturing non-ID LLSs, while this trend does not occur in the districts where there is no such correlation. The employee growth in the service sector within the districts, in fact, seems to be autonomous and virtuous enough to avoid a "sponge effect"; services do not absorb employees excluded from other productive sectors.

This trend, which characterizes the districts, seems to be more significant for distributive services that show a correlation index with industry employees next to zero (-0.0043). Instead, for manufacturing non-ID LLSs under examination, this correlation seems to confirm the presence of a substitution effect; it is equal to -0.46 (with statistical significance at 1%). As expected, there is no correlation between the growth of employees in services and the growth of employees in industry within the non-manufacturing LLSs. This happens because in these areas there is a greater tendency towards tertiarisation compared to industrialization.



Table 4 - Correlation index between employee's growth in single service categories and industrial employee's growth

	ID LLSs (156)	Man. Non-ID LLSs (136)	Non-Manuf. LLSs (394)	TOTAL LLSs (686)
Distributive services	-0.0043	-0.4613*	0.0578	-0.0079
Transport services	-0.1454	0.5793*	-0.0504	0.0439
Business services	-0.1645	-0.6233	-0.0995	-0.1315*
TOTAL services	-0.1663	-0.5373*	-0.0890	-0.1242*

Source: Own elaboration. ISTAT data

Note: \* Significance 1%

### 3.3. Econometric analysis

The previous section highlights the role of services in the considered LLSs. Distributive services emerge as a very important category in the growth of services, and differences in the dynamics of this subsector characterize ID LLSs compared to the other LLSs. Distributive services in fact seem to have two important characteristics. They are positively correlated to growth of total employees in the LLSs; moreover, they do not seem related to a weakening of the industrial structure. Indeed, the greater share of employees in the distributive services is not associated with a decrease in employees in the industrial sector. These trends seem to occur more evident in the industrial districts.

In this section, the relationship between distributive services and productivity will be tested through an econometric model. In particular, we will test if an increase in the share of employees in the distributive services is relevant to explain the productivity growth. The expected result is positive, in line with recent studies; these studies have indeed shown that some kinds of services have a positive impact on the productivity growth in advanced economies; this framework overturns the traditional view of services as unproductive activities that generate a structural burden (Baumol 1967, Maroto-Sanchez 2012). Based on this assumption, the distributive services can have a positive impact on the productivity growth. In addition, on the basis of the positive integration between distributive services and industry highlighted in the previous section, this work introduces a further new element: we will test if an increase in the share of employees in the distributive services has a positive impact on the industrial productivity growth. In order to verify these relations, an ordinary least square (OLS) regression model in a cross-section was used. The model is tested for 156 industrial districts LLSs, and the results are suitably compared with the other LLSs (manufacturing non-ID LLSs—136; non-manufacturing LLSs—394; national total LLSs—686). These comparisons allow us to consider whether the industrial districts show peculiar trends than other LLSs.

For starters, we will test if an increase in the share of employees in the distributive services has a positive impact on the total productivity growth. Additionally, two other explanatory variables are included: the initial level of productivity and the initial share of employees in the distributive services<sup>12</sup>. We also include the initial productivity level in the model, because it allows us to consider whether the differences in productivity between LLSs are decreasing. Indeed, a negative relationship between the level of initial productivity and productivity growth rates indicates the presence of a convergence process, reducing disparities (Barro and Sala-i-Martin 1992). Moreover, geographical dummies (*North-west*, *North-east* and *Centre*) are included in the model in order to control the existence of spatial autocorrelation phenomena and the significant differences between advanced and backward areas<sup>13</sup>. Hence, the model is formulated as follows:

$$GPUL_i = \alpha + \beta_1 PUL_i + \beta_2 WDSB_i + \beta_3 GDSB_i + \text{North\_west}_i + \text{North\_east}_i + \text{Centre}_i + \mu_i \quad (3.1)$$

where  $i = 1, 2, N$  is the LLSs in the sample,  $\mu_i$  is the error term and GPUL represents the total productivity growth rate over the period 2001–2005. GDSB represents the increase in the share of employees in the distributive services over the years 2001–2005. PUL represents the initial level of productivity in 2001. Productivity is measured as the ratio between the added value at constant prices and the number of labor units based on ISTAT data. WDSB is the share of employees in distributive services in 2001 (on the total employees).

Study results are summarized in Table 5. The main result is that the increase in the share of distributive services over the period 2001–2005 (GDSB) has a positive impact on the total productivity growth in the industrial districts (column 1). The estimations are statistically significant (at the 1% level).

<sup>12</sup> The source of every variable included in our model is the ISTAT database.

<sup>13</sup> Rodriguez-Pose (1999) demonstrates that the inclusion of geographical dummies minimises spatial autocorrelation problems.

Instead GDSB does not impact the total productivity growth in manufacturing non-ID LLSs (column 2). As in ID-LLSs as well, in non-manufacturing LLSs GDSB shows a positive impact on the total productivity growth (column 3). Moreover, the share of distributive services in 2001 (WDSB) makes a positive impact on the total productivity growth within the 156 ID LLSs (column 1) and it is also statistically significant (1%). With reference to the manufacturing non-ID LLSs, the results obtained are qualitatively confirmed, but the coefficients in this case are significantly lower (column 2). These results show the peculiarity of the relationship between distributive services and the district system. Indeed, in the ID LLSs the initial share of employees in distributive services and an increase in the share of employees in distributive services have a more positive effect on the total productivity growth than the manufacturing non-ID LLSs.

The  $\beta_1$  coefficients of the initial level of productivity are statistically significant and negative, confirming the presence of a convergence effect. The LLSs that show a lower level of productivity in 2001, thus, obtain a higher productivity growth rate than the others over the period 2001–2005. In the industrial districts the convergence effect is higher than the other LLSs considered; indeed, the coefficient  $\beta_1$  in industrial districts shows higher values. This means that LLSs weaker in terms of productivity have a greater probability of reducing the gap with more advanced LLSs if they are industrial districts. The goodness of the results of geographical dummies testifies the presence of strong regional disparities. Districts located in Northern Italy show better results, but also those located in the Centre show positive results, albeit at lower levels. The explanatory capacity of the model, through its R-squared, is acceptable, and in ID LLSs (0.39) is higher than other LLSs considered.

Table 5 - Distributive services and total productivity growth<sup>14</sup> - Model 1

	(Col. 1) ID LSSs	(Col. 2) Man.Non-IDLLSs	(Col. 3) Non-Manuf. LLSs	(Col. 4) Total LLSs
PUL	-0.0924668 (0.0138785)***	-0.0371961 (0.0123759)***	-0.059048 (0.0058553)***	-0.0588888 (0.0049124)***
WDSB	0.1881445 (0.0609233)***	0.100934 (0.0353415)***	0.0287402 (0.0245077)	0.0698041 (0.0188318)***
GDSB	0.2662488 (0.0737709)***	0.1241734 (0.0889595)	0.3451419 (0.0741855)***	0.2710152 (0.0550861)***
North-west	0.023014 (0.0059856)***	0.0149447 (0.0045501)***	0.0108915 (0.0040916)***	0.0147499 (0.002505)***
North-east	0.0207329 (0.0055347)***	0.0069832 (0.0050197)	0.0056092 (0.0043364)	0.0100743 (0.0026821)***
Centre	0.0159073 (0.0052906)***	0.0077572 (0.0044407)*	0.02058 (0.003391)***	0.0148787 (0.0023487)***
Vif (Mean)	1.93	1.36	1.26	1.48
F stat.	11.21	3.57	29.26	44.29
R-squared	0.3900	0.1406	0.3368	0.3195
n. obs.	156	136	394	686

Source: Own elaboration. Data ISTAT. OLS cross-section regression model. Constant coefficient not shown, although it was included in the model. Corrected standards errors in parentheses. \*\*\* Statistical significance level at 1%; \*\* statistical significance level at 5%; \* statistical significance level at 10%.

We must consider that the total productivity growth is also influenced by other variables, such as other kinds of services. Hence, a series of control variables are included in the regression: the other kinds of market services and the non-market services<sup>15</sup>. Indeed, the literature has shown, firstly, that generally only the market services have a significant role in explaining the productivity growth and, secondly, that there are marked differences in performance between the several kinds of market services (Oulton 2001, Sasaki 2007, Maroto-Sanchez and Cuadraro-Roura 2009).

<sup>14</sup> In Table 5 as well as in the other tables the data of the constant is not reported, as it appears of little interest for this type of analysis.

<sup>15</sup> In the database on LLSs other data commonly used as control variables in the literature (innovation, education, exports) are not available. Nevertheless, it is believed that the inclusion of geographical dummies allows us to identify in large part the structural differences within the Italian economy.

Based on these assumptions, in model 3.2 the performance of distributive services is compared both with the non-market services and with the other kinds of market services.

The other kinds of market services are included in the model: transport (WTRA) and business (WBUS) services, which represent the share of employees in each respective subsector in 2001, and *GTRA*, *GBUS*, which represent the growth in the share of employees in each respective subsector over the period 2001–2005. In addition, non-market services are included in the model: *WSERNM* (represents the share of employees in the non-market services in 2001) and *GSERNM* (represents the growth in the share of employees in the non-market services over the years 2001–2005). With the inclusion of these variables, the specification of the econometric model becomes:

$$GPUL_i = \alpha + \beta_1 PUL_i + \beta_2 WDSB_i + \beta_3 WTRA_i + \beta_4 WBUS_i + \beta_5 WSERNM_i + \beta_6 GDSB_i + \beta_7 GTRA_i + \beta_8 GIMP_i + \beta_9 GSERNM_i + \text{North\_west}_i + \text{North\_east}_i + \text{Centre}_i + \mu_i \quad (3.2)$$

Study results are summarised in Table 6. The main result is that distributive services emerge as the main kind of services in the impact on overall system productivity growth, and differences in the dynamics of this subsector characterise ID LLSs (column 5) compared to manufacturing non-ID LLSs (column 6). Indeed, the growth in the share of employees in the distributive services (GDSB) and the initial share of employees in the distributive services (WDSB) have a positive effect on the total productivity growth in the industrial districts.

The analysis of sectoral change dynamics for the years 2001–2005 confirms the existence of a positive relationship between GDSB and the total productivity growth of ID systems shown in Table 5. This relationship is confirmed by a high coefficient and a good explanatory power of the model (the R-squared is 0.449, see column 5). Instead, GDSB does not impact the total productivity growth in manufacturing non-ID LLSs. Indeed, concerning the manufacturing non-ID LLSs, this relationship becomes not statistically significant (column 6). In the other LLSs, the coefficients and the explanatory power of the model are reduced (columns 7-8). The growth in the share of employees in transport services (GTRA) also seems to have an interesting role in the ID LLSs, but less strong than in the distributive services.

For ID LLSs WDSB and WTRA have a positive and statistically significant impact on the total productivity growth. When considering other LLSs, we can see interesting differences compared to IDs dynamics. The role of the initial share of distributive services is much stronger within IDs; the coefficients, in fact, are more robust and statistically significant compared to those reported for other LLSs. Summarising, in the industrial districts, a higher initial share of the distributive and transport services generates a higher productivity growth than the rest of the production system.

Non-market services (*WSERNM* and *GSERNM*) do not seem to show a statistically significant impact on the productivity growth in the industrial districts. This confirms the results of the literature (Baumol 2002, Triplett and Bosworth 2004, Maroto and Rubalcaba 2008, Maroto Sanchez and Cuadraro Roura 2009) on the question that the different kinds of services show a heterogeneous impact on the productivity growth.

These variables instead take positive and statistically significant values, albeit lower, when considering the 394 non-manufacturing LLSs (column 7). Indeed, these LLSs have a weight of non-market services that is much higher than the manufacturing LLSs. The  $\beta_1$  coefficients of the initial level of productivity are statistically significant and negative; therefore, this confirms the presence of the convergence effect shown by model 1. Also in this case, the coefficient  $\beta_1$  shows higher values in the industrial districts, confirming the presence of a greater convergence effect compared to the others considered LLSs. These results highlight the peculiarity of the relationship between distributive services and the district system. The territorial dummies confirm the same trends described in Table 5. The explanatory capacity of the model, through its R-squared, is acceptable, and in ID LLSs (0.449) is higher than other LLSs considered.

Table 6 - Distributive services and total productivity growth - Model 2

	(Col. 5) ID LLSs	(Col. 6) Man.Non-ID LLSs	(Col. 7) Non-Manuf. LLSs	(Col. 8) Total LLSs
PUL	-0.0951376 (0.0127586)***	-0.0503229 (0.0149114)***	-0.0738649 (0.0067144)***	-0.0736275 (0.0054716)***
WDSB	0.1870048 (0.0717504)***	0.0939505 (0.0379184)**	0.0435191 (0.0252465)*	0.0644019 (0.0199427)***
WTRA	0.2389832 (0.0955651)**	0.0736024 (0.0492634)	0.1042856 (0.042094)**	0.1042311 (0.0336334)***

	(Col. 5) ID LLSs	(Col. 6) Man.Non-IDLLSs	(Col. 7) Non-Manuf. LLSs	(Col. 8) Total LLSs
WBUS	0.0704084 (0.0443671)	0.1334395 (0.0492634)***	0.0950472 (0.0304746)***	0.1042948 (0.021932)***
WSERNM	-0.143196 (0.1465466)	0.0678165 (0.0691842)	0.1525103 (0.0620492)**	0.1253375 (0.0462166)***
GDSB	0.3313817 (0.0848395)***	0.1416759 (0.0917579)	0.3200017 (0.0699994)***	0.2891726 (0.0517144)***
GTRA	0.0924429 (0.0528254)*	0.0589604 (0.0381653)	0.0329791 (0.0222968)	0.0458826 (0.0180527)**
GBUS	-0.0164126 (0.0555404)	0.1107567 (0.0615976)*	0.0948993 (0.0322398)***	0.0835622 (0.0255511)***
GSERNM	0.0293918 (0.0369195)	-0.0067285 (0.0342835)	0.043667 (0.0253855)*	0.0375032 (0.0191192)**
North-west	0.0209976 (0.0059099)***	0.0146859 (0.0047959)***	0.0077833 (0.0039761)*	0.014017 (0.0025146)***
North-east	0.0182464 (0.0060542)***	0.0084912 (0.0051452)	0.0076898 (0.0040785)*	0.0111164 (0.0026648)***
Centre	0.0167096 (0.0053616)***	0.0078411 (0.0049168)	0.0184847 (0.0033775)***	0.0142776 (0.002432)***
Vif (Mean)	1.97	1.53	1.33	1.53
F stat.	9.33	2.92	17.87	25.27
R-squared	0.4488	0.2158	0.3892	0.3744
no. obs.	156	136	394	686

Source: Own elaboration. Data ISTAT

Note: OLS cross-section regression model. Constant coefficient not shown, although it was included in the model. Corrected standards errors in parentheses. \*\*\* Statistical significance level at 1%; \*\* statistical significance level at 5%; \* statistical significance level at 10%.

Another new element of this work is to verify the existence of a positive relation between distributive services and the strengthening of industrial activities. For this purpose, we analyse the impact of the growth in the share of employees in the distributive services on the industrial productivity growth. Hence, the model is formulated as follows:

$$\begin{aligned}
 GPUL\_IND_i = & \alpha + \beta_1 PUL_i + \beta_2 WDSB_i + \beta_3 WTRA_i + \beta_4 WBUS_i + \beta_5 WSERNM_i + \beta_6 GDSB_i + \\
 & \beta_7 GTRA_i + \beta_8 GIMP_i + \beta_9 GSERNM_i + North\_west_i + North\_east_i + Centre_i + \mu_i
 \end{aligned}
 \quad (3.3)$$

where the dependent variable GPUL\_IND represents the industrial productivity growth rate over the period 2001–2005. The other variables are the same as in model (3.2).

Study results are summarised in Table 7. The main result is that the distributive services are also confirmed in this case as the main kind of services; indeed, distributive services have very positive impact on the industrial productivity growth, and differences in the dynamics of this subsector characterise ID LLSs (column 9) compared to the manufacturing non-ID LLSs (column 10). Consequently, the growth in the share of employees in distributive services (GDSB) and the initial share of employees in distributive services (WDSB) have a positive effect on the industrial productivity growth in the industrial districts. The analysis of sectoral change dynamics for the years 2001–2005 confirms the existence of a positive relationship between GDSB and industrial productivity growth of industrial districts. This relationship is shown by a high coefficient statistically significant at a 5% level and a good explanatory power of the model (the R-squared is 0.447, see column 9). Instead, GDSB does not impact the industrial productivity growth in manufacturing non-ID LLSs (column 10). Indeed, concerning the manufacturing non-ID LLSs, this relationship becomes not statistically significant and the regression exhibits low “goodness of fit” overall (e.g. low values of R-squared—0.1833). In the other LLSs, the coefficients of GDSB are similar to IDs, but the explanatory power of the model is reduced (column 11). This trend is justified by the greater dynamism of services in non-mainly industrial areas.

For ID LLSs WDSB has a positive and statistically significant (1%) impact on the industrial productivity growth. The impact of WDSB on the industrial productivity growth is confirmed in the manufacturing non-ID LLSs

(column 10) while it is not statistically significant in the other LLSs (column 11). The growth in the share of employees in the transport services also seems to have an interesting role in the ID LLSs. Indeed, Table 7 shows that the increase in productivity of industry in the industrial districts is associated positively both to the initial share of transport services (WTRA) and to the growth in the share of employees in this sector (GTRA). If we consider that the transport services are often classified within distributive services (Micucci and Di Giacinto 2009), this result is further confirmation that the growth in the share of employees in the distributive channel has a positive impact on the productivity growth in the industrial districts. These trends do not occur in the manufacturing non-ID LLSs. The non-market services (WSERNM and GSERNM) confirm a non-statistically significant relation with the industrial productivity growth in the industrial districts. These results once again highlight the peculiarity of the relationship between distributive services and the district system.

Also in this case, the coefficients  $\beta_1$  of the initial level of productivity are statistically significant and negative, confirming the presence of a convergence effect. Industrial districts show a high coefficient  $\beta_1$ , confirming the presence of a greater convergence effect than other LLSs considered. In the industrial districts, this coefficient shows higher values compared to previously analysed models concerning the growth of the total productivity; these results show a strong tendency towards convergence in the industrial productivity. Similar results regarding the wider issue of convergence of industrial productivity have been discussed in the literature. (Rodrik 2013)

As for the territorial dummies, the results seem to occur only in the districts of Northern Italy, which represent a majority in the total number of districts in the national territory. The Centre of Italy does not show statistically significant results. The explanatory capacity of the model, through its R-squared, is acceptable, and in ID LLSs (0.447) is higher than other LLSs considered.

Table 7 - Distributive services and industrial productivity growth - Model 3

	(Col. 9) ID LLSs	(Col. 10) Man.Non-IDLLSs	(Col. 11) Non-Manuf. LLSs	(Col. 12) Total LLSs
PUL	-0.1189007 (0.0166692)***	-0.0526028 (0.0301536)*	-0.0414389 (0.0103969)***	-0.0545087 (0.0091823)***
WDSB	0.2048559 (0.0788734)***	0.2100666 (0.0844243)**	0.0284222 (0.0390561)	0.0880623 (0.030766)***
WTRA	0.557385 (0.1415045)***	0.0227448 (0.1420596)	-0.1305766 (0.0515109)**	-0.0412278 (0.048524)
WBUS	-0.1114769 (0.0738004)	0.0708011 (0.0840482)	-0.0374177 (0.0477938)	0.0451756 (0.0367326)
WSERNM	-0.1492656 (0.2391783)	-0.2109926 (0.1664101)	-0.0018599 (0.085447)	-0.0289511 (0.0790963)
GDSB	0.3272982 (0.1302895)**	0.1709587 (0.1837827)	0.3899614 (0.1202535)***	0.3001041 (0.0877769)***
GTRA	0.1602759 (0.064389)**	0.0717287 (0.0681803)	0.0497259 (0.0412077)	0.0708374 (0.0332551)**
GBUS	0.0673297 (0.0735555)	0.1152259 (0.1290163)	0.0930124 (0.0571388)	0.1144377 (0.0481699)**
GSERNM	0.0500209 (0.058162)	0.100894 (0.0485212)**	0.0541506 (0.0392124)	0.0656056 (0.0292431)**
North-west	0.0190923 (0.0081228)**	0.0011603 (0.0095645)	-0.0069671 (0.0070668)	-0.0013123 (0.0043346)
North-east	0.0223284 (0.0078553)***	0.013568 (0.0087668)	0.0018696 (0.0064161)	0.0078071 (0.0042)*
Centre	0.0116812 (0.0072922)	-0.0030842 (0.00886)	0.0108358 (0.0056177)*	0.0042879 (0.0039357)
Vif (Mean)	1.97	1.53	1.33	1.53
F stat.	7.97	2.71	4.42	7.86
R-squared	0.4469	0.1833	0.1624	0.1761
no. obs.	156	136	394	686

Source: Own elaboration. Data ISTAT



Note: OLS cross-section regression model. Constant coefficient not shown, although it was included in the model. Corrected standards errors in parentheses. \*\*\* Statistical significance level at 1%; \*\* statistical significance level at 5%; \* statistical significance level at 10%.

In all models there are no multicollinearity problems (Vifmean shows a low value) and standards errors are robust to heteroskedasticity. The territorial dualism between Centre-north and south are confirmed by the territorial dummies. These variables show positive and statistically significant coefficients to both in the northern districts and, to a lesser extent, in the districts of the Centre of Italy.

In conclusion, the analysis shows that the distributive services contribute to the productivity growth of the economic system; the expected results therefore are confirmed; the so-called structural burden does not occur because the distributive services show a driving force in the dynamics of the growth. In addition, the results confirm the existence of a strong relation between the distributive services and industrial activities. These virtuous trends seem to advantage particularly the industrial districts. In manufacturing non-ID areas, in fact, these trends do not occur. These results demonstrate that the industrial districts still have an important role in the vitality of the Italian industrial system. It seems that the industrial districts have faced the challenge of modernisation and tertiarisation better in comparison to the rest of the national productive system.

## Conclusion

This paper analyses the effects of the increase of the employment share of distributive services, and whether it has a role in explaining total productivity and industrial productivity growth at LLSs level in Italy.

Recent literature has shown that some kinds of services, such as distributive services, can have a positive impact on the dynamic of productivity growth in advanced economies. This framework overturns the traditional view of services as unproductive activities, usually responsible for a structural burden that slows down the evolutionary dynamics of the economic system.

Given the slow pace with which the process of modernisation of services is moving forward, Italy seems to make an important exception to this general conclusion. It should be noted that the studies which in the past approached this problem are usually based on data at a national level. But, due to the coexistence in the Italian economic system of backward and advanced areas, the results achieved can be misleading. Actually, our study shows that conducting the analysis at the LLSs level, it can be seen that industrial districts show a strongly different dynamic when compared to the rest of the productive system.

In fact, two new, main elements emerge from our analysis. In the first place, the preliminary test carried out in the section 3.2 shows that in the industrial districts the growing employment in distributive services does not follow to a weakening of the industrial structure. In fact, it is not related to the loss of employees in industry, and there is rather a positive, synergistic integration between the distributive services and industrial activities. On the contrary, for manufacturing no-ID LLSs there is a negative correlation between the evolution of employment in the distributive services and in the industrial sector.

In the second place, our econometric analysis proves that the increase in the employment share of distributive services influences both the total and the industrial productivity growth. The conclusions, in this case, are quite clear: on the one hand, it can be said that in the industrial districts the so-called structural burden seems not to be at work; on the other hand, a positive integration between distributive services and industrial activities seems to be operating. These results are even more interesting when compared to the rest of the production system. Manufacturing non-ID LLSs, indeed, do not obtain analogous results. In other words, industrial districts show a peculiar trend and seem to implement, better than the other areas, the opportunities arising from structural change.

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## The Principle and the Development of Value Added Tax Gap in Slovakia and in the European Union

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### Abstract:

*In this article we would like to search the similarity respectively the diversity of gap on Value Added Tax in selected EU countries. The analysis is based on theoretical background about tax gap. Besides the dimension of VAT Gap in Slovakia and in selected European states we have analyzed also other significant indicators, which affect the VAT Gap. Than we have focused on the situation within the European Union and compared the Member States among themselves. During the comparing we observed some similarity between countries we have examined. We used the cluster analysis to verify this assumption of similarity. Main objective of the article is to explore several indicators affecting the VAT Gap and compare them in selected European countries.*

**Keywords:** tax gap, VAT, European Union, cluster analysis.

**JEL Classification:** H20, H25, H26.

### 1. Introduction

Report on Fight against Tax Fraud, Tax Evasion and Tax Havens (2013) shows that an estimated 1 trillion € in public money is lost due to tax fraud and tax avoidance every year in the EU. This alarming size of the tax gap represents a rough yearly cost of 2000 € for every European citizen. The average of the tax lost in Europe today exceeds the total amount that Member States spend on healthcare, and it amounts to more than four times the amount spent on education in the EU. The current tax gap in Europe represents not only an alarming loss of public revenue but also a danger for the safeguarding of the EU social model based on quality public services available to all. It is a threat to the proper functioning of the Single Market and a dent to the efficiency and fairness of tax systems within the EU. The loss of revenues continues to increase the deficit and debt levels in the Member States right at the most crucial time of fighting the crisis. Due to tax fraud and tax avoidance, funds available to foster public investment, growth and employment are waning. (European Parliament 2013)

### 2. Theoretical background

British tax administration called HMRC defines „tax gap“ as the difference between the amount of tax that should, in theory, be collected by HMRC, against what is actually collected. The „theoretical liability represents the tax that would be paid if all individuals and companies complied with both the letter of the law and our interpretation of Parliament’s intention in setting law (referred to as the spirit of the law). The tax gap estimate is net of the additional tax collected from enquiries. The total theoretical liability is calculated as the tax gap plus the amount of tax actually received, from HMRC receipts. The tax gap can also be described as the tax that is lost through non-payment, use of avoidance schemes, interpretation of the tax effects of complex transactions, error, failure to take reasonable care, evasion, the hidden economy and criminal attack on the tax system (HMRC 2015). The term “tax gap” tends to describe the difference between the actual tax collections and the tax collections a revenue administration should collect given the current policy framework (potential collections). A more holistic approach

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would include the two major factors: (i) the effects of compliance (or noncompliance); and (ii) the effects of policy choices that lead to reduced revenues. (Toro *et al.* 2013)

There are two different measurements of the tax gap. The first measurement is the “gross tax gap,” or the difference between tax liability paid and the true tax liability. The “net tax gap” is the gross tax gap less payments of the year’s tax liability that are collected either via voluntary late payments or via a tax agency’s enforcement efforts. Policymakers are often more concerned with the net tax gap than with the gross tax gap because the net tax gap is considered a better indication of the effectiveness of tax compliance efforts. (Alm and Borders 2014) Mazur and Plumley (2007) describe three components of the tax gap according to The Internal Revenue Service in the USA. The first component is „Nonfiling gap“. It is the tax not paid on time associated with returns that are filed after the due date (with extension, if any) or not filed at all. Any withholding (or other timely payments) paid on behalf of the taxpayer is netted out computing estimates of the nonfiling gap. The second component is „underreporting gap“ and it is defined like the additional tax due on timely filed returns arising from the misreporting of tax liability on those returns (compared to the true liability owed under the Tax Code). The last component of tax gap is „underpayment, which means the tax that is reported on timely filed returns, but is not paid on time. Alm and Borders (2014) explain two main approaches of the tax gap estimates of underreporting, whose difference lies in the type and availability of the data.

The more frequently used procedure relies upon audit-based methods by employing thorough line-by-line audits of a sample of individual tax returns to determine the underreporting of specific types of income from the selected sample; these results are then extrapolated to the entire taxable population in computing a measure of the total underreporting tax gap. The second method also uses a subset of tax returns but is not based upon tax audits. Instead, it estimates true income through more indirect methods that are by their nature somewhat less precise than audit-based measures. In methodology used in the study by Niu and Cohen (2011) they apply real estate tax data taken directly from the federal returns instead of the third party sampling data to compare income reported by business income earners to income reported by wage income earners and treat the difference of the two groups as the tax gap. The tax gap exists for both wage earners and business income earners. Therefore, the tax gap resulting from their study should be regarded as a relative gap (relative to wage earners) for business income earners, or regarded as the lower limit of the tax gap for the business income earners. Once a reliable estimation of the tax gap for the wage earners is developed, the absolute tax gap for business income earners will be easy to reach.

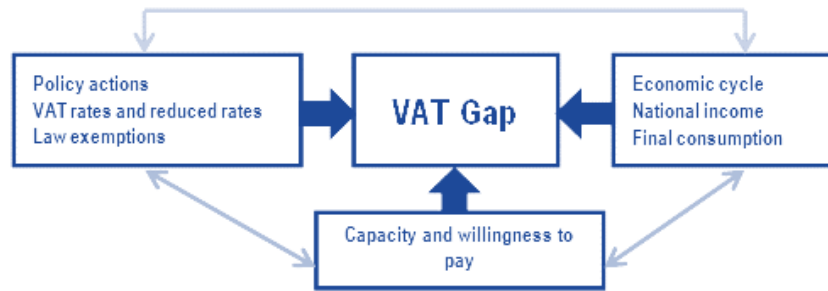
Warren and McManus (2007) focus on the importance of the „tax gap“. They point out that tax gap is crucial to governments and to the development of appropriate government policy. If tax gap is growing, tax revenue will potentially fall and the ability to meet welfare demands will diminish. A natural response for government might be to increase all tax rates to raise additional needed revenue. While indirect tax rate increases might result in increased revenue, a vicious circle of higher income tax rates, more welfare spending and a growing tax gap may result. Estimating tax gap would enable:

- verification of the level of risk assessed in relation to risk areas identified;
- a comprehensive analysis of all areas of compliance and non-compliance;
- identification of areas of risk not previously identified or ranked;
- monitoring of the quantification of risk areas over a period of time using a comparable estimate;
- assessment of the effectiveness of attempts to reduce the non-compliance in a risk area and in aggregate; and
- comparison of relative risks across all areas. (Warren, McManus 2007)

### Tax gap on Value Added tax

Lot of analyzes have confirmed that the status and the development of the VAT Gap is influenced by a number of economic variables as well as by policy actions, through the influence on theoretical VAT revenue on the one hand, and on the capacity and willingness to pay by taxpayers on the other hand.





Source: own processing

Figure 1 – Influence of different factors on VAT Gap

The VAT Gap is sensitive to different factors. Some of them are shown in Figure 1. There are also displayed mutual connections of factors.

### 3. Value Added Tax Gap in the European Union

During 2013, the overall VAT Total Tax Liability (VTTL) for the EU Member States grew by about 1.2% while collected VAT revenues rose by 1.1%. As a result, the overall VAT Gap in the EU saw an increase in absolute values of about 2.8 billion EUR, to reach 168 billion EUR. As a percentage, the overall VAT Gap stayed constant at 15.2%. The median VAT Gap rose by 1.6% point and was 13.9%. (Study on VAT Gap – 2015 Report)

Table 1 – VAT Gap Estimates (mil. EUR)

COUNTRY	2012				2013			
	Revenues	VTTL	VAT Gap	VAT Gap %	Revenues	VTTL	VAT Gap	VAT Gap %
Austria	24,563	27,629	3,066	11.1%	24,953	28,17	3,217	11.4%
Belgium	26,896	30,272	3,376	11.2%	27,226	30,412	3,186	10.5%
Bulgaria	3,828	4,697	869	18.5%	3,775	4,56	785	17.2%
Czech Republic	11,377	14,883	3,506	23.6%	11,694	15,07	3,375	22.4%
Denmark	24,296	26,563	2,267	8.5%	24,36	26,85	2,489	9.3%
Estonia	1,508	1,74	232	13.3%	1,558	1,873	315	16.8%
Finland	17,987	18,524	537	2.9%	18,848	19,66	812	4.1%
France	142,526	157,36	14,834	9.4%	144,414	158,51	14,096	8.9%
Germany	194,034	216,98	22,95	10.6%	197,005	221,88	24,873	11.2%
Greece	13,712	20,595	6,883	33.4%	12,593	19,09	6,497	34.0%
Hungary	9,084	11,963	2,879	24.1%	9,073	12,003	2,93	24.4%
Ireland	10,219	11,508	1,289	11.2%	10,371	11,596	1,225	10.6%
Italy	96,17	141,33	45,162	32.0%	93,921	141,44	47,516	33.6%
Latvia	1,583	2,391	808	33.8%	1,693	2,414	721	29.9%
Lithuania	2,521	3,971	1,45	36.5%	2,611	4,192	1,58	37.7%
Luxembourg	3,093	3,269	176	5.4%	3,485	3,672	187	5.1%
Malta	536	777	241	31.0%	586	796	210	26.4%
Netherlands	41,699	43,598	1,899	4.4%	42,424	44,276	1,852	4.2%
Poland	27,783	37,175	9,391	25.3%	27,78	37,911	10,131	26.7%
Portugal	13,995	15,33	1,335	8.7%	13,71	15,068	1,358	9.0%
Romania	11,212	19,634	8,422	42.9%	11,913	20,209	8,296	41.1%
Slovakia	4,328	7,054	2,726	38.6%	4,696	7,209	2,513	34.9%
Slovenia	2,889	3,18	291	9.1%	3,045	3,232	186	5.8%
Spain	56,652	68,262	11,61	17.0%	61,35	73,444	12,094	16.5%
Sweden	37,834	39,762	1,928	4.8%	39,091	40,867	1,776	4.3%
United Kingdom	142,943	159,700	16,752	10.5%	141,668	157,100	15,431	9.8%

Source: [http://europa.eu/rapid/press-release\\_MEMO-15-5593\\_en.htm](http://europa.eu/rapid/press-release_MEMO-15-5593_en.htm)



While 15 Member States including Latvia, Malta and Slovakia saw an improvement in their figures, 11 Member States such as Estonia and Poland saw deterioration. One of the fundamental characteristics of time series is the average growth coefficient ( $k^-$ ). Among other indicators we used it to measure the development VAT Gap in selected European countries showed in Table 2:

$$k^- = \sqrt[T-1]{k_1 \cdot k_2 \dots k_{T-1}} \quad (1)$$

where  $k_T$  is growth coefficient and  $T$  is the number of seasons.

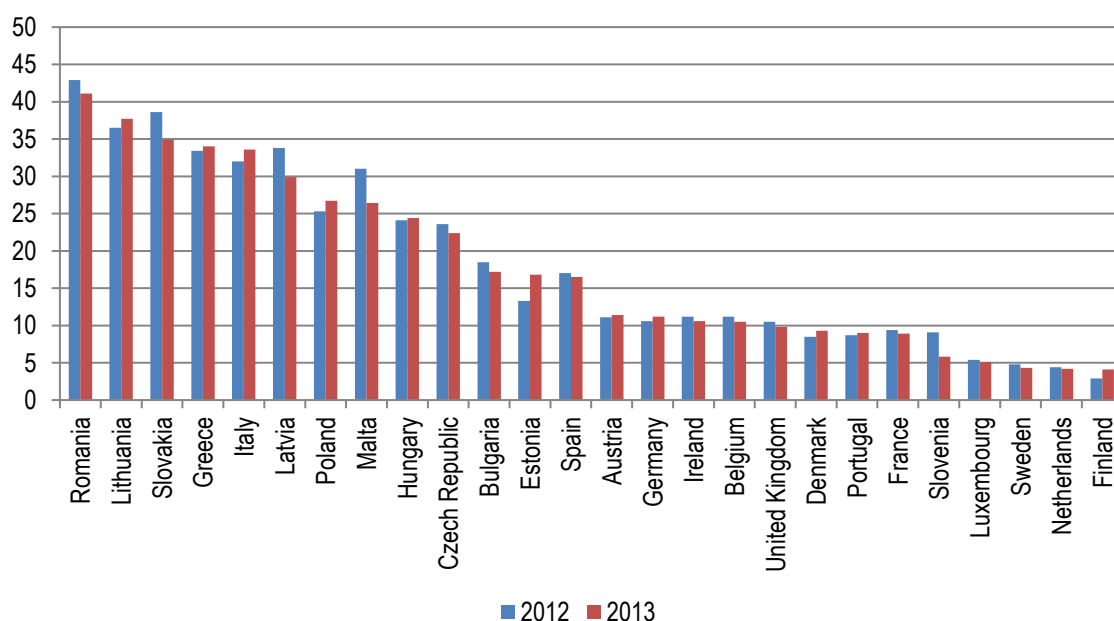
Table 2 – VAT Gap in EU-26 (mil. EUR)

Country	2009	2010	2011	2012	2013	Trend line	Average Growth Coefficient (2009 - 2013)
Austria	2289	2945	3392	3066	3217		1,070436856
Belgium	3549	3243	3236	3376	3186		0,978651248
Bulgaria	1052	930	1072	869	785		0,943128314
Czech Republic	2852	3571	2876	3506	3375		1,034248384
Denmark	1892	2067	2234	2267	2489		1,056381417
Estonia	133	156	187	232	315		1,188206114
Finland	497	1158	640	537	812		1,103163612
France	19521	12161	10566	14834	14096		0,936955071
Germany	18394	19070	22335	22950	24873		1,062210029
Greece	7577	6927	9160	6883	6497		0,969712772
Hungary	2424	2660	2550	2879	2930		1,03864468
Ireland	1709	1256	1521	1289	1225		0,935575424
Italy	49261	39231	45775	45162	47516		0,992812714
Latvia	837	649	821	808	721		0,970603742
Lithuania	1519	1358	1404	1450	1580		1,00790561
Luxembourg	68	73	115	176	187		1,224239925
Malta	144	186	216	241	210		1,078378847
Netherlands	3418	201	1749	1899	1852		0,884654691
Poland	6038	6051	6837	9391	10131		1,109051826
Portugal	2022	1865	2094	1335	1358		0,923471982
Romania	7799	7803	8251	8422	8296		1,012432236
Slovakia	2217	2334	2133	2726	2513		1,02538122
Slovenia	421	356	283	291	186		0,849270756
Spain	22169	8147	11773	11610	12094		0,885859348
Sweden	989	1082	1492	1928	1776		1,124214892
United Kingdom	14163	15135	14731	16752	15431		1,017296999

Source: processed according [http://europa.eu/rapid/press-release MEMO-15-5593 en.htm](http://europa.eu/rapid/press-release_MEMO-15-5593_en.htm)

Trend lines of VAT Gap over the period 2009 – 2013 are shown in Table 2. Member States have tended to slightly reduce their gap compared to the beginning of the period. For the EU-26 the VAT Gap declined by 4 percentage points. The highest Average Growth Coefficient over the period 2009 – 2013 has reached Luxembourg followed by Estonia. On the other hand, the most significant decline recorded Slovenia. Within the EU, Slovakia is

among countries with the largest gap in value-added tax collection. According to an EC study the difference between VAT revenues (theoretically established by legislation) and actual collected VAT revenues in 2013 amounted about 34.9%. Overall in the EU the Gap on VAT increased in 2013 by 2,8 billion EUR.



Source: processed according [http://europa.eu/rapid/press-release\\_MEMO-15-5593\\_en.htm](http://europa.eu/rapid/press-release_MEMO-15-5593_en.htm)

Figure 2 – Development of VAT Gap in EU-26 (in %)

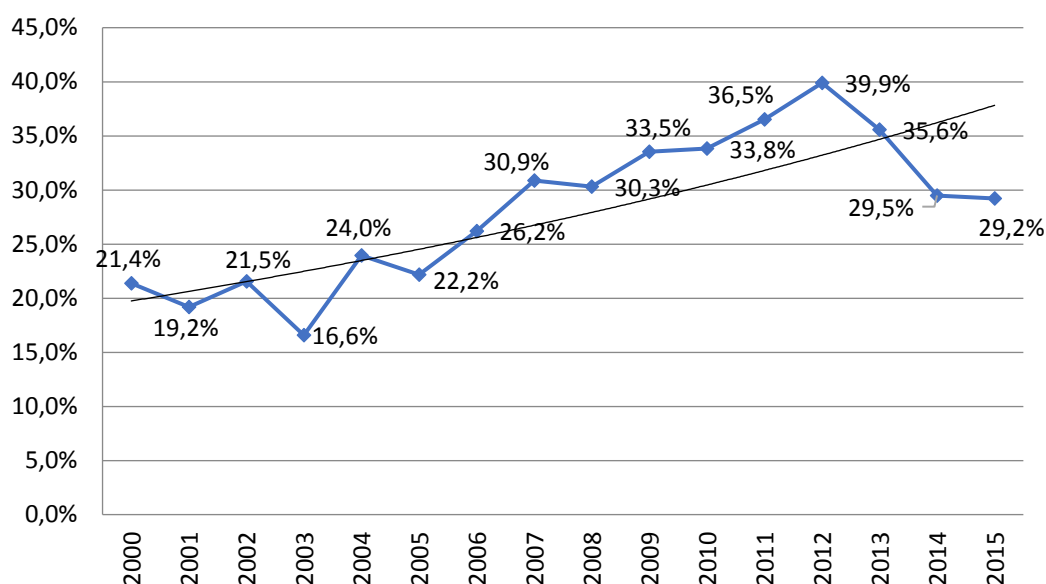
Best results recorded in 2013 Finland (4%), also Netherlands (4.2%) and Sweden (4.3%). On the other side of this rank was Romania with 41%. The most significant decline between 2012 and 2013 recorded Slovakia, Malta and Slovenia (see Figure 2).

#### Tax gap on Value Add Taxe in Slovakia

The efficiency of VAT collection in this context is understood as the ability of Financial Administration to recover tax payers declared tax liability and the tax provision resulting from control activities of financial management. Finance Administration of Slovakia is an institution which manages most of the tax obligation, while there is the greatest risk of unpaid taxes. The customs offices manage VAT just on import. The enforce ability of prescribed duties should be very high according the definition, because the goods are released to tax circulation after paying taxes. The efficiency of VAT collection is monitored in two basic stages:

- Prescribed tax collection which was declared by taxpayer itself.
- Prescribed tax collection which was charged on the basis of the active work of the Tax Administration.

According to current estimates, the value of tax gap on VAT in 2014 was 29.5% of potential VAT in Slovakia. In nominal terms, this difference corresponds to 2,5 billion EUR, representing 2.8% of GDP. Compared to 2012, when the VAT gap reached its peak it has been reduced by one quarter. Comparison to the average level in the EU points out the fundamental space for the continuation of the prior successful fight against tax evasion. To illustrate this, the reduction in the gap on VAT to the average level in the EU in 2014 would mean additional revenue for government coffers 0,8 billion EUR (1.1% of GDP) (IFP 2015).



Source: IFP, 2015

Figure 3 - Estimation of VAT gap from 2000 to 2014 in Slovakia (% of potential VAT)

A major part of the VAT gap we attribute as unidentified VAT representing the difference between the tax liability under tax returns and potential VAT. The second part of the gap is accounted for tax collection, which in the period 2008-2010 was around 5.0% of potential VAT. Thanks to the streamlining of control processes by Financial Administration of Slovakia this value decreased in 2013 up to 0.7% of potential VAT and today already represents only 2% of the total VAT gap (IFP 2015).

#### 4. Cluster analysis

Imputed variables were calculated according Study on VAT Gap – 2015 Report. Research method is cluster analysis conducted in statistical software R 2.15.2. There were used two clustering methods – hierarchical agglomerative clustering and non-hierarchical clustering. Three imputed variables were VAT Gap, Nominal Growth of Final Consumption and VAT Standard Rate in 2013 in selected EU countries (EU-26). The objective of cluster analysis was to achieve such groups of states, which would be characterized by certain homogeneity. Cluster analysis sorted data into groups with the greatest possible similarity within the group and the largest difference between groups. The basic methods of clustering we used were:

- *Hierarchical methods* are based on sequentially joining of clusters, their number decreases continuously until finally all clusters are combined into one. The result is graphically displayed as tree diagram respectively cluster dendrogram. (Litavcova *et al.* 2015)
- *Ward's method* involves an agglomerative clustering algorithm. It looks for groups of leaves that it forms into branches, the branches into limbs and eventually into the trunk. Ward's method starts out with  $n$  clusters of size 1 and continues until all the observations are included into one cluster. Ward's method use the Euclidean distance defined by the formula:

$$d_{ij} = \sqrt{\sum_{k=1}^K (x_{ik} - x_{jk})^2} \quad (2)$$

where  $x_{ik}$  is the value of „ $k$ “ variable for  $i$ -th object and  $x_{jk}$  is the value of „ $k$ “ variable for  $j$ -th object. For calculated distance is than determined the rule of linking statistical units into clusters. There are „ $p$ “ objects in the analyzed group, namely 26 countries in which are pursued „ $k$ “ quantitative characters (3 variables), the distance  $d_{ij}$  between  $i$ -th element and  $j$ -th element is Euclidean distance.

Preparing data file:

```
>data=read.csv2("GAP.csv")
```

Preparing data names:

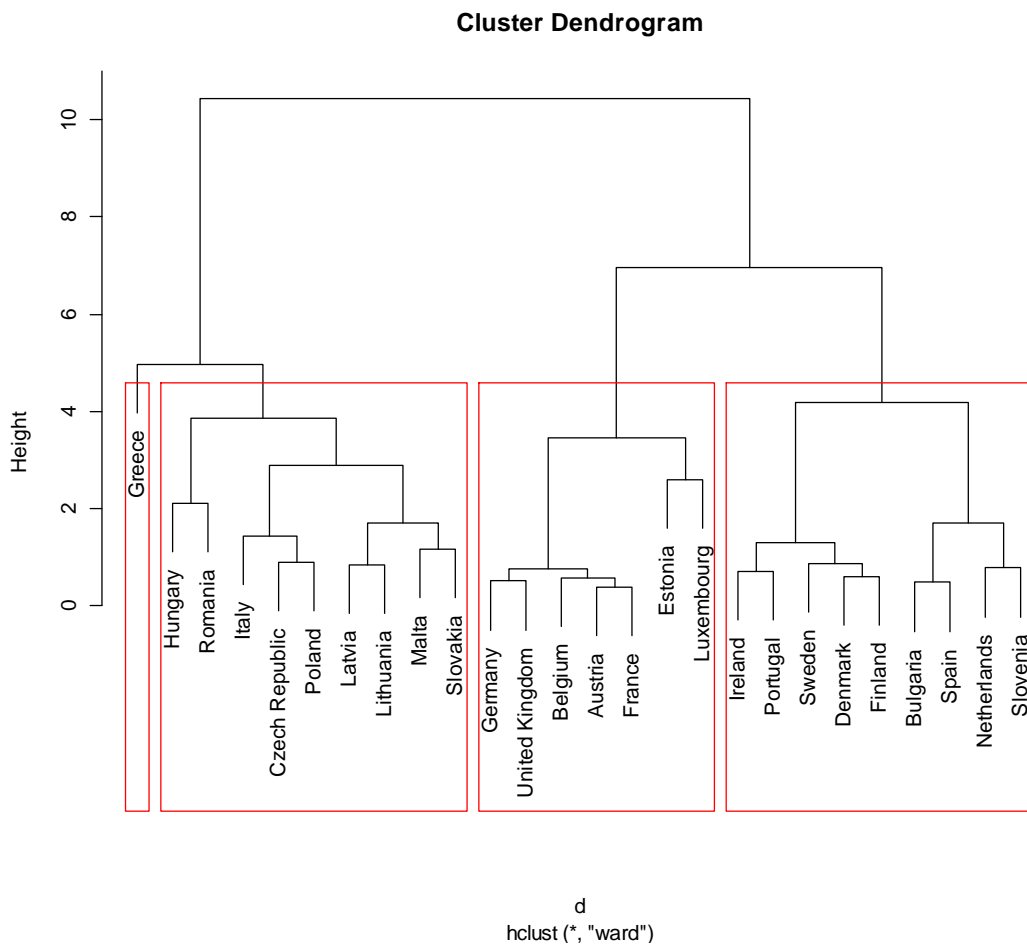
```
>country=data$ Country
>row.names(data)=country
```

In case there are missing values of variables in some countries it is necessary to remove them from the dataset. If variables are in different units, it is necessary to implement scaling, which means unit conversion to a comparable level:

```
>p<-subset (data, select=c(VATGap,NGfc,StRate))
>data<-p
>data<- na.omit(data)
>data<-scale (data)
```

Ward Hierarchical Clustering and display dendrogram:

```
>d<-dist(data,method="euclidean")
>fit<-hclust(d, method="ward")
>plot (fit)
>groups<- cutree(fit, k=4)
>rect.hclust(fit, k=4, border="red")
```



Source: own processing

Figure 4 - Cluster dendrogram according Ward's method

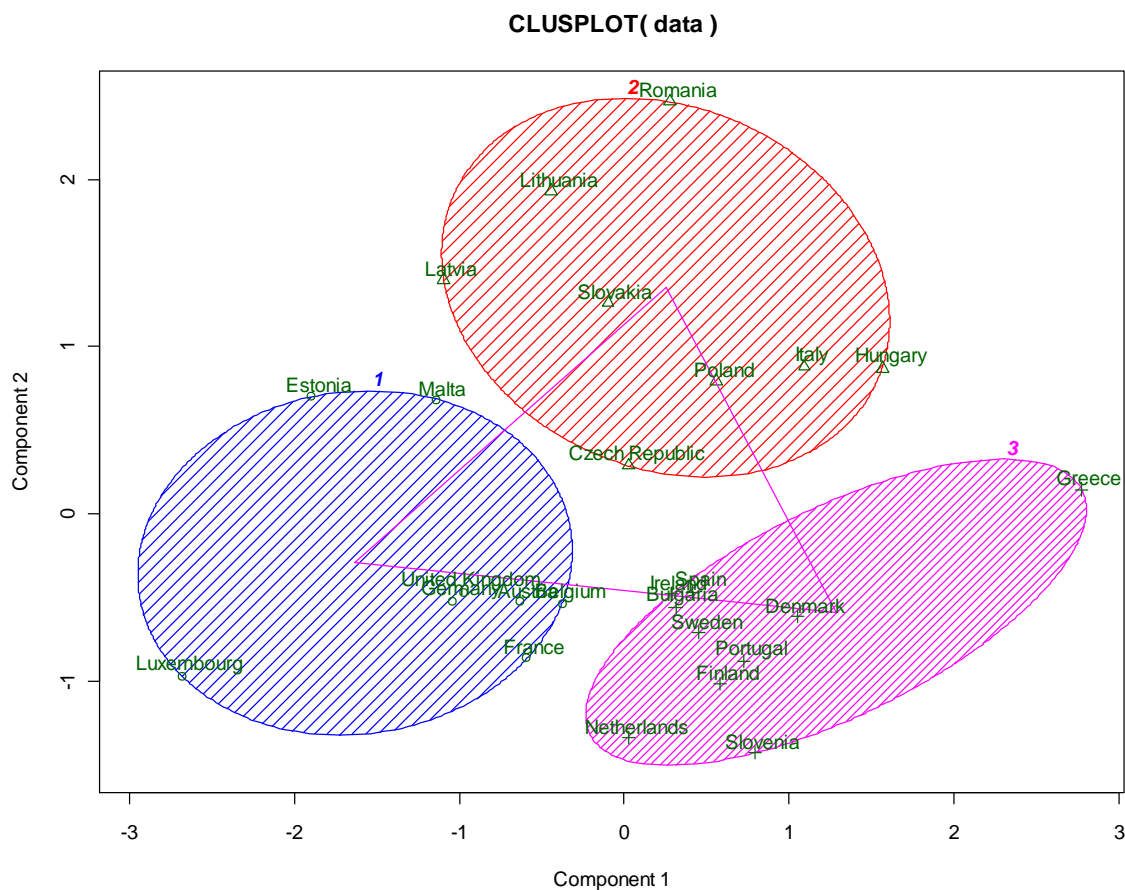
In the dendrogram we can identify only four groups of countries with similar characteristics. These groups are highlighted. According tree diagram except Greece protrude in clusters also Romania and Hungary as well as Estonia and Luxembourg.

**Non-hierarchical methods**

If we consider two variables, clusters can be visualized by using non-hierarchical method K-means. On the basis of previous hierarchical method, it is considered similar number of clusters. K-means clustering is the most

popular partitioning method. It requires the analyst to specify the number of clusters to extract. There are two components, which explain 74.33% of the point variability. K-Means Clustering with 3 clusters:

```
>fit <- kmeans(data, 3)
>library(cluster)
>clusplot(data, fit$cluster, color=TRUE, shade=TRUE, labels=2, lines=1)
```



These two components explain 74.33 % of the point variability.

Source: own processing

Figure 5 - Scatterplot according to K-means method

Due to testing we have chosen 3 clusters as an imputed command for K-means clustering. We consider the data set, which contains n=26 objects, and partition it into k = 3 clusters. The ellipses are based on the average and the covariance matrix of each cluster, and their size is such that they contain all the points of their cluster. The ellipses sizes of clusters 1 and 2 are very similar. Cluster no. 3 displays less variability of Component 2. Each cluster is quite extensive because of objects on boundaries of each ellipse. In cluster one stands out Luxembourg, in the second cluster it is Romania and Greece in cluster number three.

The lines between clusters centers indicate the distance between clusters. In our case it resembles an equilateral triangle. The largest shading intensity indicates the largest density of divided objects in ellipse respectively cluster 3.

### Conclusion

The tax Gap in Slovakia moved in the period 2000-2015 between 16.6% (minimum value in 2003) and 39.9% (peak in 2012). Among EU States Slovakia belongs to countries with highest tax gap on Value Added Tax. The lowest VAT Gap in the EU generally records Finland, Netherlands and Sweden. There are few significant factors that affect VAT Gap in a state. It is especially the tax policy, tax rates, willingness and capacity to pay, consumption of population, GDP growth etc. In the last few years, Slovak government is trying to prevent tax evasion on VAT due to several measures like reduced VAT rate on basic groceries, sales receipt lottery, stricter controls of retailers etc. But these are measures that help to reduce the tax gap only on a small scale. There are

more effective tools and methods for reducing the VAT Gap. In several sectors of Slovak economy are employee salaries under sized, there are too high differences between individual incomes groups, successful entrepreneurs are burdened by high taxes etc. To avoid tax evasion, it is necessary to create a more favorable business environment. These are the areas where we see room for improvement. There might help the cluster analysis that had created clusters of countries with similar features. There are countries with poorer routes and countries with better results within the clusters. Therefore, observing, learning and cooperation is the way forward, the way to improvement and rectification.

Cluster analysis fundamentally confirmed the intuitive division of countries during working on the paper. There are four groups of similar countries according to hierarchical clustering and three clusters as a result of non-hierarchical method. However, the results are almost the same by using both methods. The most numerous one is group 3. In cluster number 1 stand out especially Luxembourg, Estonia and Malta. Luxembourg because of very low VAT Gap, Estonia and Malta because of final consumption growth values. In ellipse of cluster two protrude Romania, which is characterized by highest VAT Gap among all analyzed countries. On the boundary of third cluster is Greece. Reason for that is the most significant decline in final consumption.

### Acknowledgement

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## Impact of Risks on the Enterprise Performance in the European Union by using Enterprise Risk Models

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### Abstract:

*We analyse an impact of systematic and unsystematic risks on the performance of production systems in the period of 2003-2015 by creating of novel enterprise risk models, with focus on Slovakia within the euro area. The method of this paper is based on the methodology of Capital asset pricing model in comparison with Building-up I Model and Building-up II Model (proposed in Czech Republic), used by the valuation Cost of Equity and its applications on Slovak conditions. For the risk analysis we used and compared data of food sectors in selected countries of the EU. By testing hypotheses was confirmed Hypothesis 1 that the valuation Cost of Equity with application of systematic risks using historical data (based on CAPM) was lower than the valuation with application of business and financial risks using expected market data (based on Building-up I). Results proved that systematic risks have a lower impact on the enterprise performance than unsystematic risks. Finally, we constructed novel 3-dimensional Enterprise Risk Models according to Slovak market conditions using our approach to modelling, scoring of risks and prediction models. We confirmed Hypothesis 2 that the enterprise performance reached the better position with the application of systematic risks and forecasting of risk parameters using prediction methods and ex ante data (in ERM2) than with the application of risk parameters based on historical data (in ERM1). Models can be applied by the modelling and strategic planning as early warning models worldwide.*

**Keywords:** business risks, financial risks, systematic risks, unsystematic risks, risk premiums, valuation of Costs of Equity, performance, Enterprise Risk Model.

**JEL Classification:** C51, C52, G32, D81.

### 1. Introduction

Risk is the category that affects enterprise existence and performance worldwide (Koscielniak 2014). Each activity on global markets is risky therefore enterprise or economic subject cannot predict the results of financial, investment or other decisions in entrepreneurship. In the classification of enterprise risks on global market conditions, it is necessary to pay attention to the risks that come into capital pricing models and calculating Costs of Equity. For calculation of discount rate for the valuation of the enterprise and its performance is needful to formulate the main risks of business activities.

For this paper, we focus on empirical risk analysis in enterprise activities and especially risks, that come into the valuation Cost of Equity in models and consequently into the calculation of the company's performance models. To manage risks more effective, risks can be divided as follow (Marik *et al.* 2011):

- business and financial risks that are necessary to be known in the case, when we summarize the input for the valuation Cost of Equity with the application of the particular partial risk,
- systematic and unsystematic risks on the market, are necessary to be known in relation to the purpose, that the valuation is being made for and to the model that is used for assessment.  $\beta$  coefficient as systematic risks has been modified to levered  $\beta$  coefficient. Risks arising from the internal enterprise environment are representing the group of unsystematic risks. These ways of looking at risks were investigated in many empirical studies such as by Klucka (2006), Olibe *et al.* (2008), Lopez - Espinosa *et al.* (2013), Marshall (2015), Vicente *et al.* (2015).

The research questions and research problems are as follow.

As a result of impact of global risks exposure increases the probability and dimension of financial losses in entrepreneurship in global context. Which enterprise performance models, capital pricing models and risk forecasting models based on risk controlling is necessary to apply in managerial practice for the purpose of early identification, quantification, minimization, prevention and forecasting of risks more comprehensive? How to measure and estimate more effectively the Cost of Equity for firms, predict risks better and the relationship between risk and expected return on assets using in managerial practice?

*Business risk* (Marik *et al.* 2011) consists of:

- sector risk – the dynamics of the sector, sector dependence on the business cycle, innovation potential of the sector, determining trends in the sector,
- risk of the market on which the business operates - market capacity, risk of achieving lower sales, the risk of market penetration,
- risk of competition – competition and competitiveness of the products, prices, quality, research and development, advertising and promotion, distribution and service,
- management risk – vision, strategy, key employees, organizational structure,
- risk of the production process – evaluation in terms of production risk, technological opportunities of production, labour force, suppliers,
- other business risk factors – level of fixed costs, position of the business towards customers and suppliers, entry barriers into the sector.

*Financial risk* (Marik *et al.* 2011) can be evaluated by financial indicators: Indebtedness (Debt/Equity ratio), Interest Coverage (EBIT (Earnings before interests and taxes)/interest expense), Debt Service Coverage Ratio (Coverage repayments from Cash Flow), Enterprise Safety indicator (Share of net working capital on current assets), Current ratio and Quick ratio, Average Collection Period, Inventory Turnover.

Statistical tools and techniques are the methods of analysing and quantifying of the risk and can express numerical level of risk (Fotr and Soucek 2011). Risk represents uncertainties by which we are capable, using different methods; quantify the probability of deviation of the actual states, processes or results from expected values. In theory the risk is understood as the possibility of either positive or negative deviation. In practice we understand risk often only as the negative possibility (Oscatka 2015). The risk represents probability that the actual results will be in disparity from the planned (expected) results in either negative or positive sense. Table 1 shows the general distribution of risks into systematic risk according Damodaran (2009, 2014b) and unsystematic risk according Neumaierova and Neumaier (2002).

Table 1 - Systematic and unsystematic risks and their classification

RISK	RISK SPECIFICATION	S/U	I/E
Beta- $\beta$	$\beta$ , levered $\beta$ , unlevered $\beta$ , total $\beta$	Systematic	External
Equity Risk Premium	$ERP = R_m - r_f$	Systematic	External
Country Risk premium	CRP	Systematic	External
$CRP = \text{Default Spread} * \frac{\text{standard deviation in the equity market in the country}}{\text{standard deviation in the long term bond issued by the country}}$			
Inflation	Statistical Office of the Slovak Republic	Systematic	External
Financial	Fundamental factor – Current Ratio	Unsystematic	Internal
Business	Fundamental factor – Return on Assets	Unsystematic	Internal
Lower stocks liquidity on the market	Fundamental factor – Equity	Unsystematic	Internal
Financial structure	Fundamental factor - Interest coverage	Unsystematic	Internal

Source: Neumaierova and Neumaier (2002), Damodaran (2009, 2014b)

Business and financial risks according Marik *et al.* (2011) are not strictly divided into systematic and unsystematic risks, but these risks are mixed together and arise from expected market development. This fact will be interesting for our further research and next modelling.

## 2. Discussion in empirical studies

In the valuation of risks and valuation Cost of Equity in models we investigate, compare and develop *two theoretical approaches*:

- *the first approach* – the methodology based on CAPM model (Damodaran 2014b) with valuation of systematic risks (using historical ex post data)
- *the second approach* – the methodology based on Building-up I model with the valuation of business and financial risks and Building-up II model with the valuation of unsystematic risks (ex post), proposed in the Czech Republic (using historical ex post and ex ante data).

These models don't are used in managerial practice in Slovak Republic within the euro area, for that rational incentive, we investigate, compare and would applied theirs for specific Slovak conditions using our approach by scoring financial indicators, scoring risks and creating of risk models. But models are dynamic developed and used more and more worldwide.

The formation and the fundamental concept of asset pricing theory marked the Capital Asset Pricing Model (CAPM) of authors Sharpe (1964) and Lintner (1965). Five decades later, the CAPM is still widely discussed, improved and used in application such as estimating the Cost of Capital for firms and the performance of managed portfolios. Many experts dealt with them and developed several different versions of CAPM to explain market pricing for explaining risk and return of portfolio. Expected excess return on a portfolio was explained by sensitivity of its return to three market factors as market premium, size premium and value premium in Fama and French Three Factor Model (1993) and developed in their further studies (2004, 2006, and 2012). There is still a lot of debate about whether the outperformance tendency is due to market efficiency or market inefficiency. The basic version of the CAPM developed by Sharpe (1964) and Lintner (1965) has never been an empirical success. The CAPMs empirical problems may reflect theoretical failings.

The problems are compounded by the large standard errors of estimates of the market risk premium and  $\beta$ s for individual stocks, which probably suffice to make CAPM estimates of the Cost of Equity rather meaningless, even if the CAPM holds. Finance textbooks often recommend using CAPM risk-return relation to estimate the Cost of Equity capital. The prescriptions are to estimate a stocks market beta and combine it with the risk-free interest rate and the average market risk premium to produce an estimate of the Cost of Equity. The typical market portfolio included just US common stocks (Lee 2009). According the empirical works the relation between beta and average return is flatter than predicted by the Sharpe-Lintner version of CAPM (Fama and French 2004).

Further studies tested the explanatory power and applicability of Fama and French Three factor model for various national equity markets (Lam 2005, Moerman 2005, Chung *et al.* 2006, Mirza and Shahid 2008, Fuenzalida and Mongrut 2010, Eraslan 2013, Abbas *et al.* 2015). Damodaran (2009) improved the CAPM model at several levels and the first approach was based on the introduction of Country Risk Premium (CRP). Further alternatives were developed in his works (2011, 2014b) for better ways of measuring risk and estimating expected returns. Recent advances in the measurement of beta and market volatility have resulted in improvements in the evaluation of alternative beta and volatility forecasting approaches (Reeves and Wu 2013). Neumaierova and Neumaier (2002) proposed Building-up II model with the evaluation of unsystematic risks (ex post) and Marik *et al.* (2011) proposed Building-up I model with the evaluation of systematic and unsystematic risks (ex post and ex ante from market development), which can better correspondent with national market conditions in the Czech Republic and Slovak Republic, too, within the European Union.

CAPM model or others don't are used in managerial practice in Slovak Republic by estimating Cost of Equity and forecasting risks, for that reason, we investigate, compare and would applied theirs for specific Slovak national and market conditions, in this study.

## 3. Methods and data used

The objective of this study is to analyse and predict an impact of systematic and unsystematic risks on the enterprise performance with focus on business and financial risks using two approaches based on the methodology of Capital asset pricing model (CAPM) in comparison with Building-up I model (Marik *et al.* 2011) and Building-up II model or Gradual Counting Risk Premium Model (GCRPM, Neumaierova and Neumaier 2002) and its applications on Slovak conditions.

And subsequently, this paper outline *our approach by scoring financial indicators, scoring risks and creating 3-dimensional (3D) Enterprise Risk Models*, which solve the impact of risks on the enterprise financial performance and can reduce, diversify and predict risks more comprehensive. We investigate the difference how systematic and unsystematic risks affect enterprise performance in the food industry in the EU countries (in years 2003-2014).

One of the objectives was dedicated to analyse systematic and unsystematic risks in the selected sector in Slovakia (the food sector). We investigate if unsystematic risks have a higher impact as systematic risks on the assessment of the enterprise performance in the sector of industry, using capital pricing models, enterprise risk performance models and forecasting of risks.

Consecutively, in this paper, in the processing of the risk analysis we investigate the selected risks that influence the valuation company's Cost of Equity, with a more detailed elaboration of systematic and unsystematic risks that need to be taken into account in the valuation of the company's capital. The first partial goal was the forecasting of the selected risks and values of risk premiums based on Slovak conditions for the year 2015. The second partial goal was the valuation of Cost of Equity in years 2003 - 2014 with application of selected risks and the comparison of the reached results with the goal to emphasize the impact of the risks on the performance of selected sector of industry. The third partial goal was the creation of novel 3-dimensional Enterprise Risk Models (ERM) for an enterprise in the food industry based on Slovak market conditions and empirical data using our approach.

In the valuation of risks and valuation Cost of Equity we elaborately investigate, compare and would use *two mentioned theoretical approaches*:

- 1<sup>st</sup> approach – the methodology based on the CAPM model with valuation of systematic risks, in Damodaran (2014b) modification,
- 2<sup>nd</sup> approach – the methodology based on Building-up I model with valuation of business and financial risks and Building-up II model with valuation of unsystematic risks, proposed in Czech Republic.

The aim of this study was achieved by using processing methods and models as CAPM model, building up I model (Marik *et al.* 2011) and Building-up II model by Neumaierova and Neumaier (2002). It is important to mention that purely systematic and unsystematic risks do not exist. Capital Asset Pricing Model (CAPM) with acceptance of systematic risks, building-up model I with acceptance of business and financial risks (Marik *et al.* 2011) and Gradual Counting Risk Premium Model (GCRPM) with application of unsystematic risks were investigated and compared by using to calculate the Cost of Equity valuation. The models are listed in Table 2.

Table 2 - The application of Cost of Equity valuation ( $r_e$ ) in models

MODEL CAPM	$r_e = r_f + \beta_L \cdot ERP + CRP$ $\beta_L = \beta_u \cdot (1 + (1 - t) \cdot \frac{D}{E})$ <p><i>r<sub>e</sub></i> – rate of Equity, <i>r<sub>f</sub></i> - Risk-free rate of return, <i>ERP</i>- Equity risk premium, <i>CRP</i> - Country risk premium  <i>β<sub>L</sub></i>- levered Beta, <i>β<sub>u</sub></i> - unlevered Beta, <i>D/E</i> – Debt/Equity</p> <p>The application of the Country Risk Premium in Damodaran model (2014b) which accepts external - systematic risks - Equity risk premium (ERP), Country risk premium (CRP), systematic risk expressed by <math>\beta</math> coefficient. To qualify <math>\beta</math> was used analogy method with application of the recalculation of levered <math>\beta</math>. This modified model accepts systematic risks (ex post).</p>
BUILDING-UP I (BU1)	$r_e = r_f + r_{br} + r_{fr}$ <p><i>r<sub>e</sub></i> – rate of Equity, <i>r<sub>f</sub></i> - Risk-free rate of return, <i>r<sub>br</sub></i>- Business risk, <i>r<sub>fr</sub></i> - Financial risk</p> <p>Marik <i>et al.</i> (2011) suggested Building-up I (the model with power function <math>\alpha^x</math>) model, which evaluates 32 risk factors. These risk factors are divided in two categories, at business and financial risks. Business risks introduce 25 risks in six areas of assessment: factors of risk in the level of the industry branch, level of market factors, competition level, risk management level, production level, as well as other factors related to the production margins. Financial risk was evaluated by application of 7 risk factors: Indebtedness (Debt/Equity ratio), Interest Coverage (EBIT (Earnings before interests and taxes)/interest expense), Debt Service Coverage Ratio (coverage repayments from Cash Flow), Enterprise Safety indicator (share of net working capital on current assets), Current ratio and Quick ratio, Average Collection Period, Average Inventory Turnover. This model accepts systematic and unsystematic risks (ex ante).</p>
BUILDING-UP II (BU2) OR MODEL GCRPM	$r_e = r_f + r_{business} + r_{finstr} + r_{finstab} + r_{LS}$ <p><i>r<sub>f</sub></i> - Risk-free rate of return, <i>r<sub>business</sub></i> - Risk premium for business risk, <i>r<sub>finstab</sub></i> - Financial risk premium, <i>r<sub>finstr</sub></i> - Risk premium for the capital structure, <i>r<sub>LS</sub></i> - Risk premium for lower stocks liquidity</p> <p>External macroeconomic risks are not considered in Gradual Counting Risk Premium Model</p>

	by Neumaierova and Neumaier (2002). The model accepts internal unsystematic risks of the company, which are set using fundamental factors. Accepted risks such as financial and capital structure and lower stocks liquidity on the market. As well accepts the risk-free rate of return of 10-year government bonds of Slovakia. This model accepts only unsystematic risks (ex post).
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Source: Damodaran (2014b), Marik *et al.* (2011), Neumaierova and Neumaier (2002)

For the calculation of unsystematic risks were investigated the model by Neumaierova and Neumaier (2002) and Marik *et al.* (2011). According to the model GCRPM were defined following unsystematic risks, calculated for Czech Republic. The group of unsystematic risks formed by lower stocks liquidity premium ( $r_{LS}$ ), Business risk premium ( $r_{business}$ ), financial risk premium ( $r_{finan}$ ) and financial structure risk premium ( $r_{finstr}$ ). In the line with the main goal the research hypotheses for production systems - enterprises in the food industry in the Slovak Republic in this study, are as follow:

#### Hypothesis H1:

We suppose that the valuation Cost of Equity with application of systematic risks using the methodology based on CAPM Damodaran modification with historical data will be lower than the valuation with application of business and financial risks. We suppose that the Cost of Equity evaluated with application of business and financial risks (systematic and unsystematic) using the methodology based on Building-up model I with expected data from market development will be higher than the valuation based on CAPM.

#### Hypothesis H2:

We suppose that the enterprise performance with the application of systematic risks and estimated and forecasting business and financial risks according Building-up I model will be higher than with the application of unsystematic risks according Building-up II model and historical systematic risks. We suppose that the enterprise performance in the novel 3D Enterprise Risk Model I will be at lower position than the enterprise performance in the 3D Enterprise Risk Model II from the risk viewpoint.

We tested these hypotheses by quantification and forecasting of systematic and unsystematic risks, business and financial risks and the assessment of enterprise performance by creation of enterprise risk models (ERM) based on Slovak conditions and national market in order to reduce and better predict risks. We investigate if the enterprise performance reaches the better position with the application of systematic risks and the estimation and forecasting of risk parameters using ex ante prediction data than with the application of risks and risk parameters based on historical data. The scoring methods, prediction models and accessible statistical and financial data were used to calculate all values of input indicators and risks.

For the creation of 3D Enterprise Risk Model (ERM1) were used secondary data from the financial statements of selected enterprise in the food industry in Slovakia for the years 2004 – 2013, selected risks and risk parameters, based on CAPM and Building-up II model and prediction models.

Our first novel 3-dimensional Model ERM1 consists of three selected dimensions:

- *risks - systematic and unsystematic*: (Risk premium for business risk, Financial risk premium, Risk premium for the capital structure, Risk premium for lower stocks liquidity, Equity Risk Premium, Country Risk Premium, Total Risk Premium, Levered  $\beta$ ),
- *financial performance indicators*: (Average Collection Period, Cash – to – cash, Current Ratio, Debt Equity Ratio, Return on Assets, Return on Equity, Stability, Turnover of Liabilities),
- *Prediction models*: (Altman Z-score, Balance sheet Analysis by Doucha I, Fulmer Model, Index IN05, Index creditworthiness, Quick test, Springate Model, Taffler Model).

Our second novel 3-dimensional Model (ERM2) based on and Building-up I model consists of these three selected dimensions:

- *risks - systematic and unsystematic*: (Equity Risk Premium, Country Risk Premium, Total Risk Premium and Levered  $\beta$  by Damodaran),
- *business and financial risks*: Debt/Equity ratio - Indebtedness, EBIT (Earnings before interests and taxes)/interest expense – Interest Coverage, Coverage repayments from Cash Flow - Debt Service Coverage Ratio, share of net working capital on current assets - Enterprise Safety indicator, Current ratio and Quick ratio, Average Collection Period, average period of inventories - Inventory Turnover (by Marik *et al.* 2011),
- *financial performance indicators*: (Average Collection Period, Cash – to – cash, Current Ratio, Debt Equity



Ratio, Return on Assets, Return on Equity, Stability, Turnover of Liabilities),

- *prediction models*: (Altman Z-score, Balance sheet Analysis by Doucha I, Fulmer Model, Index IN05, Index credit worthiness, Quick test, Springate Model, Taffler Model).

For the evaluation and empirical analysis of the selected risks we picked the sample of companies – production systems (114 enterprises) that are representatives of the food industry in Slovakia. Within this part of the paper we focused on the summarisation of major facts from the branch of food industry that are important mainly for the assessment and forecasting of risks of this industry.

The annual GDP share of the food industry in Slovakia is 2%. This share can be considered as low in comparison to other EU countries, as the major part of EU countries have the share of the food industry in GDP in around 10 – 15%. Despite this fact, the long-term studies of the food industry in Slovakia show the slightly growing tendency. From the standpoint of market structure of industry, food industry belongs to the industries with imperfect competition, that is characterised with high volatility of profits and revenues, so their prognosis is inaccurate and their processing complicated.

This industry also belongs to the branch of noncyclical industries. That means that the industry is independent from the economic cycle, which positively influences height of systematic risk. According the report of Ministry of Agriculture and Rural Development of Slovakia (2014) among the weaknesses and risks of food industry in Slovakia belong: partial absence of resources, increased depreciation of tangible fixed assets, lack of R&D investments, high expenses within the industry, insufficient use of capacities, low share of the food industry in GDP, reserves in vertical integration, high dependence of the food industry on supply business chains, lack of cooperation in food markets, lack of financial resources for propagation, low competitiveness on domestic and foreign markets (Mirdala 2015), absence of marketing strategies, departure of international corporations due to change of macroeconomic environment, liquidate of SMEs production due to insolvency, permanent pressure of imports on domestic production and others. All of these weak links should be taken into the consideration for weighting the risks of the food industry.

### 3.1. Methodology based on CAPM for application of systematic risks for the valuation cost of equity

For the analysis of systematic risks and the valuation Cost of Equity with these risks we use CAPM model in the modification by Damodaran (2014b):

$$r_e = r_f + \beta \cdot ERP + CRP \quad (1)$$

Another parameter within CAPM model is coefficient of systematic risk  $\beta$  that shows the sensitivity of an investment to the market changes. Authors Kliestik and Valaskova (2013) are of opinion, that  $\beta$  coefficient is the standardised risk rate of an asset that is added to the risk rate of an entire market - systematic risk.  $\beta$  is set by the method of analogy. This method is based on the idea of setting  $\beta$  coefficient by comparing with similar enterprises, that are listed in the stock market and their activities are not diversified. It is needed to take into account possible differences in business risk and differences in financial risk that depend on the capital structure of evaluated enterprise. Influence of this capital structure is according to CAPM evaluated in relation between “levered” and “unlevered”  $\beta$  that is edited with  $\beta$  of debt capital, which is considered as zero:

$$\beta_L = \beta_U \cdot \left( 1 + (1 - t) \cdot \frac{D}{E} \right) \quad (2)$$

where:  $\beta_L$  – levered  $\beta$ ,  $\beta_U$  – unlevered  $\beta$ ,  $t$  – tax,  $D$  – Debt capital,  $E$  – Equity.

### 3.2. Methodology based on Building-up I Model for the valuation of business and financial risks

As a starting point for valuation and forecasting of business and financial risks it was important to express risk factors (Marik *et al.* 2011). These factors were classified by the mentioned methodology, to factors of business risk and factors of financial risk. Among the business risk factors (twenty-five risks) were factors of risk in the level of food industry branch, level of market factors, competition level, management level, production level, as well as other factors related to the production margin. Financial risk was evaluated by application of seven mentioned risk factors. Risk weight of factors after the calculation was 32.8. For calculation of weight of risk factor, we used degrees:

1 - low, 2 - average, 3 - increased, 4 - high (Marik *et al.* 2011).

Own calculation of risk premium based on Slovak market conditions in relation to capital valuation we express as multiplication of Risk Free Rate of Return –  $r_f$  by National Bank of Slovakia (2015). As specific power



function for calculation we chose  $a^x$ . Result of this calculation is the Risk Premium for one risk factor and degrees of risk.

The technique of computation:

$$n_{vk} = r_f + RP \tag{3}$$

$$n_{vk} = r_f \cdot a^x \tag{4}$$

$$RP = r_f \cdot a^x - r_f \tag{5}$$

$$RP = r_f \cdot (a^x - 1) \tag{6}$$

$$Z = (a^x - 1) \tag{7}$$

where:  $n_{vk}$  - Cost of Equity,  $Z$  - Risk Premium coefficient,  $RP$  - Risk Premium,  $r_f$  - Risk Free Rate of Return,  $a$  - constant,  $x$  - risk degree

For “a” constant calculation it is important to set lower and upper price limit of Cost of Equity. Lower price limit is set at the level of Risk Free Rate of Return; upper price limit can be expected at the highest risk degree. Upper limit represents value of 35 %. It is necessary to add the Risk Free Rate of Return to the Risk Premium for calculation of upper price limit of Cost of Equity. Based on this method it is possible to calculate required “a” constant by the following relation (Marik et al. 2011):

$$a^x = \frac{n_{vk}}{r_f} a = \sqrt[n]{\frac{n_{vk} \max}{r_f}} \tag{8}$$

The result of this method is, as was stated earlier, Risk Premium for one analysed factor, according to the set degree of risk. In the case of this calculation, it is possible to calculate Risk Premium not only for the year 2015, but also for the longer time period into the future. This method of calculation can be as prediction of risk that we expect in the future. By comparison of calculated constants, we found out, that the highest values of Risk Premiums in all risk degrees were reached in year 2012. We assume that it was caused by the lowest yields of Slovak government bonds that copied the yield of bonds within the Euro area, by the directives of European Central Bank. Value of  $a^x$  is the same as it was in 2011, which was caused by the same yields of Slovak government bonds. After the “a” constant calculation it is possible to calculate “Z” coefficient (Table 3) that stands for Risk Premium coefficient that can be used on the following valuation of business and financial risk.

Table 3 - Values of Risk Premium coefficient “Z” for risk degrees, forecasting for 2015

Degrees of risk	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Low	0.69	0.70	0.68	0.65	0.72	0.99	0.74	0.81	1.08	1.11	0.84	1.00	1.08
Average	1.87	1.88	1.82	1.73	1.95	2.98	2.02	2.26	3.31	3.46	2.39	3.02	3.31
Increased	3.86	3.89	3.74	3.51	4.07	6.94	4.25	4.89	7.96	8.42	5.25	7.05	7.96
High	7.24	7.29	6.97	6.45	7.71	14.8	8.11	9.64	17.6	18.9	10.5	15.1	17.6

Source: authors calculating and processing in software

In the standard economic environment, number of risk factors is higher than one, so as we described in the beginning of methodology in this paper, we assume the existence of twenty-five factors of business risk and seven factors of financial risk that is thirty-two factors altogether. After the multiplication with risk weights the fill value of factors was 32.8. Risk Premium per one factor is in Table 4.

Table 4 - Values of Risk Premiums per one factor (%), forecasting for 2015

Degrees of risk	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Low	0.09	0.09	0.09	0.09	0.09	0.07	0.09	0.08	0.06	0.06	0.08	0.07	0.06
Average	0.24	0.24	0.24	0.25	0.24	0.20	0.24	0.23	0.19	0.19	0.22	0.20	0.19
Increased	0.50	0.50	0.50	0.50	0.50	0.47	0.50	0.49	0.46	0.45	0.49	0.47	0.46
High	0.94	0.94	0.93	0.92	0.94	1.00	0.95	0.97	1.01	1.01	0.97	1.00	1.01

Source: authors calculating and processing in software

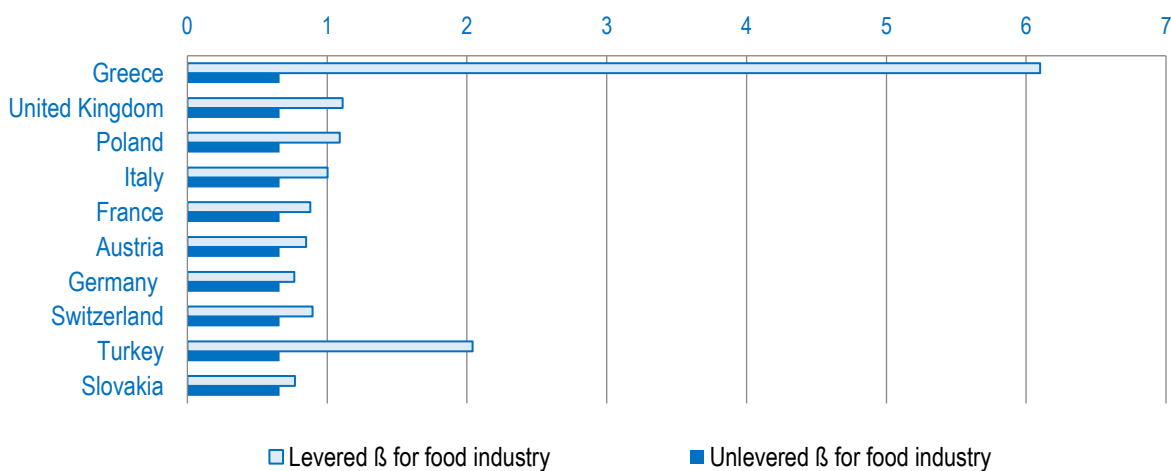
After the calculation of Risk Premium for Slovakia we can calculate particular business and financial risks for analysed years.

#### 4. Empirical research results and discussion

##### 4.1. Calculation of systematic risks for European countries in the food industry

One of the basic inputs for the calculation of the performance of enterprises with the application of systematic risks is the value of  $\beta$  coefficient and  $\beta$  pricing models (Hammami and Lindahl 2013, Horvathova *et al.* 2014). According empirical statistical data (Damodaran 2014a), for an enterprise in the food industry the average value of unlevered  $\beta$  is 0.66 and the value of levered  $\beta$  is 0.77 for year 2013, and for year 2014 is the value of unlevered  $\beta$  is 0.80 and the value of levered  $\beta$  is 0.93.

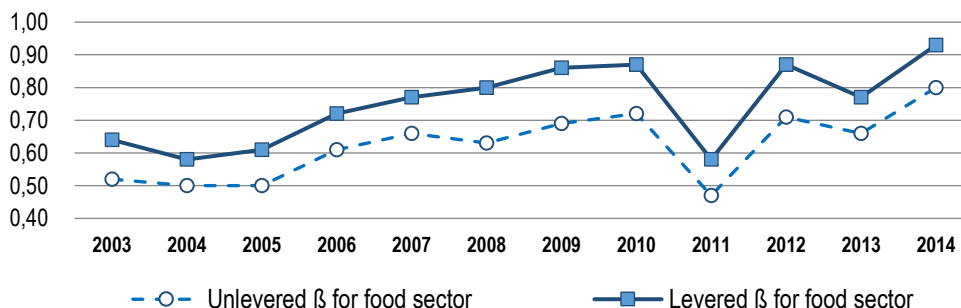
In Figure 1 we compare levered and unlevered  $\beta$  in 2013 in selected European countries. Selection is based by developed countries and emerging market countries. All selected countries have the same unlevered  $\beta$  in the sector. The influence of capital structure and indebtedness because that levered  $\beta$  varies. In Germany, Austria, France, Italy, United Kingdom and Poland the unlevered  $\beta$  is the lowest and Levered  $\beta$  reaches the highest figures in Greece and Turkey (Filip, Grzebyk and Kaliszczak 2010).



Source: authors calculating

Figure 1 - Comparison of levered  $\beta$  and unlevered  $\beta$  in selected countries of the EU in food industry in 2013

In the next figure is showed the comparison of levered and unlevered  $\beta$  from 2003 to 2014 in Slovak food industry. The levered  $\beta$  was the highest from 2008 to 2010, 2012 and 2014 and got near 0.9. That means that the average market risk was lower than the risk of the market assets. The increase of cost of equity during that period was caused by increase in the  $\beta$  value and therefore caused the drop in performance of analysed industry. Therefore, we can assume that deterioration of  $\beta$  coefficient was caused by the economic and financial crisis and by influences of external economic environment.

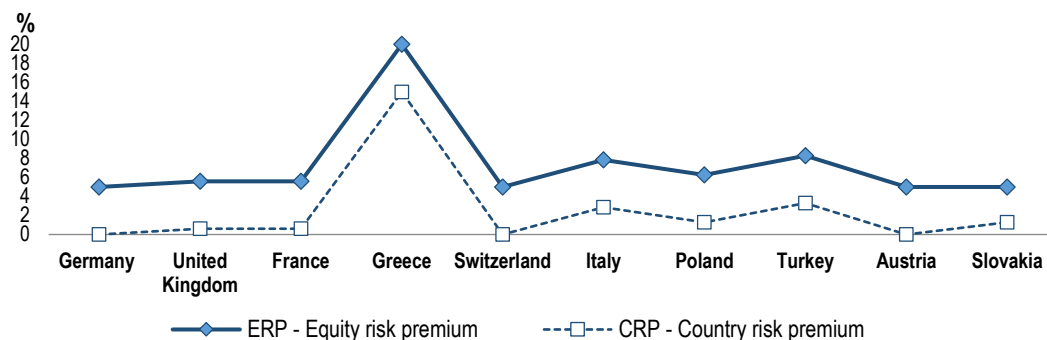


Source: authors calculating

Figure 2 - Comparison of levered  $\beta$  and unlevered  $\beta$  for Slovak food industry

The Country risk premium (CRP) is necessary to mention for additional systematic risks for calculation of the cost of equity. One of the lowest risk premium within analysed countries has Slovakia 1.28 % together with

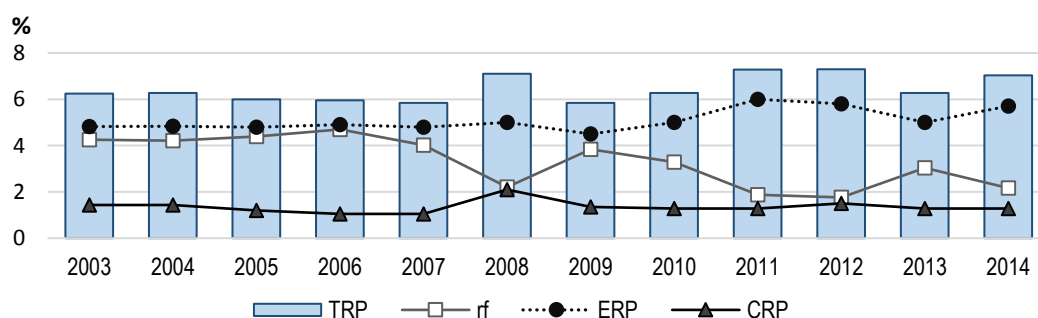
Poland, Italy and Turkey. Greece has the highest risk premium nowadays. Only few countries as Germany, Switzerland and Austria reach 0 risk premium.



Source: authors calculating

Figure 3 - Comparison of risk premiums in % of selected countries in 2013

For the calculation of the Cost of equity of the Slovak food sector were used Country risk premiums and Equity risk premium (ERP). Figure 4 shows the evolution of the risk premiums. Between years 2008 and 2012 were the largest value fluctuations of impact of ERP and sector total risk premium (TRP). The reason was the increasing debt of the enterprises in the food industry in Slovakia. Equity risk premium increased as well in 2011 and 2012 and total risk premium of Slovakia reached its peak in 2012.



Source: authors calculating

Figure 4 - Risk premiums for Slovak food industry

#### 4.2. Calculation and forecasting the valuation Cost of Equity with business and financial risks for the food industry in Slovakia

By testing Hypothesis 1 we used presented methodology based on Building-up I model (Marik *et al.* 2011) for calculation of business and financial risks of the food industry in Slovakia. Firstly, we focused on the calculation of prognosis of business risk for year 2015. Next we applied the methodology for calculation of business risks for the entire analysed time period 2003 - 2014. Within the valuation of business risk factors did occur that were part of both the systematic as well as unsystematic risks. Based on this, we can confirm, that the business risk is the sum of systematic and unsystematic risks. Business Risk Premium for year 2015 is 5.30 % and Financial Risk for year 2015 is 3.53%. Within the financial risk occurred also very high risks, influenced mainly by current liquidity, enterprise safety indicator and partially by interest coverage. Values of current liquidity are below 1 in the long term. Net working capital is negative, which as a result threatens the safety of the food industry in Slovakia. Overall development of business and financial risk as well as the Cost of Equity is shown in Table 5.

Table 5 - Development and forecasting of business and financial risks and Cost of Equity (%)

Indicators	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
$r_f$	4.25	4.22	4.39	4.70	4.02	2.21	3.84	3.29	1.88	1.76	3.04	2.17	1.80
Business Risk	6.48	6.47	6.52	6.60	6.41	5.55	6.35	6.14	5.30	5.20	6.03	5.52	5.30
Financial Risk	3.62	3.62	3.62	3.61	3.62	3.56	3.62	3.61	3.53	3.51	3.60	3.55	3.53
Cost of Equity	14.4	14.3	14.5	14.9	14.1	11.3	13.8	13.0	10.7	10.5	12.7	11.3	10.63

Source: authors calculating and processing in software

Expected Cost of Equity for year 2015 is 10.63 %. This cost is among the lowest in the analysed time period. Lower Cost of Equity was only in 2012. In that year were also lower business and financial risks. For year 2015 we can point out the historically lowest yields of Slovak government bonds that copy the yields of government bonds within the EU. To show the influence of chosen risks on the performance of food industry in Slovakia, we firstly have to point to the business risks that incorporate both the systematic and unsystematic risks. Systematic risks are influencing all branches of the industry in Slovakia and this is why it is important to mainly focus on unsystematic risks that are characteristic for food industry, particularly on the absence of chosen resources, high wearing-out of machinery, high costs, absencing Research and Development and many other factors. In food industry there is prevailing high operational risk that demonstrates on the EBIT reduction in relation to revenue.

#### 4.3 Calculation and forecasting the valuation Cost of Equity with application of systematic risks for the food industry in Slovakia

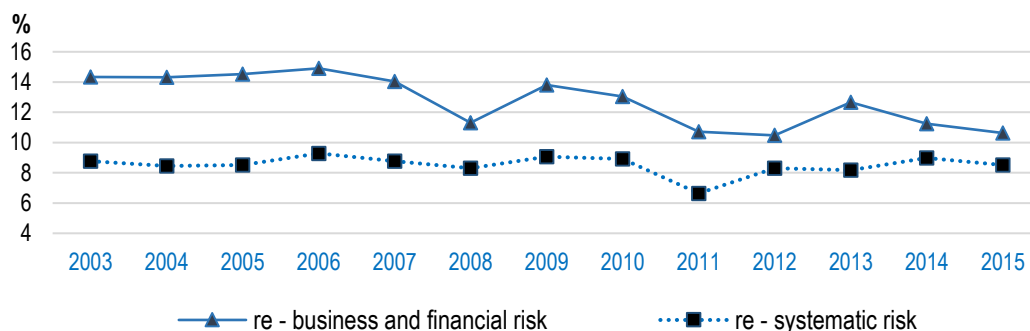
For the valuation of Cost of Equity with systematic risks we apply the CAPM model (Damodaran 2014a, 2014b). Necessary inputs are shown in the Table 6. Similarly, as is the case of valuation of business and financial risks, we did the prognosis for the year 2015.

Table 6 - Development of systematic risks and Cost of Equity (%)

Indicators	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Unlevered $\beta$	0.52	0.50	0.50	0.61	0.66	0.63	0.69	0.72	0.47	0.71	0.66	0.82	0.80
D/E	33.29	22.03	27.28	22.39	19.46	35.37	29.31	27.62	26.81	27.42	28.74	21.46	20.13
Levered $\beta$	0.64	0.58	0.61	0.72	0.77	0.80	0.86	0.87	0.58	0.87	0.77	0.97	0.93
ERP	4.82	4.84	4.80	4.91	4.79	5.00	4.50	5.00	6.00	5.80	5.00	5.70	5.75
CRP	1.43	1.43	1.20	1.05	1.05	2.10	1.35	1.28	1.28	1.50	1.28	1.28	1.28
$r_f$	4.25	4.22	4.39	4.70	4.02	2.21	3.84	3.29	1.88	1.76	3.04	2.17	1.88
Cost of Equity	8.76	8.46	8.52	9.29	8.76	8.31	9.06	8.92	6.64	8.31	8.17	8.98	8.51

Source: authors calculating and processing in software

From the Table 6 it is evident, that the predicted Cost of Equity for the year 2015 of the food industry calculated with the CAPM model and with the application of systematic risks is 8.51%. By consequent comparison of the used methods and with different application of risks we came into the finding, that in the values of Cost of Equity are differences. In the case, when we calculated the Cost of Equity with the acceptance of business and financial risks (the systematic and unsystematic, based on Building-up I model) was the Cost of Equity higher than the value calculated with the acceptance of systematic risks (based on CAPM). For the predicted year of 2015 was the price difference 2.12%. This difference represents the influence of unsystematic risks that can influence the company or the industry respectively. The comparison of calculated Costs of Equity can be seen on Figure 5.



Source: authors calculating and processing

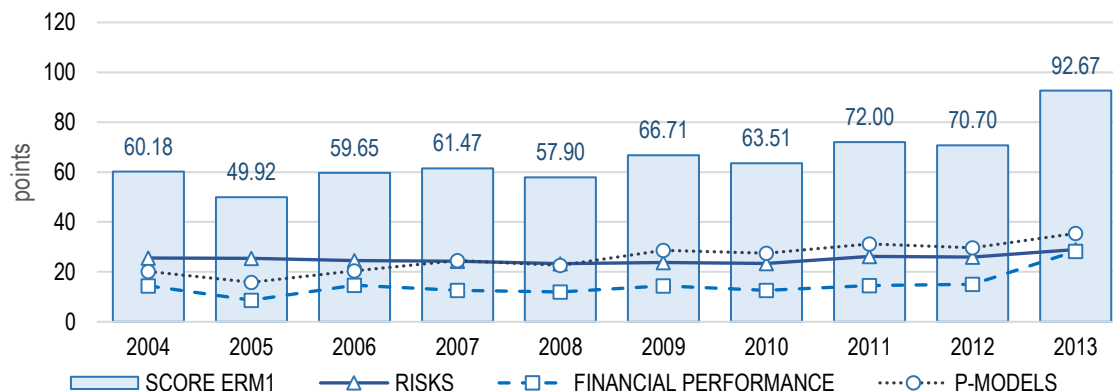
Figure 5 - Comparison of Costs of Equity ( $r_e$ ) in analysed models

If we have chosen the average Cost of Equity in the food industry to € 500,000.0, then the impact of unsystematic risk would be € 10,600.0. Hypothesis 1 was confirmed.

#### 4.4. Enterprise Risk Models for an enterprise in the food industry in the Slovakia for risk analysis and forecasting

In the following part of this paper we focus on testing Hypothesis 2 and the evaluation of an enterprise performance in the food industry in Slovakia, using our approach by scoring financial indicators, scoring risks and creating 3D ERM models.

The outputs of novel created model – 3D Enterprise Risk Model (ERM1) for selected enterprise in the food industry in the Slovak Republic with focus on impact of systematic and unsystematic risks are presented in Figure 6. This model expresses the influences between selected eight financial indicators, selected eight systematic and unsystematic risks (by Damodaran and Neumaierova and Neumaier) models and selected eight prediction models. All values of input indicators were recalculated by using historical data and the scoring method which assigns the best values of input variables a maximum of 5 points; the worst values of the input variables assigns 0 points and total points of 120.



Source: authors calculating and processing in software

Figure 6 - The outputs of ERM1

The best performance reached the Slovak enterprise which was analysed by us in 2013 (see in Figure 6). Systematic and unsystematic risks participated on this positive status. Levered  $\beta$  reaches values of 0.77 and influences the improvement of unlevered  $\beta$  in the sphere of systematic risks. We can say that levered  $\beta$  of Slovak food industry reached the value that is only 0.01 higher than Germany. In comparison with other countries of Europe, Slovak's ERP is at the comparable level as German with CRP of 1.28%. The systematic risks have smaller influence on the company's performance than unsystematic risks. This detection we can confirm with this, that unsystematic risks are derived from the financial indicators which are the key indicators of company performance.

In addition to current liquidity contributed to improving the turnover cycle of money accelerated, the indebtedness of company decreased and the profitability of company increased. As a result of improvement these parameters increased stability of the company about 1 and it achieves value 3.5. If we monitored the results of this company more detailed, so in 2013 there was eliminated all unsystematic risks and the development of financial performance, risks and business success were stabilized at one point. The company achieved the best results in

business successfulness in 2013 when reached 35.41 points from 40. The worst results of the company were in years 2005, 2006 and 2008 where were qualified with lower financial performance and higher unsystematic risks. Especially in 2005 is signed by the high indebtedness of the food sector. The best position of the analysed company in the ERM1 Enterprise Risk Model, from the viewpoint of risks, financial performance and from the viewpoint of prediction models (see in Table 7), was in the 2013.

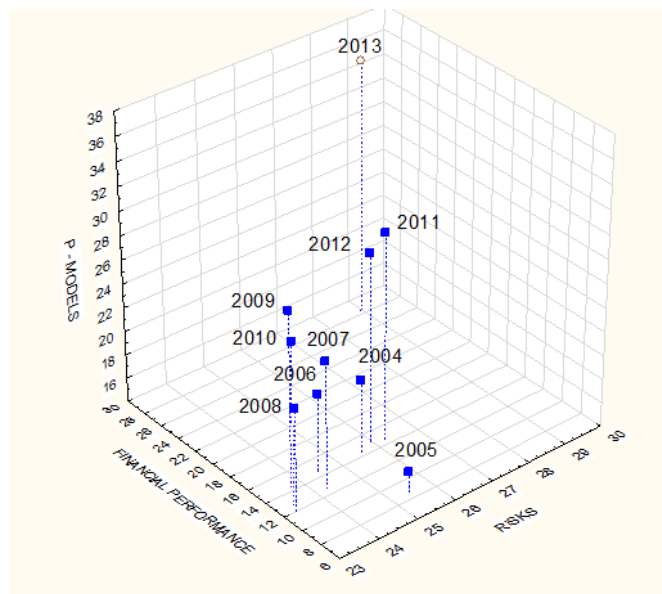
Table 7 - Calculation of 3D ERM1 score

ERM1	RISKS	FINANCIAL PERFORMANCE	P-MODELS	SCORE
2004	25.58	14.42	20.18	60.18
2005	25.44	8.65	15.83	49.92
2006	24.51	14.66	20.48	59.65
2007	24.25	12.65	24.57	61.47
2008	23.30	11.94	22.66	57.90
2009	23.72	14.36	28.63	66.71
2010	23.38	12.63	27.50	63.51
2011	26.25	14.52	31.23	72.00
2012	25.98	15.00	29.71	70.70
2013	28.95	28.31	35.41	92.67

Source: authors calculating and processing in software.

Note: the calculating basis between 3 dimensions is 40-40-40 points, total score 120 points.

The analysed company in the 3D ERM1 model reached overall point score of company’s performance of 92.67 points from the maximum 120 points.



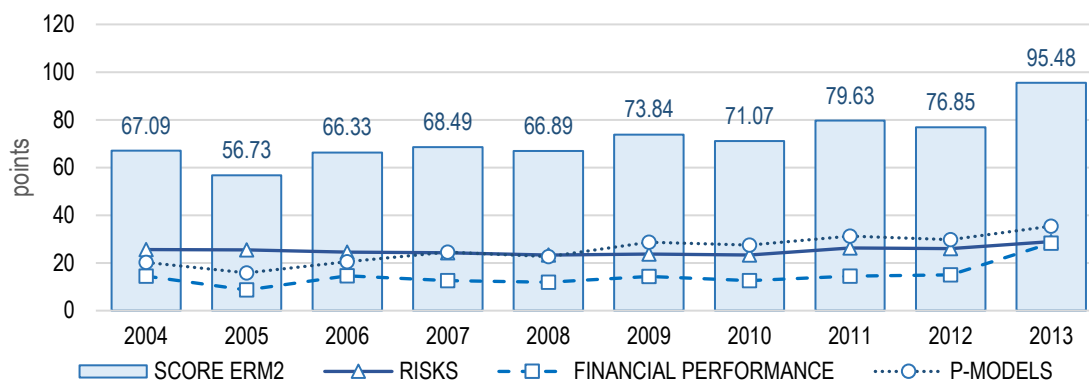
Source: authors calculating and processing in software

Figure 7 - The 3D ERM1 Combination with Damodaran and Marik risks

In Figure 7 is constructed the first 3 - dimensional Enterprise Risk Model (ERM1) for our selected company in Slovakia created by software STATISTICA V.12. In years 2004-2013 and during global crisis (can be associated with results by Chira and Marciniak 2014) this model confirms risk changes in business performance.

The outputs of the second new created model – 3D Enterprise Risk Model (ERM2) are presented for selected enterprise in the Slovak food industry with focus on impact of estimated business and financial risks in Figure 8. Similarly, using this method we assigned a maximum of 5 points for the best values and the worst values are assigned 0 points, total points of 120.





Source: authors calculating and processing in software

Figure 8 - The outputs of ERM2

Similarly, in the year 2013, this analysed enterprise in the food industry reached the best position in the ERM2 Enterprise Risk Model, from the viewpoint of risks, financial performance and from the viewpoint of business successfulness, too (see in Table 8).

Table 8 - Calculation of 3D ERM2 score

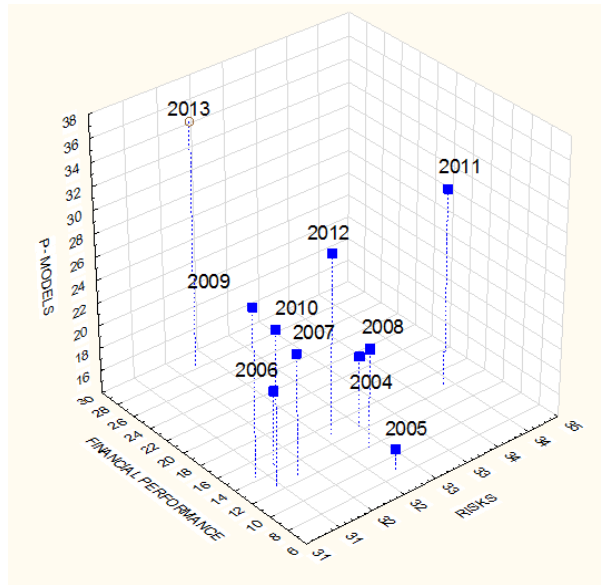
ERM2	RISK	FINANCIAL PERFORMANCE	P-MODELS	SCORE
2004	32.49	14.42	20.18	67.09
2005	32.25	8.65	15.83	56.73
2006	31.19	14.66	20.48	66.33
2007	31.26	12.65	24.57	68.49
2008	32.29	11.94	22.66	66.89
2009	30.85	14.36	28.63	73.84
2010	30.94	12.63	27.50	71.07
2011	33.88	14.52	31.23	79.63
2012	32.13	15.00	29.71	76.85
2013	31.76	28.31	35.41	95.48

Source: authors calculating and processing in software

Note: the calculating basis between 3 dimensions is 40-40-40 points, total score 120 points.

The analysed company in the 3D ERM2 model reached overall point score of company's performance of 95.48 points from the maximum 120 points in 2013. In 2013 the company reached the best overall point score, but had better position using ERM2 than ERM1 especially from risk viewpoint. Systematic risks and risks that are the forecasting ex ante in the area of business and financial risks, give the higher value, score, better performance than the risks specify from accounting historical data.

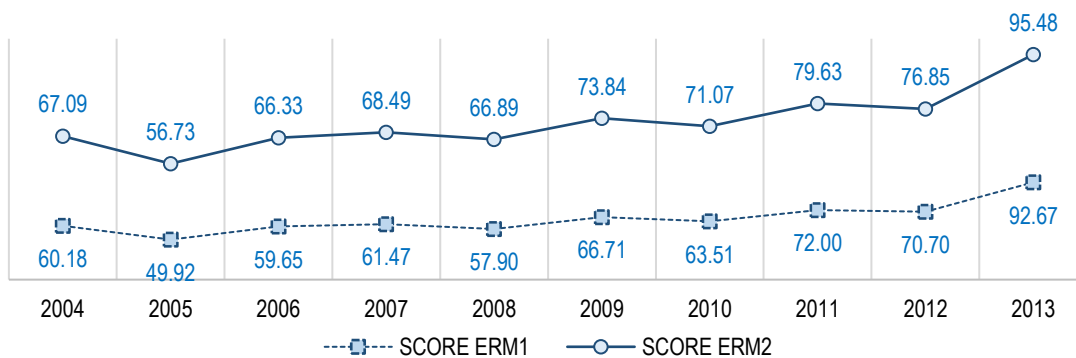
In the following Figure 9 is constructed the second 3-dimensional Enterprise Risk Model (ERM2) for our selected company in Slovakia created by software STATISTICA V.12 that comprise the business and financial risks more effectively. Model (ERM2) for an enterprise in the food industry in the Slovak Republic with impact of risks expresses the influences between selected financial indicators, selected systematic and unsystematic risks (by Damodaran and Marik models, thirty-two Marik business and financial risks) and selected prediction models. The scoring method was used to calculate all values of input indicators.



Source: authors calculating and processing in software

Figure 9 - The 3D ERM2 Combination with Damodaran and Marik risks

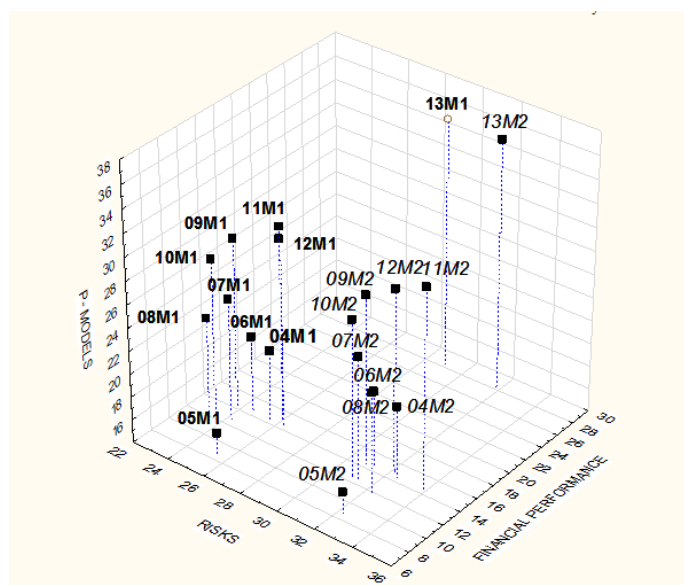
The second 3-dimensional Enterprise Risk Model (ERM2), in comparison with ERM1 can evaluate and predict risks in the future better than ERM1, because of including thirty-two business and financial risks using ex ante data from expected market development. The comparison of risk models (in Figure 10) is based on the comparison of risks. ERM2 is the model, which the resulted position of analysed enterprise is better from the risk viewpoint. It is given for the reason that the evaluation of business and financial risks according Marik *et al.* (2011) is more comprehensive in total as the evaluation of only unsystematic risks by Building-up II model Neumaierova and Neumaier (2002). Excluding the risks in the model ERM2 are extrapolated based on the analysis of business risks (systematic and unsystematic) and from expected, forecasting market development and not from historical ex post data.



Source: authors calculating and processing in software

Figure 10 - Score comparison of the models ERM1 and ERM2

In the Figure 11 are implemented outputs of the both 3D ERM models. The ERM2 model better confirms risk changes in the enterprise performance in years 2004 - 2013 and during global crisis, in the share of resulted risk score to the calculating basis. It is noticeable that the enterprise performance is positive in year 2013 in ERM1 and ERM2 but the difference is only in risks. By this comparison is explicit that unsystematic risks according Neumaierova and Neumaier Building-up II model decline the position in the enterprise performance from the risk viewpoint. We confirmed Hypothesis 2 that the enterprise performance reached the better position with the application of systematic risks and forecasting of risk parameters using prediction methods and ex ante data (in ERM2) than with the application of risk parameters based on historical data (in ERM1).



Source: authors calculating and processing in software

Note: the numbers before M are the last two numbers of relevant years

Figure 11 - The both models, marked M1 (ERM1) and M2 (ERM2)

## Conclusions

Based on above mentioned conclusions, we can assume the still attraction of the CAPM as the most appropriate model for valuation and quantification of Cost of Equity (Heckova *et al.* 2014, Horvathova and Mokrisova 2015). Abbas *et al.* (2015) found out that all three factors in Fama and French Three Factor Model are significant in explaining cross-sectional variation in average stock returns and hence the three-factor is important at explaining cross-sectional average returns on national markets.

It is necessary to modify these models to conditions of Slovak Republic. The encompassment of the financial risk is the target as from calculations it is evident that liquidity is the main problem of the food industry. Based on the above mentioned it is possible to set the following general conclusions, which we have reached also in our previous study (Sofrankova, Horvathova and Kiselakova 2014):

- Although there are numerous problems with the application of CAPM, it is the only theoretically based model of Cost of Equity valuation and is recognised throughout the world as a model of calculation discount rate of market valuation.
- This model should be applied in such a way that market risk and  $\beta$  were used based on the US data and these were supplemented by Risk premium of given country.
- Modification and supplementation of Cost of Equity by significant Equity Risk premiums of particular enterprise are recommended especially with emphasis on replenishment of unsystematic risk.
- It is recommended to use the calculation of Total  $\beta$ , if the requirement of diversification is not met but this method of calculation leads to high values of equity valuation.
- For Slovak conditions -in this case is advisable- appropriate to apply Building-up I model (Marik 2011) with the modification for assessment and forecasting risks more comprehensive from expected market development.
- In the case of using and focusing on unsystematic risk is advisable to apply Gradual Counting Risk Premium Model of valuation of equity (GCRPM) with acceptance unsystematic risks.
- In order to diversify, minimize and predict risks better and more comprehensive on global markets and to streamline enterprise performance in managerial practice for effective risk management we can use ERMs. (Olton and Glowacki 2014).
- In the case, when we calculated the Cost of Equity with the acceptance of business and financial risk (the systematic and unsystematic) was the Cost of Equity higher than the price calculated with the acceptance of systematic risks. For the predicted year of 2015 was the price difference 2.12%. This difference represents the influence of unsystematic risks that can influence the company or the industry respectively.

### Main findings:

Based on the presented facts and creating of novel 3D Enterprise Risk Models (ERM) we managed to confirm the Hypothesis 1 that the valuation Cost of Equity with application of systematic risks using historical data was lower than the valuation Cost of Equity evaluated with the application of business and financial risks, which arise from expected market development. Similarly, we managed to confirm Hypothesis 2 -The reached resulted enterprise performance was better in ERM2, including systematic risks and business and financial risks with application data from expected market development. The impact on the resulted enterprise performance in ERM2 was at the lower level from the risk point of view. The reached resulted enterprise performance was lower, worse in ERM1. The impact on the enterprise performance in ERM1 was at the higher level, including historical data in the ERM1 from risk viewpoint. The comparison of our 3-dimensional models was based on the comparison of risks, including in the models. We found out that the enterprise performance reached the better position with the application of systematic risks and the estimation and forecasting of risk parameters using prediction methods and ex ante data (in ERM2) than with the application of risk parameters based on historical data (in ERM1).

By testing hypotheses, we concluded that the most significant impact on performance of the enterprise has just financial risk, which was determined by low current liquidity and high indebtedness of the analysed company. It is confirmed that the systematic risks have a lower impact on performance of the enterprise, which the company or the industry can influence, as unsystematic risks.

Finally, it is important to emphasize the fact that CAPM is still the most suitable and most applicable model for calculating the Cost of Equity. But it is important to take into the account that this model accepts only systematic risks. Because of that it is suitable to add chosen unsystematic risks, or apply universal Building model with the use of business and financial risks, as the supplementary model to the CAPM. Besides the stated, this model is also great tool for future risk prognosis and serves well as an early warning model of sorts. But important is the applicability of models for national markets, for practitioners to decision-making processes and convergence of models in practice.

The empirical results thus obtained are highly valuable input that can be used in the construction of early warning models focused on predicting the risk development and their impact on the performance of production systems in Slovakia and in the future worldwide in order to reduce and more effectively predict risks on global markets.

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## Opportunities and Challenges of Dates Industry in Saudi Arabia: A Study of AlKharj Region

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### Abstract

*Production of dates in Saudi Arabia has a major contribution in the development of the country's economy as well as its' agricultural sector. In terms of production as well as exports of dates, Saudi Arabia is in the forefront of other countries in the world. The market for dates in Saudi Arabia is also fulfilling the needs of local markets. The geographical and climatic conditions of the country have several advantages to further increase the production of dates and their exports to compete at international markets. Almost 25% area and 40% of total production in Saudi Arabia is from AlKharj region of the kingdom. A sample of 44 respondents representing farmers, customers, and marketers are surveyed and the data results of their opinions on opportunities and challenges of the industry are analyzed. By using SPSS, goodness fit and item fit analysis of data has been also tested.*

*The study results identified several opportunities for dates marketing and however concluded that the farmers and traders are faced difficulties in marketing of their produced dates. Based on the analysis of study results, it is also proposed that by the ways of date festivals, easy hiring of labor and, awareness of financial support schemes from the government would definitely support the industry and its stakeholder to face the challenges at present.*

**Keywords:** Dates, challenges, opportunities, production, marketing, AlKharj.

**JEL Classification:** D24, E23.

### 1. Introduction

Among the several agricultural products, dates of different varieties produce in Saudi Arabia attracted not only the local markets but also the world food industry. The country stood at the second place in the world in terms of production of dates, the marketing of dates has been an ever-ending challenge in front of the kingdom to handle the demand and supply conditions in general and specifically during the month of Ramadan (Fasting) because of rising prices in the season. On the other side, the companies that are involved in marketing of dates in Saudi Arabia does obviously have some equal opportunities to reach the consumer base and therefore a strategic approach in needed to grab this opportunity. According to the news published in Saudi Gazette, dated 28 July 2014, the total production of dates in Saudi Arabia reached to 1.1 million tons was covered under the crop from 25 million palm trees spread around 157,000 hectares. This amount of magnitude in production of dates enables the kingdom to reach at 17% of world produced dates and 5% of its production is consistently involved in packaging and exporting by following the international food processing and exporting standards. However, producing more than 160 famous types of dates, all companies in the kingdom are still facing several challenges in terms of identifying ways to reach their consumers. Some reasons might have been considered for this kind of challenges that are facing by the marketers in the kingdom. The potential consumer base with high disposable income and diversified markets covered in three primary regions manifested with cities like Jeddah in Western Region, Dammam in Eastern Province and Riyadh city in Central part of the Kingdom.

Even a strong independent network of distribution channels for dates in the kingdom is moving the produced at the farm level facilitating the marketers to reach all the market regions in the kingdom by a timely storage and a careful handling of processing of dates, which are highly perishable. There is no uniform structure in technology or

infrastructure at the company level to support the unique marketing system adapted by the marketers in the kingdom.

Therefore, some companies sell the dates at their farm gates (on-farm selling); either they marketed directly to the final consumers before shifted to the wholesale markets. However, some companies are having good vendor relationships at wholesale markets and hence they handed over the production to the wholesalers at local markets instead of handed over to the processing plants for packaging and exporting the dates. Sometimes, it looks like some of those companies more organized in distribution of dates through the agents and institutions, which also perform similar functions like other channels ultimately reach the final consumers. Each kind of these channels has their own advantages and disadvantages in terms of attracting the markets and occupies a considerable amount of market share. Despite the fact that all these channels are biasing from grading the dates and their value propositions in generating a good market for each kind of variety and types of dates they are producing at their farms. Even minor differences in adapting different channels do cost more to the companies in terms of quality management. Hence, the quality management of distribution channels does determine the final value in terms of careful handling, harvesting, processing, grading, packaging, shipment and transportation of dates that are produced in the kingdom.

In pursuit of policy matters to adapt a pricing strategy for marketing of dates in the kingdom, the ministry of agriculture is encouraging farmers to avail the loans and subsidies for infrastructure development not only to produce the dates at lower costs but also to adapt a reasonable price to attract the consumers. In fact, the prices vary in terms of variety of dates and their different qualities. In extension to develop the sector, the government also providing, free of cost supporting services to the farmers for the safety of their production and storage facilities. The agriculture research centers and other related agencies are also constantly monitoring the climate and weather conditions in the kingdom to provide up to date information to the farmers to increase the productivity of dates. In this context, the importance of study the challenges and opportunities prevailed with reference to production and marketing of date industry and analyze the opinions and viewpoints of selected respondents are involved in production and marketing of dates in the AlKharj Region, Saudi Arabia presented in this study.

## 2. Review of literature

Various factors discussed in order to bring the overall understanding of the study. However, vast research done on marketing management and its functions and applications in various industries, but the research on marketing of dates has gained a lot of importance during the past several years. In fact, there were very few studies concentrated on challenges and opportunities for dates industry. The reasons might be that the dates are purely agriculture-based products and therefore the demand for the products considered to be obviously inelastic (Thompson 1916). For the purpose of the present study, some of the important studies undertaken to investigate and analyze the overall idea of the study topic.

As mentioned by Mahmoudi *et al.* (2008), the date palm either originated in North Africa or in the Middle East, as a fruit of sweet berries and the scientific name of these fruits was Phoenix Dactylifera gave the meaning of finger or toes in Latin. In the report of Sindh government (2010), mentioned that the fresh dates or table dates were mostly preferred for the consumption as such the majority of the Muslim world were taking the fresh dates as their breakfast especially in the holy month of Ramadan. Ghulam and others (2010) studied the characterization of dates during the harvest season by taking a sample of 85 varieties of dates in Pakistan. They studied on the color, size, shape and edible stages of dates to evaluate the quality and perishability of the dates. We identified that Aseel dates were one among the best in commercial varieties of dates available in Pakistan. Similar study conducted in Khairpur district of Pakistan by Momin Bullo (2011) on date crop during the harvest season, he found some of the varieties of dates were naturally resistant to monsoon rains and was good to cultivate for the commercial purposes. The study was extended to identify the quality of the dates and was damaged because of heavy rains during the monsoon and found that some varieties of dates were encountered the problem of lack of quality and therefore these dates were not used for commercial or business purposes.

While discussing on commercial and business aspects of dates industry, Mikki (2008) stated that the marketing of dates was highly depending on the structure of the industry and its attractiveness. It is pointed out in the study that there were many problems in the packaging and processing related issues of dates. Discussed about that, one among the best strategic options that the industry should consider was cost leadership through high production. It was discussed that to be competitive, one must differentiate through branding and good network of distribution in the local as well as international markets. In an another micro level study of Loutfy (2010) on degradation of date palm trees and production of dates in Arab countries, he identified that there were several serious problems that were facing by the farmers who were cultivating the date palms. The study focused on the

difficulties in marketing of dates in the regions where there was comparatively low productivity. The study found that there was a decline in the production of dates in some of the traditional growing areas. The study revealed the fact that marketing of produced dates became difficult as such nearly, 30% of production spoiled by the time of reaching to the markets because of pests and diseases.

Apart from the Arab countries, there were several studies also done in various countries on dates marketing and the issues related to the date industry. In the year 2000, Food and Agriculture Organization of the United Nations studied on commercial potential of non-traditional varieties of dates in European markets. The study was undertaken in five countries of European region and found that the substantial amount of turnover of date business was in the hands of large stores and special outlets. The report remarked that the density of sales of dates spread across the small retailers and supermarkets was remarkably low because of lack of storage facilities and weak distribution networks in the countries selected for the purpose of the study. Further, AmerJabarin and Faraoun (2001) studied on marketing and post-harvest issues of dates in Iraq.

The major challenge in marketing of date described by the authors indicates that the material using for packaging of dates was not in according to the international standards and specifications. Therefore, the authors opined that the Iraq lost its traditional markets in exporting of dates to other competitors. We identified in this study that, because of the inadequate facility for marketing as well as for pre-cooling of dates and storage facilities, the country had lost its international markets for exporting of dates. Therefore, an attempt has been done to know the importance of value chain in marketing of dates, InmaAgri Business Programme (2008) in Iraq was examined the key elements for developing the international market by means of improving value chain and quality of production and processing of dates.

The study revealed that in comparison to European markets, Iraq was under-represented in terms of integration of key distributors, establishment of links among the commercial producers, infrastructure facilities to produce high quality dates, adaptation of cost effective methods in cultivating the date palms, and preference of consumers to varieties of dates. In a programme also quoted that the production of dates in the world was showing a raising trend at par with the demand for the dates. This trend forecasted to be as same to the next few years starting from 2008. As one of the issues mentioned above in Inma programme, in a study on cost effective method of cultivating the date palms, Albert Grego (1941) found that the cost of cultivating the date palm is high and a minimum of six years would consumed to earn the money in the business. Adding to this, in a survey of 120 farmers cultivating the date palms in Khuzistan, Alimirzaei and Asady (2011) found that due to lack of formal education and motivation to participate in date's growers' organizations, the yielding of date palms was low and the cost of cultivation was becoming high during the crop season.

From the perspectives of cost effectiveness, Ahmad Aridah (2014) listed the fixed costs and variable costs in palm plantations. It was mentioned that the Libyan government was donated the equipment, labor costs and land for plantation and cultivation of date palms. The study concluded that the fixed costs did not show any impact on yield of date palms. Therefore, the study was throwing the idea that there was an impact of variable costs on yielding of date palms. However, the widely used distribution channels for dates are:

1. Producer – wholesaler – retailer – consumer
2. Producer – retailer – consumer

The marketing margin approach of Mojtaba *et al.* (2010) clarified that the marketing efficiency declined because of large difference between the farm prices of dates to their retail prices. This was because of the reason that the price of the dates decided at the farm in the village and decided by the both parties to sell at higher prices in the market. Because of this tendency, undoubtedly clarified in the study of Mojtaba that the channel one as mentioned above, will costs more because of this tendency and approach in marketing of dates via more intermediaries. The second channel argued that bares less cost because of the financial stability of farmers to carry the product directly to the consumers or the markets where he would easily sell the product. Finally, to review the study of Varden Fuller (1951), he felt that the date industry should follow some of the rules in marketing of dates. He coined that, processing and packaging standards, qualify of dates, stability in the supply, orderly marketing were the major factors influencing the marketing of dates.

### Data and empirical results

The results from the 44 respondents tabulated and analysed. The summary statistics in Table 1 measured the opportunities and challenges of dates. The data points, including extreme and non-extreme, excluded the incomplete responses. The 1376 data points acquire from this study were sufficient to remain useful and stable for the respondents to endorse the items and to obtain useful and stable item calibrations. This generated a log-likelihood chi-square value of 2206.58 with 1301 degree of freedom at  $p=0.000$ . The Global Root-Mean Square

Residual (excluding extreme scores) was 0.4462. The Cronbach's alpha ( $\alpha$ ) was at 0.74, indicating good internal consistency reliability of the items in the scale in measuring a single latent trait or construct. It is worth mentioning that there are one respondents with a maximum score (score 4 for all items) is identified and will be discarded for the purposes of this analysis since that respondents are not capable of measuring the items difficulties. (Hair *et al.* 2013, Jannarone and Laughlin 1990, Wright 1998)

**Table 1** - Summary statistic

	Person	Item
Reliability	0.71	0.52
Mean	1.27	0.80
Standard Deviation	0.63	0.40
Outfit Mean Square	0.98	0.00
Outfit Z- Standard	0.98	0.00
Max	3.20	0.77
Min	0.07	0.23
Standard Error	0.10	0.07
Cronbach Alpha	0.74	
Raw Score to measure correlation	-0.99	

Source: Author's calculations

**Table 2** - Items fit analysis - opportunities and challenges of dates

CODE	MEASURE	S.E.	ITEM	REMARKS
I0017	0.77	0.23	Government established information centres help to provide up to date information	Perceived challenges
I0031	0.55	0.24	Extension programmes by government and development partners encourage the sales of dates	Perceived challenges
I0014	0.43	0.24	During season low prices give big surplus of dates in the market	Perceived challenges
I0030	0.43	0.24	Packing fresh dates attracts the sales by dates traders	Perceived challenges
I0019	0.37	0.25	Dates producer believe major portion of prices goes to the marketing agents	Perceived challenges
I0008	0.31	0.25	Dates farmers normally sell harvesting rights to marketers at initial stages.	Perceived challenges
I0011	0.31	0.25	Agencies play an important role in dates marketing	Perceived challenges
I0026	0.31	0.25	Traditional marketing system depends mainly on selling dates without marketing services	Perceived challenges
I0012	0.25	0.25	During season consumption pattern affect the price of dates varieties	Perceived challenges
I0021	0.25	0.25	Traditional marketing system is better than modern marketing system	Perceived challenges
I0025	0.18	0.25	Proper channel selection influenced friends and social media give improvement in sales	Perceived challenges
I0003	0.12	0.26	Dates produced are used for Consumption but not use of processing	Perceived challenges
I0009	0.12	0.26	Technical knowhow effects on efficiency of dates production	Perceived challenges
I0023	0.12	0.26	Modern marketing system improves quality assurance for dates	Perceived challenges
I0024	0.05	0.26	Agencies help in marketing channel to increase the sale of dates.	Perceived challenges
I0027	0.05	0.26	Commission agents play an important role in dates marketing	Perceived challenges

CODE	MEASURE	S.E.	ITEM	REMARKS
I0002	0.02	0.26	Receive proper water availability for dates production	Opportunity
I0005	0.02	0.26	Government pays special attention to dates production through price support	Opportunity
I0013	0.02	0.26	Price variations always indicate the quality of dates varieties in markets	Opportunity
I0028	0.02	0.26	Proper branding is important as quality and tastes for selling dates in the markets.	Opportunity
I0010	0.09	0.27	During season production efficiency change the price of dates varieties	Opportunity
I0016	0.09	0.27	Prices are attractive to the farmers to continue and invest for dates farming	Opportunity
I0020	0.09	0.27	Farmers prefer direct channel due to expiry of dates which effect the prices in market	Opportunity
I0032	0.09	0.27	Dates festival serve the best meeting point for stakeholders	Opportunity
I0022	-0.16	0.27	Modern marketing system depends on standardising grading, packaging, transporting and selling	Opportunity
I0029	0.24	0.28	Applied quality management and standardization improve dates export efficiency in global market	Opportunity
I0015	0.32	0.28	After production dates immediately sell due to poor storage facilities	Opportunity
I0006	-0.4	0.29	Government provides pesticides and technical advice if needed	Opportunity
I0018	-0.4	0.29	The prices of dates always differentiate from one place to another in accordance with demand and supply	Opportunity
I0007	0.57	0.30	Improvement in production of dates is a continuous efforts by government	Opportunity
I0004	0.67	0.31	Dates production has direct proportion to marketing efficiency	Opportunity
I0001	1.41	0.40	Dates varieties production may affect depending on weather condition	Opportunity

Source: Author's calculations

Table 1 shows the summary statistics of 122 measured (non-extreme) organisations. The person reliability is  $\beta = 0.71$ , with 0.10 Standard Error (SE). This indicates that the 32 items in measuring the opportunities and challenges of dates Industry in Saudi Arabia have an excellent range of difficulties in measuring the respondents ability. The further respondents fit statistics investigation on outfit for Mean Square (OMNSQ) and Z-Score (OZSTD) show that the OMNSQ was 0.98 and OZSTD was 0.00, which is near to expectation 1 and 0. This reveals that the 32 items are targeting the right type of respondents in measuring the latent traits and the produced data is at a reasonable prediction level of the responses to the items. The maximum respondents' ability is  $\beta_{\max} = +3.20$  logit and the minimum measure is  $\beta_{\min} = 0.07$  logit with the 3.27 logit length scale. The respondents Mean  $\beta_{\text{mean}} = 1.27$  logit reveals that the majority of the respondents have the ability to endorse the most measuring items.

The Item Reliability is  $\mu_{\text{item}} = 0.71$  with SE = 0.07, suggesting that the instrument has a good fit to the model (Fisher 2007). The high item reliability also indicates that the replicability of the items would occur if these items to be given to another sample of respondents of the same size (Bond and Fox 2007). As for the Item Mean, it is set at  $\mu_{\text{mean}} = 0.00$  logit to ensure that each organisation has a 50:50 chance of success in responding to the item that matches their ability. The OMNSQ was 0.98 and OZSTD was 0.00, which are near to expectation 1 and 0. This reveals that most of the items targeted the organisation distribution, which meant an excellent targeting of the items to organisations. The maximum respondents' ability is  $\mu_{\max} = +0.77$  logit and the minimum measure is  $\mu_{\min} = 0.23$  logit with the length logit scale is 1.00 logit.

## Conclusion



The study investigates opportunities and challenges of date industry in Saudi Arabia an empirical study of AlKharj region with reference to production and marketing of dates. Using goodness fit and item fit analysis of data; the result shows the items from one to thirty-two items in the table ranging from challenges and opportunities by the opinion and viewpoints of farmers, customers and marketers. It is apparent that farmers and traders face difficulties in marketing their own produce. Challenges are complex and ranged from production to marketing aspects.

For promotional of the dates in AlKharj there is need to organize dates festival regularly in the region, make easy procedures for hiring labors, need government support to farmers, traders and agencies through short term and long terms schemes, provide facilities for storing of dates. Hence, if attention is properly given upon the suggestions in the study there will be positive change in date business in the region.

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## Selected Representatives of Regional Institutions to Support Small and Medium Enterprises in Slovakia

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### Abstract:

*The main economic functions of SMEs include also their contribution to regional development. Well-developed business environment is essential for the development of Slovakia and its regions, thus contributing to the growth of the economy of market. In those facts it is a role for government to encourage and create favourable conditions for competition and minimizing respectively or eliminate administrative barriers hindering business activities. The interaction between region and SMEs requires a build / support the existence of a series of regional institutions / centres whose mission is to help SMEs in various situations. In this article we will focus on selected representatives of regional institutions to support small and medium enterprises in Slovakia using secondary sources and prime research and point out their essential activities.*

**Keywords:** regional institution, SME, support.

**JEL Classification:** R 11, R 50

### 1. Introduction

The main economic functions of SMEs include also their contribution to regional development. Well-developed business environment is essential for the development of Slovakia and its regions, thus contributing to the growth of the economy of market. Considering these facts, the role for government is to create favourable conditions for competition and minimizing respectively or eliminate administrative barriers hindering business activities. The interaction between region and SMEs requires a build / support the existence of a series of regional institutions / centres whose mission is to help SMEs in various situations.

### 2. Small and Medium Enterprises support institution

Selected institutions supporting SMEs on regional level are: Slovak Business Agency (until 28<sup>th</sup> February 2014 NARMSP), Central Office of Labor, Social Affairs and Family; Slovenská záručná a rozvojová banka; Slovak Investment and Trade Development Agency (SITDA); Slovak Chamber of Commerce and Industry (SCCI); Entrepreneurs Association of Slovakia (EAS) and Young Entrepreneurs Association of Slovakia (YEAS)

Slovak Business Agency (until 28<sup>th</sup> February 2014 NARMSP) in Slovakia is the oldest key institution to support small and medium sized enterprises together with other regional support institutions. The group of regional support institutions is formed by the Regional Support and Information Centres and Business Innovation Centres, which together with Centres of First Contact form the Partner Institutional Network to support and develop small and medium enterprises on regional level. (Butoracová Šindlerová – Morovská; 2009)

Regional Support and Information Centres (RSIC) are established as an association of legal entities, on basis of partnership of non-profit institutions of public and private sector. The main objective of RSIC is to promote and develop economic growth on regional level due to small and medium enterprises. The mission of the Business Innovation Centres (BIC) is to support selected business plans of various regions and provide long-term care for them. They focus on firms with innovation potential, which deal with new technology, service or product and mediate contacts to companies operating within this network. Despite the differences, these support centres provide services in the areas (Kubrická 2012):

- providing information about the current support system of SMEs;
- providing advice for those interested in starting a business (start-ups and existing businesses) in different areas, e.g. marketing, management etc.;
- writing business plans, projects for regional development;

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- assessment of business plans and development projects for different purpose to support SMEs and regional development;
- training for those interested in starting their own business and existing entrepreneurs in developing business activities;
- mediation of business contacts resp. of cooperative nature;
- providing further services to support the development of SMEs, organizing professional events, etc.

Within the business incubator start-ups are concentrated in limited space in order to increase their chance of survival and support their growth thanks to different services provided at favourable conditions. The focus is on local development by creating workplaces, while technological orientation of classical incubators is the minimum. Innovative start-ups focusing on technology transfer support so called technology incubators (TI). Technological incubators are often linked to universities resp. to different research institutions and focus on specific industry clusters, technologies. Thanks to incubators increases the chance of survival of start-ups to start successful business activities after leaving the incubator. (Russev – Šubertová 2013)

Central Office of Labour, Social Affairs and Family as a state authority operate in the field of employment services for jobseekers, students and their parents, citizens at risk of losing their jobs, employers, self-employed, foreigners, citizens of the EU and their family members. The Central Office of Labour also provides wide range of active labour market measures (provided by territorial district, where the workplace is created), but it is necessary to inform, that the amount of contribution and length of provision in various districts of Slovakia can vary. Among the contributions to the citizen – respecting the researched issue our thesis deals with – we emphasize the contribution for self-employment, which is provided to cover the costs related to self-employment of unemployed citizens, registered as jobseekers in order to create jobs through self-employment. The contribution is based on the principles of co-financing and is non-refundable if certain rules and requirements are kept e.g. the applicant must be a registered jobseeker at least three months, undertakes to perform self-employment for at least two years without interruption, apply for contribution in written form, complete a training, present the business plan and defend it before the commission, etc. An employer, who hires the jobseeker registered for at least three months at Central Office of Labour or a disadvantaged jobseeker for the created position, can apply for a contribution to create new workplaces if the applicant (employer) had been operating the activity for at least 12 months without interruption. (Podnikanie a zamestnanosť na Slovensku; 2010)

Slovenská Záručná a Rozvojová Banka (Slovak Guarantee and Development Bank) is supporting development of businesses by providing special direct loans with EU support. Portfolio of products offered by the bank was extended by microcredit and „loan PODNIKATEĽKA“ (business loan for female entrepreneurs) which are aimed to simplify access to credit for existing and starting entrepreneurs. The bank has also started to provide „Credit PODNIKANIE MLADÝCH“ (business loan for young entrepreneurs) to support the activity of young as well as existing entrepreneurs. Financial resources of the bank are regularly transferred from the state budget, from relevant categories of budget cooperating with ministries and own resources-obtained from loans, which is provided by international financial institutions. (Slovenská Záručná a Rozvojová Banka; online)

The Slovak Investment and Trade Development Agency (SITDA) ensures public activity in the field of investment and trade development regarding the administration of projects co-financed by the government as well as organises seminars and events aimed at developing businesses, etc. (Butoracová and Šindlerová – Morovská 2009) The mission of SITDA is to support the Slovak economy and improve the quality of living in Slovakia. To fulfil this objective, the institution is promoting the Slovak economic environment and makes the country attractive for foreign investors by developing investment projects. (Russev – Šubertová 2013)

Regarding the region, dominant position has the following institutions: The Slovak Chamber of Commerce and Industry, Slovak Investment and Trade Development Agency (SITDA), regional organizations of Entrepreneurs Association of Slovakia, business incubators and the Agency for Regional Development. The Slovak Chamber of Commerce and Industry (SCCI), an association of businesses is aimed at increasing economic prosperity of its members as well as supporting business activity is represented in various regions of Slovakia.

The Entrepreneurs Association of Slovakia (EAS) is a non-profit organization, association of entrepreneurs of Slovak Republic. Since 1993 EAS has been a member of the European Confederation of Small and Medium Enterprises based in Brussels. The EAS focuses on creating and guaranteeing an adequate business environment. Priority task of the organization is restricting intervention into the freedom of business, ensuring the same conditions for private as well as public sector, effectively promote the interests of Slovak entrepreneurs in the EU etc. (Združenie Podnikateľov Slovenska, online)

Insufficient attention devoted to young generation of entrepreneurs was the reason to establish the Young Entrepreneurs Association of Slovakia (YEAS) in 2010. Considering the fact that young entrepreneurs mainly lack experience, contacts and capital, the YEAS is committed to carry out activities to improve these conditions. Among the main activities of the group ranks above all the exchange of experience, mentoring, networking of entrepreneurs, help with financing particularly in the early stages of business, presentation of successful and ethical entrepreneurs, examples of business practices, identification and elimination of barriers of youth entrepreneurship etc. In line with the objectives of YEAS the long term objective of the association is to inspire young people to start business, facilitating access to capital for young entrepreneurs through a network of business angels, influencing legislation in order to create a favourable business environment and provide a platform for entrepreneurs to exchange business contacts and experience. (Združenie Mladých Podnikateľov Slovenska, online)

### 3. Methodology and analysis of results

After we had compiled the research sample for regional support institutions/ centres in Nitra Region, we addressed a total of 37 institutions via internet to fill our questionnaire survey. Basic research methods were used to complete the survey. Considering the issue, various general research methods, comparison and analysis were used. The main objective of the research was to formulate the following question: Can cooperation be proved between SMEs and the regional support institutions? The institutions we examined have different mission and objectives, which is reflected in the diversity of programmes and services they offer.

**Table 1** -The number of different regional support institutions/centres for SMEs in districts of Nitra Region

	District Komárno	District Levice	District Nitra	District Nové Zámky	District Šaľa	District Topoľčany	District Zlaté Moravce
ARD	0	0	1	0	0	0	0
RDA	1	0	1	1	1	1	1
SAFCh	1	1	1	1	1	1	1
COLCAF	1	1	1	1	1	1	1
RAIC	1	0	1	0	0	0	0
SITDA	0	0	1	0	0	0	0
Other	1	3	6	3	0	0	0

Source: based on own questionnaire survey

The Agency for Rural Development provides consulting services. The Regional Development Agencies provide consulting service in development of projects backed by EU funding as well as they are involved in development of marketing case studies and business plans. The Regional Agricultural and Food Chambers are mainly engaged in developing projects financed from EU funds, organize different trainings and seminars. In addition to preparation of studies, the Regional Agricultural and Food Chamber helps to find business partners, provides services of professional organizations, supports employment and job seekers. The Central Office of Labour, Social Affairs and Family offers different services of professional organizations, provides contribution for self-employment, organizes various activation works and contributes to promotion of employment by providing assistance to job seekers. The Slovak Investment and Trade Development Agency helps entrepreneurs by providing different forms of consulting as well as finding business partners and organizing various trainings and seminars.

Consulting in different fields and participation in various support programmes are the most popular services offered to natural persons by regional support institutions. Legal entities are mainly attracted by consulting services, but they also welcome assistance in developing business plans, resp. marketing plans or application for non-repayable grants. Respondents nearly uniformly expressed their satisfaction with smooth cooperation between the support institutions and SMEs. Regarding the feedback of respondents, only 70.30% (26 institutions) declared to monitor the responses and those are: Central Offices of Labour, Social Affairs and Family, Regional Agricultural and Food Chambers, and Regional Development Agencies. In addition, 46.20% of the regional support institutions/centres view their programmes/services to be more or less helpful for companies and 42.30% declared their programmes clearly beneficial for companies. The correlation analysis cannot prove a significant relationship between the feedback of institutions and the type of cooperation between SMEs and institution. If we know e.g. a response of a business about an institution or the level of benefit these programmes/services have, we cannot comment regarding the assessment of the second variable. However, we can conclude, that natural persons prefer

support programmes/services designed for micro businesses, while legal entities use support programmes/services designed for medium enterprises.

The regional support institutions/centres, offering support programmes for SMEs in Nitra Region find it important to make certain changes/improvements and increase the institutional support of SMEs in the region. These changes should concern the increasing awareness on the part of higher authorities, as regional support institutions often lack to be informed about support programmes and services and they cannot inform businesses about regional support programmes offered in time. Further, they reported not only the importance of legislative changes regarding the possibilities and forms of support, but also re-opening of programmes to support SMEs proved to increase the budget of regional support institution/organization earlier. As a possible change, was emphasized the change in educational profile of schools as a catalyst to improve the business environment.

The absolute majority of support institutions/centres involved in research can feel the government support; however, their opinion is quite the opposite when they express their opinion about the support of municipalities. Respondents clearly confirmed their cooperation with further regional institutions in Nitra Region e.g. Office of Nitra Self-governing Region, Nitra town, Agroinstitut Nitra, Slovak University of Agriculture in Nitra and also the micro-regional associations. Regarding cooperation with the umbrella organizations (e.g. associations, chambers, unions etc.) respondents did not share an opinion as more than half of the respondents would rather not cooperate with organizations mentioned.

On the basis of question formulated in our research we wanted to know whether cooperation between SMEs and regional support institutions can be recognized. To prove this relationship, we used a correlation analysis which shows the relationship between the two variables. The strength of this relationship between two linear variables is measured with the help of Pearson correlation coefficient. First we used Box plot to examine the possible potential extremes (no extremes we found, so we did not have to exclude neither of the answers) then we proceeded to correlation analysis.

The Pearson correlation coefficient between the response of companies about institutions and the characteristics of cooperation of researched institutions with SMEs show a value of -0.361, which means a moderate negative relationship between variables. As the measure of significance is higher than 0.05, which means, that significant relationship between SMEs and regional support institutions cannot be recognized, so if we know a variable, e. g. opinion of companies about the institutions or the benefits of programmes/services offered by institutions to companies, we cannot express opinion regarding the assessment of the second variable.

Table 2 - Correlation between the opinion of companies about the institutions and the characteristics of cooperation of institutions with SMEs

VARIABLE 1	VARIABLE 2	PEARSON Correlation Coefficient	SIGN.	N
Opinion of companies about the institutions	Characteristics of cooperation between institutions and SMEs	-0,361	0,07	26

Source: based on own questionnaire survey

To learn more about support programmes resp. services of regional support institutions/centres, we used the Likert scale to research their opinion. Replies to the statements together with the response about institutions by the companies a correlation analysis was carried out. Results of the analysis are summarised in the following chart, ranked according to the level of significance. The values of Pearson correlation coefficient at 1% significance show values from -0.693 to 0.535, suggesting a correlation on scale from moderate negative to moderately positive.

Table 3 - Correlation between the statements of regional support institutions/centres

VARIABLE 1	VARIABLE 2	PEARSON Correlation Coefficient	SIGN.	N
Opinion of companies about institutions	Programmes/services mainly used by medium enterprises	-0,693	0,000	26
Programmes/services mainly attractive to natural persons	Programmes/services mainly used by micro businesses	0,671	0,000	26
Opinion of companies about institutions	Programmes/services attractive to legal entities	-0,595	0,001	26
Programmes/services mainly attractive to natural persons	Programmes/services used by medium enterprises	-0,585	0,002	26



VARIABLE 1	VARIABLE 2	PEARSON Correlation Coefficient	SIGN.	N
Programmes/services used by micro enterprises	Programmes/services used by medium enterprises	-0,585	0,002	26
Programmes/services mainly used by small enterprises	Programmes/services used by medium enterprises	0,542	0,004	26
Programmes/services attractive to legal entities	Programmes/services used by small enterprises	0,535	0,005	26
Programmes/services attractive to legal entities	Programmes/services used by medium enterprises	0,474	0,014	26
Opinion of companies about institutions	Programmes/services used by small enterprises	-0,375	0,059	26
Programmes/services attractive to natural persons	Programmes/services attractive to legal entities	0,173	0,398	26
Programmes/services attractive to legal entities	Programmes/services used by micro businesses	0,173	0,398	26
Opinion of companies about institutions	Programmes/services attractive to natural persons	0,405	0,400	26
Programmes/services attractive to natural persons	Programmes/services used by small enterprises	-0,164	0,423	26
Programmes/services mainly used by micro enterprises	Programmes/services mainly used by small enterprises	-0,164	0,423	26
Opinion of companies about institutions	Programmes/services mainly used by micro businesses	0,113	0,584	26

Source: based on own questionnaire survey

Moderate negative correlation can be recognized between the opinion of companies about institutions and the fact, that programmes/services offered by institutions were used mainly by medium enterprises (-0,693). Moderate negative correlation with rate of 1% of significance can be further shown between the opinion of companies about the institutions and the fact, that programmes/services are mainly attractive for legal entities (-0,595). Moderate positive correlation with rate of 1% of significance is proved by the fact, that support programmes/services are attractive to natural persons and variables, which emphasize that support programmes resp. services are mainly attractive to micro businesses (0,671). If we change the degree of significance for 5%, we can recognize a moderate positive correlation between the fact, that support programmes/services are mainly attractive to legal entities and variables, which emphasizes, that support programmes resp. services are mainly used by medium enterprises (0,474). For those pairs of variables, where degree of significance exceeds 0,05, recognized correlation is not significant. The analysis shows, that support programmes resp. services offered by the regional support institutions attractive to legal entities (classified as small and medium enterprises) prove, the larger the enterprise, the more likely that programmes/services offered by institutions are considered to be less successful. Based on the results of the correlation analysis it can be concluded, that natural persons interested in support programmes resp. services can be categorized as micro enterprises.

The questionnaire survey makes it clear, that certain changes/ steps are required to make in order to improve the institutional support of small and medium enterprises in Nitra Region. 24.30% of the regional support institutions consider it would be necessary to increase the awareness of higher authorities, as regional support organizations often complain about late and inadequate information received about support programmes and services, what makes them difficult to inform businesses about the regional support possibilities they offer. As further possible alternatives, not only legislative changes regarding the possibilities and forms of support would be welcomed (18.90%), but also the re-opening of previously successful programmes to support SMEs (16.20%) and increase the budget of regional support institution/organization (16.20%). As one of the inevitable changes occurred the improvement of business environment as well as necessary changes in profile of schools (8.10%) are needed.

## Conclusion

Key role in regional development is played by small and medium enterprises, local authorities, agencies of the ministries, resp. agencies set up to support businesses and project consulting. Because of the wide range of regional support institutions, we examine the selected representatives of regional institutions on support for SMEs.

Based on theoretical studies of literature we are convinced, that regional support institutions/centres have higher efficiency if they can rely on the support of further institutions. After mapping the essential activities of selected representatives based on secondary research and theoretical studies, we applied a questionnaire research to examine their activity in Nitra Region. After conducting primary research, we can conclude, that it is necessary to raise awareness of regional support institutions/centres, build a feedback system between supported enterprises and institutions, determine the basic foundations of cooperation between regional support institutions/centres and academia, resp. educational institutions in Nitra county and improve the cooperation with umbrella organizations in the county.

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## Optimum Size of Government Spending in Indonesia

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### Abstract:

*The purpose of this study is to analyze the optimum size of government spending that maximizes economic growth in Indonesia. This research considered non linear models in analysis of economic growth as a function of government spending and other economic variables. Using the time series data of the period 1970 -2014, the empirical model reveals that relationship between government spending and economic growth follows the inverted U-curve. This finding confirms the existence of Armeij curve for the Indonesian case. The optimum level of government spending that maximizes economic growth was found at 12.552% of GDP which is lower than the recent level. The result reflects that Indonesia is not in the safe fiscal zone. This upward trend in the share of government spending in the recent years meant that the government spent more money but it yields low economic growth. This result indicates that the country had excessive government expenditure in the 2010s, but it failed to encourage the national economy on the high stable economic growth. This paper recommends the government to evaluate the quality of allocation in order to achieve higher economic growth.*

**Keywords:** fiscal, government, spending, budget, army, policy.

**JEL Classification:** E62, O40, C22.

### 1. Introduction

Government size is one of the main issues in the budget management in some countries. Meanwhile, economic growth is the most important macroeconomic variable reflecting the economic performance of a country. Several recent studies have attempted to identify the relationship between government spending and economic growth in the last decade (De Witte and Moesen 2010, Ekinci 2011, Herath 2012, Tsaurai and Odhiambo 2013). Several literatures state that fiscal policy, especially the level of government spending plays significant role in managing economic growth. Otherwise, some countries experienced over spending in certain periods causing high inefficiency in their budget management. (Herath 2012, Rahmayanti and Horn 2011)

Indonesian government has increased its role to the economy since the monetary crisis which leads the government budget into high debt. In fact, government spending as the main instrument of fiscal policy has played more important role in supporting economic growth in Indonesia (Marks 2004). The impact of government sector on the economy is indicated by the effect of government spending on the main various macroeconomic indicators. During the last decade, the government has experienced sharp increases in its spending in order to maintain the economic growth stability. In fact, this policy has a positive impact on output indicated by a stable economic growth in this period, but its consequence is that the government embarked upon a debt trap. Moreover, the Indonesia's fiscal performance was also indicated in disequilibrium situation for long period (Sriyana 2015). An important factor may have caused such situation is inappropriate level of government spending indicating the government size is not in its optimum level.

The optimal size of the government becomes a problem in Indonesia that has attracted the attention of this study. Indonesian economy has experienced some stages of economic growth and stabilization in the last two decades. Furthermore, the central government has applied an expansionary fiscal policy which probably lead the government spending level is far away from its optimum. Total government spending as a percent of GDP has grown continuously in the last decade and is close to an average of about 21% of GDP. Meanwhile, economic growth has suffered from the government spending which has been above optimal levels in the country. Furthermore, it is necessary to identify the effect of government spending on economic growth and to find the optimum level of government spending in Indonesia regarding to maximize economic growth.

### 2. Literature review

The optimum government size is a point at which the economic growth is in its maximum level. Armeij (1995) proposed the general curve to present the relationship between government size and economic growth. He noted that relationship between government size and economic growth has an inverted U-curve. Because of this form, the optimum government size relates to the greatest economic growth rates. Moreover, this curve describes that

government expenditure increases economic growth until it reaches a peak level; then, excessive government expenditure will reduce economic growth.

Figure 1 depicts the Armeiy curve where  $G/Y^*$  is the optimum size of government spending regarding to the maximum economic growth ( $g^*$ ). It can be explained that expanding government size which is indicated by rising in government expenditure has an effect on diminishing returns. The expanding of government size will cause a crowding-out effect to private investment which potentially discourage the macroeconomic performances. In addition, following this situation, the government expenditure often turns into inefficient which cause a lower output. At some point, the marginal benefit from increased government spending reach to zero. The constructive features of government begin to diminish when the adverse effects of large government size result in a reduction of output growth. Further expansions of government contribute to a decline in output.

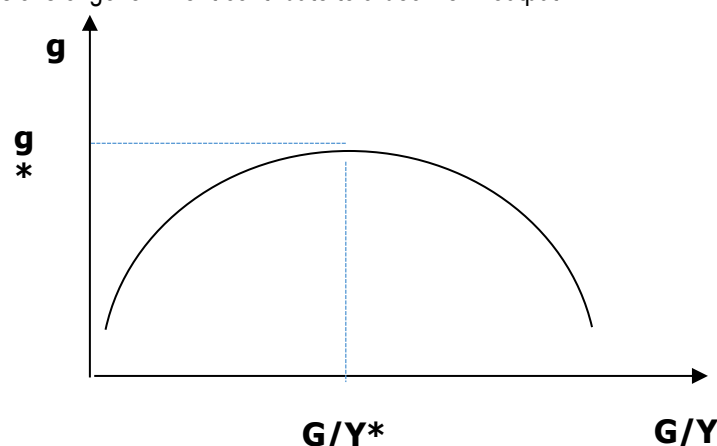


Figure 1 - Armeiy curve

Some papers have attempted to identify the size of government spending which maximizes the economic growth. Sheehey (1993) used cross country data and found the relationship between government size and economic growth follows the inverted U. He concluded that the optimum size of government spending is around 15% of GDP. In the situation government size is smaller than 15%, government size and economic growth have a positive relationship, meanwhile when government size is larger than 15%, and such relationship is negative. It shows the existing of diminishing effect of government spending on economic growth at the low government size. Moreover, Afonso, Schuknecht and Tanzi (2003) found the higher optimum size of government spending which is at about 30% of GDP. They suggest that general government spending in excess of 30% of national output reduces economic growth.

Another paper conducted by Pevcin (2004) who elaborated the data for 12 European countries. The study found that the Armeiy curve for these countries peaks when government spending is between 36.6% and 42.1% of GDP. This finding is higher than optimum size other countries as mentioned before. It might relate with the difference level of their fiscal capacity. At almost the same time, Chen and Lee (2005) also studied such issue based on the data for Taiwan. Using a threshold regression approach they tested a non-linear relationship between government size and economic growth. They found the threshold value for government size is about 22.839% of GDP. This paper concluded that in the condition the government size is smaller than that point, economic growth is promoted under expanding government expenditure, but if the government size is larger than peak Armeiy curve, then the economic growth decreases.

Moreover, Mutascu and Milos (2009) analyzed the role of the real GDP growth and the total amount of public expenditures as percent of GDP on economic growth for the period 1999-2008 for European countries. The main result suggests that an optimum government size in EU-15 is about 30.42% of GDP and in the EU-12 countries is at the level of 27.46% of GDP. In other study, De Witte & Moesen (2010) investigated the Armeiy curve using nonparametric Data Envelopment Analysis (DEA) for among 23 OECD countries. The results show the long-run optimal government size varies between 29% and 54%. The optimal average government size is about 41% of GDP. This result suggests that a large decrease in government spending should occur in Italy; meanwhile the government spending may be increased in New Zealand to maximize their economic growth.

Chen, Chen and Kim (2011) used a panel threshold approach to investigate Armeiy Curve for 24 OECD countries. They employed the regression method to investigate the relationship between government size and

economic growth. Again, they found such relationship is in line with inverted U-curve. A comprehensive study using statistical analysis for US and European countries was conducted by Ekinci (2011). This research classified into three level of government size regarding to the economic growth. The total amount at optimum level of public expenditures as percent of GDP is 4.55%, and the maximum is 31.7%; meanwhile the optimum size is 13.4%.

Herath (2012) found the value of optimal government size is about 27.35% of GDP in the case of Sri Lanka. Therefore, he suggests that the curve peak of government spending is approximately equal to 27% of GDP. Overall, these papers present that the magnitude of the effect of government size on economic growth varies on some levels. When the economic growth is low, increasing the size of the government generally has a positive effect and stimulates economic growth. However, as the economic growth rate increases, such an effect declines and has a negative effect on economic growth.

Some empirical studies generally suggest that government spending has positive effect on economic growth which indicates the early stage of Arme curve (Asimakopoulos and Karavias 2015, Ekinci 2011, Mehrara and Keikha 2012). In addition, much of mentioned recent literatures on this topic describe a positive non-linear relationship when the share of government in economic activity is low, but it changes downward as the relative size of government grows (Herath 2012). The government contributes to the economic growth by providing basic public goods and infrastructures. However, as government expands its scope, it will cause increasing in economic inefficiency. Higher government spending also requires an increase in tax rates, which will reduce disposable income. Therefore, the identification of the optimum size of government spending may provide new insight as to how appropriate policies might help to control government budget. This is the main reason of examining the government size on the fiscal policy implementation in Indonesia. Moreover, this study also aims to contribute to the current literatures especially in the field of fiscal policy by considering an optimum size of government expenditure that maximizes economic growth.

### 3. Research method

This study focuses on how to find the optimum size of government spending regarding to the maximum economic growth based on Arme Curve. It is assumed that the government spends their budget on expenditures to achieve optimal economic growth. Therefore, this research estimates economic growth model which is modified from Herath (2012). The model used in this study relates government size ( $g_t$ ) and other economic variables to economic growth ( $y_t$ ). The theoretical is developed as follows:

$$y_t = f(g_t, g_t^2, cons_t, inv_t, op_t, m_t, n_t) \quad (1)$$

Economic growth ( $y_t$ ) as a dependent variable is represented by growth of real GDP. Some explanatory variables include government size ( $g_t$ ) which is represented by total government expenditure as a percentage of real Gross Domestic Product (GDP), the square term of government size ( $g_t^2$ ), private consumption ( $cons_t$ ), investment ( $inv_t$ ), openness ( $op_t$ ), money supply ( $m_t$ ) and labour force ( $n_t$ ). The inclusion of the variable  $g_t^2$  assists in empirically analysis the Arme curve which is in quadratic form. Money supply is included in the model since the monetary sector plays an important role in the economy of the country. In addition, since Indonesia is a country with large number of labour force, this variable is relevant as main source of economic growth. As usual,  $\varepsilon_t$  is the random error term. The positive coefficient of the linear  $g_t$  term is related to the positive effects of government spending on output. The expected negative coefficient of  $g_t^2$  term is related to the quadratic function of economic growth which implies negative effects of increased government size after the maximum value. This regression equation includes both the linear term ( $g_t$ ) and the negative squared term of independent variable ( $g_t^2$ ) in the estimation process. Therefore, the equation can be estimated using the Ordinary Least Squares (OLS) technique.

Consistent with the mentioned literatures, only the linear and quadratic terms of  $g_t$  are employed, assuming that the relation between government spending and growth is single quadratic form depicting this relationship has no more than one maximum point. Furthermore, equation (1) may be written as follows:

$$y_t = \beta_0 + \beta_1 g_t - \beta_2 g_t^2 + \gamma_1 cons_t + \gamma_2 inv_t + \gamma_3 op_t + \gamma_4 m_t + \gamma_5 n_t + \varepsilon_t \quad (2)$$

Based on the equation (2), it can be found that using simple mathematical solution, the optimum level of government spending is the peak of the quadratic curve. Therefore, the first partial derivative of economic growth with respect to  $g_t$ , assuming that the other independent variables are constant gives:

$$\partial(y_t) / \partial g_t = \beta_1 - 2\beta_2 g_t = 0 \quad (3)$$



Finally, optimum government size ( $g^*$ ) may be calculated as follows:

$$g^* = 0.5(\beta_1 / \beta_2) \tag{4}$$

In order to compare with other alternative method of examining the optimum government size, the present study employs a non linier model of economic growth modified from Scully (2003). This model concerns to estimate the share of governmentspending that maximizes real economic growth. The model is developed based on the assumption of Cobb-Douglas form:

$$Y_t = a(G_{t-1})^b [(1 - \tau_{t-1})Y_{t-1}]^c \tag{5}$$

where,  $Y_t$  is real GDP at year  $t$ ,  $G_t$  is total government spending in constant prices at year  $t$ ,  $\tau_{t-1}$  is tax rate in the economy measured as the share of government spending as a percentage of GDP at previous year. Moreover, a balanced-budget assumption is held if  $G_t = \tau_t Y_t$  each year. By substituting this assumption into equation (5) gives:

$$Y_t = a(\tau_{t-1} Y_{t-1})^b [(1 - \tau_{t-1})Y_{t-1}]^c \tag{6}$$

By finding the first and second differential of  $Y$  with respect to  $g$ , the maximum real output is derived when government spending as a share of GDP equals the following equation:

$$\tau^* = [b / (b + c)] \tag{7}$$

Equation (7) shows the formula of the optimum size of government spending. Therefore, estimable equation to estimate the optimum level of government spending may be developed as follows:

$$\ln Y_t = \ln a + b \ln(\tau_{t-1} Y_{t-1}) + c \ln[(1 - \tau_{t-1})Y_{t-1}] + e_t \tag{8}$$

where,  $y_t$  is growth of real GDP in year  $t$ ;  $\tau_{t-1}$  is government spending as share of percent of GDP at the period  $t-1$ ; and  $Y_{t-1}$  is real GDP at period  $t-1$ .

#### 4. Empirical results and discussion

The present study employs annual data including government spending ( $g_t$ ), Gross Domestic Product ( $Y_t$ ), economic growth ( $y_t$ ), private consumption ( $cons_t$ ), total investment ( $inv_t$ ), openness ( $op_t$ ) which was indicated by export, money supply ( $m_t$ ) and labour force ( $n_t$ ) for the period of 1970-2015. All data are obtained from annual report of Indonesian Central Bank (Bank Indonesia). Figure 1 depicts the data of government spending and economic growth for that period. Government spending increased sharply at 1995-1997, a few years before financial crisis which occurred in 1997. After that year, government spending average was about 21.097 % of Gross Domestic Product (Table 1). Meanwhile, economic growth in the beginning 1970s reflected the dynamic situation as a result of new era after more than thirty years under centralism policy. Unfortunately, the country experienced a deep monetary crisis which led to the negative economic growth. As an impact of the crisis, Indonesia recorded economic growth at -13.1% in 1998 which was noted as the lowest level in among the Asian countries. This situation reflected the effect of decreasing in government spending as a consequence of contractive economic policy. Then, the fiscal expansion and tax reform policies since 1999 have led the country booked a positive economic growth.

**Table 1** - Descriptive statistic of economic growth and government spending

Statistical Indicators	Data period of 1970-1999		Data period of 2000-2015		Data period of 1970-2015	
	Economic Growth (%)	Government Spending (% of GDP)	Economic Growth (%)	Government Spending (% of GDP)	Economic Growth (%)	Government Spending (% GDP)
Mean	6.343	10.738	5.301	21.097	5.980	14.341
Median	7.397	9.600	5.265	22.050	6.203	11.135
Maximum	9.776	19.590	6.345	22.887	9.776	22.887
Minimum	-13.126	7.160	3.643	17.160	-13.126	7.1600
Observations	30	30	16	16	46	46



Figure 1 - Economic Growth and Government Spending, 1970-2015

According to the methodological framework, this study employed linear regression which involves economic growth as a dependent variable and several economic explanatory variables. Specifically, economic growth of real GDP is specified as a function of government share of GDP, investment share of GDP, consumption share of GDP, openness which is indicated by export as share of GDP, money supply which is indicated by broad money (M2), and number of labour force. To examine the effect of such independent variables to economic growth, this research conducted a series of regression analyses using the OLS estimation technique. Table 2 presents the results of three empirical models; these are the full model which uses all the explanatory variables and other two reduced models. Since the Model 1 as a complete model has only two significant coefficients, the insignificant explanatory variables are left out step by step in order to find the best empirical model which consists only significant explanatory variables. This procedure yields two reduced models; these are Model 2 and Model 3. Model 2 leaves out labour force ( $n_t$ ) and money supply ( $m_t$ ), while Model 3 leaves out consumption share of GDP ( $cons_t$ ), labour force ( $n_t$ ) and money supply ( $m_t$ ) from the regression equation. Model 3 might be considered as the best model in this analysis. Furthermore, this research used Model 3 to explain the effect of explanatory variables to dependent variable. As consequence, this model is also used to determine the optimum size of government spending in Indonesia.

This paper attempts to empirically verify the existence of the Armeij curve in order to find the optimum size of government spending. Before discussing the optimum size of government spending which is derived from Model 3, it is useful to elaborate the quality of other two models. This is to provide some information regarding to the role of all explanatory variables on economic growth. Indicators of model quality illustrate that the equation's overall F tests are significant at 1% level in all three models. The F-statistic has also improved from the full model to the reduced models, indicating that effect of explanatory variables to dependent variable has improved. The number of significant variables also improves from complete to reduced model indicating the reduced models are valid. The power of the explanatory variables is in moderate level which is indicated by coefficient of determination is in around 0.06. Since all explanatory variables are strongly significant in Model 3, it demonstrates that economic growth is substantially caused by government size, square term of government spending, export and investment.

Most of the coefficients in Model 1 are statistically significant at the 1% level, only investment variable is significant at 5% level. The positive significant coefficients of the variables such as government spending and investment are consistent with the theoretical view that these variables positively affect economic growth. In line with the expectation, the government size and investment are beneficial for economy of the country. In order to prove the Armeij curve, the coefficient of the linear term of government share of GDP should be positive; meanwhile the coefficient of the square term of government share of GDP must be negative. More importantly, this finding shows that the square term of government spending has the expected negative coefficient with a significance level of 1%. This result reflected the quadratic relationship between government spending and

economic growth as expected in this study. The properties of the estimated parameters of the quadratic government spending provide evidence the existence of the Armey curve for the data of the country.

Table 2 - Estimates result of economic growth model

Independent Variables	MODEL 1		MODEL 2		MODEL 3	
	Coefficient	t-statistic	Coefficient	t-statistic	Coefficient	t-statistic
Constant	-13.651	-1.199	-0.457	-0.055	5.718	2.889***
$g_t$	0.653	1.394	1.081	2.707***	1.122	3.150***
$g^2_t$	-0.032	-1.831*	-0.039	-2.275**	-0.042	-3.233***
$op_t$	-0.421	-5.415***	-0.359	-5.159***	-0.354	-5.190***
$inv_t$	0.153	1.257	0.246	2.232**	0.168	2.405**
$const_t$	0.110	1.106	0.068	0.695	-	-
$\eta_t$	0.000098	1.656	-	-	-	-
$m_t$	-0.001129	-1.216	-0.00035	-0.432	-	-
Adjusted R <sup>2</sup>	0.623		0.596		0.587	
F statistic	8.979***		9.589***		14.584***	
Durbin-Watson	1.356		1.374		1.459	

Note: \*, \*\* and \*\*\* denote significance at the 10%, 5% and 1% level.

Empirical model in Model 3 not only provides the existence of Armey curve, but also presents the significant role of investment on economic growth. In fact, the model exhibits unexpected negative relationship between export and economic growth. Since Indonesia has experienced with export declining in the last five years, it seems reasonable that this variable has negative correlation with economic growth. The positive sign of the linear term of government spending exhibits the positive effect of government spending on economic growth as it was also found by Christie and Rioja (2014) and Mehrara and Keikha (2012). The coefficient of liner term of government spending is 0.65 indicating the dominant role of government size on the economy of the country. In contrast, it was also mentioned by Asimakopoulos and Karavias (2015) and Herath (2012), the negative sign of the square of government spendingshows an adverse effect associated with increased governmental size.

Since the Model 3 involves several explanatory variables, it is important to examine whether the parameters of the estimated models are stable across various subsamples of the dataset. In other words, a stability testing for that model is needed. Based on the data of economic growth in the period of study, it was a possible breakpoint at 1998 as consequence of financial crisis in 1997. Therefore, using 1998 as the breakpoint year, this research applied Chow's breakpoint test. The result of such analysis is presented in Table 3. It suggests that the empirical equation is not significantly different for the periods 1970-1998 and 1999-2015. Therefore, the null hypothesis of the absence of a structural break in the year 1998 is accepted. It can be concluded that the parameters estimated are stable throughout the period of research.

Table 3 - Stability test of economic growth model

Chow Breakpoint Test: 1970-1998 and 1999-2015			
F-statistic	1.813251	Prob. F(5,36)	0.1350
Log likelihood ratio	10.33228	Prob. Chi-Square(5)	0.0663
Wald Statistic	9.066254	Prob. Chi-Square(5)	0.1065

As mentioned in the previous section, this research provides alternative analysis regarding to the evaluation of optimum size of government. This alternative model is known as Scully model in which the empirical estimation is based on equation 8. The result of estimation based on such model is reported in Table 4. Using ordinary least square procedure, the empirical equation provides a strong relationship between two explanatory variables and log of Gross Domestic Product as mentioned in equation 8. The model also shows a high power of the effect of explanatory variables to dependent variable which are indicated by a high coefficient determination and the level of significance of F statistic. The high quality of the model is also indicated by the significance level of all explanatory variables which are at 1% level. This finding implies that elaborating optimum size of government may be derived based on this empirical equation.

Table 4 - Estimates result based on scully model

INDEPENDENT VARIABLES	COEFFICIENT	T-STATISTIC
Constant	-3.517	-8.637***
$\ln(\tau_{t-1}Y_{t-1})$	0.111	3.129***
$\ln(1-\tau_{t-1})Y_{t-1}$	0.835	12.703***
Adjusted R <sup>2</sup>	0.994	
F statistic	3721.2	
Durbin-Watson	1.012	

Note: \*\*\* denotes significance at 1% level.

### Optimum size of government

The Armeij curve provides the possibility of calculating optimal government spending using simple differential method. It also may be used as a policy tool in determining the efficient levels of government expenditure. Table 5 summarizes the calculation of optimum size of government spending in Indonesia. This evaluation is referred on empirical model on Model 3 (Table 2) and the estimation result of Scully model (Table 4). As mentioned in the research method section, the solution of the optimum size of government spending is the peak of the quadratic equation using partial differentiation. Mathematically, it could be calculated using equation 4 and equation 7. The mechanism presented at Table 4 is used to calculate the optimal level of government size.

This study found that the optimum size of government spending based on economic growth model (Model 3) is about 13.357% of GDP. Meanwhile using the Scully model, the optimum size of government spending was found at 11.746% of GDP. Moreover, the average value of optimum size is about 12.552% as share of GDP. This level is almost similar with the result using data for Nigeria (Olaleye, Edun, Bello and Taiwo 2014). This result suggests that economic growth achieves its peak when the government spending is approximately equal to 12.552% of GDP. In fact, the average government share of GDP in Indonesia sharply increased from 10.738% in the period of 1970-1999 to 21.097% in the period of 2000-2015. The actual government expenditure percentage in recent years reflects that Indonesia is not in the safe zone. A such condition was also found in several papers (Akpan and Abang 2013, Rahmayanti and Horn 2011, Rajabi and Muhammad 2013). This upward trend in the share of government spending meant that the government spent more money but it yields lower economic growth than it was expected. This result indicates that the country had excessive government expenditure in the 2010s, but it failed to encourage the economy.

Table 5 - Optimum size of government spending

Source of Estimation	Formula for Optimum Size of Government Spending	Optimum Size of Government Spending (% of GDP)
Table 2 (Model 3)	$g^*_t = 0.5(\beta_1 / \beta_2)$	13.357
Table 4 (Scully Model)	$\tau^* = [b / (b + c)]$	11.746
AVERAGE		12.552

As proposed before, an important research question of this study is to answer the relationship between government expenditure and economic growth in the context of Indonesia. Therefore, this needs to analyze whether government expenditure increases or decreases economic growth. This research reveals that Indonesia has experienced over budget spending since 2000s. This finding also indicates that the increase of government expenditure did not associate with higher economic growth in the period of analysis. It can be inferred that Indonesian government needs to improve the budget management quality. According to Armeij (1995), low levels of government expenditure can increase economic growth until it reaches a critical level. However, as noted by Herath (2012), an excessive incremental of government spending will be less efficient, therefore it can harm economic growth. Chen *et al.* (2011) also found such phenomena for OECD countries; therefore the quality of budget management in Indonesia is a part of such situation in most countries. Moreover, the result of this research is similar with other literatures regarding to this issue.

Although the results of the study suggest an optimal government expenditure percentage of approximately 12.552% of GDP, it is difficult for government to reduce the budget size. Since the government budget is used to finance the government operation and public projects, reducing the budget size may discourage the economy. In

the last ten years, the government spending is approximately 10% more money than the required amount of spending from its optimum point. It can be assumed that current government size is still in the safe zone, but the budget management regarding to the efficiency and allocation quality should be improved. This point of view was also recommended for developing countries as suggested by Rahmayanti and Horn (2011). The fact describes that governments in Indonesia have increased in size drastically since the 2000s to reach higher and stable economic growth. Historically, the increase of government in Indonesia since that period has brought positive growth effects and a stable some key economic variables.

## Conclusion

This study reveals information about the optimum size of government spending growth in Indonesia that maximizes economic growth. Based on the economic growth model, the empirical equation shows that linear term of government size, quadratic term of government spending, and investment are positively significant affect economic growth. Export variable as proxy of the openness indicator of the country is negatively influence economic growth. In addition, using second model with the dependent variable is log of GDP presents that government spending is strongly significant determine the dependent variable. Furthermore, these two models are used to determine the optimum size of government spending that maximizes economic growth.

In answering the question as to whether government expenditure increases or decreases economic growth, the regression analysis that uses economic growth validates a nonlinear relationship between government expenditure and economic growth. The results are generally consistent with the previous findings; therefore, government spending and economic growth are positively correlated. Moreover, excessive government expenditure is negatively correlated with economic growth. These phenomena reveal the existence of Arme curve based on the data for Indonesia. The empirical model also presents that investment strongly promotes economic growth. Unexpected result was found regarding the negative role of export on economic growth. The result of an alternative analysis using Scully model, which employs real GDP as a proxy for economic growth, is similar with another one. It confirms the findings of the first regression analysis. The novelty of this study is that increasing of government size along period of research does not cause higher economic growth although it is still in the low level. This finding also reveals that economic growth is represented by a productive government budget.

In this paper, examining the optimal size of government that maximizes economic growth in Indonesia confirms that the government is not in the safe zone. The overall results suggest that the optimal level of government spending is 12.552 % of GDP. This result is in line with other empirically studies which show that generally the government size should be reduced. The government size for developing countries should be evaluated if economic growth is to be maximized. Furthermore, Indonesia has a serious problem regarding to the budget management quality. This is due to the inefficiency of allocation of scarce resources in the public sector and the crowding-out effect phenomena. The increase of government investment has negative effect on private investment. Reducing the government budget size will discourage the economy; meanwhile an excessive spending does not support economic growth. This paper recommends the government to evaluate the quality of allocation in order to achieve more productive spending.

Concerning further research on government size, it is important to test the relationship between the quality of budget management and government size. This paper also recommends estimating the optimal composition regarding the productive assessment of public expenditure. Evaluating some aspects of budget allocation would be a significant contribution to the research question on the optimal size of government.

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## Green Supply Chain Management: Genesis, Trends and Phases

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### Abstract:

*Green Supply Chain Management (GSCM) has emerged as an important organizational philosophy to achieve the competitive advantage by reducing environmental risks and improving ecological efficiency. Research on GSCM has grown substantially over the past two decades. This paper represents a brief report on various issues of GSCM on the basis of literature survey. The paper eventually contains two parts – literature survey and discussion of existing trends and phases representing functioning of GSCM. To serve this purpose 274 research articles published during 1996 through 2015 were reviewed. Knowledge extracted from the survey of the literature helps in understanding the existing trends and various concepts related to GSCM. The discussion of existing trends and various phases constitute a relevant knowledge base and will help industry and academia in developing a better understanding about GSCM.*

**Keywords:** Green supply chain management, green design, green procurement, green operations, reverse logistics, performance measurement.

**JEL Classification:** M11, Q52, Q53.

### 1. Introduction

With the increase in environmental concern, the topic “green supply chain management” has received substantial attention in the field of industry and academia. Organization faces new challenges and opportunities in addressing the environmental issues. Green supply chain management (GSCM) has unique issues related to competitive advantages, scarcity of resources, and environmental performance (Zhu *et al.* 2007). Zhu and Sarkis (2007) have addressed that organizations need to incorporate green supply chain practice in their supply chain activities to reduce environmental pollution. The benefit of GSCM includes all the stakeholders directly or indirectly. It helps in controlling pollution and wastages at each level of the supply chain (Vachon and Klassen 2006). All the stake holders, like suppliers, customers, manufacturers and society gets benefited by practicing GSCM. Considering the importance of GSCM, descriptive study has been done in this study. To serve this purpose 274 research paper published during 1996 through 2015 have been carried out. On the other hand, knowledge extracted from the survey gives rise to the development of various concepts and issues related to GSCM. These concepts are discussed under the heads of different phases of GSCM. The paper is structured as follows: Genesis of GSCM is given in Section 2, followed by method of literature survey in Section 3. The present and past trends of GSCM are discussed and phases of GSCM are discussed in section 4. Section 5 describes conclusions and future scope of the research.

### 2. Genesis of Green Supply Chain Management (GSCM)

The concept ‘Sustainable Development’ received its first international acknowledgement at the conference on human environment held in Stockholm in year 1972 (UN Report 1972), further defined and popularized by the World Commission on Environment and Development (WCED) in 1987, in its report “Our common future” popularly known as Brundtland Report (Diabat *et al.* 2014). This report bestowed the classic definition of sustainable

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development and defined it as “development that meets the needs of the present without compromising the ability of future generations to meet their needs”. It is widely recognized that the WCED broad definition of sustainable development integrates social environmental and economic issues. These issues are commonly known as the triple bottom line concept (Vachon and Klassen 2006).

According to Oliver (1982), “Supply chain management (SCM) is the process of planning, implementing and controlling the operations of supply chain with the purpose to satisfy customer’s requirements as efficiently as possible.” From the above definition, it is clear that economic concern as already involved in the concept of SCM the need was to extend the concept of SCM to encompass social and environmental concern to make it sustainable. Recent trends such as outsourcing from developing countries have led wide range of stakeholders to raise the social, ethical, and environmental issues in supply chains (Jiang 2009). The integration of these issues in SCM is known as sustainable SCM (Gimenez and Sierra 2013). Carter and Rogers (2008) define sustainable supply chain management as “the strategic, transparent integration and achievement of an organization’s social, environmental and economic goals in the systematic coordination of key organizational business processes.” Thus the concept SSCM is based on the triple-bottom line concept, *i.e.* economic, social and environmental. The concept of GSCM has emerged from environmental management as well as SCM (Srivastava, 2007) and it may be considered as one of the pillars of sustainable SCM. Environment management systems (EMS) are strategic management approaches that define how an organization will address its impact on the natural environment. It is a collection of internal policies, assessments, plans and implementation of actions affecting the entire organization and its association with the natural environment (Darnall *et al.* 2008). It is recognized as systematic and comprehensive mechanisms for improving environmental and business performance within the organization’s boundaries (Handfield *et al.* 2004). To spread the impact and advantages of practicing EMS beyond the boundary of the organization, it must be linked with organization’s supply chain management.

Green Supply Chain Management concept is about incorporating environmental concern into supply chain management and defined as “Integrating environmental thinking into supply chain management, including product design, material sourcing and selection, manufacturing processes, delivery of the final product to the customers as well as end - of - life management of the product after its useful life” Srivastava (2007). According to Zhu and Sarkis (2007) “green supply chain management covers all phases of product’s life cycle from design, production and distribution phase to the use of products by the end users and its disposal at the end of product’s life cycle”. GSCM has gained popularity in terms of reducing wastages, preserving the quality of product life and natural resources. As Sarkis (2012) has acknowledged GSCM as an extension of SSCM and the term GSCM is substituted by Environmental Supply Chain Management. Accordingly, it may be considered that the origin of GSCM lies within the ambit of SSCM.

### 3. Methodology

The methodology adopted for this study is shown in Figure 1. Structured keyword search technique was used while searching the related research papers. Papers were collected by using the keywords such as “Green supply chain management”, “Green operation”, “Green design”, “Green procurement”, “Drivers and barriers of GSCM”, and “Performance measurement of GSCM”. Papers were mainly found from major publications such as Science Direct, Emerald, Springer, Wiley, Francis & Taylor, online library and Google Scholar. Papers were either selected or rejected after analyzing the context of the paper. Only those papers were selected which fulfilled the following criteria.

- Papers published in peer reviewed journals;
- Papers related to GSCM and its operational issues;
- Papers for a period of 1996 through 2015.

In our survey, we have collected a total 688 articles out of which 274 were found relevant, fulfilling the stated conditions. Only these 274 papers were considered under study. These papers were studied to explore the existing trend of GSCM in terms of number of publication, country wise publication, method and area of study. Further important phases of GSCM are discussed to have a better understanding of it.

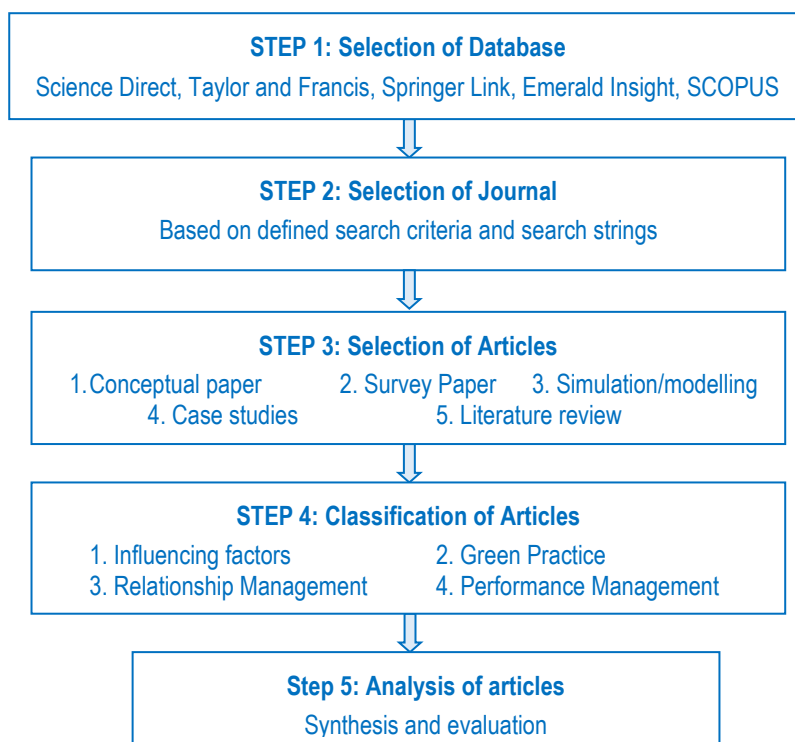


Figure 1 - Flow diagram for literature survey

#### 4. Discussion

On the basis of the selected paper, present and past trends in GSCM is discussed in the first part and further important phases of GSCM are discussed in the second part.

##### *Trends of green supply chain management*

In this section the past and present trend of GSCM literature is discussed. For this purpose, materials are collected and further analysed to explore the trend of GSCM literature.

##### *Year wise distribution of research papers*

The basic body of literature identified comprises 274 papers. The allocation of the publications in the research period (1994-2015) is shown in Figure 2.

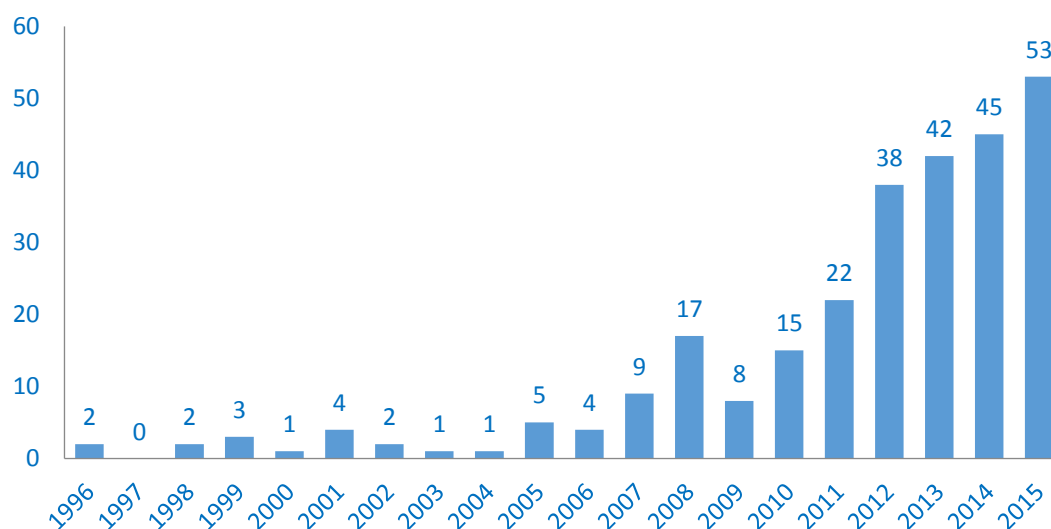


Figure 2 - Year wise distribution of research papers

Figure 2 represents the number of papers and their year of publication. It can be observed that from 2005 onwards there is a remarkable increase in the number of publications related to GSCM. Perhaps, this is due to the impact of the Kyoto protocol, which came into force in 2005. Out of total 274 papers maximum publications have been made between the period 2011 and 2015 which consists approximately 87% of total publication. It is interesting to note that although environmental issues have been identified as a major concern years ago, it has gained the attention of researchers in recent years perhaps because of globalization. It is interesting to note that though environmental issues were always a major concern, but gained the attention of researchers in recent years with the increasing globalization.

*Country wise classification of research papers*

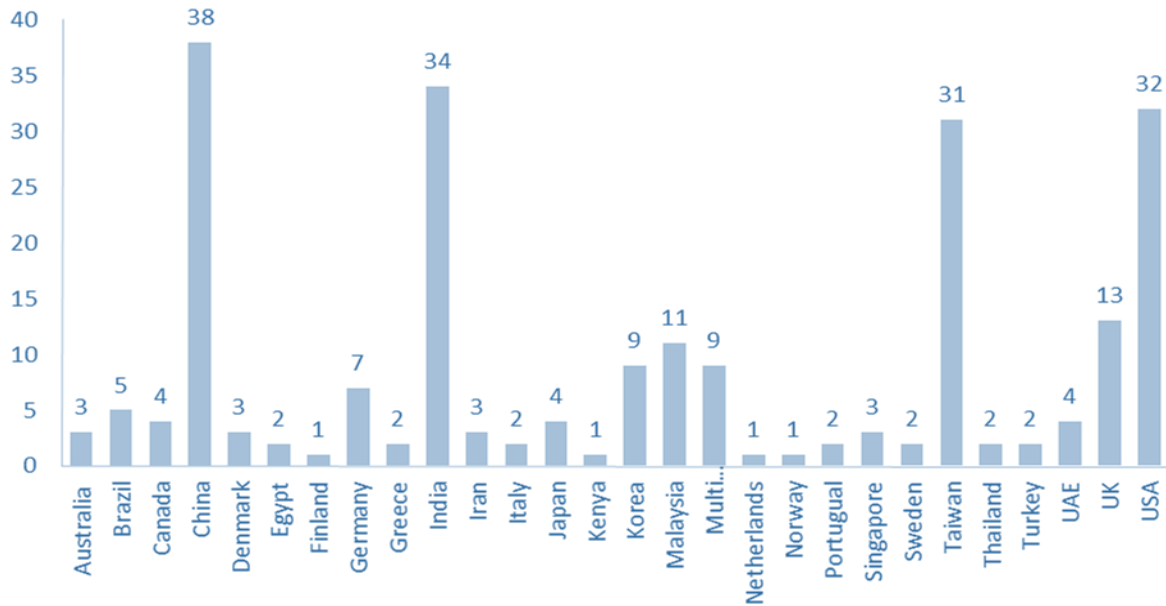


Figure 3 - Country wise distribution of research papers

Papers have been classified on the basis of countries where the practice of GSCM has been implemented. Out of 274, 29 papers were found in which specific area of GSCM implementation was not mentioned. There were 5 papers which covered more than one countries to study the implementation of GSCM. It is clear from the above diagram that china recorded the maximum number of studies of implementation of GSCM followed by India and Taiwan. It might be possible that, because both are fast developing countries and are in the phase of rapid industrialization along with population growth and increasing environmental awareness, therefore they strive to attain development with ecological balance.

*Classification of paper based on methods and area of study*

Table 4 - The breakdown by the methodology and focused area

Focused Area → Methodology	General Paper (GEN)	Performance Management (PM)	Green Practice (GP)	Influencing Factors (IF)	Relationship Management (RM)	TOTAL
Theory	16	4	11	3	0	34
Model	3	17	36	18	8	82
Case	7	8	8	11	2	36
Review	6	1	3	0	0	10
Survey	13	42	26	19	12	112
TOTAL	45	72	84	51	22	274

Table 1 represents the relationship of methodology to the focus area of study. On the basis of the methodology adopted by the published papers they are classified into five different areas i.e. theory based, case based, survey based, model based, and review based. Theory based includes all those published papers which are only theoretical and conceptual in nature, not presenting empirical study and showing less concern on practical



implication. Case based includes those published materials which are exclusively based on case methods, articles using case just as an example to support the findings of the study have not been considered under the head case study methodology in this study. Survey oriented articles are the papers which primarily include empirical studies on the basis of questionnaire or interview based data. The outcome of these types of studies often helps in establishing theories on the basis of hypothesis testing.

Model clan of articles includes the reports which attained to analyze the decision situation leading to either mathematical modeling or simulation in their study. Similarly, based on area of study mentioned in the published papers, we have classified them into five different heads. Here, the phases of GSCM such as green design, green operation, green procurement, and reverse logistics, are clubbed into a single head termed green practice (GP). IF- refers to influencing factors for the adoption of GSCM (barriers and drivers of GSCM), PM stands for performance measurement, measuring the impact of implementation of GSCM on the performance of the organization, RM refers to relationship management, managing the relationship with GSCM partners as well as the customers to make it successful. GEN belong to the papers in which no specific research area has been focused. The Table 1 depicts that the survey method (40%) is a most preferred methodology specially for measuring the performance of GSCM practice. The maximum number of studies, i.e. 84 (30%) out of total 274 papers have been done in the area of green practice (GP) applying mathematical modeling as a methodology. Relationship management (RM) has received least attention by the researchers. Therefore, it can be inferred that relational aspect of GSCM is required to fetch more attention by the researchers.

### *Phases of green supply chain management*

Unlike a traditional supply chain, where the flow of materials and information is lined from one end to other with limited collaboration and sharing of information among partners (Bhateja *et al.* 2011), green supply chain considers all process of the supply chain from extraction of raw materials to the final disposal of goods, wherein each player motivates other players to go green and provides the necessary information, support and guidance. According to Zhu and Sarkis (2004), green supply chain also includes the four areas of traditional supply chain, such as upper and lower flows and the activities occurring within the organization and logistics processes. The practice of GSCM eliminates or minimizes all sorts of waste occurred in supply chain, either at its source or during the process. The practice of green design and green operation which consists of green manufacturing, remanufacturing, reuse and recycle, make the internal supply chain green. While external supply chain which consists of upstream and downstream activities can be green through green distribution, reverse logistics, green procurement and green logistics. Organizations adopting green supply chain practice get benefitted as their overall (environmental, economic and social) performance improves. GSCM can be generally divided into different phases. In the line of GSCM are discussed in the following sub sections.

### *Green procurement*

The term green procurement, first time appeared during 1980s (Dowlatahahi 2000), is integration of environmental management into the purchasing function of any firm (Igarashi *et al.* 2013). Martha and Houston (2010) emphasized the basic purpose of green procurement is to eliminate waste, and purchasing department should focus on value by comprehensively considering the total cost in the process of eliminating waste and waste disposal activities. It strives to ensure that purchased products or materials meet environmental objectives set by purchasing firm that minimizes environmental impact. Thus the ultimate goal of green purchasing is to reduce the source of wastage, promote recycling, reuse and reduce the uses of resources, and substitution of materials.

Preuss (2001) in his paper has introduced the notion of "green multiplier effect". He proclaims that purchasing can be a major agent for enabling environmental initiative in the supply chain. The availability, characteristics, knowledge, ambitions, equipment and actions of the suppliers can have an impact on green purchasing (Knudsen 2003). Many authors have developed different approach individual and integrated to evaluate suppliers and selection (Govindan *et al.* 2013). According to Igarashi *et al.* (2013), the most commonly used multi-criteria decision-making approach is analytical hierarchy process (AHP) and the most commonly considered criteria for green supplier evaluation and selection is environmental management system. Green procurement has a significant role in selecting suppliers. They have identified four key dimensions of green supplier selection (GSS). (i) Aligning supplier selection with a firm's overall green strategy. (ii) The role of decision making tools and models in GSS (iii) GSS as a series of interrelated decisions and information processing activities (iv) The wider supply chain context in which GSS takes place. Min and Galle (2001) had identified major Barriers to the adoption of green procurement; they are inadequate information among decision makers, lack of common implementation standards, real and perceived cost obstacles, and market and technical uncertainties.

In the process of purchasing and procurement, suppliers, purchasing managers, upstream members of the supply chain should work with a common goal to reduce wastage and provide environmentally friendly products. Green procurement often highlights specific attributes such as recycled content, energy efficiency, and waste reduction. It can be treated as pre-steps taken to control the environmental impact. It is like precautionary action taken at the start of the supply chain to check waste rather than taking at the end of the supply chain.

#### 4.2.2 Green design

Conventional design involves an ignorance of environmental effects of producing, inefficient use of energy and the generation of waste at each stage of designing process. Whereas, green design or design for the environment or life cycle design is about designing a product or service in a systematic and structured way that reduces its adverse impact on the environment. It is intended to develop more environmentally amiable products and process. The primary concern of green design is minimizing the damage in the whole designing process (Luthra 2011). It can be achieved by replacing hazardous material and process by one that appears less problematic, bringing ecological balance between man and nature, reducing or minimizing the consumption of material/ energy (Kumar *et al.* 2013). Scope of green design encompasses many different disciplines including environmental risk management, safety of the product, safety of employee health, pollution prevention, conservation of resource and waste management. (Amemba *et al.* 2013)

The central concept of green design is a Life Cycle Analysis (LCA). Life cycle analysis is described as a process for assessing and evaluating the environmental, occupational health and resource related consequences of a product through all phases of life cycle (Gungor and Gupta, 1999). Environmentally related data are generally collected, analyzed, and presented through LCA. Steps involved in LCA are as follows 1) identification of the goals and boundaries of LCA, 2) analysis of inventory to achieve a balance between material and energy in the system, 3) evaluation of the system's impact on the environment, assessment of the most promising system improvements to reduce the negative environmental impact.

#### 4.2.3. Green operations

Green operations consist of product manufacture, remanufacture, use, handling, logistics, and waste management once the design has been finalized (Lund 1984). The scope of green operations (GO) spans from product development to management of the entire product life cycle involving such environmental practices as eco-design, clean production, recycling, and reuse with a focus on minimizing the expenses associated with manufacturing, distribution, use, and disposal of products (Guide and Van Wassenhove 2001).

Environmental management literature reflects that orientation of green operation is a product as well as process related environment practice (Ferguson and Toktay 2006) with the purpose of reducing the environmental impact of product and supply chain processes on natural resources (Porter and Linde 1995). During the 1990s the green manufacturing relatively a new concept was emerged (Sezen and Cankaya 2013). It is a combination of multidisciplinary approach focused on reducing energy consumption and material used by using green energy, developing and selling green products and employing green process in the business operation (Ferguson and Toktay 2006). Green manufacturing engineering includes two types of activities. First one is taking the end-of-life products as the blanks, and recovering products' performance by using remanufacturing technology. Usually the remanufactured products' performance can reach or even surpass the performance of new products. Second one is working on outdated products and improving products' performance to meet the requirement of the time (Xiaoyana 2012). According to Fleischman *et al.* (2000), any firm during its production, operational activities should encompass zero potential safety problems, zero health threats on the operators and product users, zero environmental pollution, waste recycling, and waste disposal to match the set standards of green manufacturing.

Remanufacturing, in the words of Sundin and Bras (2005), is "the process of rebuilding a product, during which the product is cleaned, inspected and disassembled; defective components are replaced; and the product is reassembled, tested and inspected again to ensure it meets or exceeds newly manufactured product standards". It is a process of returning a used product to like-new condition with a warranty to match. Remanufacturing system consists of three phases: collection, remanufacturing process and redistribution. In the collection phase the used products are collected from previous customers. After collecting the used product, it is sent for remanufacturing process with different remanufacturing operations like inspection, cleaning, disassembly, component reprocessing, reassembly and testing (Sundin 2006). The remanufactured products are then distributed to reach the target customers (Fleischman *et al.* 2000).

Many of the authors have distinguished remanufacturing and manufacturing on the basis of activities involved in remanufacturing process, which is absent in case of manufacturing, activities are disassembly, cleaning,

inspection and sorting. In remanufacturing the quality, quantity and timing of the used products cannot be controlled, whereas it can be controlled in the case of manufacturing (Fleischman and Krikke 2000). It can be inferred that production planning for remanufacturing is a complex task (Sundin 2006). In general remanufacturing is 3 to 5 times more labour intensive. Nevertheless, it has advantages over the manufacturing as the customer has to pay less, the remanufacturing companies earn more since fewer new components are required and the whole process is pro to the environment. That is why remanufacturing is sometimes being referred to as a “win-win-win” situation compared with manufacturing (Seitz and Peattie 2004). In spite of having advantages, some challenges exist at each phase, i.e. collection, remanufacturing process and distribution of remanufacturing system. The main challenge in remanufacturing is to match the demand and supply of remanufactured goods, which is due to uncertainty in both demand for remanufactured products and supply of remanufacturable product to the firm.

#### *4.2.4. Reverse logistics*

The terms reverse channel or reverse flow was first time came into context after being used by Guiltinan and Wokoye in 1975. Lambert and Stock in 1981 used the term reverse logistics for the first time (Roger and Tibben Lemcke 2001). Terms such as return logistics; retro logistics or reverse distribution have been used as synonyms of reverse logistics in many literatures. Reverse logistic is an environmentally conscious approach encompasses reverse distribution and resource reduction (Carter and Ellram 1998). The reverse logistics executive council defines it as “a specialized segment of logistics focusing on the movement and management of the products and resources after the sale and after delivery to the customer”. According to Hervani *et al.* (2005) it is an operating practice to recover materials for re-entry at forward supply chain to make new or used products, by means of reuse, remanufacturing and/or recycling. In contrast to traditional logistics which involves forward flow of goods from manufacturer to final consumer, reverse logistics involves the backward flow of goods from customers to the manufacturer with the aim of adding value to the product or proper disposal (Fleischmann *et al.* 1997, Rogers and Tibben Lemcke 1999). The prime purpose of reverse logistics is proper disposal of discarded products or re-obtains the useful value. (Wang and Gao 2003)

Reverse logistics operations include the following major steps: collection, inspection, separation, storing, leading to remanufacturing or recycling, densification or disassembly, transitional processing, delivery and integration (Kinobe *et al.* 2012). The operational emphasis on reverse logistics varies according to the type of material or component that flows into it. Nowadays reverse logistics is being considered as strategic activities to enhance long run competitiveness of supply chain (Dowlatshahi 2000). The advantages offered by practice of reverse logistics are such as, increase revenue return, enhance economy of scale (Fleischmann *et al.* 2001), improving competitiveness of firm within same industry (Abdullah *et al.* 2012), enhancing customer retention rate (Srivastava 2008) and creating employment opportunities (Williams *et al.* 2008). Due to these advantages, it has gained tremendous popularity (Dowlatshahi 2000) and widely being used by industries such as automobiles and photocopiers (Srivastava 2008).

Despite of the above mentioned advantages, certain issues are associated with reverse logistics. Some of the practical issues faced by reverse logistics were identified by Pohlen and Farris (1992). These are as follows as 1) Most logistics systems are ill-equipped to handle product movement in a reverse channel. 2) Reverse distribution costs may be up to nine times higher than moving the same product from producer to consumer. 3) Returned goods often cannot be transported, stored and/or handled in the same manner as in the forward channel. Finally, it is more labour intensive than traditional logistics. Despite of all issues, regulatory pressure, governmental support, organizational support, quality of human resources, and relative advantage and compatibility are driving the organizations to adopt reverse logistics. (Lin *et al.* 2011)

#### *4.2.5 Performance Measurement of Green Supply Chain Management*

Many firms are adopting GSCM policy due to pressure from public, government, competition, and numerous benefits such as cost reduction supplier integration environmental innovation (Rao 2002). Large firms are not only adopting GSCM but also putting pressure over their suppliers (small firms) to go green (Zhu *et al.* 2005). To improve environmental image and gain economic profit, GSCM has become emerging environment practice for manufacturer (Zhu *et al.* 2007). Seeing the importance, it has become obvious to measure the degree of GSCM practice and its contribution to the firm's performance (Zhu *et al.* 2007). The relationship between environmental and economic performance is positive and significant (Zhu and Sarkis 2004), however direct impact of GSCM on economic performance probably takes longer time to realize (Bowen *et al.* 2001). Firms may have to bear short term economic losses when going for improving their environmental performance but in long term, there is

possibility of environmental practices due to competitive pressure and other factors which can lead to fetch positive economic performance (Zhu and Sarkis 2007).

Performance of GSCM should be measured on the basis of some criteria. Zhu *et al.* (2007) in their paper has mentioned that the criteria should recapitulate the overall impact of GSCM. In general, criteria can be divided into following heads. 1) Generation of pollution and waste management, which may include emissions of hazardous gas, water consumption, reducing the volume of residues and lowering pollution levels. 2) Preservation of resources, it may include using fewer natural resources and less energy, decreasing the consumption of hazardous and toxic materials. 3) Economical benefits, it may include reduction in costs material purchasing, fees for water treatment and discharge, penalties for environmental accidents. On the basis of these criteria or such other criteria performance of can be measured for the long term benefit. The ISO 14031 further extension of ISO 14000, is designed for use in environmental performance evaluation with indicators in three key areas: (1) Environmental condition indicators; (2) Operational performance indicators; and (3) Management performance indicators (Zhu *et al.*, 2013).

Performance measurement tools for environmental operations are increasing, but they are not so adequate to entirely evaluate the impact of GSCM. Hervani *et al.* (2005) in their paper has mentioned the following common tools used for measuring the performance. They are Analytical Hierarchy Process (AHP), Activity-Based Costing (ABC), Balanced Scorecard (BSC), Life Cycle Analysis (LCA), Product Stewardship, Design for Environment (DEF), and Data Envelopment Analysis. Some of the tools can be directly applied to aspects of GSCM and performance, and others require adjustments and extensions (Hervani *et al.* 2005). Overall, there is none of the tools are perfect for performance measurement of GSCM. Any of the tools that are to be used for planning, estimation, and management, their practice is greatly rely on agreement across organizations and the ease and accessibility of data and knowledge to apply these tools.

## Conclusion

This paper represents an overview of green supply chain management. The overview is based on the literature of GSCM which provides a better understanding of GSCM with an integrated approach. To meet this purpose, papers were segregated year wise, country wise, methods wise and on the basis of its focused area of study. Number of papers published in recent years indicates that there is rising interest and concern of green issues among researchers. This study gives a glimpse of the past and the present trend of the study on GSCM. The study shows increasing trends in GSCM research in developing countries like India, China and Taiwan. Survey method is mostly preferred by researchers while studying the GSCM. There is less study on relationship management with suppliers and customers. For GSCM practice, there should be more study on environmental collaboration with the supply chain partners. Although there is a remarkable amount of publications related to GSCM, but still there is a different viewpoint on GSCM. It is treated as operational philosophy of management, a business culture, and a business strategy to gain competitive advantage. These different interpretations are not mutually exclusive rather overlapping each other. However, the prime objective of GSCM, improving the environmental performance along with improving the operational efficiency remains unchanged. This study has taken broad outlook at GSCM and the relevant issues related to it.

The key themes that came out of the GSCM literature over the last twenty years are the concept of green design, green procurement, green operations, reverse logistics and performance management. All these aspects of analysis about the literature survey, and explaining the different phases of GSCM will significantly contribute to the literature of GSCM and further reinforce in the creation and dissemination of particular theories.

It is suggested to formulate a combination of various tools and techniques to address various issues in GSCM. A significant contribution by the researches is needed in the area of GSCM and its implementation in SMEs sector. More study should be conducted to find the association between adoption of GSCM and evaluation of its performance. More study need to be conducted to establish trade-off between environmental and economic performance caused by GSCM.

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## The Determinants of Money Demand Function in the ASEAN-5 Countries

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### Abstract:

*The purpose of this paper is to examine the long-run and short-run determinants of money demand function in the ASEAN-5 countries, including Thailand, Singapore, Malaysia, Philippines, and Indonesia. The research was conducted by using secondary data sets from the ASEAN- 5 countries, covering the time period from 1990 to 2014. The paper was started by using unit root test for detecting a stationary of each variable that included in the models. Then, co-integration approach was applied for estimating the long-run determinant of money demand function. After that, Vector Error Correction Model was used to test the short-run determinant of money demand function. The results indicate that income has relationship with money demand in Thailand, Singapore, and Indonesia. The exchange has effect in money demand in Indonesia. Price level has relationship with money demand in every country in ASEAN-5 except Thailand. In addition, change in domestic interest rate has significant related with money demand function in Singapore and Indonesia. However, the foreign interest rate has significant related with the long run money demand in Thailand, Malaysia, and Indonesia. The results of this research could be used as a guideline for the central bank in ASEAN countries to set an effectiveness monetary policy.*

**Keywords:** money demand function, ASEAN 5, cointegration.

**JEL Classification:** E40, E41.

### 1. Introduction

After the Global Financial Crisis in 2009, many countries, including the ASEAN-5 countries (Indonesia, Malaysia, the Philippines, Singapore, and Thailand) faced the unstable economic situation, such as reducing in export demand, where the export is a major growth of the countries. These lead to economic recession and unemployment crisis in the countries. In addition, some developed countries such as USA adopted an expansionary and accommodative monetary policy by lower interest rates and liquidity injection that caused huge capital inflows to the five ASEAN countries, which lead to appreciate currency and exacerbated export downturn. The uncertainty economic situation directly affects a quantity of money holding in economic system, which becomes unstable money demand in the countries. Since policy makers face the challenge of global financial turmoil, it is necessary to understand the behavior of money demand and the role of macroeconomic policy response in order to conduct efficiency monetary policy

The issue of money demand function had been one of the most concerns in monetary economics research, especially the relationship between money demand and its determinants since the stable of money demand plays an important role in economic system and economic growth, especially with respect to monetary policy conducting. If the demand for money is stable, the monetary authorities will be able estimate the effect of monetary policy on economics activities, and then they will be able to carry out monetary policy actions with greater confidence and more efficiency. In addition, the determinant of money demand has important implications for the selection appropriate monetary policy instruments. Therefore, understanding the money demand function and its determinant is a key successful for conducting monetary policy in any country (Rutayisire 2010).

Over the past decade, many researchers attempted to examine the relationships between the money demand and its determinant in both developed and developing countries. In Asian country, most papers emphasize on testing the effect of financial liberalization on the stability of demand function. For example, Dekle and Pradhan (1997) investigate the effect of financial liberalization and financial reform on instability of money demand in Southeast Asian countries. Khalid (1999) estimates the degree of foreign factor opportunity cost impact money demand in South Korea, Philippine, and Singapore by applying the Johansen co integration technique and estimating an Error Correction Model with quarterly data from 1977:1 to 1993:4. He argues that money demand in those three countries has long run relationship with both domestic and foreign variables. James (2005) offered the new approach to analyse the effect effects of financial liberalization on the money demand in Indonesian. He found that liberalization plays a major role in determining money demand. Moreover, he claims that there is existence of long run relationship between broad money and its determinant when the proxy liberalization is included.

As can be seen from the previous studies, most papers focus on stability on money demand function and the effect of financial liberalization on the demand for money but they seem to ignore the factors of money demand function, especially the money demand behavior in the ASEAN countries. Therefore, this paper aims to provide information on the relationship between money demand and its determinant in major five developing countries in ASEAN (ASEAN-5). This paper is one of the a few empirical researches that concerned both long-run and the short run equilibrium of demand for money in developing countries.

Theoretically, there are three motive of money demand. Firstly, transactions demand for money, which had positively related with income and inversely related to interest rates. Second motive called precautionary demand for money, which also positively related to income. The last motive is speculative demand for money, which had negative related with interest rates. However, many of previous studies and real world experience usually include the cost of credit in money demand estimation. Therefore, this paper aims to analyze money demand function and its determinant in the ASEAN-5 by applying both money demand theory and review from previous research. The paper applied econometric model for investigating the determinate of money demand function in the ASEAN-5 by using broad money (M2) as a proxy of money demand in each country in the ASEAN-5 since the M2 was adopted as monetary targeting in monetary policy in many developing countries. The major objective of this paper is to test a long run and short run equilibrium relationship between money demand and its determinants in the ASEAN-5 countries, including Malaysia, Philippine, Indonesia, Singapore, and Thailand.

## **2. Literature reviews**

One of the pioneer studies on the money demand function in developed countries was generated by Lucas (1988). He used post-war data to estimate the money demand in the United States. He concludes that there is evidence of a stable long-run relationship between M1 money holding, domestic interest rates, and income in the United States over the sample period. After the study of Lucas, many researchers attempted to analyse the money demand in the United States. For example, Miller (1991) adopted the Eagle and Granger co-integration approach (EG) and the Error Correction model to analyze the money demand function in the USA during 1959-1987. He found that there is a single co-integration relationship between broad money and its determinants. After that Lucas (2000) re-estimated the M1 money demand in the United States but was more focused on the interest rate elasticity of money demand during 1900-1994, and the result was similar to the previous study that the M1 money demand in the United States appeared to be stable.

There is also a huge amount of literature about money demand in the industrial countries. For instance, Ghosh (2000) applied the co-integration approach to estimate the existence of the long-run equilibrium relationship of the narrow money demand (M1 demand function) in five industrial countries, including the US, the UK, Canada, Germany, and Japan. The empirical results of his study indicate that there is a long-run relationship between the M1 money demand and short-term and long-term interest rates in the US, the UK and Canada while only long-term interest rates appeared to be strongly significant in Japan. In addition, he found that there is no evidence about a stable relationship for Germany's money demand function. This study was supported by Hansen and Kim (1995) and Bahmani-Oskooee and Bohl (2000). They claimed that the M3 money demand in Germany appeared to be unstable.

Bahmani-Oskooee (2001) used the Johansen co-integration model to test the long-run relationship between the M2 money holding and interest rates in Japan. This research shows that the long-run M2 money demand function in Japan is stable. Similarly, Bahmani-Oskooee and Chomsisengphet (2002) applied the same model to test a long-run relationship in the M2 money demand function in 11 OECD countries, including Australia, Austria, Canada, France, Italy, Japan, Norway, the US, Sweden, Switzerland, and the UK. In addition, they also used the CUSUM and CUSUMSQ to test the stability of M2 money demand in those industrial countries. The results show that there is some sign of instability in the money demand function in Switzerland and the UK. However, money demands of the remaining countries are stable. Choi and Oxley (2004) examined the stability of demand for money function in New Zealand by using the quarterly data from 1990-2000 based on the cointegration and error correction models. The result indicates that there exists a long-run relationship for the money demand function.

Some of the empirical studies emphasize the linkage between the money demand function and monetary policy. For instance, Cargill and Parker (2004) analyzed the money demand and monetary policy in Japan, China, and the United States during a deflation period. They review the history of deflation of those three countries and analyze the effect of deflation on money demand. The empirical results show that money demand in Japan influenced by the deflation process, similar to the results from the United States. However, deflation has no effect on money demand in China. Coenen, Levin, and Wieland (2005) consider money demand as a monetary indicator when conducting monetary policy. In addition, they attempt to answer the question whether there is a linkage

between money demand and current real output. The result indicates that money demand has limited information content as an indicator of contemporaneous aggregate demand in the Euro area.

Another interesting empirical study about the money demand function is the study of Lim (1993). He used a set of Australian quarterly and monthly data from 1974-1990 to examine the relationship between the broad money demand and its determinants. The variables included in the model are 90-day bank bill rates, two and five-year t-bond rates, the inflation rate and the dummy variable, which represent the structural change. The co-integration result shows that there exists a long-run relationship for both the monthly and quarterly money demand function and the error correction model (ECM) indicates that the short-run money aggregate in Australia was influenced by the 90-day bank bill rate. This was followed by Felmingham and Zhang (2001) who tested the broad money demand function but with a different method. They used the Gregory and Hansen (GH) methodology to examine the stability of money demand when a structural break is included, and the results indicate that the structural break was found in 1991 with the deep recession. Valadkhani (2005) re-examined the long-run determinants of the broad demand money function in Australia during 1976-2002 by using the Johansen co-integration technique. The result is similar to the previous study in that demand for broad money is co-integrated with real income, the rate of return on 10-year treasury bonds, the cash rate and the rate of inflation

Some empirical researches present the money demand estimation in ASEAN. For example, the studied of Tang (2007) shows the long-run relationship between broad money demand (M2) and its determinant components, including real GDP, exchange rate, and inflation rate in ASEAN economies (including Malaysia, the Philippines, Thailand, Indonesia and Singapore) from 1960 to 2005. The research indicated that M2 balances in Malaysia, the Philippines and Singapore co-integrated with real GDP, exchange rate and inflation. However, the other two countries had no co-integration. In addition, the research applied the ARDL test and found that, excluding Indonesia, the money-demand function in all member countries was stable in the short run. Valadkhani (2008) analyses the long-run and the short-run relationship between money aggregate and its determinant in Asian-Pacific countries by using the Engle-Granger two-step procedure testing for long-run integration between M2 and its determinants. The research presents that all the determinants in money demand function can change significantly if the monetary policy is in place. However, in the short-run, the ECM test showed that only income, inflation and interest rate have significant effects on the change in M2 suggesting that currency substitution and capital mobility are only valid in the long-run period.

Base on the previous studies, they seem to ignore the money demand behavior in developing countries. This paper provides information on the relationship between money demand and its determinant in major five developing countries in ASEAN. This is one of the a few empirical researches that concerned both long-run and the short sun equilibrium of demand for money in developing countries.

### 3. Research methodology

#### 3.1 Research model

Model specific in this research was driven from the simplest form of demand for money function as following:

$$\left(\frac{M}{P}\right) = f\left[\left(\frac{Y}{P}\right), R\right] \quad (1)$$

where  $M/P$  presents real money balance,  $Y/P$  is a real income and  $R$  represent the domestic interest rate. As can be seen from the equation above, the demand for real money balances or money demand is depended on real income and domestic interest rate, which presents the opportunity cost of holding money.

In an open economic system, the international trade and foreign capital movement become greater important factor in economy. Domestic investors have more choice of asset holding, both domestic and foreign asset. Therefore, many empirical researches on demand for money function attempted to test the determinants of money demand function by including external factor, such as foreign interest rate as of the independent variables due to globalization trend. For example, Bahmani-Oskooee (1991) indicated that the foreign sector such as foreign interest rate has a significant relationship with demand for money in an open economic system. Sriram (1999) also claimed that the exchange rate and foreign interest rate should be considered in the demand for money function. Therefore, the model that applied for estimating demand for money in this paper will be:

$$\text{Ln}M_t = f(\text{Ln}Y, P, \text{LnEXC}, \text{FIR}, \text{DIR}) \quad (2)$$



where LnMt refers to log of money demand in each country. This paper was applied board money aggregate (M2) as a proxy money demand in each country. LnY presents log of real income (log of GDP), a Gross Domestic Product at 1988 constant prices was used as a proxy of GDP. P represent price level of each country in the ASEAN-5, the inflation rate of each countries was adopting as a proxy of P. LnEXC is log of the exchange rate, which used the individual ASEAN-5 currency against US dollar. FIR is foreign interest rate. The paper applied LIBOR (London Interbank Offered Rates), as a proxy of the foreign interest rate. DIR represents domestic interest of eachcountry in the ASEAN-5. The Bank Rate of each country was used in the paper.

### 3.2. Methodology

There are three methodologies used in the paper, the unit root testing, co integration testing, and the vector error correlation.

#### Testing for Stationary and Unit Root Test

There are two common ways for detecting non-stationary variables of time series data. Firstly, an informal observance of a time series plots of variables to see whether there is any obvious trend in the series. Another method is the unit root testing, which is formal method of detecting non-stationary data. A standard test for detecting unit roots was developed by Dickey and Fuller (1979). An original Dickey-Fuller test (DF test) is valid if only the error term ( $\varepsilon_t$ ) appeared to be white noise. In other words, the assumption of the DF test is that the error term is uncorrelated. Indeed, the error term ( $\varepsilon_t$ ) will be auto-correlated if there are autocorrelations in the dependent variable of the regression model. Therefore, Dickey and Fuller (1981) introduced an alternative approach to test a unit root in the case where the error term is unlikely to be white noise. This model is well known as the Augmented Dickey-Fuller test (ADF test).

The Augmented Dickey-Fuller (ADF test) test is actually the extension of the DF test by including the extra  $\rho$  lag value on the dependent variable  $\Delta Y_t$  in order to eliminate autocorrelation. This research applied the ADF approach for testing unit root of each variable included in the model. The equation that used for the test is following:

$$\Delta y_t = \delta y_{t-1} + \sum_{i=1}^p \phi_i \Delta y_{t-i} + \varepsilon_t \tag{3}$$

$$\Delta y_t = \alpha + \delta y_{t-1} + \sum_{i=1}^p \phi_i \Delta y_{t-i} + \varepsilon_t \tag{4}$$

$$\Delta y_t = \alpha + \beta t + \delta y_{t-1} + \sum_{i=1}^p \phi_i \Delta y_{t-i} + \varepsilon_t \tag{5}$$

where  $Y_t$  is the time series variable at time t,  $Y_{t-1}$  is the lag of the time series variable,  $\rho$  is the coefficient of lag of the time series,  $t = 1, 2, \dots$ ,  $\varepsilon_t$  is the disturbance term which is independent and identically distributed (iid) with zero mean and variance.

The hypothesis of ADF testing is the same as the original DF test. Therefore, the null hypothesis of the unit root test is that  $H_0: \delta = 0$  and the alternative hypothesis is  $H_1: \delta < 0$ . Practically, the ADF procedure will be tested by comparing the absolute value of the ADF statistic (t-statistic of  $\delta$ ) with the MacKinnon critical value<sup>20</sup>. If the absolute value of the ADF statistic is greater than the absolute value of the critical value, then the null hypothesis of a unit root is rejected and the series is stationary. On the other hand, if the ADF test is smaller than the critical value, then the series is no stationary. However, in case the time series is no stationary at level, then it would be first differenced, second differenced, and so on. The differencing method will continue until the null hypothesis can be rejected.

#### Co-integration Test

<sup>20</sup> The critical values which were provided by MacKinnon (1991) which calculate from the equation are:  $CV = \phi_\infty + \phi_1^{N-1} + \phi_2^{N-2}$  where CV is the critical value, N is the sample size and the parameters  $\phi_\infty, \phi_1, \phi_2$  are provided by MacKinnon for the differing models (constant with no trend, constant and trend).

The second step of paper is co-integration test by using Johansen (1991) approach. Johansen (1991) proposed two likelihood ratio statistics to test the hypothesis of co-integration vectors, called trace statistic and maximal eigenvalue statistic. Those two equations can be expressed as:

$$\lambda_{trace}(r) = -T \sum_{i=r+1}^n \ln \left( 1 - \hat{\lambda}_i \right) \tag{6}$$

$$\lambda_{max}(r, r+1) = -T \ln \left( 1 - \hat{\lambda}_{r+1} \right) \tag{7}$$

where  $\hat{\lambda}_i$  is the estimated value of the characteristic roots obtained from the estimated metric and  $\pi$  is the number of usable observations.

The aim of the trace statistic is to test the null hypothesis that the number of co-integrating vectors is less or equal  $r$ ,  $r \leq r_0$  against the alternative hypothesis  $r > r_0$  for  $r_0 = (0, 1, 2, \dots, n)$ , while the maximal eigenvalue statistic test is for the hypothesis that at least  $r$  co-integrating,  $r = r_0$ , against the alternative  $r = r_0 + 1$ .

**The Vector Error Correction Model**

A co-integration method is more concerned about the long-run equilibrium relationship between two variables but it is not concerned about the short-run relationship between the two variables. To capture the short-run dynamic between the two variables, Engle and Granger (1987) and Granger (1988) proposed an alternative method to describe the short-run dynamic relationship between variables, known as the Error Correction Model (ECM). The major idea of the ECM is that a proportion of disequilibrium from any change in one of these variables is related to change in past equilibrium error (Engle and Granger 1987). Since Granger introduced the concept of ECM, it became more popular among economists due to the ECM method being formulated in terms of first difference, which can eliminate trend from the equation. In addition, ECM can capture short-run and long-run equilibrium relationships of the set of variables

A suggestion of Engle and Granger (1987) was that if the two-time series  $Y_t$  and  $x_t$  are cointegrated in the same order (both  $Y_t$  and  $x_t$  are  $I(d)$ ), any linear combination of the two series should be the same and the residual that obtains from the regression  $Y_t$  on  $x_t$  should be  $I(d)$ . Therefore, the simple way to derive the Error Correction Model is to show if  $Y_t$  and  $x_t$  are linear functions of the latent integrated progress, the residual of  $Y_t$  regressed on  $x_t$  should be stationary.

To capture the short-run equilibrium between the two variables, Engle and Granger suggest the simple dynamic of short-run adjustment in Equation below:

$$y_t = \alpha_0 + \alpha_1 y_{t-1} + \beta_0 x_t + \beta_1 x_{t-1} + \varepsilon_t \tag{8}$$

Rearrange Equation above by taking first difference

$$\Delta y_t = \alpha_0 + \gamma(y_{t-1} - x_{t-1}) + \lambda_1 \Delta x_t + \lambda_2 x_{t-1} + \varepsilon_t \tag{9}$$

where  $\gamma = (\alpha_1 - 1)$ ,  $\lambda_1 = \beta_0$ , and  $\lambda_2 = \beta_1 + \beta_0 + \alpha_1 - 1$

The  $\gamma$  or  $(\alpha_1 - 1)$  in represents the speed at which  $Y_t$  adjusts to any discrepancy between  $Y_t$  and  $x_t$  in the previous period, while  $(Y_{t-1} - x_{t-1})$  is equal to zero when  $Y_t$  and  $x_t$  are in equilibrium and it measures the extent to which the long-run relationship is not satisfied. The  $\lambda_1$  represents the short-run relationship between the two variables. However, instead of explicitly including an error correction term in the form of  $(Y_{t-1} - x_{t-1})$  it is convenient model for estimating the error correction model is:

$$\Delta y_t = \alpha_0 + \gamma y_{t-1} + \eta_1 \Delta x_t + \eta_2 x_{t-1} + \varepsilon_t \tag{10}$$

where  $\gamma = (\alpha_1 - 1)$ ,  $\eta_1 = \lambda_1 = \beta_0$ , and  $\eta_2 = \beta_1 + \beta_0$

Therefore, it can be re-written in the form of an Error Correction Model as:

$$\Delta y_t = \alpha_0 + \gamma(y_{t-1} + \eta_2 x_{t-1}) + \eta_1 \Delta x_{t-1} + \varepsilon_t \quad (11)$$

## 4. Empirical results and discussion

### 4.1. The result of Unit Root Testing

Since using stationary data is an important condition for analyzing time series data, therefore, this paper starts by detecting for stationary data of all variables that will be included in money demand function in the ASEAN-5 countries. The test of stationary data is conducted by using the Augmented Dickey-Fuller (ADF) unit root method in order to test a stationary of each variable.

The results of ADF unit root method are presented in Table 1 and 2, where the numbers in table display the ADF statistic and the number in bracket presents the optimum lag-length of ADF statistic. While Table 1 indicates the unit root test at level, Table 2 presents the unit root test at first difference level. The results of unit root were conducted by comparing the ADF statistic with a MacKinnon critical value. If the ADF statistic is greater than the MacKinnon critical value, the null hypothesis of unit root will be rejected, that means the variable is stationary. On the other hand, If the ADF statistic is smaller than the MacKinnon critical value, the null hypothesis of unit root will be accepted and its can be said that the variable is non-stationary.

The results of unit root by using ADF statistic at level found that the null hypothesis of unit root cannot reject for most of variable included in the model (except price level in Singapore and Malaysia). These means most of variables are non-stationary at level. However, at the first difference of time series, the ADF statistics indicated that the null hypotheses of unit roots can be rejected at 1% and 5% significant for every variable since the ADF statistic are greater than the critical values. This can be said that every variable that included in the demand for money model in ASEAN-5 are integrated at order 1 (I (1)). Therefore, all variables are stationary first difference and can be used in time series analysis. That means all variables can be used in the model of money demand in the ASEAN-5.

Table 1 - Summaries the Result of Unit root test in ASEAN-5 at Level

VARIABLE	THAILAND	SINGAPORE	MALAYSIA	PHILIPPINE	INDONESIA
Ln M	0.52(1)	-1.65(0)	-1.70(0)	-2.68(0)	0.34(0)
Ln Y	2.74(0)	-0.94(0)	-1.27(0)	-0.20(1)	0.20(0)
P	0.88(0)	-4.01(1)*	-4.49(0)*	-3.51(0)	-3.76(0)
Ln EXC	0.35(0)	-1.20(0)	-1.36(0)	-2.90(0)	-1.45(0)
FIR	-1.35(0)	-2.09(1)	-2.29(0)	-1.50(0)	-1.46(0)
DIR	-2.77(2)	-4.59(0)*	-2.52(0)	-2.09(0)	-2.09(1)

Note: \* indicate the significance level, the number in ( ) indicates the optimum lag-length of ADF

Table 2 - Summaries the Result of Unit root test in ASEAN-5 at first difference Level

VARIABLE	THAILAND	SINGAPORE	MALAYSIA	PHILIPPINES	INDONESIA
Ln M	-7.94(0)*	-4.26(0)*	-3.15(0)**	-1.42(1)	-3.78(0)**
Ln Y	-2.88(0)*	-3.78(0)*	-5.09(0)*	-6.22(0)*	-5.04(0)*
P	-8.27(0)*	-7.12(0)*	-5.12(0)*	-6.27(0)*	-6.36(0)*
Ln EXC	-3.07(0)*	-4.42(0)*	-3.45(0)*	-3.86(0)*	-4.65(0)*
FIR	-3.24(0)*	-3.73(0)*	-3.73(0)*	-6.76(0)*	-4.40(0)*
DIR	-11.98(1)*	-7.35(0)*	-6.85(0)*	-3.73(3)**	-3.73(3)*

Note: \* and \*\* indicate the significance level at 1% and 5%; the number in ( ) indicates the optimum lag-length of ADF

### 4.2. The empirical result of Co-integration, Long –Run demand for money function

The results of long run money demand function in each country in the ASEAN-5 present in Table 3 -7. Table 3 displays the estimation of Johansen co-integration method for money demand function in Thailand, where the number in the Table indicates the trace statistic ( $\lambda_{\text{trace}}$ ). The results of trace statistic claims that the null hypothesis of at most 3 can be rejected at 5% significant level, since a trace statistic (35.61) is greater than 5% critical value (35.19). However, the null hypothesis of at most 4 cannot be rejected because the trace statistic (13.52) is smaller than 5% critical value (20.26). This implies that there are at least 3 stationary linear combinations of variables that are co integrated in the long-run relationship.

Table 3 - Johansen co-integration for money demand in Thailand

HYPOTHESIZED		TRACE	0.05	
No. of CE(s)	Eigenvalue	Statistic	Critical Value	Prob.**
None *	0.969	206.040	103.847	0.000
At most 1 *	0.949	136.278	76.972	0.000
At most 2 *	0.870	76.491	54.079	0.000
At most 3 *	0.668	35.615	35.192	0.045
At most 4	0.393	13.526	20.261	0.323
At most 5	0.161	3.514	9.164	0.489

Note: \* denotes rejection of the hypothesis at the 0.05 level

The results of co-integration test for money demand function in Singapore in Table 4 indicate that the hypothesis of  $r$  at most 2 is rejected since the trace statistic of at most 2 is greater than 95% critical value. It implies that there is the existence of 2 co-integrating vector in long run demand for money function in Singapore.

Table 4 - Johansen Co-integration for money demand in Singapore

HYPOTHESIZED		TRACE	0.05	
No. of CE(s)	Eigenvalue	Statistic	Critical Value	Prob.**
None *	0.986	86.425	40.077	0.000
At most 1 *	0.920	50.561	33.876	0.000
At most 2 *	0.813	33.631	27.584	0.007
At most 3	0.611	18.884	21.131	0.100
At most 4	0.250	5.7754	14.264	0.642
At most 5	0.044	0.908	3.8414	0.340

Note: \* denotes rejection of the hypothesis at the 0.05 level

Table 5 presents that result of Johansen co-integration for long run money demand function in Malaysia. The trace statistic presents that the null hypothesis of at most 4 can be rejected at 5% significant. This mean that there exists 4 co-integrating vector in long run money demand function in Malaysia.

Table 5 - Johansen co-integration for money demand in Malaysia

HYPOTHESIZED		TRACE	0.05	
No. of CE(s)	Eigenvalue	Statistic	Critical Value	Prob.**
None *	0.966	147.591	83.937	0.000
At most 1 *	0.751	79.700	60.061	0.000
At most 2 *	0.679	51.871	40.174	0.002
At most 3 *	0.555	29.126	24.275	0.013
At most 4 *	0.434	12.891	12.320	0.040
At most 5	0.072	1.499	4.1299	0.258

Table 6 presents the result of Johansen co-integration for money demand function in the Philippines. The trace statistic shows that the null hypothesis of at most 2 can be rejected at 5% significant, since the trace statistic (66.63) is greater than 95% critical value (40.17). This means that there exists 2 co-integrating vector in long run money demand function in Philippine

Table 6 - Johansen co-integration for money demand in Philippine

HYPOTHESIZED		TRACE	0.05	
No. of CE(s)	Eigenvalue	Statistic	Critical Value	Prob.**
None *	0.971	194.699	83.937	0.000
At most 1 *	0.942	123.804	60.061	0.000
At most 2 *	0.911	66.634	40.174	0.000
At most 3	0.521	18.230	24.275	0.238
At most 4	0.160	3.495	12.320	0.782
At most 5	0.000	0.006	4.129	0.945

The result of co-integration test of money demand function in Indonesia in Table 7 shows that the statistic of at most 3 (20.93) is greater than 95% critical value (17.79), this implies that hypothesis of  $r$  at most 3 can be rejected. There is the existence of 3 co-integrating vector in long run money demand function in Indonesia.

Table 7 - Johansen co-integration for money demand in Indonesia

HYPOTHESIZED	Eigenvalue	TRACE Statistic	0.05 Critical Value	Prob.**
No. of CE(s)				
None *	0.988	89.227	36.630	0.000
At most 1 *	0.941	56.813	30.439	0.000
At most 2 *	0.776	29.961	24.159	0.007
At most 3 *	0.648	20.936	17.797	0.016
At most 4	0.204	4.566	11.224	0.540
At most 5	0.046	0.941	4.129	0.384

Note: \* denotes rejection of the hypothesis at the 0.05 level

Table 8 present a normalize co-integration vector of the stable demand for money function, which represents the long run money demand function in the ASEAN-5 countries. The results of long run money demand function were performed by setting the estimated coefficient on demand for money equal -1 and then dividing each co-integrating vectors by the negative of relevant money coefficient. The vectors can represent demand for function and the long run elasticity of demand for money (Chowdhury 1997).

The results show that income (Ln Y) has long run relationship with money demand in Thailand, Singapore, and Indonesia at 0.05 significant levels. The income elasticity of money demand equal 2.4 in Thailand, 1.86 in Singapore, and 0.68 in Indonesia. This means that 1 percent increase in income, leads to 2.4% increase in money demand in Thailand, 1.86% increase in money demand in Singapore, and 0.68percent increase in money demand in Indonesia.

Price level (P) influence changes in money demand in every country in ASEAN-5 except Thailand. The price elasticity of money demand in Malaysia and Indonesia appeared to be negative. The price elasticity of money demand is -0.04 in Malaysia and -0.06 in Indonesia, meaning that 1% increase in price level because 0.04% dropped in money demand in Malaysia and 0.06 percent in Indonesia. However, price level has positively effect on money demand in Singapore and Philippines. The price elasticity of money demand indicates that 1% increase in price level, lead to 0.13% increase in money demand in Singapore and 0.22% increase in money demand in Philippines.

The exchange rate has 5% significant relates with long run money demand function in Indonesia, but not significant effect on the long run money demand in other countries. The result shows that 1% increase in exchange rate in Indonesia lead to 0.28 percent increases in money demand in the country.

The foreign interest rate (FIR) has 5% significant related with the long run money demand in Thailand, Malaysia, and Indonesia. However, it has no effect to the money demand in Singapore and Philippines. The coefficient of the foreign interest rate indicates that 1% changes in foreign interest rate lead to 1.11% increase in money demand in Thailand, 0.10% in money demand in Indonesia. On the other hand, the money demand in Malaysia will be 0.05% dropped if the foreign interest rate rise 1%. Domestic interest rate has 5% significant effect on the long run money demand function in Singapore and Indonesia, while it has no relationship with money demand in Thailand, Malaysia, and Philippines.

Table 8 - Normalize co-integrating Vectors for Money Demand Function in ASEAN 5

VARIABLE	THAILAND	SINGAPORE	MALAYSIA	PHILIPPINES	INDONESIA
Ln Y	2.4* (0.01)	1.86* (0.02)	1.33 (0.14)	3.01 (0.26)	0.68* (0.03)
P	1.10 (0.08)	0.13* (0.00)	-0.04* (0.00)	0.22* (0.03)	-0.06* (0.00)
Ln EXC	1.36 (0.13)	2.75 (0.07)	-0.19 (0.08)	-3.29 (1.16)	0.28* (0.02)
FIR	1.11* (0.01)	2.11 (1.23)	-0.05* (0.00)	0.42 (0.08)	0.10* (0.01)
DIR	-1.10 (0.12)	0.01* (0.00)	0.07 (0.13)	0.02 (0.19)	-0.33* (0.02)

Note: The numbers in parenthesis indicate the p-value, \* indicate 0.05 significant levels



4.3. The Empirical Result of Vector Error Correction, Short –Run Demand for Money Function

While the previous section shows long run money demand function in the ASEAN- 5 countries by using the co integration approach, this section shows a short run dynamic relationship of the set of variables in demand for function by using the Vector Error Correction Model.

The results of short run demand for money function of the ASEAN-5, Thailand, Singapore, Malaysia, Philippine, and Indonesia, were written in an equation form by eliminating an insignificant lagged variable from the system based on t-statistic. The equation for short run money demand in ASEAN-5 estimated by ECM present as following:

Thailand

$$\Delta LnTH\_MD = -0.50\Delta LnTH\_MD_{t-1} - 1.25\Delta LnTH\_MD_{t-2} + 3.90\Delta LnTH\_Y_{t-1} + 4.62\Delta LnEXC_{t-2} + 0.23\Delta TH\_P$$

(-2.41)
(-2.17)
(2.01)
(3.53)
(4.40)

(12)

R-square = 0.884                      Adjust R -square = 0.685  
 SEE = 0.053                          Sum sq resides = 0.872  
 Log likelihood = 2.938              F-statistic =4.458

Singapore

$$\Delta LnSG\_MD = 0.90\Delta LnSG\_Y_{t-1} + 0.47\Delta LnSG\_EXC_{t-1} - 0.01\Delta SG\_P_{t-1}$$

(3.40)
(2.04)
(-3.33)

(13)

R-square = 0.990                      Adjust R -square = 0.986  
 SEE = 0.058                          Sum sq resides = 0.047  
 Log likelihood = 34.22              F-statistic =240.8

Malaysia

$$\Delta LnMA\_MD = 0.89\Delta LnMA\_Y_{t-1} - 0.03\Delta MA\_DIR_{t-1} + 0.03\Delta MA\_FIR_{t-2}$$

(-2.04)
(-2.63)
(2.37)

(14)

R-square = 0.998                      Adjust R -square = 0.995  
 SEE = 0.046                          Sum sq resides = 0.015  
 Log likelihood = 43.44              F-statistic =355.49

Philippines

$$\Delta LnPH\_MD = 0.89\Delta LnPH\_MD_{t-2} - 0.03\Delta LnPH\_Y_{t-2}$$

(19.03)
(-2.23)

(15)

R-square = 0.994                      Adjust R -square = 0.991  
 SEE = 0.067                          Sum sq resides = 0.059  
 Log likelihood = 29.74              F-statistic =371.52

Indonesia

$$\Delta LnIND\_MD = 1.54\Delta LnIND\_MD_{t-1} - 0.76\Delta LnIND\_EXC_{t-1}$$

(3.40)
(-2.39)

(16)

R-square = 0.959	Adjust R -square = 0.942
SEE = 0.273	Sum sq residues = 1.047
Log likelihood = 1.682	F-statistic = 55.79

AS can be seen from equation, the short run money demand function in Thailand influence by the money demand in last 1 and 2<sup>nd</sup> period, income, exchange rate, and price level, while domestic interest rate and foreign interest rate has no relationship with short run money demand in Thailand. The short run money demand function in Singapore was determined by income, exchange and price level. In Malaysia, the factors that effect on money demand in the short run including income, domestic interest rate, and foreign interest rate. The short run money demands in Philippine was influenced by only income. The short run money demand in Indonesia was determined by the exchange rate.

## Conclusions

Although the issue of money demand is very important for conducting monetary policy, there have been relatively few empirical studies of a stability of money demand in ASEAN countries. In addition, most of the studies have emphasized the relationship between money aggregates and a range of economic indicators, and placed less concern on the stability of the money demand. Therefore, this research analyzed the stability of money demand in the ASEAN 5 countries, including Thailand, Singapore, Malaysia, Philippines, and Indonesia. The research conducted by testing the relationship between money demand and its determinant by using co integration, error correction techniques

The result of the first stage in this research is the test of the stationary of each variable by applying the unit root procedure. The results of the ADF and clearly showed that all variables that were used in the research were integrated of order one (I (1)) and eligible for testing in the next step.

The second stag was the testing of the long run money demand relationship by using co-integration. In this stage, M2 money demand was adopted as a proxy of money demand in the ASEAN5 countries. The results of co-integration suggest that exists co-integrate vector in the money demand function in all countries in the ASEAN-5. The results of long run money demand function indicate that income elasticity has significant relationship with money demand function in Thailand, Singapore, and Indonesia, while it is not effect on long run money demand in Malaysia and Philippines. The exchange has effect in money demand in only Indonesia, but not significant effect on the long run money demand in other countries. Price level has long run relationship with money demand in every country in ASEAN-5 except Thailand. In addition, change in domestic interest rate has significant related with the long run money demand function in Singapore and Indonesia. However, the foreign interest rate has significant related with the long run money demand in Thailand, Malaysia, and Indonesia. In short-run, exchange rate is one of the import factors affecting money demand in Thailand, Singapore, and Indonesia but not for Philippine and Malaysia.

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## Why Do the Minimum Capital Adequacy Ratios Vary across Europe?

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### Abstract:

*In the paper we seek an explanation of disparities in the required minimum levels of the capital adequacy ratio. Attention is given to 40 European countries mainly in the pre-crisis period. Cluster analysis results justify a need for a discretionary approach of the national prudential authorities when adopting the supranational prudential recommendations, to be more precise, Basel Committee conclusions. In such a manner, lower regulatory burden, i.e. lower minimum level of capital adequacy ratio in this case, is and should remain a privilege of the more transparent, ethical and accountable economic systems with better country credit rating, higher GDP per capita and lower inflation rate. Despite insignificance of the banking sector variables in the cluster analysis, when linear regression method is adopted, variables such as bank concentration indicator and asset quality have the highest explanatory power. A conclusion can be made that the set-up of the minimum capital adequacy ratio should be carefully planned due to threats of loss in the economic output if the banking sector is over-regulated or on the other hand increased financial instability in case of being under-regulated.<sup>23</sup>*

**Keywords:** banking regulation, capital requirements, commercial banks, cluster analysis, linear regression, and European countries.

**JEL Classification:** G21, G28, P51, O52, C38.

### 1. Introduction

Capital requirements regulation is one of the finest examples of the convergence in the regulation of the banking industry. What usually starts as Basel Committee i.e. supranational prudential institution's recommendations, soon after appears on the "to do list" of the national prudential authorities. However, criticism of the capital adequacy standard is widely present since their introduction in the late 1980s (Basel I) and despite their afterwards modification (Basel II and Basel III). The standard has changed the way in which banks measure and manage their risks, causing limitations in the credit growth as well as financial leverage usage. Thus, banking lobbies have regularly been opponents whenever capital requirements were on the agenda, while academicians investigated the potential side-effects and counter-effectiveness from the capital regulation implementation assuming that the "regulatory struggle" phenomenon<sup>24</sup> will eventually occur.

Namely, regulatory costs are usually sizeable what banks endeavour to avoid by performing so called "cosmetic" rather than true compliance with the regulatory rules or they even try to invent financial products and practices which are not regulated yet. The regulatory burden of implementing capital requirements is rather diverse with respect to the bank size, the banking sector characteristics and country in which banks operate. Some authors pinpoint country's characteristics as the factors of utmost importance for the capital adequacy standards implementation. For instance, Caprio and Honohan (1999) assume macroeconomic volatility, persistency in regulatory regimes, independence of prudential authorities from political pressures and overall institutional environment to be key determinants of certain regulatory strategy outcome. Moreover, Delis *et al.* (2009) conclude that capital regulation should be adapted to country specificities, while Morrison and White (2005) confirm that the size of capital requirements should be in inverse relationship with regulator's reputation which is approximated with the income level of certain country and various indices for the country's "rule of law" development level. Similarly, Ribakova (2005) shows that there is a trade-off between supervisors' quality and minimum capital adequacy ratios,

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<sup>24</sup> For more detailed explanation of the "regulatory struggle" phenomenon see e.g. Kane (1977).

while Buck and Schliephake (2013) prove that only when both, supervision and minimum capital requirements instruments are implemented the costs of preventing the collapse of financial intermediation will be minimized. On the other hand, some authors uphold the view that disparities in the regulatory burden *i.e.* the minimum capital adequacy ratios and other regulatory instruments will alter the problem of cross-border regulatory arbitrage (Acharya 2003, Moshirian 2011, Marinč *et al.* 2014) and thus point out a necessity of increasing harmonization in regulatory instruments between countries, especially in the European union (Marinč *et al.* 2014) which promotes the idea of financial and economic integration, levelling the playing field and recently affirmed the project of creating the banking union.

Although it is clear that financial and economic integration enable faster transmission of the crisis events (see *e.g.* Nasreen and Anwar 2015) it is still questionable whether global regulation can be effective mechanism for preventing future financial crisis. Whatever the case might be, two contrast views regarding desirability of differences in the capital regulation among different countries inspired our research which aims to detect factors that justify disparities in the minimum capital adequacy ratios using a sample of 40 European countries.

The remainder of the paper is organized as follows. The next section reviews the survey of literature. The third section discusses the empirical strategy and research findings, while the last section concludes the paper.

## 2. Determinants of the minimum capital adequacy ratio: empirical background

The most of empirical researches on the determinants of regulatory capital ratio are conducted on the bank-level data and thus focus on the bank-specific characteristics and their effect on the capital adequacy indicator or some other approximation of the bank capitalization level. Besides microeconomic variables some of the proposed models also employ country's characteristics and other uncontrollable aspects such as public policies and regulatory framework (*e.g.* Brewer III *et al.* 2008, Gropp and Heider 2009). Since Basel III and the idea on the countercyclical capital buffers were launched, empirical researches on the cyclicity of bank capital buffers and its relation to macroeconomic circumstances are more frequent. Usually it is proven that bank decrease their capital surpluses in case of economic expansion and favourable macroeconomic performance (*e.g.* Jokipii and Milne 2008), and thus the same analogy could be expected on the sector-level data for the minimum levels of capital adequacy ratio.

On the other hand, in case of higher uncertainty banks hold higher capital (Valencia 2010) which brings them better performance (Demirgüç-Kunt *et al.* 2010). However, until nowadays less attention in the empirical work has been given to the reasons why some countries have lower and other countries higher regulatory requirements considering minimum capital adequacy ratio. For instance, Le Leslé and Avramova (2012) discussed causes of differences in the risk-weighted assets calculations across countries, while Posner (2014) criticised the praxis of bank regulators who regularly set up minimum capital adequacy requirements without performing serious economic analysis about the chosen minimum levels. Marinč *et al.* (2014) confirmed that complexity and stringency of capital regulation varies across the world, regardless of sharing the common legal and regulatory framework or even being members of the political and economic associations, likewise EU. We are not aware that the aforementioned authors explained what contributed to these disparities in capital regulation, although they (Marinč *et al.* 2014: 425) pointed out that "macroeconomic and institutional development together with the characteristics of the banking system may shape the bank regulatory landscape". This research aims to fulfil the literature gap about this issue. The work of several authors that additionally inspired our paper hereafter follows.

By examining the differences in the non-performing loans between 59 countries over the period 2002-2006, Boudriga *et al.* (2009) found out that regulatory instruments have secondary importance in the bank asset quality improvement, while institutional development of country *e.g.* strong legal system, developed transparency and democracy are of vital relevance in this matter. With focus on bank-level data in 15 Eastern European countries in transition and pre-crisis period, Fang *et al.* (2014) proved that reforming the institutional environment adds to banking stability *i.e.* increases the asset quality and lowers volatility of bank profitability. This implies that institutional factors also influence the effectiveness of regulation and supervision. Regarding the capital level, Fonseca and González (2010) based on the data of about 1,300 banks in 70 countries between 1992-2002 conclude that institutional quality has negative effect on capital buffers, while more stringent accounting disclosure requirements and less generous deposit insurance will have positive impact on the bank capital buffers. Similarly, on the bank-level data for almost 400 banks in about 70 developing and emerging countries for the 2002-2008 period Klomp and de Haan (2014) evidenced that the country's level of economic development and institutional quality (which is composed of six governance indicators – voice and accountability, political instability and violence, government effectiveness, regulatory quality, rule of law, and control of corruption) impact the overall effectiveness of regulatory measures which was stronger in case of emerging markets than developing economies.

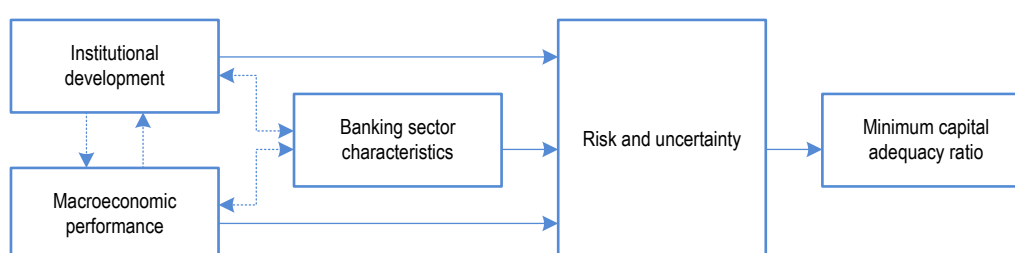


Altogether, an assumption can be made that having more restrictive regulation is a side-effect of weak institutions, poor transparency and potentially widely present corruption problem in one country. In a more general sense, Abu and Karim (2015) point out the relevance of political stability as it fosters economic development and lowers corruption. Therefore, in order to prevent imprudent behaviour by banks and downsize the costs of their failures, more regulatory stringency considering financial leverage usage could be necessary in case of immature democracies and weak capacities of their institutions as “banks in different countries face different gambling opportunities” (Hellmann *et al.* 2000). Clearly, practical implication of such empirical researches is that national policymakers should retain certain flexibility in the capital requirements set up in order to adapt them to country-specific circumstances and obtain the best cost-benefit results from their usage.

To sum up, a survey of literature indicates that the research problem is both, relevant and actual while empirical evidence on the determinants of the minimum capital adequacy ratio is welcomed. Altogether, a research hypothesis  $H_1$  is set up:

$H_1$ : Macroeconomic performance and institutional development level of country as well as its banking sector specificities explain disparities in the minimum capital adequacy ratios between countries.

Linkages between variables are transparent from the Figure 1.



Source: Authors' presentation.

Figure 1 - Interplays between explanatory variables and their relationship with the minimum capital adequacy ratio.

### 3. Empirical strategy and research findings

The empirical examination of disparities in the required minimum levels of the capital adequacy ratio and its determinants is carried out on the country-level data for the following 40 European economies in the year 2010: Albania, Austria, Belgium, Bosnia and Herzegovina, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Former Yugoslav Republic of Macedonia, Malta, Moldova, Montenegro, Netherlands, Norway, Poland, Portugal, Romania, Russian Federation, Serbia, Slovak Republic, Slovenia, Spain, Sweden, Switzerland, Turkey, Ukraine, and United Kingdom. The year 2010 was selected as the most suitable year for the analysis regarding the latest data availability for the largest number of countries.

The minimum level of the capital adequacy ratio (MIN\_CA) is set out as dependent variable. The aforementioned indicator for the listed countries was taken from the official websites of their central banks whenever this information was transparent. In the opposite case, we took that data from the previously published papers about this research problem, to be more precise Fonseca and González (2010) and Kundid Novokmet (2015: 163). Although, this might be seen as the second best solution, e-transparency of central banks varies across Europe as well as responsiveness of their employees to the e-mails that we send in order to obtain this information. Due to our assumption that country's development level (i.e. its macroeconomic and institutional development) as well as banking sector characteristics might explain differences in the capital requirements regulation, the data related to potential explanatory variables were taken from the World Bank's Global Financial Development database (GFDD) for the year 2010, and from the Global Competitiveness Report (2010-2011) for the years 2009-2010. The following indicators (and their explanations) were taken from the GFDD database:

- Concentration - bank concentration i.e. assets of three largest commercial banks as a share of total commercial banking assets (%);
- NIM - bank net interest margin (%);
- NPL\_L – bank nonperforming loans to gross loans (%);
- ROA - bank return on assets (% , after tax);
- Z-SCORE - bank Z-score;

- Banking crisis - banking crisis dummy (1=banking crisis, 0=none)<sup>25</sup>;
- INFL - consumer price index (2005=100, December) and
- GDPperC - GDP per capita (Constant 2005 USD).

The Global Competitiveness Report served mainly to obtain the data on the countries' institutional development. The following indicators were assumed to be relevant for this analysis:

- Property – protection of property rights, including financial assets in country (in scale from 1-7 where 1=very weak; 7=very strong),
- Burden\_regulation – burden to comply with governmental administrative requirements (e.g. permits, regulations, reporting) for businesses in country (in scale from 1-7 where 1=extremely burdensome; 7=not burdensome at all),
- Transparency - transparency of government policymaking (in scale from 1-7 where 1=impossible to obtain information; 7=extremely easy to obtain information),
- Ethics – ethical behavior of firms in interactions with public officials, politicians, and other enterprises, in comparison with those of other countries in the world (in scale from 1-7 where 1=among the worst in the world; 7=among the best in the world),
- Reporting – strength of auditing and reporting standards regarding company financial performance (in scale from 1-7 where 1=extremely weak; 7=extremely strong),
- Country\_CR – country credit rating i.e. expert assessment of the probability of sovereign debt default on a 0-100 (lowest probability) scale,
- BankSoundness – soundness of banks in country (in scale from 1-7 where 1=insolvent and may require a government bailout; 7=generally healthy with sound balance sheets) *and*
- FM\_develop - financial market development (in scale from 1-7 where 1=poorly developed; 7=highly developed).

In order to detect variables which might explain disparities in the capital regulation i.e. MIN\_CA among European countries and to somewhat reduce the list made of 16 potential explanatory variables we firstly conducted One-Way Analysis of Variance (ANOVA)<sup>26</sup>. Table 1 contains results of the test of homogeneity of variances, while ANOVA results are transparent from Table 3. Nevertheless, non-parametric solution, to be more precise Kruskal-Wallis test had to be adopted for variables for which Levene's test of homogeneity of variances was  $\alpha \leq 5\%$  i.e. the condition of homogeneity of variances was not fulfilled. Therefore, Kruskal-Wallis test statistics is encompassed with Table 2.

Table 1 – Test of homogeneity of variances

	Levene Statistic	df1	df2	Sig.
Concentration	2,286	2	37	0,116
NIM	7,218	2	37	0,002
NPL_L	2,865	2	36	0,070
ROA	3,026	2	37	0,061
Z-SCORE	1,541	2	37	0,228
Banking crisis	10,341	2	37	0,000
INFL	2,701	2	37	0,080
GDPperC	9,347	2	37	0,001
Property	4,860	2	37	0,013
Burden_regulation	0,306	2	37	0,738
Transparency	0,877	2	37	0,425
Ethics	9,157	2	37	0,001

<sup>25</sup> With respect to that, banking crisis is defined as systemic if two conditions are met: 1) significant signs of financial distress in the banking system (as indicated by significant bank runs, losses in the banking system, and/or bank liquidations), 2) significant banking policy intervention measures in response to significant losses in the banking system. The first year that both criteria are met is considered as the year when the crisis start becoming systemic. The end of a crisis is defined the year before both real GDP growth and real credit growth are positive for at least two consecutive years.

<sup>26</sup> All calculations and figures were made in statistical package SPSS Statistics 23.

	Levene Statistic	df1	df2	Sig.
Reporting	1,260	2	37	0,295
Country_CR	1,202	2	37	0,312
BankSoundness	4,229	2	37	0,022
FM_develop	3,026	2	37	0,061

Source: Authors' calculation.

Table 2 – Kruskal-Wallis Test Statistics

	NIM	Banking crisis	GDP per C	Property	Ethics	Bank Soundness
Chi-Square	10,737	11,381	16,406	15,735	10,570	3,821
df	2	2	2	2	2	2
Asymp. Sig.	0,005	0,003	0,000	0,000	0,005	0,148

a. Kruskal Wallis Test, b. Grouping Variable: MIN\_CA

Source: Authors' calculation.

Preliminary analysis shows that ROA, Z-SCORE, Burden\_regulation and BankSoundness might not be helpful in explaining varieties in the dependent variable due to insignificant differences in their mean values among samples. However, according to ANOVA and Kruskal-Wallis test results 12 explanatory variables could be perceived as determinants of MIN\_CA. In order to detect their impact on the dependent variable cluster analysis is performed. A cluster analysis is used in order to group countries i.e. their minimum capital adequacy ratios based on the characteristics they possess, for instance banking sector and contextual specificities. To be more precise, the K-means clustering technique is employed in order to assign each country to a cluster. However, clustering based on 12 variables when sample size is relatively small (39-40 countries) might be a problem. Namely, number of observations should be at least  $2^m$ , where "m" is the number of clustering variables. (Mooi and Sarstedt 2011)

Therefore, only 5 clustering variables could be used at once in order to make sure that the relationship between objects and clustering variables is reasonable. Furthermore, there should be low level of collinearity among the variables and according to Mooi and Sarstedt (2011) this means that correlation coefficients are lower than 0.9. With regards to that, both Pearson and Spearman correlation analyses were performed<sup>27</sup> with the highest correlation coefficients found between "Property" variable and other institutional development variables ("Transparency", "Ethics", and "Reporting"). This is why we eliminated "Property" variable from our further analysis.

Table 3 – ANOVA

		Sum of Squares	df	Mean Square	F	Sig.
Concentration	between Groups	3,850,990	2	1,925,495	3,539	0,039
	within Groups	20,129,298	37	544,035		
	TOTAL	23,980,288	39			
NPL_L	between Groups	326,618	2	163,309	6,995	<b>0,003</b>
	within Groups	840,505	36	23,347		
	TOTAL	1,167,122	38			
ROA	Between Groups	0,913	2	0,456	0,320	0,728
	Within Groups	52,720	37	1,425		
	TOTAL	53,633	39			
Z-SCORE	between Groups	316,299	2	158,149	0,886	0,421
	within Groups	6,603,760	37	178,480		
	TOTAL	6,920,059	39			
INFL	Between Groups	10,613	2	5,307	6,227	0,005
	within Groups	31,532	37	0,852		
	TOTAL	42,146	39			

<sup>27</sup> Correlation matrices are available upon request.

		Sum of Squares	df	Mean Square	F	Sig.
Burden_regulation	between Groups	1,082	2	0,541	1,302	0,284
	within Groups	15,382	37	0,416		
	TOTAL	16,464	39			
Transparency	between Groups	4,356	2	2,178	4,148	<b>0,024</b>
	within Groups	19,428	37	0,525		
	TOTAL	23,784	39			
Reporting	between Groups	7,422	2	3,711	9,393	<b>0,001</b>
	within Groups	14,618	37	0,395		
	TOTAL	22,040	39			
Country_CR	between Groups	7,115,726	2	3,557,863	14,047	<b>0,000</b>
	within Groups	9,371,285	37	253,278		
	TOTAL	16,487,011	39			
FM_develop	between Groups	3,680	2	1,840	6,282	<b>0,004</b>
	within Groups	10,839	37	0,293		
	TOTAL	14,519	39			

Source: Authors' calculation.

Taking into consideration guideline on the maximum number of clustering variables with respect to the sample size and aiming to perform meaningful analyses, we finally decided to conduct separate cluster analyses for each group of clustering variables:

- banking sector variables (Concentration, NIM, NPL\_L, Banking crisis and FM\_develop),
- macroeconomic variables (INFL, GDPperC and Country\_CR) and
- country's institutional development variables (Transparency, Ethics and Reporting).

Tables 4 and 5 contain results when banking sector indicators are used as clustering variables. Only concentration variable possesses statistical significance (sig.=0,000) despite obvious differences in cluster centers for other variables. The mean value of the MIN\_CA in the first cluster is 9.11, while in the second cluster is 8.67. Furthermore, t-test confirms that difference in the aforementioned mean values among clusters is insignificant. Altogether, a conclusion can be made that the banking sector variables are irrelevant for explaining disparities in the minimum capital adequacy ratios of European economies. This is not surprising if exogenous character of prudential regulation in relation to banking sector is borne on mind.

Table 4 – Final cluster centers for banking sector clustering variables

	CLUSTER 1	CLUSTER 2
Concentration	45,780538720	88,316264200
NIM	2,851368500	3,907551748
NPL_L	6,094611086	9,330285668
Banking crisis	0,7	0,4
FM_develop	4,4	4,3

Source: Authors' calculation

Note: Cluster 1 (18 countries): Albania, Austria, Belgium, Bosnia and Herzegovina, Croatia, Czech Republic, Denmark, France, Germany, Italy, Luxembourg, Poland, Portugal, Russian Federation, Serbia, Sweden, Switzerland, United Kingdom. Cluster 2 (21 countries): Bulgaria, Cyprus, Estonia, Finland, Greece, Hungary, Iceland, Ireland, Latvia, Lithuania, FYR Macedonia, Malta, Moldova, Netherlands, Norway, Romania, Slovak Republic, Slovenia, Spain, Turkey, Ukraine.

Table 5 – ANOVA for banking sector clustering variables

	CLUSTER		ERROR		F	SIG.
	Mean Square	df	Mean Square	df		
Concentration	17,536,175	1	167,426	37	104,740	0,000
NIM	10,812	1	6,848	37	1,579	0,217
NPL_L	101,474	1	28,801	37	3,523	0,068
Banking crisis	0,549	1	0,247	37	2,224	0,144
FM_develop	0,249	1	0,382	37	0,652	0,425

Source: Authors' calculation

Contrary to banking sector variables, macroeconomic variables have higher explanatory power in k-means clustering. According to Table 7 all macroeconomic variables possess statistical significance. Thus, countries with lower inflation, higher GDP per capita and higher country credit rating have lower MIN\_CA (Table 6) as the mean value of the MIN\_CA in the first cluster is 9,44, while in the second cluster is 8,00. Table 8 confirms that this difference is also statistically significant.

Table 6 – Final cluster centers for macroeconomic clustering variables

	CLUSTER 1	CLUSTER 2
INFL	101,8909149	101,0261286
GDPperC	10397,00834	46898,78831
Country_CR	57,4	86,1

Source: Authors' calculation.

Note: Cluster 1 (25 countries): Albania, Bosnia and Herzegovina, Bulgaria, Croatia, Cyprus, Czech Republic, Estonia, Greece, Hungary, Latvia, Lithuania, FYR Macedonia, Malta, Moldova, Montenegro, Poland, Portugal, Romania, Russian Federation, Serbia, Slovak Republic, Slovenia, Spain, Turkey, Ukraine. Cluster 2 (15 countries): Austria, Belgium, Denmark, Finland, France, Germany, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Sweden, Switzerland, and United Kingdom.

Table 7 – ANOVA for Macroeconomic Clustering Variables

	CLUSTER		ERROR		F	SIG.
	Mean Square	df	Mean Square	df		
INFL	7,011	1	0,925	38	7,583	0,009
GDPperC	1,249E+10	1	97716012,35	38	127,830	0,000
Country_CR	7702,733	1	231,165	38	33,321	0,000

Source: Authors' calculation.

Table 8 – Independent samples test when macroeconomic variables define clusters

MIN_CA	Levene's Test for Equality of Variances		t-test for Equality of Means					95% Confidence Interval of the Difference	
	F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Equal variances assumed	83,243	0,000	3,114	38,000	0,003	1,440	0,462	0,504	2,376
Equal variances not assumed			4,042	24,000	0,000	1,440	0,356	0,705	2,175

Source: Authors' calculation.

All institutional development variables are also statistically significant (Table 10). Based on the Table 9, a conclusion can be made that countries with higher transparency of government policymaking, more ethical behavior of firms and higher strength of auditing and reporting standards regarding company financial performance have lower MIN\_CA as the mean value of MIN\_CA in the first cluster is 9.55, while in the second cluster it is 8.11. Table 11 reveals this difference being statistically significant.



Table 9 – Final cluster centers for institutional development clustering variables

	CLUSTER 1	CUSTER 2
Transparency	4,0	5,3
Ethics	3,7	5,8
Reporting	4,5	5,6

Source: Authors' calculation.

Note: Cluster 1 (22 countries): Albania, Bosnia and Herzegovina, Bulgaria, Croatia, Czech Republic, Greece, Hungary, Italy, Latvia, Lithuania, FYR Macedonia, Moldova, Montenegro, Poland, Portugal, Romania, Russian Federation, Serbia, Slovak Republic, Spain, Turkey, Ukraine. Cluster 2 (18 countries): Austria, Belgium, Cyprus, Denmark, Estonia, Finland, France, Germany, Iceland, Ireland, Luxembourg, Malta, Netherlands, Norway, Slovenia, Sweden, Switzerland, United Kingdom.

Table 10 – ANOVA for Institutional development clustering variables

	CLUSTER		ERROR		F	SIG.
	Mean Square	df	Mean Square	df		
Transparency	15,133	1	0,228	38	66,474	0,000
Ethics	45,377	1	0,371	38	122,351	0,000
Reporting	12,671	1	0,247	38	51,390	0,000

Source: Authors' calculation.

Table 11 – Independent samples test when institutional development variables define clusters

MIN_CA	Levene's Test for Equality of Variances		t-test for Equality of Means					95% Confidence Interval of the Difference	
	F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Equal variances assumed	68,844	0,000	3,207	38,000	0,003	1,434	0,447	0,529	2,340
Equal variances not assumed			3,510	24,295	0,002	1,434	0,409	0,591	2,277

Source: Authors' calculation.

Small sample size limited us in performing the cluster analysis by using all clustering variables at once. Besides segmentation of variables in three groups another solution can be applied. In order to see explanatory power of all variables in one model, a linear regression analysis was perceived as an appropriate technique, especially the stepwise method, as it eliminates insignificant variables and defines the final model with variables which possess the highest explanatory power of the dependent variable. Small number of observations and the problem of multicollinearity among the independent variables were obstacles to use some advanced multivariate statistical methods, for instance discriminant analysis.

All potential explanatory variables (12 variables) were set out as independent variables in the linear regression. After using the stepwise method only 5 variables were identified as predictors of the MIN\_CA (appendix, Table 1). Although all models were statistically significant (appendix, Table 2), variance inflation factor (VIF) was higher than 5 for "Property" and "Ethics" variable (appendix, Table 3). That means that there is a problem of multicollinearity for those variables. Therefore, they were excluded from the model and the linear regression was repeated without them (Tables 12 and 13). At last, three banking sector variables are related to the minimum capital adequacy ratio: NPL\_L, "Banking crisis" and "Concentration". NPL\_L increases MIN\_CA, while "Banking crisis" and "Concentration" decrease it (Table 14).

Only the NPL\_L coefficient sign is expected as banking sectors with lower asset quality are perceived as less stable and thus prudential authorities are more restrictive towards banks' financial leverage increase. However, some developed countries have considerable bank concentration levels, and at the same time the lowest MIN\_CA what might explain the obtained result for concentration variable. In addition, after financial crisis 2007/2008 in the USA, the crisis in Europe firstly hit the most developed banking sectors, while banking sectors of transitional economies much later faced the turmoil. At last, capital requirements are ex ante measure in maintaining the banking sector stability. Thus, higher concentration and crisis occurrence could mean that other crisis management

tools such as the lender of last resort for too-big-to-fail banks or other prudential instruments have been employed and act as ex post measures for crisis events which capital requirements have not prevented.

Table 12 – Model summary after exclusion of variables

MODEL	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	0,489 <sup>a</sup>	0,239	0,218	1,393	
2	0,619 <sup>b</sup>	0,384	0,349	1,271	
3	0,777 <sup>c</sup>	0,603	0,569	1,034	1,491

Source: Authors' calculation.

Note: a. Predictors: (Constant), NPL\_L; b. Predictors: (Constant), NPL\_L, Banking crisis; c. Predictors: (Constant), NPL\_L, Banking crisis, Concentration; Dependent Variable: MIN\_CA

Table 13 – ANOVA after exclusion of variables

MODEL		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	22,554	1	22,554	11,622	0,002 <sup>a</sup>
	Residual	71,805	37	1,941		
	TOTAL	94,359	38			
2	Regression	36,202	2	18,101	11,205	0,000 <sup>b</sup>
	Residual	58,157	36	1,615		
	TOTAL	94,359	38			
3	Regression	56,943	3	18,981	17,755	0,000 <sup>c</sup>
	Residual	37,416	35	1,069		
	TOTAL	94,359	38			

Source: Authors' calculation.

Note: a. Predictors: (Constant), NPL\_L; b. Predictors: (Constant), NPL\_L, Banking crisis; c. Predictors: (Constant), NPL\_L, Banking crisis, Concentration; Dependent Variable: MIN\_CA

Table 14 – Coefficients after Exclusion of Variables

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	7,782	0,390		19,969	0,000		
	NPL_L	0,139	0,041	0,489	3,409	0,002	1,000	1,000
2	(Constant)	8,614	0,456		18,872	0,000		
	NPL_L	0,116	0,038	0,409	3,055	0,004	0,957	1,045
	Banking crisis	-1,213	0,417	-0,389	-2,907	0,006	0,957	1,045
3	(Constant)	10,763	0,613		17,556	0,000		
	NPL_L	0,138	0,031	0,486	4,410	0,000	0,933	1,072
	Banking crisis	-1,565	0,349	-0,502	-4,489	0,000	0,907	1,103
	Concentration	-0,031	0,007	-0,492	-4,405	0,000	0,908	1,102

Note: Dependent Variable: MIN\_CA

Source: Authors' calculation.

Taking into consideration that regression model is statistically significant (Tables 12, 13 and 14) it can be expressed by the following equation:

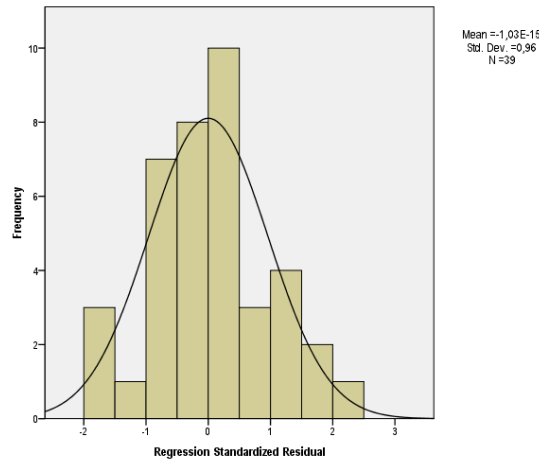
$$Y=10,763+0,138X_1-1,565X_2-0,031X_3 \tag{1}$$

where Y is the MIN\_CA, X<sub>1</sub> is NPL\_L, X<sub>2</sub> is dummy variable for banking crisis and X<sub>3</sub> is bank concentration.

The mentioned model shows that if NPL\_L increases by 1%, minimum capital adequacy ratio will be increased for 0,138 ceteris paribus and if "Banking crisis" occurs and "Concentration" increases by 1%, the

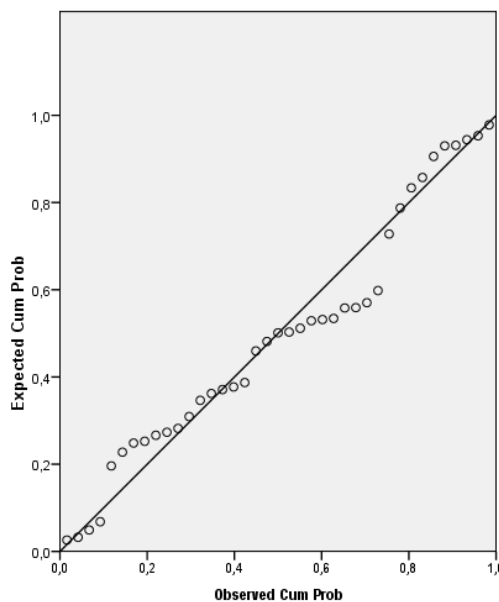
minimum capital adequacy ratio in the country will be decreased by 1,565 and 0,031, respectively. Correlation coefficient reaches value 0,777 and R Square records 60, 3%, which indicates fair model representativeness. To detect the presence of autocorrelation in the residuals from a regression analysis, the Durbin-Watson statistics was used. It was found that d-value is 1,491 (Table 12) and thus there are no indications of autocorrelation since for sig. =1%,  $d_u(1,452) < DW(1,491) < (4-d_u)$ . In order to detect are residuals normally distributed, a histogram of regression standardized residuals is shown with Figure 2.

According to Figure 2, residuals are normally distributed, with mean value which equals 0, and standard deviation which is close to 1. The same conclusion can be made from Figure 3 which contains normal probability plot of regression standardized residuals. At last, heteroscedasticity of residual variance is tested using Spearman correlation. Correlation coefficients between NPL\_L and absolute residuals as well as between “Banking crisis” variable and absolute residuals are statistically significant (at 5% level), but correlation coefficients are rather small (lower than +/- 0.4).



Source: Authors' calculation.

Figure 2 – Histogram of regression standardized residuals



Source: Authors' calculation.

Figure 3 – Normal probability plot of regression standardized residuals

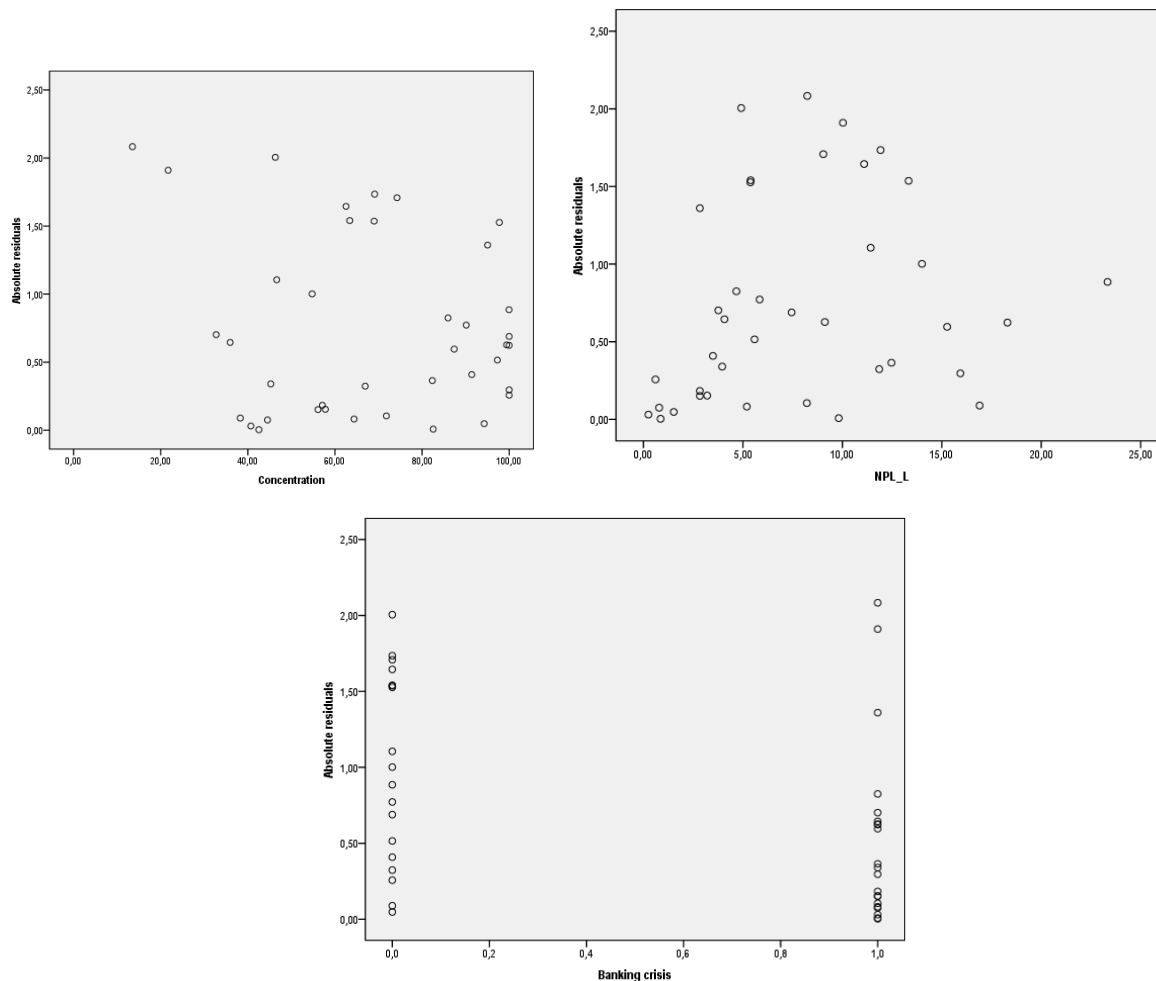
Therefore, scatter diagrams for independents variables are shown (Figures 4, 5 and 6) and heteroscedasticity of residual variance seems not to be a sizeable issue.

Table 15 – Correlation between absolute residuals and independent variables

Spearman's rho		Concentration	NPL_L	Banking crisis	Absolute residuals
Concentration	Correlation Coefficient	1,000	0,204	-0,267	-0,023
	Sig. (2-tailed)	.	0,212	0,096	0,891
	N	40	39	40	39
NPL_L	Correlation Coefficient	0,204	1,000	-0,238	0,369*
	Sig. (2-tailed)	0,212	.	0,145	0,021
	N	39	39	39	39
Banking crisis	Correlation Coefficient	-0,267	-0,238	1,000	-0,379*
	Sig. (2-tailed)	0,096	0,145	.	0,017
	N	40	39	40	39
Absolute residuals	Correlation Coefficient	-0,023	0,369*	-0,379*	1,000
	Sig. (2-tailed)	0,891	0,021	0,017	.
	N	39	39	39	39

Source: Authors' calculation.

Note: \*. Correlation is significant at the 0.05 level (2-tailed).



Source: Authors' calculation.

Figures 4, 5 and 6 – Scatter diagrams of absolute residuals and independent variables

## Conclusion

Inequalities in regulatory costs from the capital requirements implementation in the world of banking without borders might amplify the problem of cross-border regulatory arbitrage. Thus, harmonizing the content of various regulatory measures became prominent goal on the agenda of supranational policymakers, especially after the recent financial crisis and troubles that global banking i.e. providing banking services on a global scale caused to national prudential authorities as well as to the lenders of last resort. Standardization of rules is of particular relevance for the EU which since recently promotes the establishment of banking union as one of catalysts for fulfilling what the EU “project” stands for - the international financial and economic integration. However, some differences in the prudential instruments will always exist as discretionary policies remain an option for at least non-EU and non-Eurozone countries in periods of financial stability as well as a part of crisis management for all countries in extraordinary times.

With respect to the emerging debate on the two opposing views about regulation i.e. harmonization of rules vs. more discretionary approach in setting rules, in this research we focused on the minimum capital adequacy ratios in Europe and investigated the factors which might explain differences between them. To be more precise, we hypothesized that the country’s development level i.e. its macroeconomic and institutional development as well as its banking sector characteristics impact the regulatory requirements about the minimum capital adequacy ratio. The secondary data collected for a sample of 40 European countries were tested by using the univariate and multivariate statistics. ANOVA and Kruskal-Wallis test were helpful in order to detect variables which might have explanatory power in the K-means cluster analysis. Due to relatively small sample size and rather large number of potential explanatory variables cluster analysis was conducted separately for banking sector variables, macroeconomic variables and institutional development variables. It was found that countries with more stable macroeconomic environment i.e. lower inflation, higher GDP per capita and lower probability of sovereign debt default have lower regulatory requirements considering bank capital adequacy ratio. In addition, countries with higher transparency of policymaking, more ethical behaviour of firms and better corporate reporting practices also have lower capital requirements. Altogether, a conclusion can be made that countries with better macroeconomic performance and more developed institutions have lower systemic risk and therefore decrease their regulatory burden. On the other hand, banks which are doing business in countries with the opposite characteristics are perceived as more fragile and are requested to have higher capital adequacy which serves to limit their excessive risk-taking and to decrease social costs in case of their instability. Another explanation is that prudential authorities in more developed economies have better know-how to perform banking supervision, and thus their quality in supervising becomes a substitute for the quantity of minimally required capital adequacy. Differences in the clusters when banking sector variables were set out as clustering variables were not statistically significant, although concentration indicator had some significance in ANOVA results for clusters.

Besides partial cluster analysis for each group of variables a stepwise linear regression analysis was performed in order to obtain results from an integrated analysis i.e. analysis which took into consideration all independent variables at once. According to the latter approach, banking sector variables, to be more precise, concentration indicator, bad debt indicator and dummy variable for banking crisis shaped the final regression model. Thus, non-performing loans add to minimum capital adequacy ratio, while bank concentration and occurrence of banking crisis have negative impact on the aforementioned ratio. While the regulator’s response to lower asset quality is expected, it seems that higher concentration of the banking sector works the same way as the bank size in the researches with the bank-level data. Namely, large banks usually have lower capital adequacy in comparison to small-sized banks due to their better market position in raising capital, more developed risk management practices, possibilities of providing services to prime customers and finally the too-big-to-fail phenomenon. In the same way, more concentrated banking sectors imply lower refinancing and asset risks and more tolerant prudential authorities. Alternative explanation could be that some developed countries have sizeable concentration ratios, and thus a negative effect of concentration to capital adequacy occurs. Finally, the most of countries that were among the first hit by the banking crisis were the most developed European countries and thus negative impact of the crisis on the capital adequacy is somewhat less unusual. In addition, capital adequacy is more crisis prevention or ex ante prudential instrument, which could be perceived as ex post instrument when there are bank failures and necessity to decrease costs from their occurrence.

It is evident how adoption of the two statistical techniques led us to different explanations regarding the drivers of the minimum level of capital adequacy ratios in European countries. Despite that, the main caveat of the research remains the same in both cases and can be summarized in the following way: there is an empirical



justification for the praxis of designing the regulatory policies by taking into consideration country's characteristics whereas less stringent regulation can be an option only for more developed countries. Altogether, uniform prudential regulation might still not be a desirable solution despite threats of unequal regulatory burden and cross-border regulatory arbitrage. Nevertheless, we strongly encourage further studies in this field in order to obtain more convincing results regarding our conclusions and/or proposals for methodological improvement.

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## APPENDIX

Table 1 – Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	0,656 <sup>a</sup>	0,430	0,414	1,206	
2	0,706 <sup>b</sup>	0,498	0,470	1,147	
3	0,748 <sup>c</sup>	0,560	0,522	1,089	
4	0,783 <sup>d</sup>	0,613	0,568	1,036	
5	0,818 <sup>e</sup>	0,668	0,618	0,974	1,618

Source: Authors' calculation.

a. Predictors: (Constant), Property

b. Predictors: (Constant), Property, Ethics

c. Predictors: (Constant), Property, Ethics, Banking crisis

d. Predictors: (Constant), Property, Ethics, Banking crisis, Concentration

e. Predictors: (Constant), Property, Ethics, Banking crisis, Concentration, NPL\_L

Dependent Variable: MIN\_CA

Table 2 – ANOVA

Model	Sum of Squares	df	Mean Square	F	Sig.	
1	Regression	40,562	1	40,562	27,897	0,000 <sup>a</sup>
	Residual	53,797	37	1,454		
	TOTAL	94,359	38			
2	Regression	46,971	2	23,486	17,842	0,000 <sup>b</sup>
	Residual	47,388	36	1,316		
	TOTAL	94,359	38			
3	Regression	52,830	3	17,610	14,841	0,000 <sup>c</sup>
	Residual	41,529	35	1,187		
	TOTAL	94,359	38			
4	Regression	57,860	4	14,465	13,475	0,000 <sup>d</sup>
	Residual	36,499	34	1,073		
	TOTAL	94,359	38			
5	Regression	63,072	5	12,614	13,305	0,000 <sup>e</sup>
	Residual	31,287	33	0,948		
	TOTAL	94,359	38			

Source: Authors' calculation.

a. Predictors: (Constant), Property

b. Predictors: (Constant), Property, Ethics

c. Predictors: (Constant), Property, Ethics, Banking crisis

d. Predictors: (Constant), Property, Ethics, Banking crisis, Concentration

e. Predictors: (Constant), Property, Ethics, Banking crisis, Concentration, NPL\_L

Dependent Variable: MIN\_CA

Table 3 – Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	13,222	0,846		15,630	0,000		
	Property	-0,910	0,172	-0,656	-5,282	0,000	1,000	1,000
2	(Constant)	13,429	0,810		16,572	0,000		
	Property	-1,787	0,430	-1,288	-4,155	0,000	0,145	6,892
	Ethics	0,862	0,391	0,684	2,207	0,034	0,145	6,892
3	(Constant)	13,187	0,777		16,972	0,000		
	Property	-1,687	0,411	-1,216	-4,105	0,000	0,143	6,977
	Ethics	0,909	0,372	0,721	2,446	0,020	0,145	6,915
	Banking crisis	-0,847	0,381	-0,271	-2,222	0,033	0,842	1,187
4	(Constant)	14,045	0,839		16,749	0,000		
	Property	-1,356	0,420	-0,977	-3,232	0,003	0,124	8,042
	Ethics	0,653	0,373	0,518	1,752	0,089	0,130	7,689
	Banking crisis	-1,107	0,382	-0,355	-2,898	0,007	0,759	1,317
	Concentration	-0,016	0,007	-0,257	-2,165	0,038	0,806	1,241
5	(Constant)	12,198	1,114		10,945	0,000		
	Property	-1,043	0,416	-0,751	-2,503	0,017	0,112	8,968
	Ethics	0,677	0,350	0,537	1,932	0,062	0,130	7,696
	Banking crisis	-1,271	0,366	-0,407	-3,475	0,001	0,732	1,367
	Concentration	-0,022	0,008	-0,354	-2,972	0,005	0,710	1,409
	NPL_L	0,095	0,040	0,333	2,345	0,025	0,497	2,012

Source: Authors' calculation. Dependent Variable: MIN\_CA

## Emerging Profiles of Indian Outward Foreign Direct Investments

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### Abstract

*Emerging economies are coming forward and contributing large share of FDI outflows in world's total FDI outflows. In the global economy, India has spring up as major recipient of FDI and also significant outward investors. Due to the strategic importance of Outward FDI Indian companies spreading their footprints by making Greenfield and brownfield investments across the globe. There is a need to study the status of emerging India in terms of OFDI country. In this paper attempt is made to analyze the FDI outflows from India. The study tries to explore trends of Outward FDI to exhibits the sector-wise and year-wise distribution of Indian direct investments abroad. The period of study covers the data from 1996 to 2014. Additionally, the study attempts to provide list of top foreign acquisition by Indian firms' industry-wise, sector-wise. From the results obtained, Singapore is the most preferred investment destination by Indian corporates followed by Mauritius, Netherland, USA and UAE. India is showing unprecedented growth in FDI outflows, there is a need of appropriate investment promotion efforts and home country government supporting terms of bargaining with host country government for implementation of projects should be given to boost the confidence of Indian companies.*

**Keyword:** emerging economies, India, outward FDI, market- seeking, internationalization of firms, acquisition.

**JEL Classification:** D40, F23, F63.

### 1. Introduction

After gaining success in attracting bulk inward FDI emerging economies (EMEs) are increasingly becoming a major source of foreign direct investment in global scene. Through internationalization Indian multinational companies are building high profiles worldwide. The investment development path (IDP) framework explains the relationship of outward and inward FDI flows and the level of economic development of the country (Dunning 1981, UNCTAD 2001, Narula and Guimon 2010). Over the past years, India's economic growth is based on its export driven policy which mainly concentrated in searching new markets for exports of goods manufactures in India. Through in the beginning Indian Outward FDI had concentrated in developing nations as its host nations. Path of Indian FDI outflows have been continuously changing from developed nations to developing nations as a location for investments. Internationalization of Indian firms depends on the nature of the host region, according to which Indian companies implement their OFDI activities in target market. Due to the strategic importance of Outward FDI Indian companies spreading their footprints by making Greenfield and brownfield investments across the globe. There is emergence need for growing Indian economy to open up its door of restricted FDI policy and become a global player to create a competitive image across the world by acquiring reputed brands and setting up its own production facilities abroad.

Over the last two decades, increased globalization has played a strong role in upbringing FDI activity and Internationalization of firms. In the recent years, Internationalization of firms from emerging markets in the form of Outward Foreign Direct Investment has undergone a rapid change. This upsurge is the results of economic reforms initiated since 1991, which results in increasing openness of markets, growing interdependence and strengthening economic ties in the world economy. Outward FDI provides an opportunity to Indian investors to access the markets globally and it eases the process to target the major export markets. Path of Indian FDI outflows have been continuously changing from developed nations to developing nations as a location for investments. Mainly firms invest overseas either by opening wholly owned subsidiary or by acquiring renowned brands to gain strategic advantage.

Motivation behind Indian FDI outflows ranges from market-seeking, resource -seeking, efficiency-seeking and strategic-seeking. Eminent scholars are looking to the motivations of Indian companies their FDI decision-making process (Pradhan 2007, Kumar 2008, Duanmu 2009, Anwar and Mughal 2011, Baskaran and Charlas 2012). The most important type of OFDI is efficiency-seeking where firms set up their operations on the basis of



the locational advantages to access the cheap resources. By doing this, they can earn the benefits of economies of scale and incur less costs. Thus both the home country and host country can take the advantages of value addition in their business operations in terms of sales, foreign assets and employment. Home country firms also experiences through learning by networking their firms globally. Outward investment policy regime was liberalized since 1992.

The academic literature has shown that emerging nations are coming forward and contributing large chunk of OFDI investment in world total share of FDI outflows. But it has shown that there is mixed results related with the FDI as a substitute or complimentary to the home country exports. Indian government initiated FDI outflows in slow pace then it has gained momentum. Department of commerce is the nodal agency which has published information on overseas investment till 1993. After that Indian Investment Centre, under the department of Ministry of Commerce has been opened but in 2005 it was wounded up. Now at present RBI is the sole agency publishing information on outward direct investment remittances – wise. Reserve bank of India has changed overseas investment policy from time to time. Basically RBI provides different routes for Overseas Investment. The rest of the paper will unfold as follows. The following section presents various schemes of overseas investment from India. Section 3 deals selective review of literature on Outward FDI. Section 4 provides analysis of FDI outflows in financial year 2013-14. It also attempts to make analysis of FDI outflows from India from period 1996-2012 remittance –wise. Additionally, it also reveals the preferred destination of Indian OFDI and its sartorial composition. Section 5 exhibits the major foreign acquisitions by Indian firms. At the end study concludes with the major findings and research implications.

## 2. Different entry routes for overseas investments

There are four different types of routes for overseas investment. The liberalized policy framework provides for the following routes (Department of Economic Affairs, Ministry of Finance):

- *Automatic Route:* Indian corporates/ Partnership firms are allowed to invest abroad up to the limit of 400% of their net worth in a year as on the date of the last audited balance sheet. In this scheme no prior approval of Reserve Bank or Government of India is required (RBI Notification No. FEMA 173/2007-RB dated 19<sup>th</sup> December 2007).

- *ADR/GDR Automatic Route:* In terms of this route, Indian companies are allowed to utilize up to 100% of ADR/GDR proceeds for overseas investments with no limit under the automatic route subject to post facto report to the Reserve Bank (Refer RBI Notification No. FEMA.40/2002-RB dated March 2, 2001 in partial modification of notification No. FEMA 19/2000-RB dated 3<sup>rd</sup> May 2000).

- *ADR/GDR automatic stock/ swap route:* Under this scheme Indian companies can automatically swap their fresh issue of ADRs/GDRs for overseas acquisitions in the same core activity subject to post facto report to RBI. (Refer RBI Notification No. FEMA 19/2000-RB dated 3<sup>rd</sup> May 2000 as amended by Notification No. FEMA 40/2001-RB dated March 2, 2001).

- *Normal Route:* Cases which are not entertained under the above mentioned automatic routes, those proposals are considered by the Special Committee on Overseas investments. Special committee is headed by the Deputy Governor of RBI. It consists of representatives' members from Ministries of Finance, External Affairs, Commerce and the Reserve Bank. The application for direct investment in joint venture/ wholly owned subsidiary outside India or by way of exchange of shares of a foreign company shall be made through proper channel in form ODI or in form ODB respectively, to RBI, Exchange Control Department.

## 3. Review of literature

Based on the Outward FDI concept, some of the major studies and their summarized findings have been discussed below: Dunning (1980) in his study explained the phenomenon behind the internationalization of the firms. He framed an eclectic approach for comprehensive explanation of international process which results from ownership-based advantages, localization advantages and internalization. The ownership advantages are firm specific intangible assets determine the competitive position of firms in relation to its rivals which includes, patents, know-how, labor skills and other forms of high production technology, managerial capabilities and control over markets. Location advantages deals with the availability of inputs such as natural resources, favorable cultural and political environment, low factor prices, and transport costs in the host country has lured firms to established their business in that region. Existence of market imperfections in the home country leads to internalization advantages

Dunning (1988) presented the OLI framework to explain the importance of firm specific advantages, location advantages and internalization of the firms. The ownership advantages are referred as competitive advantages which are significant to outweigh the cost of setting up and to operate in the foreign market. Firms have to use

these advantage in other markets rather to sell them to the host nations firms to make competitive edge over them. These variables differ among sectors, industry and countries. He concluded that eclectic paradigm framework is useful in examining how multinational firms decide their internationalization process.

Kwon and Hun (1995) made comparison between US firms engaged in export business and foreign production oriented firms. He examined the measure of internationalization process for foreign market entry strategy followed by US manufacturers. He concluded that firms having international business experience served different foreign markets with different products. On the basis of international experience export oriented are different from foreign production oriented firms. Foreign production firms opt for long-range planning and prefer pragmatic and strategic rule for foreign market entry mode.

Buckley and Casson (1998) analyzed the foreign entry strategies which explain the internationalization approach of firms. An integrated analysis is made between various choice of entry mode ranges from exporting, licensing, acquisition and greenfield investment. All the decisions of firms to internationalize depends on the firm's investment and production facilities. Location costs, internationalization factors, trust and psychic distance, market structure and competitive strategy, adaptation costs (for local environment), and the cost of doing business in foreign market are determines the firms' foreign market entry decisions. Various factors affect the entry mode choices. He concluded that intensity of competition from home country rivals is significant driver of entry strategy into both production and distribution facilities.

Urata (2000) studied the host country specific factors which attracts the Japanese FDI. Various supply side factors include availability of low cost labor, quality infrastructure, good governance of host country and demand factors include large market size. He found that firm considers host countries market conditions before making investments. Supply side factors are significant for developing nations while demand side factors are important in attracting Japanese firms. He concluded that market size exchange rate, exchange rate volatility wage rate, macroeconomic stability, labor quality, infrastructure, agglomeration, exchange rate shows significant results.

Pantelidis and Kyrkilis (2005) analyzed the various macroeconomic variables like interest rate, human capital, patents issued in home country, R & D in home country. Study is conducted for the time period of 1970-1999, 25 countries are included in this study and found different results for different countries. Based on the country classification results are different. Interest rate is significant in middle and advanced income countries while human capital, exchange rate and technology variables are significant affect the outflows from advanced countries. The determinants such as market structure differentiation and openness of the home country are significant in all the country groups.

Buckley *et al.* (2007) investigated the host specific determinants affecting Chinese outward direct investment and by evaluating the three types of factors such as market imperfections, firm based competitive advantages and institutional factors. Study is conducted for the period of 1984 to 2004 and host specific variables are considered such as market size, political stability, and geographic proximity and natural resources. Chinese OFDI has positive related to political risk, cultural proximity and host country market size. Kokko (2006) in his study survey the effects of OFDI by MNC's on developed home countries. He found that there are many benefits of outward FDI to investing firm's size and competitiveness. Nature of investment, industry, time effects and home and host country environment affects the home country health differently. OFDI activity has small effects on the exports and production of the home country because firms shift their production structure related to labor-intensive activities to host country for where cheap labor is available. He concluded that home country exports will grow, firm's financial profit raises which belong to home country. In this manner firms with huge profits will spend more on R&D, marketing expenses etc.

Pradhan (2006) in his study analyzed the trends and patterns of OFDI from Indian service sector. This is a firm level study in which firm's intangible assets are quantified which affects the OFDI intensity of service sector firms. He found that the rising trend of OFDI from Indian service sector is promoted by structural shift in economic activity. Various firm specific factors such as age of the firm, R&D expenditure, total sales labor productivity, export, and profit margins are examined by using Heckman two stages to bit model. He suggested firms O-FDI behavior significantly differs from industry to industry. Firm age and firm size negatively affects the OFDI activity from service sector. R&D intensity, export intensity and profit margin are found to be significant firm specific factors influencing OFDI activity. He found that profits assist the firms for its expansion of operation abroad or they ought to confine to the domestic markets.

Pradhan and Singh (2009) studied the various dimensions of outward direct investment in automotive industry for the period 1988-2008. Study analyzed the influence of outward investment activities on firm's in house R & D performance. Firms from Indian automotive industries possess various ownership or competitive advantages and exploit them to expand their business in foreign markets. Various firm level determinants such as firm age,

technology purchase, profit margin, inward FDI, export orientation, liberalization, product specialization, outward FDI impact the R & D activity. Asset exploitation in OFDI results in two way cross-border knowledge flows He found that emerging economies significantly contributes in OFDI (outward foreign direct investment). He founded positive impact of OFDI activities on firms' R & D intensity.

Zucchella and Denicolai (2007) studied the drivers of early internationalization among 144 SMEs firms. He found that there are many reasons for speedy international growth of firms and add many dimensions by time to it international process. There exists a significant relationship between firm's age and international precocity. He concluded that younger firms have rich experience and they tend to expand in foreign markets within the first three years of their business operations. International experience of the Entrepreneur in terms development of personal business contacts abroad found significant driver for early internationalization. Only experience allows access to vital information exchange for the start-up of operations to entrepreneurs. Derman *et al.* (2008) examined the drivers for internationalization of Chinese SMEs. The survey is conducted on 102 Chinese SMEs. The main aim is how firms positioned themselves strategically in foreign markets. The profit, volume matrix framework explained the starting position of exporting companies. Based on Uppsala model, Transaction cost theory, Network and Born Global models various competitive advantages factors such as international experience, increase profit, increase sales volume, skilled human resources, brand recognition, government support, improve customer service, cost efficiency and quality products are quantified. He concluded that Chinese firms follow low price high volume strategy; all drivers are significant except government support which is applicable for large companies not SMEs. Chinese firm must possess competitive advantages like brand recognition and international experience in order to reposition themselves in the premium price category.

Fратиanni and Oh (2009) tested the relationship between Regional Trade Agreements and expansion of MNE activities in the foreign countries. He used the statistical tool of gravity equation model on eleven regional trade agreements, seven with the complete membership and four with the expanded membership. He conducted with the positive link between geographic strategy of Multinational enterprises and openness of the Regional trade agreements. Lu *et al.* (2010) examined role of home country government, firm resources and industry dynamisms on outward foreign direct investment of Chinese firms. Using Strategy tripod framework, he collected data from 362 Chinese firms and analyzed the results. Mostly firm's resource government policies influenced the different types of firms' motives behind outward direct investment. He found that home government policies promote market seeking and strategic seeking outward FDI Firms owing monopolistic advantages such as research and development and high level of expertise technology tend to move strategic asset-seeking type of FDI. On the other side firms with high level of domestic industry rivals and good export experience tends to motivate towards market-seeking outward FDI.

Goh and Wong (2011) analyzed empirically the determinants of Malaysian Outward FDI (OFDI) from home country perspective. Using multivariate co-integration and error-correction, he found that in long run, there is positive association between Malaysia's OFDI and host country market size, trade openness, liberal exchange rate and foreign exchange reserves. He suggested market-seeking FDI and outward-oriented policies stimulate OFDI.

Catherine and Rashid (2011) analyzed the macroeconomic variables and FDI flows in ASEAN nations which include Malaysia, Indonesia, Philippines, Singapore and Thailand for the period 1975 to 2009. He found that in the most of the country's economic growth rate and trade openness significantly affects FDI flows. In Thailand, Inflation rate is significant for FDI flows. The Malaysian exchange rate play significant role while in in Philippines, manufacturing output drives FDI flows. In different stages of development different factors more important for counties. Employment show negative response to the investments in Indonesia and the Philippines, while tourism respond positively to FDI in the Philippines and Malaysia. Other significant host county specific factors include skill and knowledge, consumer income and infrastructure.

Baskaranand Charlas (2012) analyzed the trends and patterns of outward FDI from India. He found that Indian firms are going global to serve the overseas market due to improvement in countries economic performance and its firm competitiveness which is the result of liberalization in Indian FDI policies regime. He concluded that government should support the Indian firms for the expansion of their overseas operation to provide benefit to the nation by increased exports and it will provide access to cheaper raw material to parent firms through backward FDI.

### Study period

FDI outflows from India year-wise from 1996-2014. At sectoral level, distribution of FDI outflows is shown from 2008-12.

## Objectives of study

With every passing year, India being one of the emerging economies has reached a historic high in FDI outflows. With the integration of India in the international scene, Outward FDI by Indian firms has attracted attention. In this context, this descriptive study attempts to (i) understand the different patterns and routes of Indian Outward FDI, (ii) study the sector-wise and year-wise distribution of Indian Outward FDI, (iii) survey of major foreign acquisition by Indian firms and their locations.

## Research methodology

The study is descriptive research and the secondary data has drawn from published records of various journals, magazines, and websites particularly from the Ministry of Finance, Department of Industrial Policy & Promotion, Reserve Bank of India, Ministry of Finance, RBI website source on RBI Bulletins, Handbook of Statics on Indian Economy, UNCTAD. The study is based on the time period from 1996-2014. Statistical data for FDI outflows have been used and data is presented using graphs, charts and tables for the given period. Secondary data has been consulted to gather reports and publications of various associations connected with business and industry, agencies, government, journals related with overseas investments, different circulars of RBI, books and magazines related with FDI outflows related with various sectors.

## 4. Analysis of outward Foreign Direct Investments and interpretation

### 4.1. Foreign Direct Investments outflows from India (month-wise) during the financial year 2013-2014

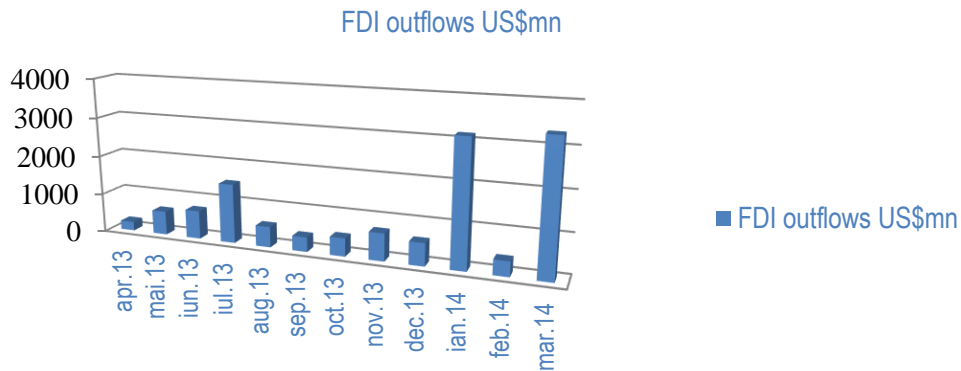
Table1 - FDI outflows position (month-wise) during the financial year 2013-14

FINANCIAL YEAR 2013-14 (April-March)		Amount of FDI outflows				Total Financial commitment (1+2+3) (USD million )
		Equity (1)	Loan (2)	Total (1+2)	Guarantee issued (3)	
1.	April 2013	1353.13	228.13	228.13	6056.27	7637.53
2.	May 2013	318.86	291.28	610.14	1218.37	1828.51
3.	June 2013	291.78	432.79	724.57	989.81	1714.38
4.	July 2013	681.95	828.23	1510.18	1731.49	3241.67
5.	August 2013	144.71	381.27	525.98	1414.75	1940.73
6.	September 2013	183.39	186.98	370.37	928.89	1299.26
7.	October 2013	283.11	178.55	461.66	754.9	1216.56
8.	November 2013	404.2	294.2	698.4	1586.51	2284.91
9.	December 2013	383.22	192.24	575.46	999.59	1575.05
10.	January 2014	2962.94	194.5	3157.44	3398.64	6556.08
11.	February 2014	279.18	98.61	377.79	1994.93	2372.72
12.	March 2014	2908	418.72	3326.72	1906.33	5233.05
2013-2014 (up to March 2014)		10194.47	3725.5	13919.97	22980.48	36900.45
2012-2013 (up to March 2013)		5856.22	4351.73	10207.95	16664.44	26872.38
% age growth over last year				<b>(36%)</b>		<b>(37%)</b>

Note: The amount reported towards equity and loans represents actual outflows during the month.

Source: Compiled from RBI bulletin (various issues) and annual reports.

**Interpretation:** Table 1 shows the amount of FDI outflows from April 2013 to March 2014. Total financial commitment against FDI outflows consists of equity, loans and guarantee issue. During the month or year, amount reported towards equity and loan represents the actual outflows. It shows the amount in US\$ Million. In the month of March 2014, Indian firms have contributed highest FDI outflows i.e. US 3326.72 \$million. As compared with other months March, 2014 shows highest FDI outflows and during the year FDI outflows shows the fluctuating trend.



Source: Compiled from RBI bulletin (various issues) and annual reports

Figure 1 - Amount of FDI outflow

*Interpretation:* Figure 1 shows trends of FDI outflows from India for Financial year 2013-14. The Outward FDI follow the fluctuating trends in different months. During the March 2014, Indian firms invested bulk amount overseas.

#### 4.2. Sectors attracting highest Foreign Direct Investments outflows from India

Table 2- Sectors attracting highest FDI outflows from India

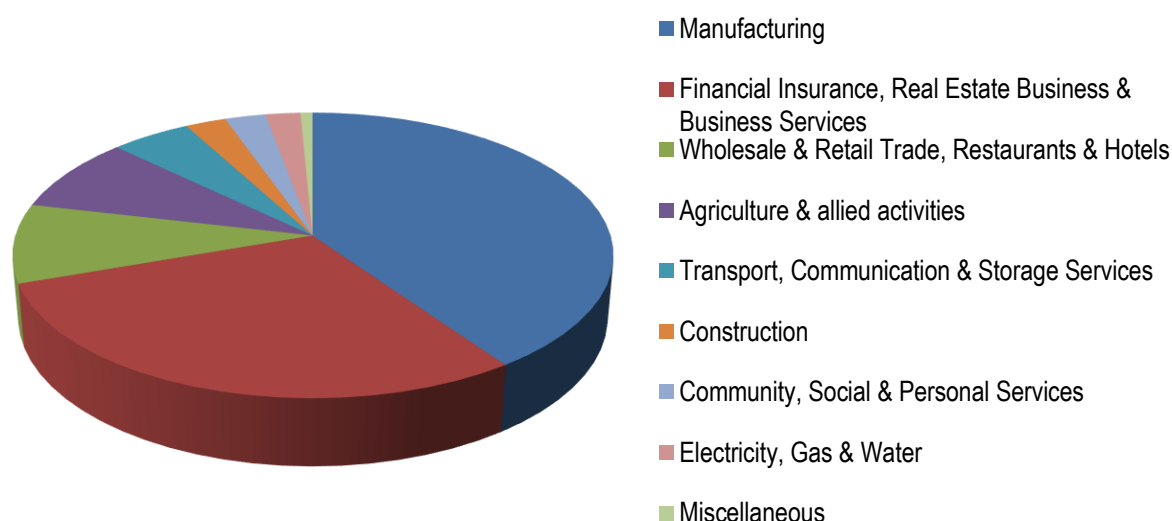
RANK	Major sector-wise distribution of Indian direct investment (in USD billion)						
	SECTORS	2008-09	2009-10	2010-11	2011-12	TOTAL	% Share
1.	Manufacturing	10.18	5.35	5.04	2.74	23.31	40.30
2.	Financial Insurance, Real Estate Business & Business Services	3.55	4.41	6.53	2.53	17.03	29.43
3.	Wholesale & Retail Trade, Restaurants & Hotels	1.17	1.13	1.89	1.00	5.19	8.96
4.	Agriculture & allied activities	2.38	0.95	1.21	0.41	4.94	8.53
5.	Transport, Communication & Storage Services	0.31	0.38	0.82	1.34	2.85	4.94
6.	Construction	0.35	0.36	0.38	0.37	1.46	2.52
7.	Community, Social & Personal Services	0.39	0.18	0.70	0.18	1.45	2.51
8.	Electricity, Gas & Water	0.14	0.84	0.10	0.04	1.19	2.16
9.	Miscellaneous	0.12	0.11	0.18	0.10	0.51	0.74
<b>TOTAL</b>		18.58	13.71	16.84	8.37	57.86	100

Source: Bombay Chamber of Commerce & Industry, Mumbai on March 2, 2012, available at the RBI website, [http://rbi.org.in/scripts/BS\\_SpeechesView.aspx?id=674](http://rbi.org.in/scripts/BS_SpeechesView.aspx?id=674), accessed July 25, 2014

Note: Classification and grouping of activity is as per NIC Code 1987 [siadipp.nic.in/policy/nic/nic.ht](http://siadipp.nic.in/policy/nic/nic.ht)

*Interpretation:* Table 2 shows the sectorial composition of FDI outflows from India. On the basis of its distribution table shows the leading and favorite sectors after that ranks are allotted to them. According to Reserve bank of India bulletins, manufacturing sector is the leading sector having highest FDI outflows of 40.30%. After manufacturing sector, Financial Insurance, Real Estate Business and Business Services are the second favorite sectors attracting investors to invest overseas. Other sectors are also showing good future prospects for the investors based on different motives for investment.





Source: Bombay Chamber of Commerce & Industry, Mumbai on March 2, 2012, available at the RBI website, [http://rbi.org.in/scripts/BS\\_SpeechesView.aspx?Id=674](http://rbi.org.in/scripts/BS_SpeechesView.aspx?Id=674), accessed July 25, 2014.

Figure 2 - Sector-wise FDI outflows from India

*Interpretation:* Figure 2 shows that manufacturing sector is the leading sector contributing in FDI outflows share. At second place, sectors such as Financial Insurance, Real Estate Business and Business Services Wholesale and Retail Trade, Restaurants and Hotels Agriculture and allied activities also attracts good share of 29.67% in total FDI outflows. Other sectors have less FDI outflows from India. Gas, Water and Electricity has attracted only 2.16% of FDI outflows.

#### Outward direct investment to top five countries by India

Table 3 - Amount of Foreign Direct Investment outflows country-wise by Indian companies

INDIAN OUTWARD DIRECT INVESTMENT TO TOP FIVE ECONOMIES (in USD million)								
COUNTRY	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14
Singapore	1,020.41	8352.19	3,680.74	3,798.49	3,980.18	2,318.70	1,833.30	1,060.52
Mauritius	909.74	1467.18	1,804.92	2,148.38	5,045.83	2,582.19	1,762.00	1,291.04
Netherlands	442.06	1,935.490	2,776.01	1,529.90	1,516.63	1,284.08	1,012.32	1,778.34
USA	695.41	1,095.914	873.85	870.35	1,206.98	606.94	1,650.00	1,254.02
United Arab Emirates	196.81	783.771	791.78	637.47	839.86	238.00	837.71	1,059.72

Source: Compiled from RBI monthly FDI outflows database (various issues)

*Interpretation:* Table 3 represents the country receiving highest FDI outflows from India. The table depicts that Singapore country attracts the Indian investors the most. After Singapore, Indian investors are spreading their footprints in Mauritius, Netherland, USA and Mauritius attracts large pie of Outflows from India because of it is referred as tax heaven. UAE also gets 5<sup>th</sup> position in Outward FDI from India.

#### 4. RBI's Year-wise position of actual outflows

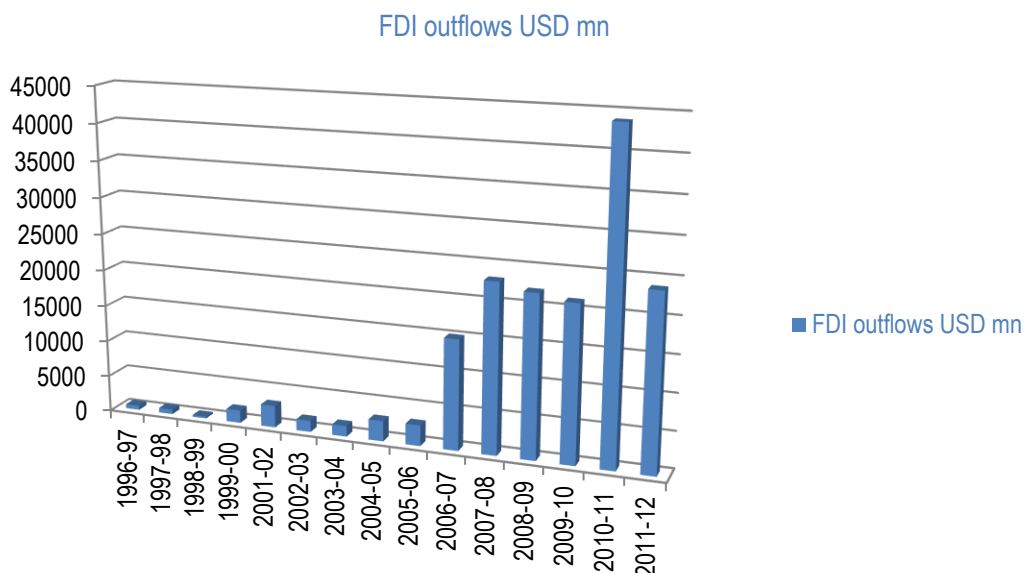
Table 4 - Year-wise position of actual outflows in respect of outward FDI & guarantees issued

Period	Equity	Loan	Guarantee Invoked	Total (in million US \$)	% growth over previous years	Guarantee Issued
1996-1997	363.73	37.76	-	401.49	-	155.12
1997-1998	482.01	8.34	-	490.35	(+22.13%)	135.50
1998-1999	144.98	18.48	-	163.46	(-66.66%)	86.21
1999-2000	314.31	3.93	0.40	318.64	(+ 95.20%)	-
2000-2001	1,138.32	68.55	4.98	1,211.85	(+ 280.31%)	112.55
2001-2002	859.82	121.43	0.42	981.67	(-18.99%)	155.86

Period	Equity	Loan	Guarantee Invoked	Total (in million US \$)	% growth over previous years	Guarantee Issued
2002-2003	1,698.06	100.38	-	1,798.44	(+ 83.20%)	139.63
2003-2004	1,234.75	261.99	-	1,496.74	(-16.77%)	440.53
2004-2005	1,477.93	415.11	-	1,893.04	(+ 20.93%)	315.96
2005-2006	3,883.55	1,212.68	2.99	5,099.22	(+ 169.36%)	546.78
2006-2007	12,497.22	1,428.74	-	13,925.96	(+ 173.09%)	2,260.96
2007-2008	15,527.21	3,221.79	-	18,749.00	(+ 34.63%)	6,553.47
2008-2009	13,103.49	2,844.27	-	15,947.76	(-14.94%)	3,322.45
2009-2010	9,392.98	4,296.91	24.18	13,714.07	(-14%)	7,603.04
2010-2011	9,234.58	7,556.30	52.49	16,843.37	(+22.81%)	27,059.02
2011-2012*	4,031.45	4,830.01	0.00	8861.46	(-47.38%)	14,993.80

Source: Computed by Authors Calculations and Ministry of Finance database and RBI bulletin [http://finmin.nic.in/the\\_ministry/dept\\_eco\\_affairs/icsection/Annexure\\_2.asp](http://finmin.nic.in/the_ministry/dept_eco_affairs/icsection/Annexure_2.asp)

**Interpretation:** Table 4 shows the total amount of FDI outflows from India during the last 14 years i.e. 1996-2012. The total amount of FDI outflows from 1996-97 to 2011-12 is i.e. USD 164112.7 million. In 2001-02 it was USD 1000.07million. It shows success of FDI outflows from India. Over the years, FDI outflows are showing upward as well as downward trend. In 2005-06, FDI outflows were showing rising trend and increased to 293.7% from the previous year. Emerging Indian enterprises are making gigantic investments in varied sectors across the global economy.



Source: Ministry of Finance database and Reserve Bank of India bulletin [http://finmin.nic.in/the\\_ministry/dept\\_eco\\_affairs/icsection/Annexure\\_2.asp](http://finmin.nic.in/the_ministry/dept_eco_affairs/icsection/Annexure_2.asp)

Figure 3 - FDI outflows from India (Year-wise)

**Interpretation:** Figure 3 shows that FDI outflows showing increasing trend in the year 2010-2011. In the beginning period from 2001-02 to 2004-05 FDI outflows are modest. From 2008-09 to 2011-2012 FDI outflows are showing fluctuating trend. Drastic change in amount of FDI outflows is the result of the liberalized framework of Indian overseas policy regime which has been changed during the years because of growing Indian economy.

Major Foreign acquisitions by Indian Companies from 2000 to 2010

Table 5 - Major foreign acquisitions by India from 2000 to 2010

RANK	YEAR	VALUE	INDIAN FIRMS	TARGET FIRMS	COUNTRY	INDUSTRY	OWNERSHIP
1.	2007	12100	Tata steel	Corus steel	UK	Steel	100
2.	2007	6000	Hindalco	Novelis	USA	Aluminium	100

RANK	YEAR	VALUE	INDIAN FIRMS	TARGET FIRMS	COUNTRY	INDUSTRY	OWNERSHIP
3.	2006	1400.0	ONGC Videsh	Petrobras	Brazil	Petroleum	
4.	2002	766.1	ONGC Videsh	Greater Nile oil project	Sudan	Petroleum	25
5.	2008	764.0	Essar Oil Ltd	Kenya Petroleum Refineries Ltd	Kenya	Oil and Gas	50
5.	2006	677.0	Tata Tea and Tata sons	Glaceau	USA	Health Drink	30
6.	2004	600.0	ONGC Videsh	Greater Plutonio Project	Angola	Petroleum	50
7.	2004	600.0	Opto India Circuit Ltd	Eurocor GmbH	Germany	Medical Equipment	
8.	2006	570.3	Dr. Reddy's	Betapharma Arzeniemittel GmbH	Germany	Pharmaceutical and Healthcare	100
9.	2006	565.0	Suzlon Energy	Hansen transmissions	Belgium	Energy	100
10.	2006	522.0	Krafts Food Ltd	United Biscuits	UK	Food and Beverages	
11.	2000	431.2	Tata Tea	Tetley Group	UK	Food and beverages	100
12.	2006	324	Ranbaxy Laboratories Ltd	Terapia SA	Romania	Pharmaceutical and healthcare	97
13.	2000	323	ONGC Ltd	Sakhalin I-PSA Project	Russia	Petroleum	100
14.	2005	300	Ispat Industries	Finmetal Holdings	Bulgaria	Steel	100
15.	2005	289.2	Videocon International	Thomsan SA (CRT business)	Europe, China	Consumer goods	100
16.	2004	283.5	Tata Steel	NatSteel Asia Pte.	Singapore	Steel	100
17.	2005	254	VSNL	Teleglobe International Holdings	USA	Telecom	100
18.	2005	234.7	Matrix Laboratory	Docpharma NV	Belgium	Pharmaceutical and healthcare	95.5
19.	2006	220.0	Tata Coffee			Food and beverages	100
20.	2006	210.0	Susken Communication Tech Ltd	Bomia high tec	Finland	Information Technology	
21.	2006	209.0	Ballarpur Industries Ltd	Sabha forest Industries	Malaysia	Pulp and paper	77.8
22.	2003	191.2	Reliance Infocomm	Flag telecom	USA	Telecom	100
23.	2006	185.0	Seagate Tech Ltd	Evault Inc.	USA	Information	

RANK	YEAR	VALUE	INDIAN FIRMS	TARGET FIRMS	COUNTRY	INDUSTRY	OWNERSHIP
24.	2001	184.6	Citrix Software Pvt. Ltd	Sequoia Software	USA	Information technology	
25.	2005	175.0	Tata Ltd	Millennium steel Plc.	Thailand	Steel	100
26.	2010	10.7	Bharti Airtel	Kuwait Zain (African mobile phone network)	Africa	Telecom	100

Source: Rienda *et al.* (2013) and Reserve Bank of India (various monthly issues)

**Interpretation:** Table 5 represents top foreign acquisitions by Indian firms from 2000-2010. On the basis of its value, acquisitions are ranked accordingly. Indian enterprises are making overseas investment through OFDI mode either by opening their own production facilities abroad or entering in joint ventures. In 2007, huge overseas investment was made by Indian Tata steel by acquiring UK based firm named Corus steel. It is one of the biggest take-over deals in the Indian history. Likewise, Bharti Airtel, market leader in Indian telecommunications has acquired operations of Kuwait Zen, an African mobile phone network and running its business operation in 17 African nations successfully. In the same manner, the big Indian enterprises like Hindalco, ONGC Videsh, and Dr. Reddy's have acquired big foreign enterprises.

#### Findings:

- Outward direct investment acts as a catalyst for Indian economic growth.
- OFDI is a channel by which Indian firms invest overseas and become a global player. By following liberalized policy framework Indian investors channelize their investments capture the target their major export markets.
- Since post liberalization period overseas investment policy changed from time to time. It is only after revised policy in 1995 overseas investment has shown rising trend. Indian investors showed keen interest in making overseas investment due to more liberal policy framework. During the years, there is a tremendous growth in the FDI outflows.
- In 2007-08 and 2010-11, Indian corporate firms have invested a hefty amount of investment.
- Singapore is India's preferred destination followed by Mauritius and Netherland. They are receiving highest FDI outflows by Indian enterprises.
- Indian firms possess competitive assets such as firm's age, technology, product differentiation, managerial skill which contributes in promoting their business operations abroad.
- Bulk of ODI from India is in manufacturing sector followed financial Insurance, Real Estate Business and Business Services. Resource-seeking and efficiency-seeking types of FDI are the main motivations behind the Indian direct investments abroad to fulfill the needs of growing economy. It also helps firms to achieve economies of scale.
- Financial Insurance, Real Estate Business and Business Services segment is having good prospects in future in attracting more investment from Indian investors.
- Overseas investment provide platform to Indian multinationals to leveraged their domestic-based resources and cost advantages effectively abroad by learning through networking and experience in international trade and investment.
- Manufacturing sector is the leading sector and lured large share in FDI outflows sectorial composition.
- Outward FDI also creates high perks jobs for skilled employee host nations. It is considered as a developmental tool because Indian investors also investing in Financial Insurance, Real Estate Business and Business services which acts as a boon for developing nations which creates employment opportunities for them.

#### Conclusion and research implications

Emerging powers are becoming important in trade and development. In this context, the above analysis shows that India after gaining success in attracting massive inward foreign direct investment, India has also become a major source of Outward Foreign direct investment worldwide. The study has provided complete data on FDI outflows remittance-wise d. FDI outflows are presented in terms of financial commitment which involves equity, loans and guarantee issues. It can be observed that at sectorial level of Indian economy, investors are investing

outside in manufacturing sector to seek cost advantage and to get access to cheap raw material for production purposes keeping in mind of growing needs of Indian population. On the other side, financial Insurance, Real Estate Business and Business services help in providing employment to host country population. So we can conclude that outward FDI is an instrument of economic ties which helps in establishing good relation between India and various host nations.

Big Indian corporates like Tata, Bharti's and Wipro are acquiring brands globally to seek strategic advantages. It also provides opportunity to small scale and medium sized Indian enterprises to expand their business operations and take India to the new heights of success. Indian government provides different routes for doing overseas investments on the basis of specified rules applicable on different schemes. Assistance must be given in terms of financial support, legal support, provide basic political and macroeconomic stability that offers ability to investors to make normal business decisions. Government should put appropriate investment promotion efforts which facilitates dissemination of information related with the investment site and service existing and potential investors. By this endeavor government would contribute in bringing up the investors' confidence. It also provides country to put an impression on the world wide level and set their competitive image globally.

The above analysis raises a natural question: that does the Indian economy benefit or cost from direct investment abroad by its firm. The answer to this question has two side, home country as well as host country both get benefits against cost incurred by them. Firstly, the benefits arise from three different sources. The foreign earning adds to the capital account of Balance of Payments. It also benefits India's current account if subsidiaries create demand of exports in host country are in demand. Similarly, more exports lead to more employment in source country. Hence production of capital equipment's, intermediate complementary goods rises. Home country firms by exposing themselves in foreign markets will learn some valuable effects and return back in home country and creates spillover effects. This amounts to resource transfer effect.

Many investor nations now have government support programs in terms of investment overseas services includes project development, insurance programs to cover major types of investment risk. Government must provide support to the companies by giving information on opportunity available in other developing and developed countries. They must provide overseas investment services to the domestic firms such as investment insurance, finance at reasonable rates which help in boosting their confidence. Appropriate investment promotion efforts and home country government support should be given to boost the confidence of Indian companies. Home country should invite projects from companies and after that home country government should bargain with the host country government in the implementation of the projects.

The day is not far India will be a frontrunner in world Outward FDI the global scene. Indian MNEs will continue to invest in companies of developed-country, particularly now that they are more affordable due to the global crisis.<sup>1</sup> In addition, Indian MNEs are seeking more strategic investments in emerging markets, particularly in Africa.<sup>2</sup> According to a recent report, India might be the largest source of emerging market MNEs by 2024, with 20% more new MNEs than China, and over 2,200 Indian firms are likely to invest overseas in the next fifteen years (Pricewaterhouse Coopers)

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## The Housing Problem in the Light of Market Imperfections Theory

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*Whether it is really impossible that all should start in the world  
With a fair chance of leading a cultured life,  
Free from the pains of poverty and the stagnating influences of excessive mechanical toil...  
But the answer depends in a great measure upon facts and inferences,  
Which are within the province of economics?  
And this it is which gives to economic studies their chief and their highest interest.*  
Alfred Marshall

### Abstract:

*The housing problem in Russia is discussed in terms of social-economical and ideological-political problems of the state. Modern trends in the development of economical science methodology and their impact on the solution of housing issue in Russia are analyzed. Market imperfections and their role in the acute problem of housing availability in post-reform Russia are considered. The challenges in housing supply and demand and its equilibrium price in Russia are studied. The socially-oriented approach to the solution of housing problem is proposed.*

**Keywords:** economic policy, market imperfections, housing supply and demand, social-oriented economy.

**JEL Classification:** A 130, J110, R310.

### 1. Introduction

Together with public health and education, the housing availability represents a long-standing challenge for social and economic community. In Russian federation, this problem seems to be especially contradictory. On the one hand, the social factor is interwoven with economical one. From the other hand, quality of the housing reflects social and economical status of individual and is incorporated to the concept of social welfare. In our opinion, the housing is a vital need, without which population dooms to degrade and die out, especially in the countries like Russia, where the people simple cannot live in the open air.

### 2. Market imperfections

The analysis of the state-of-the-art in economic science at the turn of the century has provoked serious dissents and debates concerning perspectives of its future development. In opinion of O. Ananyin (Ananyin 2007, 259), the level of methodological reflection has increased, and the turn of the century became a formal cause to hot discussion of alterations taking place in methodological approaches and the paradigms of L. Walras's general economic equilibrium theory (GEET). According to the latter, the essence of economic phenomena is described by the triad "rationality – market – equilibrium".

In such an economics, rational subjects strive to maximize individual benefit, and in the course of this striving they take rational decision in the market of products supply and demand. Consequently, a set of such decisions bring the economic system to equilibrium, which is considered as the only "correct" and "normal" state. This state can be exhaustively described by linear functional dependences.

Now we are living in interesting time. We observe the changes in paradigm of economic science and this should be marked by a deep break with the Walras tradition. For a long time, the scientific community develops the alternative approaches. The core of a new paradigm is forming. However, the scientific community, in our opinion, expecting certain synergetic events in world economic reality (which development pathway become more and more bifurcation), does not dare to comprehend and accept this paradigm.

According to Kuhn (as he is interpreted by Ananyin 2007) scientific paradigms do not change under the pressure of criticism, but they instantly collapse when the appropriate alternative appears. In other words, in the

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framework of a tradition, new theories should imperceptibly be grown into the state when they can independently exist, and thus can be managed, analyzed and studied. We can define the following four main directions in development of new paradigms in economic theory:

- The macroeconomic analysis of the market equilibrium, when compared to objective reality, reveals excessive formality of basic ideas, nonrealistic character of prerequisites and unverifiability of conclusions of the GEET. In this line, theories and descriptions of numerous "imperfections" of the market act "soft" variants of criticism. These "imperfections" should not be considered as a sentence to the GEET, but they give a convenient pretext to move from the universal equilibrium approach towards real typical problems of economic reality, i.e. towards the problems arising in certain nonstandard (from the Walras point of view) situations, which can not be rationalized by the GEET. Rapid development of information technologies and computation technique in the second half of the XX century has allowed revisiting and considerably expanding the mathematical apparatus applied in the economic theory.
- Nowadays, discrete and nonlinear mathematics, stochastic processes, theory of games are used instead of linear dynamic models. Moreover, already now the future of economic science is associated with analysis algorithms of complex systems and synergetic methods. "Here Walras statics is opposed to the evolution and synergetic approaches, which model irreversible processes having complex nonlinear dynamics and alternative development tendencies in bifurcation points" (Ananyin 2007).
- The linear trend of the GEET development, which does not consider innovative-technological changes, political decisions, and structural alterations, is replaced by "the analysis and comparison of possible development tendencies and probable consequences of economical and institutional and structural reforms" (Ananyin 2007).
- Here "theory of games" approach proposed by von Neumann and Morgenstern competes to institutional approach, which has gained popularity due to the works of Bowels and Gintis, R. Cause and O. Williamson.
- Institutes as structural motifs of the social organization allow explaining almost all problems, which economic theory faced previously, from "imperfections" of the market to structural economic leaps of development and their sociocultural prerequisites.
- Further uncovering of the market "imperfections", some of which are already referred to as "market failures", has aggravated the problem of a deeper state intervention in economy and has questioned the need of accounting the ideological component in development of national economies. Ideological futility of classical interpretations shows its lameness more and more brightly. One of the main subjects of such scientific discussions is so-called QWERTY effects or, otherwise, "dependence on development way".

Below we will try to discuss these four directions in detail and to connect them with the purposes of our study. Blanchard (2000) states that modern macroeconomic studies are focused on searching for a possibly largest set of the market "imperfections" and their consequences, novel aspects of which become today evident. In common nomenclature of the macroeconomists, "the imperfections" are referred to as deviations from the standard perfect competition model. Thus, the most current research in this field is organized in terms of what happens when one relaxes one or more assumptions in that model. Imperfections of the market usually generate shocks, negatively influencing the different aspects of the national state economy. The main of these shocks arise in labor of market, goods or credits.

### *Imperfections of labor markets*

Imperfections lead to very different efficiency and welfare characteristics of the equilibrium. Thus, they prompt us to modify the way we think about fluctuations and the role of macroeconomic policy. For example, it relates to the question whether the equilibrium rate of unemployment is too high or too low, and its implications for macroeconomic policy. (Blanchard 2000)

In this field, problem of dynamic interaction between wage and labor market remain unaddressed. Indeed, here the empirical data in no way correspond to the theoretical models as applied to the rate of wage development. In our opinion, the detailed justification of unemployment determinants and under-elaborated theory of the effective wage, which searches for the relationship between wage and labor productivity, as well as other research in the field do not account for another important "imperfection", which over the last decades become challenge for the developed and transitional economies. We mean *here the importance of the competition between labor costs and capital cost for a producer*. We believe that this imperfection has an effect on availability of housing in a specific concrete, which is determined, first of all, by welfare of citizens.

Imperfections of product markets are manifested, for instance, in the increasing returns or in countercyclical characters of surchargers. «If increasing returns to scale are sufficient to offset the short-run fixity of some factors of production, short-run marginal cost may be constant or even decreasing with output. Firms may be willing to supply more goods at roughly the same (Blanchard 2000). This effect generates in economy not one, but a set of equilibriums: low effective with low output and highly effective with high output.

Countercyclic dynamics of surcharges, in turn, is based on a considerable difference between the price and marginal costs. This effect can be easily explained by a desire and opportunity of firms to increase the output (goods supply) at constant prices that contradicts to classical interpretation of the dynamics of supply and demand curves.

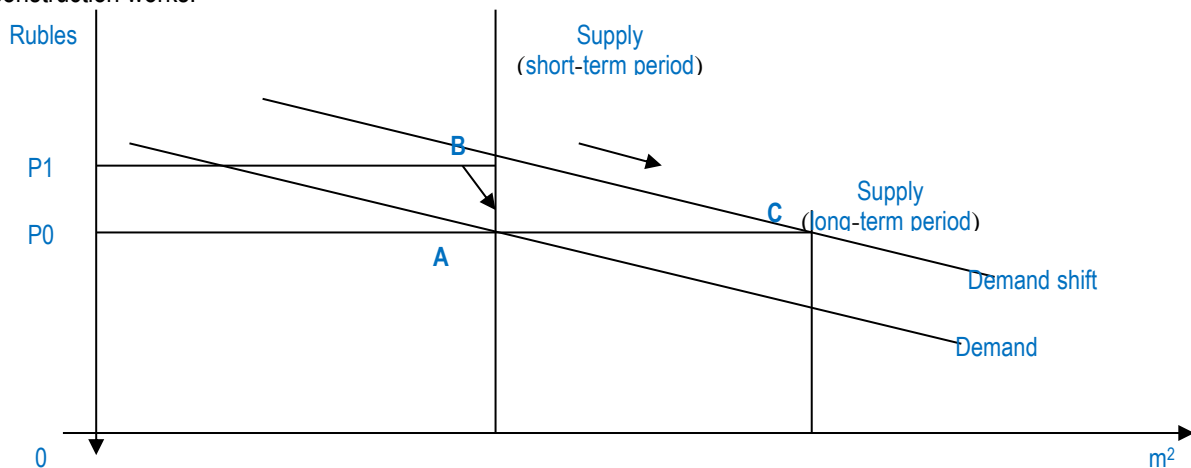
We believe that this type of imperfection can be applied for the explanation of situation, which is observed in the field of house construction in Russia. Strangely enough, but the increase in supply due to mortgage did not lower the price of 1 m<sup>2</sup> of living space. In fact, in the housing market of the Russian Federation there is "a low effective equilibrium with a low output", caused by a significant gap between the price and marginal (variables per 1 m<sup>2</sup>). This is a characteristic indicator of the oligopoly competition, which is accompanied by the effect of *real rigidity*, i.e. low sensitivity of the relative prices to the demand shifts. When the prices are artificially high, this effect is more than real at insignificant shifts of the demand, and considerable shifts are not expected, since the effective demand for housing at the established prices seems to be rather limited.

The equilibrium model of supply and demand ratio, accepted in the classical housing economy, has its peculiarities. The plot of schedule of housing (unlike other goods) supply and demand has a characteristic feature: inelasticity of the supply in the short-term period and ability to react to alteration of change by via the change in supply elasticity in the long-term period. In such situation, the increase in demand for housing leads to surge in prices in order "to clear the market". This phenomenon usually takes place in the case of local economic boom. The increase in prices for housing gives a signal to investors, and, in the long term, the supply is shifted to the right, and the equilibrium price falls (Polyakovsky 1996). This orthodox hypothesis is presented in Figure 1.

We believe that the dynamics of supply and demand, shown in Figure 1 as A → B → C does not work in the modern Russian economic reality.

The A → B → C shift depicted in Figure 2 has absolutely different character. The tendencies of supply and demand for housing in Russia not only be described by the classical equilibrium model, but they also have all parameters of nonequilibrium (nonstationarity) processes.

The A → B shift can be explained by the effect of mortgage credit lending. The latter service was boomed in 2002-2007. Contrary to the expectations, the mortgage resulted in noticeable increase of prices for 1 m<sup>2</sup> of living space, but considerably expanded the supply in the housing market. The matter is that the artificially high prices for housing (1 m<sup>2</sup>) allowed the construction organizations existing comfortably with minimum volumes of construction works.



Note: P<sub>0</sub> — equilibrium price in long-term period; P<sub>1</sub> — increase of price in short-term period at high demand and inelastic supply. (Polyakovsky 1996, 14)

Figure 1 - Equilibrium of housing demand and supply

As for the absolute majority of population needing of housing and having an average family income, the equilibrium price can be found somewhere in D point, even in the conditions of mortgage, available to the people.



Apparently, as seen from Figure 2, between C and D point there is a yawning gap for "jump" of the supply, which we have designated as "investment gap". Significant infusion of investments is badly needed to make the supply extension so vigorous. But it is absolutely impossible at the current state of financial and economic system in the Russian Federation. Therefore, any statements about final solution of the housing problem within the framework of modern paradigm are just verbosity.

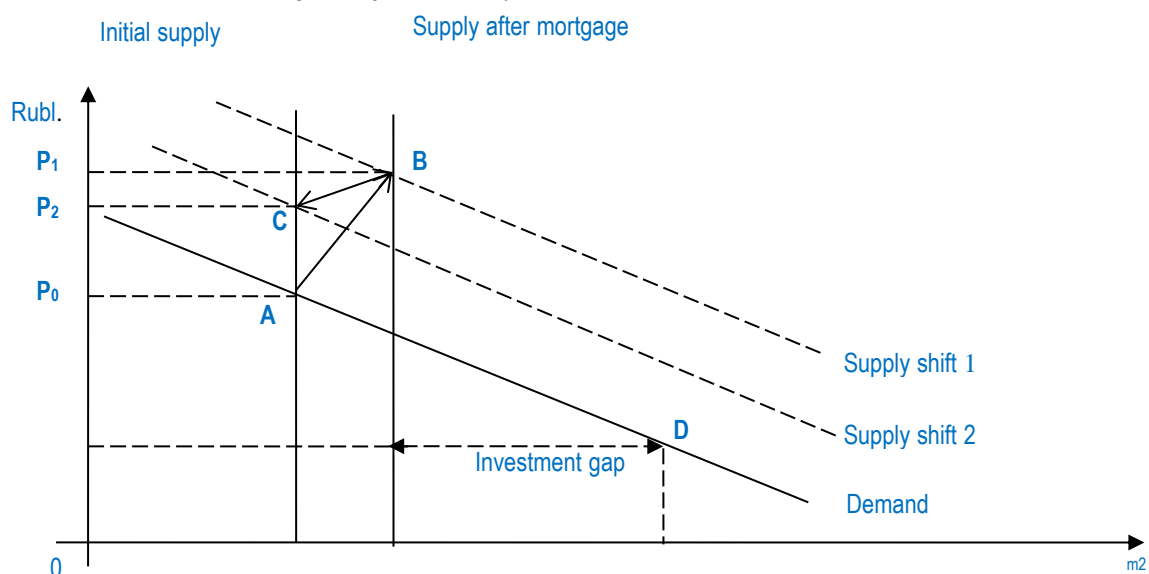


Figure 2 - Dynamics of supply and demand for housing in Russian Federation

Impossibility of reaching the D point can also be explained in other fashion using more straightforward method.

Nowadays the development of global and national economic processes represents a steady challenge to the equilibrium models describing behavior of the stationary economic systems. Short-term deviations from equilibrium state, and of course, return to it ceased to be implemented in reality. The investigations into such processes have lead to the appearance of new research direction, namely evolution (synergetic) economy. It should be noted that this direction has no yet distinct definitions and axioms in terms of nomenclature. However, it is clear that the research here is focused on *non-stationary processes* and forecasting of their variables behavior.

Non-stationary processes allow fairly explaining the housing prices surge with simultaneous increase in demand and insignificant growth of supply. Such situation was observed in Russia before the crisis period, and these tendencies have gained force after the legalization of mortgage.

It is a common knowledge that in the conditions of the perfect competition, the cost of goods is equal to the minimum average costs for their production. This is valid true for modeling of the equilibrium price. However, "the imperfect (monopolistic) competition with a priori unpredictable results is typical for the non-stationary economic behavior" (Kostyuk 2004). It is proved that among the sequences of such competition is the formation of non-equilibrium "supercost", which significantly exceeds the minimum average costs. This process can be somewhat justified by the fact that against the formation of this new cost "there can be a real improvement of consumer appeal due successful implementation of the innovations based on discoveries and inventions" (Kostyuk 2004). Therefore, the "supercost" can be referred to as the innovative cost. The consumer itself, preferring to use the goods with somehow improved properties, starts voting for the innovative supercost (though, truly speaking, the consumer casts a vote thanks to the massive "innovative" advertising and the appeal to not the best human qualities: pride, vanity, laziness, appetite for pleasure, etc.)

We believe that similar processes define the behavior of prices, supply and demand in housing market in the Russian Federation (Figure 2), but only in the negative sense with long-term consequences that gives cause for concern. We should make the following explanation here.

The "innovative" supercost in the housing construction in the Russian Federation at the beginning of the 2000<sup>th</sup> has demonstrated a noticeable gap from the minimum average construction costs owing to the following reasons.

First, due to the aforementioned oligopoly competition, when a limited number of large construction corporations began to dominate in the housing market of Moscow, this tendency has expanded over the regions.

Second, the supercost generally includes not innovative component, but lobbying the interests in terms of land allotment, building licenses obtaining, infill projects approval, etc. "The construction sector is strongly oligopolistic. In no small degree, it belongs to officials, who are secret shareholders of construction corporations and lobby their interests. The consequences of this are the kickbacks collected from buyers as well as artificial high prices in the absence of competition"<sup>29</sup>.

Third, there is a limited, but paying class of consumers (who became the owner of the superincome from the same transition non-stationary processes). They "yearned" for free sale-purchase of apartments and original landscape planning that was impossible during the Soviet and early Post-Soviet periods. This circle of consumers was ready to pay high price for similar changes in the quality of housing and the construction corporations were happy with such a situation, which allowed them not to care of global extending of the supply.

Fourth, in non-stationary economic processes, the tendency toward equalization of the profit rate in various branches is not observed. Moreover, since the profit is not averaged, the financial resources are continuously and steadily transferred from low-profitable branches to higher-profitable branches. Consequently, unlike the equilibrium models, the difference in profit rate grows and this process becomes self-sustaining. In housing construction, it is manifested especially clear. Indeed, a close circle of consumers, which has been forming and preserving for several years, comes back again and again to the housing market, but this time with speculative and investment interests.

The realization of mortgage program, a novelty for the Russian economy, has strengthened this process. A circle of consumers who can buy the housing at a supercost has been expanded owing to the families with high income, which allows paying off monthly the mortgage payments in 30-60 thousand rubles and above. Contrary to the equilibrium models, the demand was increased against the noticeable growth of prices and insignificant augmentation of the supply (point C in Figure 2).

According to the estimations of the mortgage adherents, 10–15% of the Russian Federation population can use this type of crediting. However, during the pre-crisis good 2006, 2007 and partially 2008 years, *the total number of the provided mortgage loans was about 900 thousand* (Nevinnaya 2010) that corresponds to less than 1% of the Russia's population, i.e. the growth of housing supply is insignificant. Meanwhile, too much hype around the mortgage in the conditions of economic upturn has led to the considerable increase of prices for housing. However, the mortgager people tolerate easily such situation, since duration of the pay off is rather long (10-20 years).

It should be underlined that in the non-stationary economy, the growing uncertainty of the future is observed. Ultrahigh cost is unstable and can quickly change. The accelerated growth of the non-stationary economy can suddenly stop or can sharply be slowed down. Then current state of economy stays in the bifurcation point, at the fork of evolution choice.

The crisis of 2008-2009 quickly returned the supply to the former level (B → C, Figure 2), the prices being reduced. This was not return to the speculative demand, but contraction of the mortgage and decrease of its availability even for the above small group of population, which lost job or a part of wage due to the crisis. Nowadays, in the Russian Federation there are about 60 thousand non-performing loans in the field of mortgage lending. The total sum of these loans is about 90 billion rubles, about 55% of mortgager being hoping the twig<sup>30</sup> (Mesitov). A peculiarity of the mortgage in the Russian Federation is in the fact that it cannot solve the housing problem on a nationwide scale. After December 2014, the situation with mortgage became worse than before. In January-February 2015, the arrears on mortgage loans were 53.9 billion rubles from total portfolio of mortgage loans that was by 16.9% higher than in 2014. Such increase in the payment delay seems to be unprecedented for the last six years<sup>31</sup>. According to estimations of the Ministry of Economical Development of Russia (made in March 2014 – March 2015), only 10% of Russians is capable of taking out a mortgage. At the same time, living conditions of more than 60% of Russians stay to be unsatisfactory<sup>32</sup>.

In principle, the mortgage is an opportunity for banks to make money from the superincome of the certain citizens. The source of this superincome is either hydrocarbons trade or simple redistribution of a scarce resource, i.e. money. The mortgage in the Russian Federation has nothing to do with the solution of the housing problem.

<sup>29</sup> Housing construction in the USSR and Russia (1918–2007) – URL: <http://muacre.livejournal.com/54014.html>

<sup>30</sup> Mesitov A. Real delay in mortgage payment in Russian Federation exceeds 90 billion rubles/A. Mesitov. URL: <http://www.interfax.ru/realty/realtyinf.asp?id=109555&sec=1457> on April 15, 2010.

<sup>31</sup> What impedes to mortgage in Russia? // URL: <http://moezhile.ru/ipoteka/problemy.html> on February 19, 2016.

<sup>32</sup> Mortgage arrears grow every day//Кризис 2015-2016/Недвижимость, URL: <http://www.krizis-2015.ru/rost-zadolzhennosti-po-ipoteke-velichivaetsya-s-kazhdym-dnem.html> on February 19, 2016.

The average citizens, who have gained rather high income thanks to the world economic boom, have felt the elevated pressure of the mortgage debt just right after the crisis has broken out. Debts restructuring only provides the additional income to bank and drags the family to debt hole.

The accelerated development of non-stationary processes due to positive feedback leads to strengthening of the undesirable tendencies and increase of risk of catastrophic consequences for the population. "For non-stationary economic processes, it is impossible to prove the statement that pursuing of personal interests automatically leads not to chaos, but to harmony for the sake of majority. Usually, serious intervention of the state is necessary, when there is a stable positive feedback strengthening the undesirable tendencies in economy. (Kostyuk 2004)

It is supported by the information on benefits from non-stationary processes. First of all, the sales income is more and more shifted from the real producers to the promoters and advertisers of goods. Thus, promotion of others brands becomes more profitable than the development of own production. Secondly, unlike the classical capitalism, characteristics of the person reaping a benefit from the modern economic conditions change. The more uncertainty exists in our world, the more probable is that the gentleman of fortune will gain the profit, but not careful, logically thinking, informative person. (Alchian 1977)

All this at the country level may lead may lead to dire consequences of Malthusian character. If to try to adapt the well-know Malthusian model to the housing problem of the Russian Federation population, we will deduce the following deplorable conclusion:

$$N_0 = \frac{H_0}{m_0}, \text{ where } H_0 - \text{housing space of the state; } N_0 - \text{population; } m_0 - \text{housing needed for population } N_0.$$

Lets us say the current value  $N$  becomes more than  $N_0$  (for example, due to the effect of the law on a maternity capital). Then the housing level becomes less than necessary,  $m < m_0$ . An attempt of the population to enhance the housing space meets with no success: it appears that in Irkutsk, for example, the sum of maternity capital allows to buy 10 m<sup>2</sup> of living space (in Moscow even lesser), the average family income decreases after the birth of the child, the prices of 1 m<sup>2</sup> of housing remain too high, the mortgage becomes inaccessible in principle, and the total housing level continues to drop. The total housing stock is gradually reduced due to liquidation of slum dwellings. If between two inequalities ( $m < m_0$  and  $H < H_0$ ) there will be such a positive feedback, the population will start dying out (Samuelson 2002) and  $N$  will tend to zero, instead of tending to  $N_0$ . However, according to the statistics, we can surprisingly see that the housing level in the Russian Federation is quite sufficient (20–22 m<sup>2</sup> per capita). In this line, the data on the average area of new apartments are quite impressive. On the eve of crisis, this value was 138.7 mp<sup>33</sup>. It is clear that this distortion is caused by the accounting of the elite possessing the super income. Our model is valid for middle and poor class of Russians.

The gradual transition  $C \rightarrow D$  is impossible, since in Russia, the social stratum, which could pay the equilibrium prices for housing in the intermediate states, is absent. This gap represents a tragedy of housing construction in Russia. It is a paradoxical that this tragic situation is directly connected with embeddedness of Russia in the periphery of world financial and economic system on peripheral roles, and is determined by imperfections of the financial and credit markets.

#### *Imperfections of world and credit markets*

In O. Blanchard opinion, the main "imperfections" of the credit markets relate to asymmetry of information, while those of the financial markets refer to expectations and other psychological effects (just to mention the reflexivity theory of J. Soros).

We don not agree with Blanchard's statement that the credit mechanism probably played the central role in the past, especially in the time of the Great depression. But owing to the changes in financial system, currently this role is not so significant. The crisis of 2008 has already proved that this statement is not justifiable. The imperfection can be referred to as "asymmetry of the world capital redistribution". In the work of G. Arrighi "The long twentieth century", this problem has been studied in detail One of detailed researches in the field is J. Arrighi's work "A long 20<sup>th</sup> century" (Arrighi 1994). In particular, Arrighi writes about hegemony of the separate civilization centers in the area of world capital accumulation. In the case of hegemony of one center, "the capital price", competing with the labor costs, growth for other participants. Consequently, a possibility of family to build cash balance, sufficient for purchase of expensive durable goods (including housing), significantly lowers. When the wage is low and the

<sup>33</sup> Russian statistical annual. 2007. Statistical annual. – M. Rosstat, 2007; Housing construction in the Russian Federation in 2007 // Statistical bulletin. – 2008. – № 6 (146). – P 19–29.

credits are available, the second wave of the capital redistribution takes place, i.e. the augmentation in a number of credits increases the income of banks owing to "virtual money" (the multiplier effect), and the real wages drops even more decreases due to the need to interest on the loan.

According to the theory of expectations on the financial markets, these expectations are easily prepared via asymmetry of information: when the large bulk of information is concentrated in hands of small group of people, it is possible to initiate any expectations. This is a total antithesis to the effective market of Modigliani-Miller and absolute rationality of the investors.

Activity of the financial mediators, which theoretically should mitigate the asymmetry of information, actually increases an overflow of the capitals to ensure profitability of the market agencies (pure speculative capital). Besides, activity of the financial mediators provides the "distention" of financial "bubbles", which serve for the storage of surplus capital of the world financial and economic system.

The concise analysis of the main market imperfections, one can draw a conclusion that they represent a tool of centralized pressure on the world economic system, this centralization being not effected by the government of any state. That is why among the challenges of future macroeconomics is the development of "an integrated macro model, based on only a few central imperfections" (Blanchard 2000).

However, until now, from the macroeconomic point of view, creation of various institutes is considered as a main approach to overcome imperfections of the market.

### 3. Institutes and institutionalism

In opinion of Makasheva (2007) "today institutionalism is our economical and theoretical everything". Historically, the institutionalism is associated with the names of Thorstein Veblen and John Commons. Ideology of the institutionalism is based on the ideas of historical school, sociological and social aspects of economy. It is a common knowledge that advocates of the institutionalism consider any economy as characteristics of its technology and institutes.

Generally speaking, the institutionalism deals with the effects of norms and rules existing in society on the organization of economy in the state. In such interpretation, the institutionalism should account for the aspects of tradition and worldview, morale and law, ideology and religion, which influence the economic construction that is especially important for our research. However, being a mainstream of the economics, the institutionalism has chosen a route of rational emasculation.

Among the novel theoretical directions of the institutionalism, described in modern economic textbooks, are the contract theory considering economic actors in the context contractual arrangements; the economic theory of the property rights determining how resources or goods are used and owned; and the most popular transaction theory studying the transaction bargaining costs. The latter interpretation of the institutionalism considerably reduces its scope, though initially its scope was intended to explain everything.

Figuratively speaking, the institutionalism has found a new brick (structural unit), a number of which can be used for the construction of a society or for explanation of its structure. In this sense, the institutionalism is universal. However, the scientific community does not recognize existence of "the institutional paradigm" (it is known that scientific paradigms are formed by scientific community, but not by scientific theories) because of its too large generality and fashionable tendency to rationalize diverse problems (from legal to the social ones) from the point of view of the institutionalism.

We can not agree absolutely with N. Makasheva's statement that the sharing of the institutionalism ideas represents a first successful step towards creation of a new paradigm. This means abandoning the Marxism. As for the second step is concerned, i.e. formation of a new picture of social and economic reality instead of old Marxist one, it is obvious that this goal has also been reached" (Makasheva 2007).

Has "a new picture of social and economic reality" been reached? Unambiguously, yes, from the viewpoint of new technical representation of its components and their interrelation. But the Marxism was always full of ideology in essence and tried to solve the problems of social inequality. Today, in O. Blanchard's apt words, "the front of macroeconomic research is surprisingly free from ideology". It means that, in principle, the institutionalism can be described by any ideology.

According to Samuels (1981), ideology can be defined as a special filter, which selects the ideas and directs their evolution; as a mainstream of thinking, which defines the direction of research.

If to consider the problem of housing availability in Russia in the context of TOER, we should, from the positions of Walras economic theory, lift our hands in dismay and say: Alas! Equilibrium in the housing market was reached in the point of high prices and the limited supply. There is nothing for it: homo economicus is not interested in moral and ethical problems. Costs of housing construction are very high. Among them the considerable part



belongs to the capital cost (%) and "official rent", kickbacks. Homo economicus is not able to reduce them: from the position of rational and egoistical interest, the action of capital owners and officials are completely justified.

If to reason about the problem of housing availability in terms of care and justice (moral categories) and in terms of development and strengthening of human potential (political categories), this problem cannot be solved without ideological justification of government and political support.

And, strangely enough, such a solution will be in the spirit of the times: more and more research disciplines and scientific communities in the beginning of the XXI century become "post-normal" (Weingart 2010). According to one opinion, a characteristic feature of the "post-normality" is that "the policy and ideology influence science, its subject area and methods of research and, that is not less important, to a certain extent, form scientific community, which directs the process of economic knowledge production and its growth" (Makasheva 2007).

The "pure economic theory", so actively promoted in the second half of the XX century (we believe that it was the effect of not only a naive faith in "invisible hand" of the market, but also a desire to hide ideological and political motivation to construct the world financial and economic system), over the last decade is subjected to strong criticism.

In opinion of S. Bowles and H. Gintis, the economic outcome is significantly affected not only by egoistical motivation of homo economicus, but also social norms, ethical principles and psychological propensities. Additionally, quite often the outcome of the market activity is mainly defined by political action of the authorities pursuing the strategic interests. (Bowles and Gintis 2000)

Starting from this assumption, many modern economists deduce inference that the economy should be behavioral and institutional. We could add that the economy should be more political and ideological, since it is a myth that a person can live without ideology: if the state has no own policy and ideology, it will exist under the authority of other policy and ideology. D. Hume believed that "political writers have established it as a maxim, that, in contriving any system of government, and fixing the several checks and controls of the constitution, every man ought to be supposed a knave, and to have no other end, in all his actions, than private interest" (Hume 1898). If it is so, the economic structure of the state will produce just these properties and the intrinsic logic of the economic system will bring to the fore those persons, in whom the above qualities are most brightly expressed (this phenomenon we observe in modern Russia).

As A. Marshall wrote in 1890 "for man's character has been molded by his every-day work, and the material resources which he thereby procures, more than by any other influence unless it be that of his religious ideals; and the two great forming agencies of the world's history have been the religious and the economic" (Marshall 1930). The forgotten commandments of Christian Europe and America and, especially, orthodox and Soviet Russia, even more often face the hypertrophied transformation of classical economy features mentioned by Hume.

Bowles and Gintis note that modern economists have changed the classical views about the benefits derived by political actors and institutes from egoistic and mercantile interests of people. Now it is postulated that the policy of such institute should stimulate the motives of care and concerns which can form the behavior of public-desirable, but not egoistic-rational character.

As follows from the aforesaid, today the institutionalism is inevitably interrelated with ideological and social issues. Governmental authorities and specially created institutional structures try to endogenically form non-egoistic preferences in humans in order to solve the public problems tasks and overcome "imperfections" of the market. We believe that a problem of the housing availability, i.e. the development of the state economic mechanism providing all citizens with a roof over the head is of the same nature. In the Russian Federation, this problem obviously relates to the market failures and its solution using the model based on homo economicus, are limited and misleading. (Bowles and Gintis 2000)

Before the preliminary conclusions, we will discuss the abovementioned methodological direction of modern economic science, namely dependence on the development path (QWERTY effect).

#### **4. Dependence on development path**

A dynamic process whose evolution is governed by its own history is path dependent. (David 2007) This approach, which now finds ever-increasing application, easily describes the evolution of biological and physical processes and can be applied for better understanding of social dynamics laws. The methodological background of this approach is quite simple: to comprehend the logic of current state of the reality (or to explain the absence of any logic), it is necessary to refer to those events, which consistently led to this state.

Reference to elementary historical narratives such as these, or, indeed, to the chain of Old Testament "begats," are a helpful first step in conveying the core idea that lately has been more formidably labeled as "path dependent social dynamics" (Blume and Durlauf 2001, Durlauf and Young 2001). This phrase refers to systems of



human social interaction, whose motions remain under the influence of conditions that are themselves the contingent legacies of events and actions played out within each system's history. (David 2007) We would like to argue this exaggeration of a role of accidents in social and economic development of a society.

Perhaps, the history of QWERTY is "fascinating and intriguing" for somebody. However, in our opinion, it is absolutely unreasonably to identify the random choice of a technical solution (keyboard layout) from a set of similarities (which leads to "quasi-irreversibility of the investments" supporting the randomly chosen standard) with random character of social and economic development of the society. In the latter case, the course of history is defined not by causalities, but by the motion to the target due to conflict of opposites. Human passions, evils or virtues, and (what is most important) in-depth worldview attitudes are the cornerstone of this conflict. This concept becomes especially keen and debatable, when historical choice of economic events is attempted to be explained in "a critical point", i.e. *at a road fork*.

What were the real opportunities for the USSR in August, 1991? What did the arbiters of Soviet and Russian history know? Here the obvious effect of "information asymmetry" is observed. We mean here the situation, when one ruling group (so-called reformers or "The Chicago boys") knows much more both about the purposes, way of their achievement, and those, allegedly, "causalities" which will lead to the true way, than other ruling group. (Poltoranin, etc.)

## Conclusions

A brief review of general theoretical issues of the current development of "economic mainstream" allows us to make the following conclusions concerning the scope of our research.

Today the numerous market "imperfections" represent, on the one hand, "abnormal" deviations from dry Valrasian equilibrium, and, on the other hand, the understanding of deep social injustice (for which capitalism was always criticized) and non-realization of the idea of public welfare growth. It gave an impetus to the development of so-called socially oriented market economy (neosmithianism, neomarxism, social capitalism) and to fierce dispute concerning the need for the state intervention in economy. The combined effect of three main imperfections (labor market, goods market and credit market) has aggravated the social aspect of the housing problem in the Russian Federation that indicates the need for formation of the state investment policy in sphere of housing construction.

The market imperfections in the modern world can be circumvented by the creation of special structures, institutes. The institutionalism is all-encompassing and ideologically faceless. To be more exact, it is multifaceted. Various institutional structures can be supported by different ideologies, and hence can solve the same "imperfections" problems in diverse fashion.

The housing problem can be solved from a position of different ideological priorities. Consequently, institutional and organizational mechanisms of its solution will also be different. One of the priorities is integration of the Russian Federation into world financial and economic system meeting the requirements of the latter as far as possible. In this case, the prices for housing are obeyed to the market laws. Indeed, the higher prices are profitable for the construction companies, who do not wish to increase the construction volumes and the housing may be acquired by direct purchase or mortgage. The mortgage is beneficial for owners of the capital, but for housing buyers, the price of 1 m<sup>2</sup> will be considerably raised. The person, who is unable to purchase an apartment or take out a mortgage, is ideologically condemned and is marginalized. For this purpose, diverse social clichés are used, just to mention a few: "he works a little", "he found a bad job", "he got the wrong profession" or "he has many children". Representatives of strategic professions, for example, military men, are supported by the state. The others have to be confined in narrow houses of the Soviet epoch. The main consequence of such priority commitment is underdevelopment or even degradation of the human capital of the state.

Other priority is a *socially oriented*. It is aimed at the strategic development of human potential of the state and growth of the people prosperity. From this position, the housing is necessary for man to the same degree as basic level of education or food demand. Only in this case, a man can perfect himself *pro bono publicum*, without being afraid (in the case of mistakes, temporary difficulties and crisis), to be tightened by mortgage throttlehold, and to raise a family, without being afraid of necessity of long living in the confined space. New institutional strategy, which still does not exist in the Russian Federation, should be developed for the implementation of this priority of housing.

The concept of "dependence on development path" explaining a state-of-the-art of the economic processes, which are defined by historically random choice at the "road fork", does not hold up against criticism. All key evolution choices are prepared and made absolutely consciously and purposefully. In this sense, the mathematical apparatus, and, in particular, a synergetic explanation of bifurcation points and choice of a certain evolution way,

which is involved in the scope of a target attractor, is much closer to truth. Importantly, this process is always based not on causality, but on idea, worldview fractal as the main driving force of human activity.

What ideology dominates today in the field economic research? Does it come back from the bifurcation point to a route proposed by A. Marshall, who has said that the economic should contribute to the growth of public welfare? And one of the main indicators of the latter is the housing and its availability.

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## Methodology of the Assessment Industrial and Raw Agglomerations of the North: Results of Application. Case Study Komi Republic

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### Abstract:

*The article analyzes the results of applying the methodology for assessing the impact of regional economic structures in the socio-economic development of the northern regions of Russia. This is determined by the need to improve the theoretical and methodological aspects of the assessment. The purpose of the study is testing a methodical approach to assessing the impact of industrial raw agglomerations of the northern region (the Republic of Komi). Implementation targets demanded formulation and solution of the following tasks: 1) approve the methodical approach to assessing the impact of industrial raw agglomerations on the socio-economic development of the northern region; 2) prove methodical approach to assessing the impact of industrial raw agglomerations on the socio-economic development of the northern region.*

**Keywords:** industrial and raw material agglomeration, territory development, impact assessment, socio-economic development.

**JEL Classification:** O14.

### 1. Introduction

The impact of regional economic structures in the socio-economic development of the northern region has been researched in the works of such scholars as E.A. Zakharchuk, V.S. Drums, I.V. Makarov, V.G. Loginov Y.U. Nesterenko, N.Y. Vlasov, S.Y. Yurpalov, V.A. Yatnov, A.F. Stepchildren, M.B. Petrov, A.G. Shelomentsev, O.V. Gubin, V.N. Lazhentsev, V.P. Lukanicheva, L.V.Chayka, as well as foreign researchers and practitioners within the designated works: M.E Porter, Ch Ketels., M. Delgado (Porter *et al.* 2007). Special attention is paid to the problems of the North. (Eremeyev 2015)

The object of the study is the northern region as organizational and economic space formation and development of industrial raw agglomerations. The subject of the study is organizational and economic relations in the process of formation and development of industrial raw agglomerations in the northern regions.

Basic research methods: systematic analysis, summary and grouping of data, comparison and analogy, generalization, project approach in the framework of study and practice of implementation of management decisions (Lazhentsev 2008).

### 2. Relevance of the research topic

The study of the existing scientific literature reveals lacks of knowledge about effective methods of development of individual assessment of the northern regions as a structural element of the national economy. To obtain new materials that explain unsolved phenomenon in the framework of the regional economy, it is necessary to conduct a special study of laws and functioning of industrial agglomerations, assessment of the impact of industrial raw agglomerations in the socio-economic development of the northern region, to justify the particular methodical approach to assessing the impact of industrial raw agglomerations on the socio-economic development of the northern region. Thus, the relevance of the study assessing the effectiveness of industrial raw agglomerations northern region is acknowledged (the Republic of Komi). (Donskoi *et al.* 2006)

In view of the refusal of the public administration national economy we are aware that it is the primary sector of the economy of our country which has natural competitive advantages; its modernization will enhance the impact

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of upstream and downstream sectors of the economy of Russia in the international division of labour. (Eremeyev 2015)

### 3. Methodology

Testing methodology for assessing the impact of industrial raw agglomerations of the northern region was made using the Republic of Komi as a case study. The method of assessing the effectiveness and efficiency of PSA tested in three metropolitan areas of the northern region (Komi Republic), a mining, oil and gas and timber agglomeration, revealed the levels of influence of industrial raw agglomerations on the socio-economic development of regions (Eremeyev *et al.* 2014). As an objective quantitative indicator of socio-economic development of regions we took gross value added (GVA), see Table 1-3.

Demonstration of changes in estimates of dynamic coefficients in agglomerations of the Republic of Komi presented in Tables 1-3 and on Figures 1-3.

Table 1 - Evaluation quality ratios for mining agglomeration

Period	x1g.r.	x2g.r.	x3g.r.	x4g.r.	x5g.r.
2008	0.426	0.04	0.007	0.02	0.07
2009	0.449	0.03	0.007	0.014	0.083
2010	0.553	0.03	0.017	0.013	0.065
2011	0.474	0.04	0.007	0.011	0.055
2012	0.581	0.33	0.009	0.010	0.060
2013	0.581	0.38	0.002	0.014	0.080

Qualitative dynamic coefficients (the author's procedure of formula 1-7) are calculated as follows:

- x1j - dynamic coefficient estimates of the contribution of industrial production of the j-th agglomeration per 1 ruble. GVA:

$$x_{1j} = \frac{C_{n.n.j}}{VDS}, \quad (1)$$

where  $C_{n.n.j}$  - industrial output j-th agglomeration bln. rub.;

- x2j - dynamic coefficient of contribution of investment j-th sintering per 1 rub. of GVA:

$$x_{2j} = \frac{C_{iof.j} + C_{i.osr.j}}{VDS}, \quad (2)$$

where  $C_{iof.j}$  - investments (capex) in fixed assets j-th agglomeration bln.;  $C_{i.osr.j}$  - investment in fixed assets for environmental protection and rational use of natural resources, the j-th sintering (for example, the construction of sewage treatment plants, construction of absorption towers, construction dust collectors, cyclones, etc.), bln. rub.;

- x3j - dynamic coefficient of the cost of environmental management j-th agglomeration per 1 ruble of GVA:

$$x_{3j} = \frac{C_{r.p.j}}{VDS} = \frac{C_{izi.j} + C_{ooc.j}}{VDS} \quad (3)$$

where  $C_{r.p.j}$  - the costs of environmental management in j-th agglomeration rub.;  $C_{izi.p}$  - the cost of the study of mineral reserves of j-th sintering (for example - is the current costs of exploration expeditions, cartography, transportation, field studies, etc.), rub. ;  $C_{ooc.j}$  - the cost of environmental protection of j-th sintering (for example - is the current cost of replacing sorbent absorbers, other consumables, maintenance and repair of fences, booms and etc.), rub.;

- x4j - dynamic rate of growth in living standards and human development in j-th agglomeration per 1 ruble. GVA in the region:

$$x_{4j} = \frac{C_{razv.cel}}{VDS} = \frac{C_{fot} + C_{pov.kv} + C_{nacc.}}{VDS}, \tag{4}$$

where  $C_{razv.cel}$  - the cost of rising living standards and human development in j-th agglomeration, rub.;  $C_{fot}$  - Fund of staff salaries in j-th agglomeration, rub.;  $C_{pov.kv}$  - The costs of training and staff development in j-th agglomeration, rub.;  $C_{nacc.}$  - Costs of preservation and development of national cultural traditions and customs of the North in j-th agglomeration, rub.;

- $x_{5j}$  - dynamic coefficient of income in j-th agglomeration of the regional budget per 1 ruble of GVA:

$$x_{5j} = \frac{C_{budj.post.}}{VDS}, \tag{5}$$

$C_{budj.post.}$  - Tax revenues and payments to the budget of the region in j-th agglomeration rub.

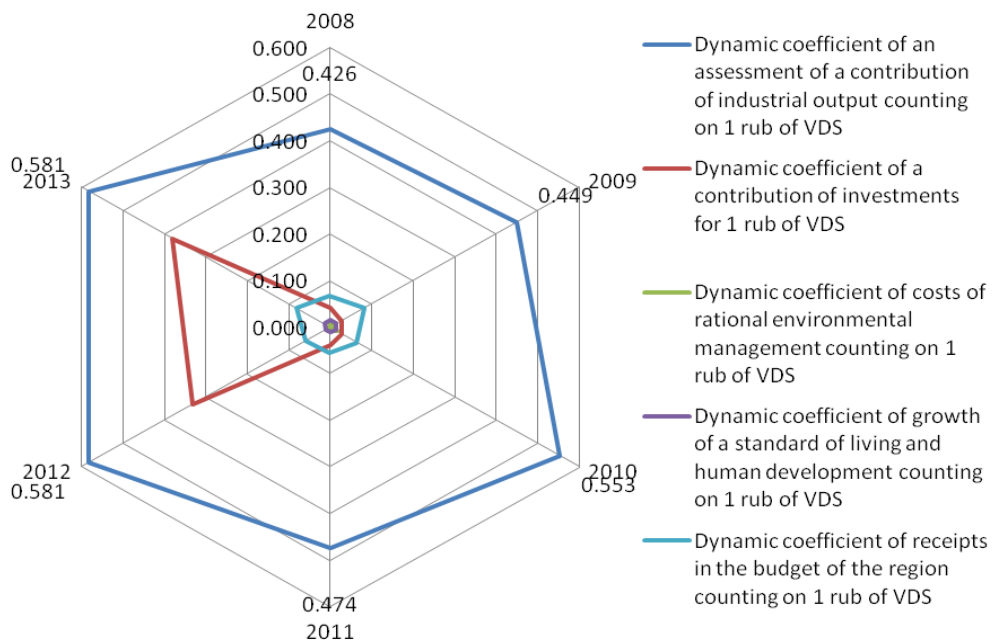


Figure 1 - Comparison of estimates of dynamic coefficients of the mining agglomeration (Shelomentsev *et al.* 2012)

Table 2 - Estimated dynamic coefficients for oil and gas agglomeration (Lazhentsev 2010)

Period	x1n.g.	x2n.g.	x3n.g.	x4n.g.	x5n.g.
2008	0.39	0.20	0.041	0.02	0.310
2009	0.94	0.19	0.033	0.017	0.220
2010	0.97	0.17	0.040	0.015	0.185
2011	0.86	0.13	0.025	0.013	0.172
2012	0.86	0.47	0.018	0.012	0.149
2013	0.50	0.57	0.006	0.014	0.167



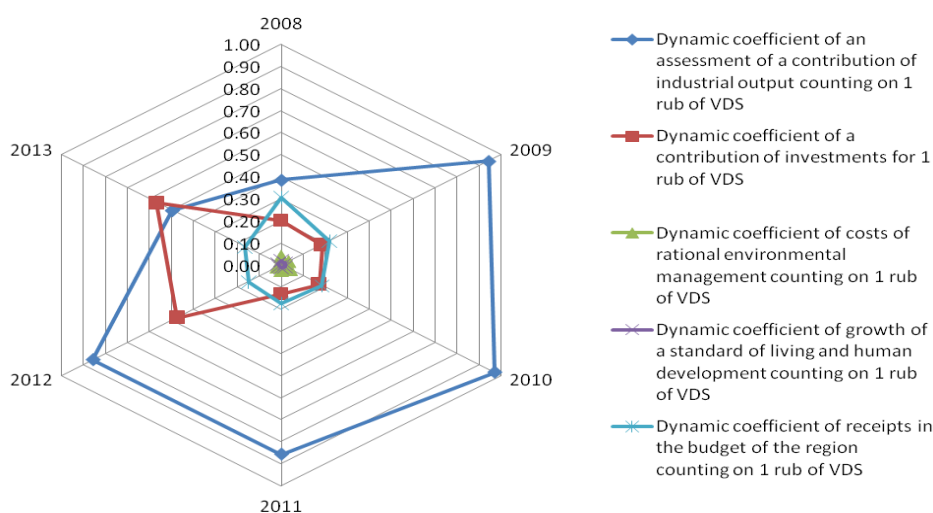


Figure 2 - Comparison of estimates of dynamic coefficients of the oil and gas agglomeration (Shelomentsev and Doroshenko 2012)

Table 3 - Estimated dynamic coefficients for timber agglomeration (Lazhentsev 2012)

Period	x1LP	x2 LP	x3 LP	x4 LP	x5 LP
2008	0.600	0.231	0.025	0.037	0.165
2009	0.844	0.316	0.021	0.020	0.018
2010	0.809	0.458	0.303	0.019	0.000
2011	0.724	0.048	0.073	0.020	0.007
2012	0.824	0.178	0.031	0.023	0.061
2013	0.820	0.175	0.029	0.023	0.080

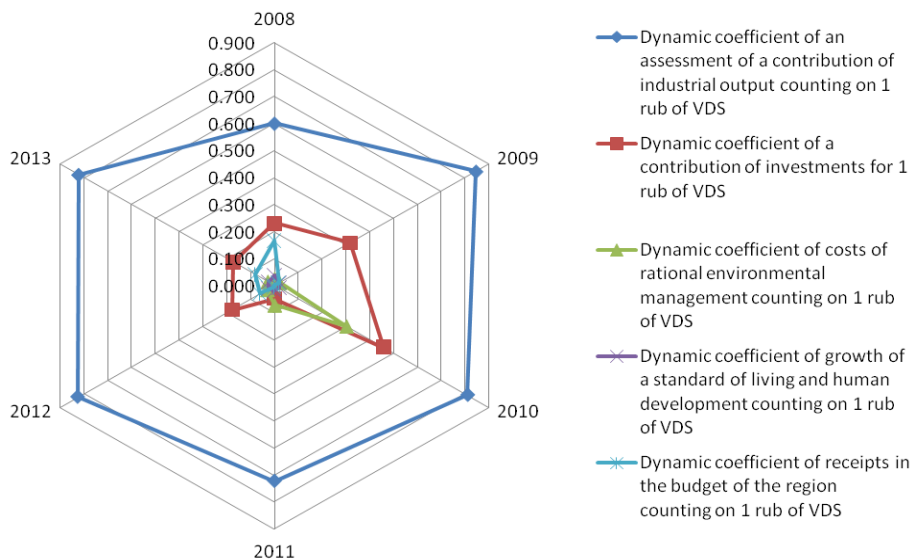


Figure 3 - Comparison of estimates of dynamic coefficients of the timber agglomeration (Shelomentsev et al. 2008)

To achieve the complexity of assessing the effectiveness of agglomeration author suggests using the

$$\text{integral index } Y_{aj} = \frac{1}{n} \sum_{i=1}^n x_{ij} , \tag{6}$$

where:  $x_{ij}$  - indicators of the  $j$ -th agglomeration, describing the objectives of social and economic development of the northern regions;  $n$  - the number of quality indicators of the contribution of  $j$ -th agglomeration ( $n = 1,2,3,4,5$ );  $j$  - number of agglomerations (in the study of the number of agglomerations  $j = 1,2,3$ ).

The total impact of the analyzed agglomerations expressed indicator  $Y_a$ , is presented in Table. 4. The evaluation of the overall performance of agglomerations (PSA) in the socio-economic development of the region is invited to make using the integral sintering index ( $Y_a$ ), representing:

$$Y_a = \sum_{j=1}^m Y_{aj} ,$$

(7)

where  $j$  - number of agglomerations (in the study of the number of agglomerations  $j = 1, 2, 3$ );  $m$ - analyzed agglomerations number ( $m = 3$ ).

Table 4 - Analysis of the performance indicator agglomerations PSA (Lazhentsev 2007)

Period	Yaj mining	Yaj oil and gas	Yajtimber	Ya
2008	0,111	0,192	0,212	0,515
2009	0,103	0,280	0,244	0,626
2010	0,122	0,276	0,318	0,716
2011	0,107	0,239	0,174	0,521
2012	0,198	0,302	0,223	0,723
2013	0,211	0,250	0,225	0,686

### 3. Results

The author of the study suggested that a scaling exponent  $Y_{aj}$  of confidence intervals: Low (0,100-0,200), batting average (0,201-0,300), high (more than 0,300), and the obtained values of performance indicators agglomerations (Table 4-5).

Table 5 - Results of the analysis (scaling) of the integral performance indicator agglomerations in the analyzed period (2008-2013) (Lazhentsev 2010).

The name of the agglomeration	Level of integrated performance indicator agglomerations ( $Y_{aj}$ )
Mining	Low level
Oil and gas	Average
Timber	Average

The total integrated performance indicator  $Y_a$  of the industrial agglomerations (Table 4, Figure 4 and 5) represents a significant contribution to the achievement of agglomerations result of socio-economic development of the subject (GVA), especially in 2010 (0.716) and 2012 (0.723).

General integrated agglomerative productivity ( $Y_a$ )

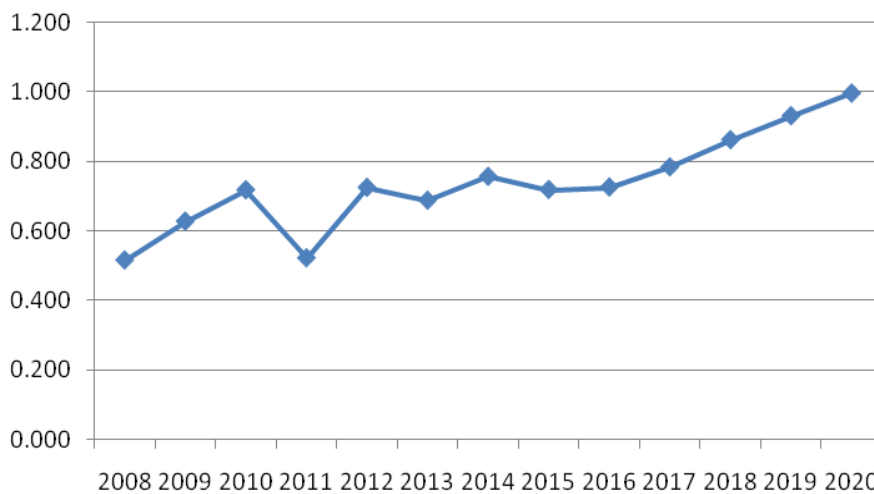


Figure 4 - The general index forecast integral sintering performance up to 2020 (Shelomentsev *et al.* 2012)

We analyze the degree of contribution of PSA in the socio-economic development of the Republic of Komi. The value of GVA of the Republic of Komi in the end of the analyzed period made on the basis of socio-economic development of the country until 2020 was 610.98 billion rubles. And if at the starting point of the analysis (2008), the contribution of PSA in the total GVA of the Republic was 79.4% (Figure 5).

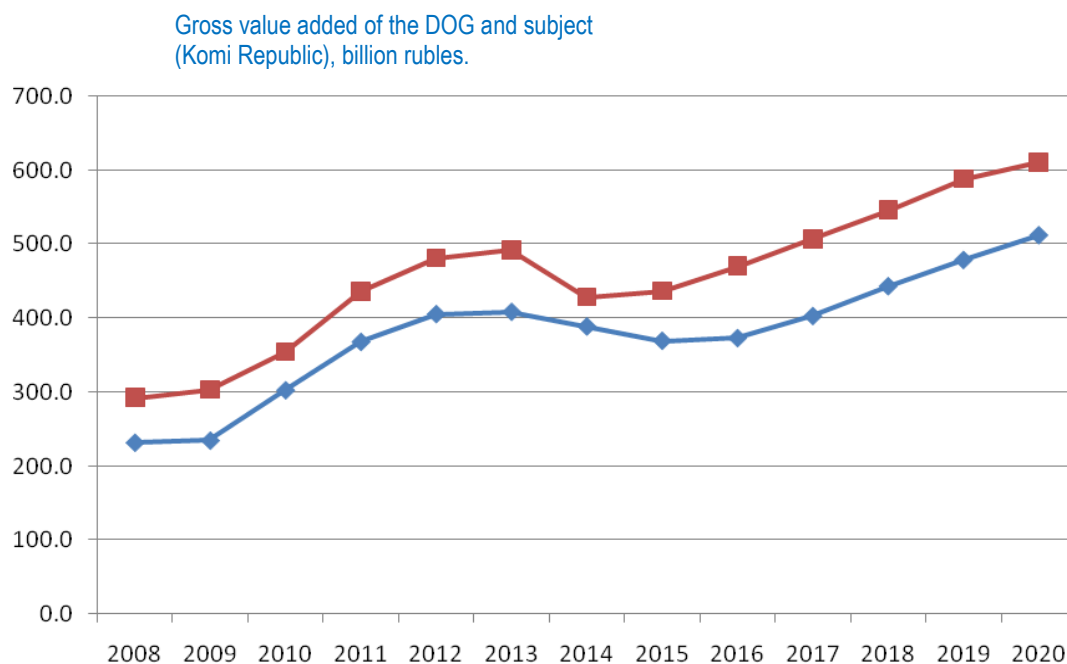


Figure 5 - The volume of the participation of the subject agglomerations of the northern region (Komi Republic) on the basis of methodology for assessing the impact of agglomeration in GVA (Tatarkin *et al.* 2007)

However, it should take into account the inertia of economic development: the return on investments in fixed capital and other areas of the agglomeration does not occur immediately but with a certain time lag (delay) and, in addition, there is the lack of absolute growth of quantitative indicators (investments in the agglomeration) (Eremeyev 2015).

The degree of involvement of the subject agglomerations of the northern region (Komi Republic) on the basis of methodology for assessing the impact of agglomeration in GVA are presented in Figure 6.

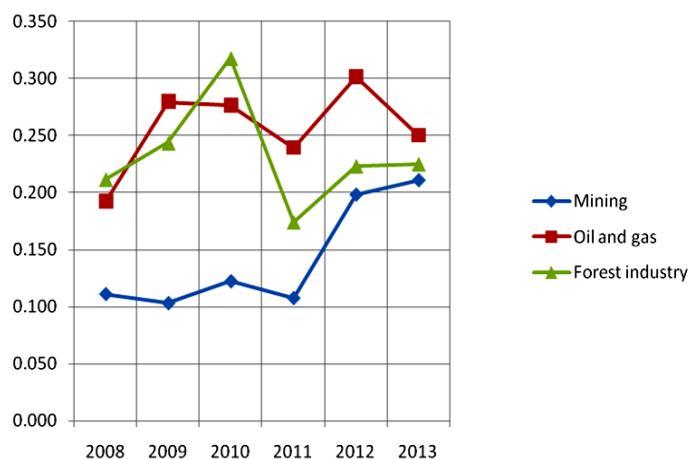


Figure 6 - Integral performance indicator agglomerations of the Komi Republic (Y<sub>i</sub>) (Problems of the North / Scientific Council for Regional Development, 2005)

The period 2009-2010, is characterized by the growth of the integrated performance indicator for the timber industry agglomeration (Figure 6). This is due to the commissioning of new projects, pulp and paper production. The forecast of performance indicators and gross value added in the agglomerations analyzed is done by linear extrapolation of the three options: pessimistic, baseline, optimistic (Table 6).

Table 6 - Prediction of performance indicators of industrial raw agglomerations (Razumovsky 2010)

Period	Ya pessimistic	Ya optimistic	Ya average	GVA pessimistic.	GVA agglomeration average	GVA agglomeration optimistic
2008	0.515	0.515	0.515	231.7	231.7	231.7
2009	0.626	0.626	0.626	234.5	234.5	234.5
2010	0.716	0.716	0.716	302.6	302.6	302.6
2011	0.521	0.521	0.521	368.0	368.0	368.0
2012	0.723	0.723	0.723	405.7	405.7	405.7
2013	0.686	0.686	0.686	408.7	408.7	408.7
2014 (estimate)	0.755	0.755	0.755	389.0	389.0	389.0
2015 forecast	0.681	0.717	0.760	351.0	369.5	391.7
2016 forecast	0.688	0.725	0.768	354.5	373.2	395.6
2017 forecast	0.743	0.782	0.814	382.9	403.1	419.2
2018 forecast	0.818	0.861	0.887	421.2	443.4	456.7
2020 forecast	0.883	0.930	0.948	454.9	478.8	488.4
2019 forecast	0.945	0.995	1.005	486.7	512.4	517.5

Forecast of the general integrated agglomerative productivity

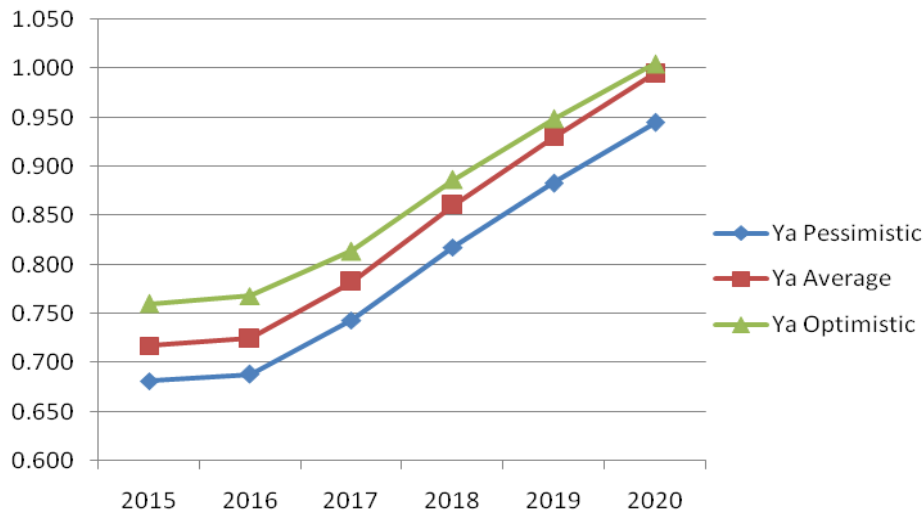


Figure 7 - Option forecasts in overall integrated performance agglomerations of the Komi Republic till 2020 (Baklanov 2006)

Forecast of the VDS agglomerations, billion rubles

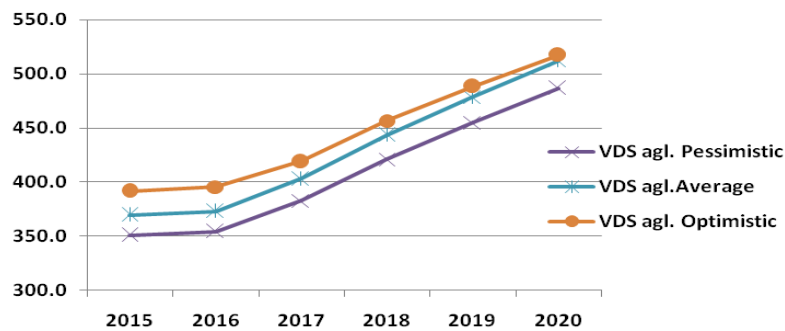


Figure 8 - Options for change projections of gross value added agglomerations of the Komi Republic till 2020 (Shikhverdiyev et al. 2015)

#### 4. Discussion

The obtained results are summarized as follows:

- The integrated dynamic performance evaluation of the impact of industrial raw agglomerations of the northern region, which allows formalizing the procedure for evaluating organizational and economic mechanism of PSA.

- The approbation techniques to obtain objective quantitative and qualitative indicators of the effectiveness and efficiency of sintering processes in the northern region of the subject (for example, the Republic of Komi). PSA is considered for a given region, allowing to test the methodology developed, identify the level of influence of each metropolitan area, as well as PSA as a whole by estimating the contribution of PSA in the socio-economic development of the region as well as to forecast the development of regional economy.

- Rank contribution to the socio-economic development of the northern region of each accepted to study agglomeration (mining, oil and gas, timber), and evaluated effectiveness of the budgetary forecast of key investment projects in the Republic of Komi, which made it possible to assess their importance for the region.

- Perform forecast performance indicators of industrial agglomerations under three scenarios: pessimistic, optimistic, base (realistic).

- On the basis of the developed methodology for assessing the impact and effectiveness of agglomeration processes scientific and methodological basis was established for the improvement of the organizational-economic mechanism of development of industrial agglomerations in the northern regions.

The main advantages of the offered methodology for assessing the agglomerations in the socio-economic development of the region are: ease of comparison of the actual contribution of the industrial agglomerations in the overall result of the region, as well as the potential development of the PSA, which allows to determine the prospects of development of the PSA; focus on the features of the northern regions; the existence of an objective evaluation framework - a set of sound characteristics of regional socio-economic system.

#### Conclusion

To improve the system of organizational and economic mechanism of industrial raw material agglomeration in the northern regions, we bringing these rates in line with the mining capacity will reduce the impact of negative factors of the northern specifics of the socio-economic development of the northern regions (in particular, increased transport costs) and still use the potential territory most productively (to increase the depth of processing and added value), which will increase the effectiveness of PSA and efficiency. This area of the improvement scheme of organizational and economic mechanism of industrial raw material agglomeration in the northern regions may be most successfully implemented using the PPP model, given the potential inflow (return) of private capital into Russia.

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## Economic Growth in the Conditions of Resource Constraints: Ordinal Approach to Optimization of Macroeconomic Production Structure

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### Abstract

*This article approaches the problems of economic growth and development in the conditions of limitation and non-reproducibility of part of the natural resources that determine the limits of extensive growth. An ordinal approach employed in microeconomic theory in the interpretation of the rational production was used to justify the criterion of optimization of the production structure at the macro level of the economic system and to determine the conditions under which the maximum possible rates of balanced economic development within existing resource constraints are achieved. An analysis of the proposed model reveals the feasibility of the threats associated with the possible ecological and economic collapse in the conditions of the extensive economic growth. At the same time, it confirms the possibility to avoid negative scenarios of development related to the reduction of stocks of non-reproducible natural resources and weakening of the recreational opportunities of the ecological system. The conclusion was justified that the conditions for sustainable development are balanced economic growth, optimization of the macroeconomic structure of production, large-scale investment in the development and implementation of "closing" technologies that reduce demand for energy and raw materials while maintaining and expanding the production capacity of the economic system, as well as the formation of an effective innovation system that ensures implementation of scientific achievements and new technical and technological solutions in the production process.*

**Keywords:** economic growth, sustainable development, rational production choice.

**JEL Classification:** O14, R19, L69.

### 1. Introduction

Mankind has felt the absolute lack of the necessities in life for a long time, and even after getting the advanced technology able to meet the basic necessities of life and to ensure acceptable living standards for the majority, it continues to see a higher meaning of industrial activity and the initial source of demand in the increasing private consumption. The economic growth is in most cases considered to be a condition for the population welfare gain and satisfaction of its growing needs. (Jones 2002)

Most economists reasonably believe that economic growth, understood as the increase in the gross domestic product, leads to the accumulation of wealth, expands the potential possibilities of the national states in addressing poverty and in solving other social problems, and considers the high rate of economic growth as one of the most important guidelines of the economic policy. Due to this, the task of ensuring the conditions for sustainable growth and overcoming the threats posed by the resource constraints is in the focus of scientists from

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neo-Keynesian and neoclassical schools of thought, exogenous and endogenous growth theories (Solow 1988, 2000, 2004, Kaldor 1961, Harrod 1966, Hansen 2012, Tietenberg 2005, 2006, Romer and Nelson 1996, Witt 2001, Ruttan 2001).

The theory of economic growth in the context of resource constraints in Russia has been developing almost independently within the framework of solving the common challenges faced by humanity. It was originally developed by the scientists who are better known in the world as representatives of the natural sciences – biogeochemistry and mineralogy, population genetics and geography (Toumashev and Toumasheva 2015).

Many researchers, starting from J. Schumpeter (Schumpeter 1982), maintain a positive view on the opportunities offered by economic growth and differentiate economic growth and economic development, giving preference to the latter. Schumpeter defined the economic growth as the quantitative increase in the goods and services produced and consumed in the economy regardless of the qualitative change in the structure of the public product and the existing system of technological ties.

Modern system analysis assumes that the development shall objectively include the multiple reproduction of a certain object; deviations in the newly created objects from the previous samples that arise in reproduction; unequal preservation of various deviations, selective choice of the most successful of them in terms of optimizing the trajectory of economic development and improving the functioning of the system. According to this criterion, J. Schumpeter defined the economic development as the accumulation of positive qualitative changes that act as a result of implementation of progressive changes in engineering, technology and organization of production and emergence of new types of products and services that better meet the needs of society.

The parameters of the volumes of national production achieved by individual countries currently serve as the main indicator of the level of their development and production and technical strength. In some cases, these indicators are absolutized; the performance of the national economy at the macro level is assessed without taking into account the real content of GDP and the equation of its branch structure. It is expected that the economic growth expressed in the GDP growth expands the resource capacities of the society and allows to increase the production of final consumption goods in any case. This theoretical position has been used in practice in the course of economic reforms in the post-Soviet space.

The existence of an alternative point of view cannot go unnoticed (Forrester 1971, Meadows *et al.* 2004, Mesarovic and Pestel 1974, Brown 2011). Several researchers of resource and environmental problems caused by the expansion of the production scale of human activity and increase in the world population consider the economic growth as a real threat to the existence of civilization (Rees *et al.* 1998, Auty 2001). On their opinion, the uncontrolled economic growth can result in the systemic collapse associated with the depletion of natural resources on the planet. The very posing of the question about the instability of the dynamics of development of national economies and the world civilization as a whole was first set out in the report to the Club of Rome titled "The Limits to Growth" (Meadows *et al.* 1974), which reveals the results of a study of immediate and long-term consequences of strategic decisions related to the development paths chosen by the mankind. The report's findings were based on an analysis of statistical data on the basis of a systemic approach with the use of mathematical modeling techniques. The report rationalizes the position that the threat to the stability of the functioning and development of the world civilization originates from the exhaustion of the growth resources. According to its authors, the world population should have doubled every 33 years with an annual growth of 2.1%.

Despite the fact that the real population growth rate appeared significantly lower than projected and the world's population grew at a slower rate (it increased by 1.7% in 1982), it does not eliminate the severity of the problem. The world's population exceeded 7 bln by 2013. According to D. Meadows and his co-authors, the statistically stated population growth comes into conflict with the biological productivity of the Earth, which objectively leads to a shortage of food and raw materials. Dennis Meadows confirmed his commitment to his theoretical position in 2012 during a visit to Moscow, saying: "Russia is also making efforts to become more economically and technologically efficient. But it must be clearly understood that the more effectively you move in one direction or another, the lower the potential survival rate of such a system will be" (Meadows 2012). The fact that the existing mechanism of development in the environmentally-filled niche occupied by the mankind is imperfect was highlighted in further reports to the Club of Rome, prepared by Jan Tinbergen, Ragnar Frisch (Vane and Mulhearn 2010, 2011), Ervin Laszlo (Laszlo, Ervin 1994), and Report to the World Bank written by a group of economists and ecologists led by Goodland, Daly and El Serafy in 1991. (Goodland *et al.* 1991)

The founder and leader of the movement "New Right" in France, Alain de Benoist (Benoist 2007), sharply criticized the dominant model of the consumer society that leads to the destruction of nature. He formulates a program of anti-growth movement and the ecological economy based on ideas of reducing the excessive

production and consumption. His criticism and normative judgments are largely based on moral and ethical arguments and may have additional rationale of the suggested measures to ensure the development sustainability.

Considering the problem of the natural constraints of economic growth, one cannot ignore the concepts of a sustainable state of the economy of the economic and ecological nature, which criticized the neoclassical growth theories. It primarily relates to concerns to the works of one of the founders of the International Society for Ecological Economics, Herman Edward Daly (Daly 2007). Considering the growth constraints as a means of solving environmental problems, he introduced the concept of the economy in a sustainable state, the initial resource (physical) components of which are limited and do not change over time. The main parameters of this economy are population, real GDP, level of energy and other material resources consumption, which, in his opinion, should be maintained at a level not higher than the carrying capacity of the ecological system in which it operates. In some cases, the need to reduce production is suggested in order to achieve the desired state to the extent not exceeding ecological requirements. (Jackson 2009)

Even if the increase in private consumption is considered as a goal of production and economic development is considered as the main way to achieve it, a problem of allocating resources between unproductive consumption and investment persists. Options for possible solutions are illustrated by the production capacity curve, within which the choice is made between current consumption (goods for the present) and real investments (goods for the future).

At first glance, the dilemma lies in the fact that the growth in consumption increases the current level of life, while reducing the rate of economic development and an increase in welfare of the population in the future. Obviousness of this interpretation is convincing but cannot be considered the proof of its full validity. For example, if the amount of current consumption is reduced to zero, thus bringing the savings ratio (savings and investment) in GDP up to 100%, the economic growth won't accelerate but stop, as the necessary conditions for reproduction of the labor factor will be eliminated. The problem of the growth acceleration is not always solved by increasing the savings share – it is a special, though the most common, case. The optimization of allocating resources between savings and consumption is the condition for high rates of sustainable development. (Shlychkov and Nestulaeva 2015)

Introduction of the assumption about the possibility of intensive development of the labor force not limiting the reproduction with its population to the theory of growth is a significant achievement of the authors of the endogenous theory of growth (Romer 1986 or Lucas 1988). Improving living conditions – quality of food, health services, and in particular the general and vocational training – becomes the element of the expanded reproduction of resources in this context, and expenditure for this purposes act as investment in human capital. As a result, in the face of rapid technological development, even with constant population with an increase in investment and the accumulation of capital, a situation may emerge described by not decreasing but constant capital returns. In a simple model of endogenous growth  $Y = A \cdot K$ , which establishes the dependence of the production volume  $Y$  on the total capital  $K$ , the marginal productivity of capital, unlike R. Solow's model, is not a decreasing variable but a constant, parameter  $A$  describing the nature of this dependence is not changed depending on the amount of capital employed. Given the prediction of emergence of a new generation of more efficient technology, the appearance of the phenomenon of its increasing return, provided that workforce quality improves, can be theoretically assumed. With this approach, the population growth and increasing its qualifications and vocational skills should be considered as an increase in resource potential rather than just the emergence of new customers applying for additional share of the "public pie". (Shlychkov, Vedin, Khasanova 2015)

## **2. Method**

An alternative rendering of personal consumption as a process that determines the reproduction of labor power requires justification of the criterion of optimization of allocating resources between the area of use in scale of the society and definition of the conditions for maintaining optimal proportions of savings and consumption with limited or dwindling natural resources.

Criteria for optimal allocation of resources between the needs of the current private consumption and investment can be determined by applying the method of the ordinal utility theory developed in relation to microeconomic analysis of a rational consumer choice on the macroeconomic level. (Pareto, 2014 Edgeworth 2014, Allen 1964, Hicks 1980)

First of all, justification of this criterion requires the consideration of the economy as integrity of the system, the elements of which change their usefulness depending on the relationship with other goods (resources). The theoretical description of such a system involves the use of the ordinal approach used in justifying the rational production choice in the long and short term, for the interpretation of macroeconomic processes. Commodities on

the production capacity curve should not be regarded as "goods for the present", as opposed to "goods for the future", but rather as resources and services required, along with education and healthcare, for reproduction of "labor" factor, which develops in conjunction with the improvement and accumulation of real capital. In accordance with the reproductive approach, the results of each production cycle form the resource capabilities of the next cycle.

The proposed scheme limits the feasibility of personal consumption with rational needs that realize the creative function of people and deny the use of the volume of personal unproductive consumption as a criterion and indicator of the ultimate target production function. In this case, increase in the level of development of the personal factor should not be considered as a parameter identical to the population growth, although the latter can be directly connected with it, especially in the presented ideal case of the purely extensive growth. The difference between the development of the potential of the personal factor of production and the growing number of workers is most evident in the field of scientific, technical and artistic creativity, where the quality of professionals is crucial and cannot be fully offset by an increase in the number of employees. Nor any personal use, including the demonstrative consumption of luxury goods, should be equated with public expenditure that improves the quality and quantity of the labor factor. Demonstrative institutional consumption, described by Thorstein Veblen (Veblen 2008, 2006), prestige, and image projects in reality reduce economic growth by diverting the constraint resources from the real development needs. If we translate this description of the scheme in the forms corresponding to the tools of microeconomic analysis, it can be represented in the form of a dynamic model of economic growth, which allows identifying the criteria for optimizing the allocation of resources aimed at savings (investment) and private consumption (Figure 1).

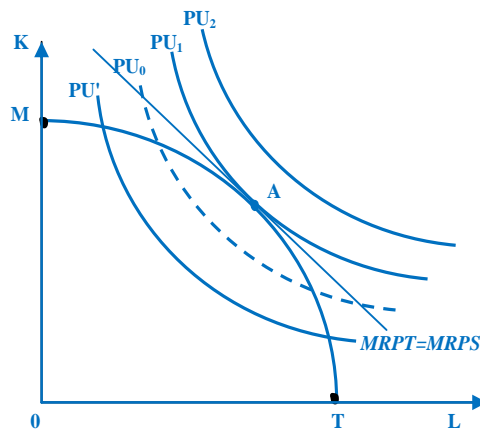


Figure 1 - Dynamic model of economic growth

where: L is a personal factor of production (labor); K is a material factor of production (capital); MT is a curve of production capacity of society that describes the possible combinations of production of goods aimed at the formation of the capital (K) and goods the consumption of which is necessary for the reproduction of the labor factor (L) with the available initial resources;  $PU_n$  is public utility (production capacity) – a curve of the equal public utility (equal potential of the prediction of the next production cycle), which describes the level of public utility corresponding to reaching a new, higher level of production capacity of the society;  $PU_0$  is a curve where the achieved production capacity is equal to the initial, which corresponds to simple reproduction (net real investment calculated as the difference between gross investment and expenses that compensate for eliminated capital is equal to zero);  $PU_1$  is a curve corresponding to the maximum possible level of public utility within existing resource constraints and showing the possibility of increasing the capacity of the society in optimizing the structure of the produced GDP;  $PU_2$  is a curve that reflects the level of public utility, unachievable at the volume of available resources;  $PU'$  is a curve that describes the level of social utility (the productive capacity of society) smaller than the original  $PU_0$  (net investment gains negative value).  $MRPT_{LK}$  is a marginal rate of transformation of public resources that shows how much of the goods intended for the reproduction of the labor factor must be refused to ensure the production of an additional amount of capital, while remaining within the original resource constraints. The marginal rate of transformation of public resources is inversely proportional to their quantitative changes considered as shares in the potentially possible volume of production and is described by the formula:



$MRPT_{LK} = \lim_{\Delta K \rightarrow 0} \frac{\Delta K}{\Delta L}$ .  $MRPS_{LK}$  is a marginal rate of substitution of public resources that shows how

much of the capital can be sacrificed on the condition that it will be compensated by an additional amount of public good labor, while the overall level of utility of the product remains unchanged.

$MRPS_{LK} = \frac{\Delta K}{\Delta L} = \frac{MU_L}{MU_K}$  Initial resources of society meet its potential  $PU_0$  and production capacity curve MT.

A certain amount of investment costs in the production of the social product is required to compensate the retired capital. If the net investment – the difference between the gross investment and the investment needed to compensate the retired capital – is equal to zero, a simple reproduction is ensured. If the gross investment exceeds the needs to compensate the retired capital and is accompanied by qualitative and quantitative growth of the labor factor, the society is able to move to a higher level of its development. The best choice would be the formation of a social product structure that corresponds to the point A, where the production capacity curve reaches the highest available level of the total utility. At this point, the equality  $MRPT_{LK} = MRPS_{LK}$  is fulfilled, and the ratio of the marginal utility of expenditure on investment and reproduction of the labor factor are equal.

The choice of the production capacity curve located at the segment MA is described by the overproduction of capital to the detriment of labor reproduction. If the accumulation and improvement of means of production – buildings, equipment, inventory – are not accompanied by a corresponding development of labor, then the capital efficiency and its marginal productivity will decline, and the increase in the marginal productivity of the absolutely scarce factor – labor – will not be able to compensate it. Part of the production capital may fail to find its application. Resource spending on their production will not actually be socially necessary. This means that the society managed the public time not in full accordance with the structure needs, overproduced the investment goods compared with the need for them. Marginal productivity of capital will decline; the pace of development will slow down.

The opposite situation, described by the overproduction of the labor factor and observed in the segment of the production capacity curve AT, will have similar effects: employees who have improved their skills will not be provided with real conditions for operations, join the ranks of structural unemployment, or have to accept the job that does not require their skills, with all the negative emotional and psychological consequences. Surplus labor will not be able to find its application, and the society will remain within the boundaries of the former production capacity.

The best correspondence of reproduction of the material and personal factors of production represented in the product structure ensures the most rapid economic development. This understanding of the public benefit is based on different methodological assumptions than the public choice theory, the foundations of which were laid by James Buchanan (Buchanan 1959), and which considers the common welfare as the maximization of the sum of subjective assessments of the own welfare and sees the main problem in determining the mechanism of bringing many subjective evaluations down to a common integrated evaluation of the public welfare based on improving the contractual and constitutional bases of economic and political decision-making.

If the market system is located at the point of choice on the MA segment on the production capacity curve, where the economy is in the overinvestment state, the Keynesian measures to stimulate consumption can be effective and useful to ensure the sustainability of socio-economic development. On the segment of the curve AT, when the economy is described by a lack of capital and a corresponding increase in its marginal productivity, the recommendations of the supply side theory (Laffer 2014, Feldstein 1987) and endogenous growth theory (Romer and Nelson 1996, Lucas 1988) to increase the share of savings in the national income to enhance the productive investment become relevant. These recommendations will always have an objective basis in the market system, because the objectives of the current consumption of the majority of the population prevail over the long-term social development objectives, while decisions on spending household income in most cases are less rational than those of the representatives of the business.

Attention must be paid to the following positions and conclusions related to the graphical display of the objective needs of the society as an integral system in the curve map of the equal social utility:

- The curve map of the equal social utility is built using the approaches of the ordinal theory. It is impossible to express the quantified social utility through the value of GDP because, firstly, the GDP may have different structures at the same value, but only one of the many is optimal. Secondly, the value appraisal of the progress of development potential is described by unavoidable features that contribute to the inability of its universal application to assess the utility of the product with the rapid growth of labor productivity.

- The curve map of the equal social utility is defined and invariable only at the time of taking the decision on the choice of the direction of society development and is defined by the production capacity of society, the

structure of its productive forces and needs existing at the time. This choice is made either jointly or by each participant of the economic system individually, always bears the imprint of a subjective decision and may not reflect the optimal development path with absolute accuracy, but is capable to approach it to a greater or lesser extent. After the realization of the chosen direction of movement, the structure of the productive forces of the society and its productive capacity begin to change, thus changing the system of social needs. The curve map of the equal social utility is transformed accordingly. This transformation is usually gradual and evolutionary in nature, but the changes in the needs structure may also occur revolutionary in a rapidly developing society. The biggest, fundamental changes in it will take place under the influence of factors that significantly change the ratio of the marginal productivity of factors of production. Reasons for changing these ratios were first described in a cycle integral theory of A. Hansen (Hansen 2012). This is an emergence or reduction of new business territories, discovery or exhaustion of mineral deposits, significant demographic changes, and major scientific and technical discoveries able to change the organization of the material and technical foundations of the global community and marking the transition to a new, more perfect technological order.

- The optimum at the level of the entire economic system is not identical to the situation arising in the optimization of the functioning of its individual elements by profitability.

The development of the presented model assumes taking into consideration the impact of factors that can affect the movement of the society along the optimal trajectory of development. Supporters of the ecological economics, who highlight the dangers of unbridled economic growth and uncontrolled increase in the scale of civilization activity, list the following main threats to the survival of the mankind:

- The exhaustion of non-renewable natural resources. This includes hydrocarbons, mineral deposits and fresh water reserves. Over a hundred years of the scientific and technological revolution, the mankind has spent a significant proportion of hydrocarbon resources, the formation of which took nature about one and a half billion years. Although the volume of proven reserves continues to grow, the pace of growth in the medium term may be surpassed by the consumption growth rates. The hypothesis of the formation of oil in the deep layers of the earth that is not associated with the transformation of organic plant matter, which arose in result of discovery of large reserves of hydrocarbons through ultradeep drilling, may inspire some optimism, but so far is not absolutely proven. Since the rate of oil extraction exceeds the rate of explored and proven reserves, the more realistic assumption is that the humanity will begin to experience difficulties associated with an absolute reduction in its extraction in 30-35 years, although this process probably will not avalanche and be mitigated by the "gas pause" – the time during which the mankind can have significant reserves of natural gas that would satisfy the necessary volume of consumption.

- The mankind largely transforms mineral resources into toxic waste, which by now has polluted almost all environment areas – land, water, air, and even near space. There are currently about 50,000 pieces of space debris on Earth orbit, and not all of them are environmentally harmless and able to burn in the upper atmosphere without causing environmental damage to the planet. The use of plastic packaging, production of which was originally launched without a specific plan for its disposal, has caused significant problems. Given that the period of the plastic waste breakdown, accompanied by the release of toxic substances, is 200-250 years, laws restricting the use of plastic containers have been adopted in many countries. They were responded with the statements about the invention of the environmentally friendly biodegradable plastic with additional chemical components in its composition. Recent studies have shown that the period of its breakdown and toxicity of breakdown products do not differ from those of conventional plastics, and its use does not lower the environmental damage. (Selke *et al.* 2015)

The use of the first generation of pesticides in the second half of the twentieth century has caused great ecological damage. Road transport causes significant damage to the ecology of cities. Apart from automobile exhausts, the air is filled with the fragments of worn rubber and roadway cover, noise pollution occurs. As a result, it increases the incidence of cancer, allergic, cardiovascular, nervous diseases in population, which entails the need to increase spending on health care and increases the cost of the required product in the total value of the cost of manufactured goods.

- The production activities of the mankind change the nature and frequency of natural and geological phenomena (for example, production of shale gas in the USA has caused an increase in the number of earthquakes, in addition to the contamination of groundwater by toxic agents) and contributes the share of the anthropogenic factor in global climate change that causes a threat of the temperature collapse in result of the process development in blow-up mode. These consequences of industrial and economic activity of the mankind and their negative impact on the environment that threatens the existence of civilization are not factitious and raise

questions about the adjustment of production activities of the mankind and choice of the trajectory of its development, designed to enable it to avoid the realization of a catastrophic scenario.

Let's use our proposed model of economic growth for the graphical interpretation of threats to sustainable development by introducing the factor of constraint and reduction of the part of the resources that are provided by nature and are not reproducible (Figure 2).

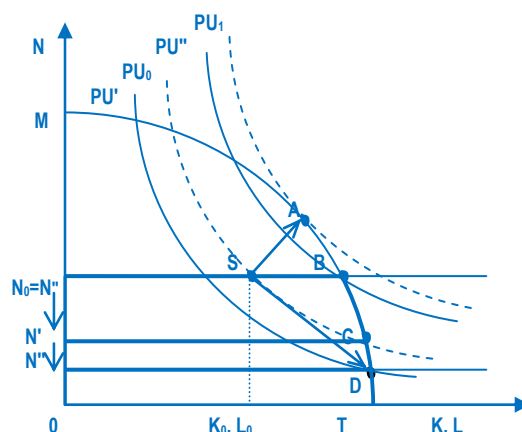


Figure 2 - Dynamic model of economic growth with the resource constraint

Let's show the production capacity curve in the following form. We place the factors of production  $K$  and  $L$ , an increase of which is not directly related to the natural constraints, on the  $x$ -axis. On the  $y$ -axis we will consider a change of the resources, increase in the consumption of which encounters an objective natural limit related to their absolute constraint, depletion or reduction, designating it  $N$  (nature). They are economic areas, the expansion of which is possible only given the existence of the land not yet involved in the economic turnover but suitable for the organization of production, non-renewable reserves of natural raw materials, as well as recreational opportunities of the environment, the regenerating potential of which can be destroyed by excessive anthropogenic load.

Let's suppose that the structure of the productive forces of the society at the initial moment of time is described by a point  $S$  on the social utility curve  $PU_0$ , where the potential of the extended reproduction of all types of resources is described by the production capacity curve  $MT$ . The optimal trajectory of development will then be a shift from point  $S$  to point  $A$  on the social utility curve  $PU_1$  that corresponds to the optimal production choice of the product structure.

Let us assume that the reserve of the limited natural resource is  $N_0$  and cannot be reproduced on an extended scale. The production capacity curve in this case becomes a broken line and takes the form  $N_0BT$ . Obviously, the society will not be able to reach the level of utility  $PU_1$ , but using the relative interchangeability of resources it will try to shift to point  $B$  on the social utility curve  $PU''$ . The choice in this point will represent the angular resolution. Despite the fact that the equality  $MRPT = MRPS$  is not fulfilled there, the level of social utility will be the maximum possible. The achieved level of utility  $PU''$  will still be sufficient to ensure the expanded reproduction conditions in spite of the drop in the marginal productivity of factors  $K$  and  $L$  at the constant factor  $N$  ( $N''=N_0$ ).

Finally, let's consider the worst possible scenario in which the society faces an absolute reduction in the consumed natural raw materials, and recreational opportunities of nature are violated. Graphically, the model will display a situation in which the society would be unable to fully ensure even simple reproduction of exhaustible natural resources in the process of its functioning. These reductions will be expressed in the displacement of the constraint line from  $N_0$  to  $N'$  and then to  $N'''$ . The production capacity curve of the next cycle will change to a broken line  $N'CT$  and further to a broken line  $N'''DT$ . The maximum available level of social utility will first be curve  $PU_0$  and then curve  $PU'$ , which does not ensure even simple reproduction conditions. It is a situation of ecological and economic collapse, the possibility of which was mentioned by the supporters of voluntary restriction of development and zero economic growth: in the process of reproduction, the former capacity is unachievable when using the old conservative technologies, the mankind cannot ensure the former way of its existence and standard of living.

### 3. Result

The presented model does not doom the industrial development. It only shows the need for a system of measures to guide the society development trajectory to an environmentally safe path. The first thing that is offered to form the conditions for development is to ensure an economical mode of consumption, including energy saving. It is difficult to disagree, but this obvious measure is in contradiction with the growth of personal consumption as a measure of success in life put forward by the modern market civilization. The second line of measures is associated with recycling and reuse of waste, replacement of natural hydrocarbons and energy produced using non-renewable resources with environmentally friendly and renewable ones.

However, this method of energy supply is currently less efficient than conventional methods of electricity production in thermal power plants. Morbid fears that have developed after the accidents at Chernobyl and Fukushima-1 nuclear power plants prevent the wide use of new generations of nuclear reactors in some European countries. As for the collection and recycling of production and life waste, achievement of these goals will require not only the development of modern technology to process them, but also considerable organizational effort, expenses and a high level of environmental awareness, which does not always correspond to actual practice. The proposed measures are, of course, necessary, but not sufficient to address the threats to the development of the mankind.

Technically, the way out is seen in development and introduction of a new generation of technologies with so-called "closing nature." Scientific and technological development must define the emergence of technologies that require significantly fewer resources to produce the desired result than currently used. In this case, the structure of the needs of the society will change, which will be reflected on the curve map of the equal social utility. The model describing the rational public choice will take the following form (Figure 3).

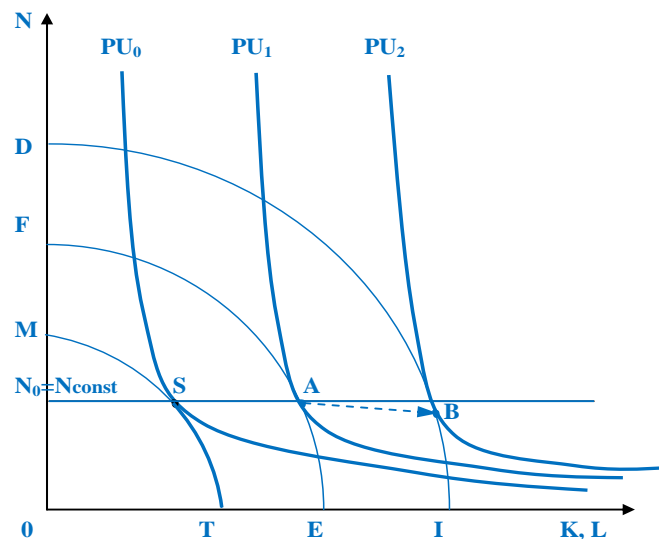


Figure 3 - Dynamic model of rational social choice when using resource-saving technologies

If the initial production potential is described by the ratio of resources at the point S on the social utility curve  $PU_0$  and determines the production capacity curve  $MT$ , and if variable  $N_{const}$  limits natural resources, the initial production capacity curve will take the form of broken line  $N_0ST$ .

The functioning of the economy when using resource-saving technologies will determine the transition to a higher curve of social utility without increasing the consumption of limited natural resources at point A, and the use of more effective "closing" technologies can help shift to point B, where part of the limited natural resources like land will be released from the area of utilitarian use and recreated in its original form as the system of protected lands and national parks.

At the same time, the equality  $MRPT = MRPS$  will be fulfilled both at point A and point B, where the allocation of produced resources in terms of the ratio of their marginal utility (performance) is optimal.

Thus, the situation is theoretically possible in which the use of the resource-saving (closing) technologies may not only prevent the ecological and economic collapse, but also ensure the implementation of such a function of production as the development and perfection of human nature.

#### 4. Discussion

The presented model has its limitations and assumptions. Firstly, it describes the allocation of real resources – land, labor and capital – and does not take into account the effect of monetary factors discussed in detail in macroeconomics, starting from Keynes (2011). It reflects only the actual process of expanded reproduction outside of connection with its specific historical form.

By default, it is assumed that the basic macroeconomic identical equation is ensured, the amount of net savings is equal to gross investment. This brings it closer to the neoclassical theory and determines the possibility of criticism from the neo-Keynesian positions.

Secondly, the further development of the model involves the introduction of another variable – change in the ratio of the marginal productivity of the factors due to scientific, technical and technological innovation, as it was done in the model of Robert Solow (2000). This will undoubtedly reveal the problems associated with the release of not only natural but also human resources. The economic development of the factor "labor" in the conditions of intensive reproduction is usually accompanied by the release of a significant amount of unskilled workforce and the increase in demand for intelligent services. The society may face the increase in the specific variety of structural unemployment, which will require improvement of its social organization aimed at anticipating changes in the area of training the specialists with necessary qualifications for a constantly modernized production.

#### Conclusion

The proposed model indicates the objective possibility of a situation in which the use of the resource-saving (closing) technologies may prevent ecological and economic collapse and ensure the preservation of the sustainable and balanced economic development, as well as the realization of such a production function as the development and perfection of human nature, the formation of a more advanced, creative and functionally effective population. Intensive economic development will require not so much population growth as the growth of its quality.

Constraints of growth in such a system are limited mainly not by deficiency of natural resources, but by the lack of scientific and technical knowledge, level of development of methods and technology and qualification of the workforce. In order to ensure sustainable development in this scenario, it is necessary to maintain a heavy share of spending on fundamental and applied research, general and vocational education in the structure of gross product and the availability of an effective innovation system that can form the conditions of transformation of scientific knowledge into energy saving technologies. The problems of structural unemployment, which objectively emerge in the market system along with its technical and technological development, involve anticipating structural changes in the field of vocational training.

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## Corporate Governance, a Shield of Bankruptcy

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### Abstract

*The primary aim of the paper is to review previous literature with respect to corporate governance, bankruptcy prediction in various ways and the importance of the variables used in predicting bankruptcy. The paper attempts to conduct a literature review, to analyze and synthesize the data from previous studies illustrating the variables used to predict bankruptcy or survival of the business in many developed countries in a group of developed countries such as Italy, the United States, Australia, New Zealand, Spain and France as well as those in a group of developing countries such as China, Malaysia and Thailand. The literature review could gather structural variables of corporate governance. Obviously, the relevant studies reviewed used both quantitative and qualitative research methodologies such as multiple regression, the pooled ordinary least squares, Altman's z-score, t-test, ordinary least squares regression, survival analysis, cox proportional hazard technique, questionnaires (Likert scale), probit regression, generalized least square, McKinsey approach and competing-risks model and so on; and also they have used various variables indicating the corporate governance of the company, leading to the business survival. This research is a beginning point of taking the variables gathered from such literature review in quantitative modeling of study.*

**Keywords:** Corporate governance, bankruptcy, company survival.

**JEL Classification:** G34.

### 1. Introduction

The good corporate governance for listed companies in the year 2012 was the implementation of 15 corporate governance practices in accordance with the Stock Exchange announcement in 2006, equivalent to corporate governance of the Organization for Economic Co-operation and Development (OECD 2004), that is the prototype of the laws and practices of corporate governance of the government and World Stock Exchanges, consisting of principles and good practices divided into 5 categories.

The concept of corporate governance is simply defined as "corporate governance is the relationship between many parties involving making a decision in the aspects of performance and direction of the company". There are three major parties including the board, chief executives of the company and shareholders. The board controls the executives in determining the company direction such as creation of enterprise value and also the major shareholders can appoint a committee (Monks and Minow 2008). The structure of the corporate governance composed of three main groups: shareholders, board of directors and chief executives who play an important role in involving lower-potion persons in other groups such as stakeholders, audit committee and independent board.

Based on literary review, it is found that all these factors affect the bankruptcy of a company listed on the Stock Exchange of Thailand.

### 2. Literature review and theoretical development

Corporate governance of the Organization for Economic Co-operation and Development (OECD 2004), that is the prototype of the laws and practices of corporate governance of the government and World Stock Exchanges, consisting of principles and good practices divided into 5 categories: 1) rights of shareholders, 2) roles of stakeholders, 3) equal treatment of shareholders, 4) responsibility of the board and 5) information disclosure and transparency.

The Stock Exchange of Thailand and the Securities and Exchange Commission (SEC) have adopted several measures to improve the responsibility in shareholder management to increase transparency, revelation and fairness to all shareholders by bringing the west corporate governance to use in Thai culture suitably. Many researchers have pointed out that the mixture forms of corporate governance are appropriate for developing

countries such as Thailand )Keong 2002 and Khan 2004) and expected that there is a modified form of the mechanism of western corporate governance style to suit Thailand.

In 1997, economic crisis in Thailand affected more than 56 listed companies which later were defunct. This caused both governmental and private organizations focus on corporate governance in business management more. Since then, the corporate governance has played an important role in bankruptcy of the companies listed on the Stock Exchange of Thailand more and more due to the idea that good corporate governance would result in creating or adding a value to the company and its shareholders as well as the perspective that the bankruptcy had a relationship to corporate governance )Daily and Dalton 1994). Not only making the financial markets and high quality (Strong investment protection and enforced rules), but also it reassures the investors with belief that the companies are sufficiently effective to survive )Roberto *et al.* 2008). The researchers therefore try to link the corporate governance to the factors influencing bankruptcy. As can be seen in the results of several studies )Limpaphayom and Connelly 2004, Nam and Lum 2005), they indicate that corporate governance and information disclosure system in Thailand had been weak before 1997 financial crisis.

The Stock Exchange of Thailand has tried to improve regulatory compliance and implementation of the organizations in regards to the disclosure and transparency of financial report since such financial crisis. The influencing factor includes the characteristics of corporate governance consisting of internal characteristics such as board size, audit committee, women on board, leadership structure, ownership concentration, number of meetings, company ages and company size and external characteristics such as independent board, auditor reputation (Brown *et al.* 2011). Based on literary review, it is found that all these factors affect the bankruptcy of a company listed on the Stock Exchange of Thailand.

The paper is structured as follows. Section 2 shows the evolution of corporate governance in Thailand and Section 3 explains the relationship between corporate governance structure and corporate survival and its variables obtained through the process of literature review is detailed. The main conclusions are in the final section.

### **3. Evolution of corporate governance in Thailand**

Most businesses today are in capitalism with the main goal of acquiring the highest profit (Smith 1776). More intense competition is a driving force of the business to act in any way in order to achieve the set goals. This does not reflect the real economic event in the world of globalization.

Scandal of corruption, information distortion including management mistakes of large multinational companies with unreliability strongly indicates a lack of operating systems with corporate governance and impacts on the macro economy and society as a whole. This also makes corporate governance more important. The incident leads many of both local and international business in the United States to signal the disaster due to the lack of ethics, transparency or a lack of good corporate governance. This causes many companies which experienced problems leading to company closing down use the corporate governance in company operation to prevent such situation. Corporate governance therefore plays an important role in national business operations and corporate sustainability.

Corporate governance is the system that provides the structure and process of relations between the Board, management department and shareholders to build capacity in the competition contributing to the growth and increase of value for the shareholders in the long term by taking into account of other relevant stakeholders (The Stock Exchange of Thailand 2005). Each country has a different structure and corporate governance criteria (Johnson *et al.* 2000).

Thailand has developed a system of corporate governance continuously after the economic crisis in 1997, resulted from ineffective corporate governance, lack of transparency. This led closing down of 56 companies listed on the Stock Exchange of Thailand (The Stock Exchange of Thailand: SET) and heavily impacted the capital market of Thailand. As a result, it became the crisis of East Asia. Later in 2012, the World Bank assessed the corporate governance of the Stock Exchange of Thailand with the scores high at 82.83, ranked as the top in the region in the category of disclosure and transparency. The disclosure in the annual reports of listed companies, mainly have to meet international standards. This also included improving legislation and regulations in order to encourage the development of good corporate governance. The assessment result reflects the corporate governance of the Stock Exchange of Thailand developing at a breathtaking pace, with the collaboration of many departments to change the laws, rules and practices laid down. This causes the corporate governance of the capital market in Thailand recognized internationally.

For the concept of corporate governance, the management or executive calls 'agent' and equity calls 'principal' (Bonazzi and Islam 2007), the shareholders hire the management agent to achieve the goal and the principal pays the agent under the agreement and performance. (Intakhan and Ussahawanitchakit 2009) However,

potential conflicts between the principal and agent in managing. (Jensen and Meckling 1976) The shareholders therefore will be monitoring the implementation of activities by appointing the agent called the board to control and monitor in order to reduce conflicts between agency problems. This causes the corporate governance have the relationship between the board. The administrator or the executives and the shareholders make a decision on the performance and direction of the company with the potential of three important groups: board, executive and shareholders. This creates the capacity in the competition led to the growth and increases long-term value to the shareholders. (Monks and Minow 2008)

Corporate governance plays an important role in predicting failure of listed companies of Thailand more as the idea that good corporate governance will result in creating a value or added value to the company and its shareholders. Additionally, there was a study of the failure related to the corporate governance (Daily and Dalton 1994), which makes high-quality financial markets, care of investment, strict enforcement of rule use, reassuring of investors and creating a belief that the effective implementation of the company is caused by corporate governance only (Pietr *et al.* 2008). This leads many researchers to study the relationship between characteristics of corporate governance and the financial failure. The study results of Limpaphayom and Connelly (2004), Nam and Lum (2005) show that the corporate governance and information disclosure system in Thailand were weak before the financial crisis in 1997. After such crisis, many organizations have tried to enforce and improve the regulatory compliance and disclosure, transparency in reporting financial documents.

#### 4. Relationship between corporate governance structure and corporate survival

There are many studies that examine the relationship of the corporate governance structure and firm performance, influencing the business survival, such as the studies of Maran and Indraah (2009), Hu, Tam and Tan (2010), Chitnomrath *et al.* (2011), Luckerath-Rovers (2011), Chancharat *et al.* (2012), Azmi and Barrett (2013) and Velnampy (2013) consistent with the studies of Zong-Jun and Xiao-Lan (2006) finding that there is a relation of the corporate governance characteristics and risk of financial crisis occurrence in China.

In this section, there will be a review of the relationship between variables in the corporate governance structure and collecting the research methodologies found in the past studies as shown in Table 1. The study of the corporate governance structures classifies as internal and external attributes (Brown *et al.* 2011). The internal attribute is a characteristic resulted from the decision and the actions of the shareholders and company board committees. The external attribute is the audition of a third party, investment institutions and external auditors. This study will firstly illustrate the internal characteristics and the external characteristics will be described afterwards.

##### 4.1. Internal characteristics

###### Board Size

The board is important to the company as its role in determining policies, implementation, rules and regulations of the company, including a focus on compliance with corporate governance principles (Bupakarakul 2008). For factors involving number of the board, although there is no clear definition of the appropriate board size, the big size of the board could make the company operation more effective (Goktan, Kieschnick and Moussawi 2006) as the effective consultation before making decisions on the company's matters can be carefully performed.

The study of Haniffa and Hudaib (2006) mentioned that there is a correlation between the board size and company's operating results. That is, the firm with a large size of the board makes its company performance better because of board's experience and a variety of perspectives in choosing the best option for the company. This is consistent with the studies of Noor and Iskandar (2012) finding that there is relation between the board size, company survival and risk reduction of the company's bankruptcy. Additionally, it increases the benefits for the company, if there is a large size of the board )Coles, Daniel and Maveen 2008, Lehn, Patro and Zhao 2008). Moreover, it causes the administration flexibility resulting in performance increases. (Graham, Hazarika and Marasimhan 2011)

Anyhow, this contrasts with the study of Fich and Stezak (2008) arguing that if the company board size is small, it has a better chance to avoid the failure of the company than the company with the large board size. (Susan *et al.* 2002, Xie *et al.* 2003, Chiang and Chia 2005, Coleman 2007, Roberto *et al.* 2008, Mohamed *et al.* 2009 and Eyenubo 2013)

Furthermore, the study of Bupakarakul (2008) said that the board size is related to operating results in opposite direction of the findings of Hermalin and Weisbach (2000). This is the same as the study of Suleiman, 2014 finding that the board size has the relationship in the opposite direction with account reporting. That is, the large board size results inexact accounting report based on the perspective diversity.



Alternatively, that of Tachapichaya (2007) insisted that the board size has no effect on company's operations at all.

#### *Women on Board*

Currently, many researchers are interested in the studies of business management performed by women (Yasser 2012). Since 21<sup>st</sup> century, the number of female workers who drive the business has increased. This results in a difference in the races, ways of life and span of age (Langdon, McMenamin and Krolok 2002). A feminine has important characteristics for business management with efficiency consisted of precision, risk-averse, capacity of accounting and finance, and a good decision (Azmi and Barrett 2013). Vandergrift and Brown (2005) and Wester *et al.* (2007) insisted the theory that women are more risk-averse than men. This results in the difference of attitudes towards risk between the male and the female board. This affects the financial decisions of the company.

In Thailand, a country in Asia, the rate of business succession of women is lower than in the West, but it is likely to increase (Bull 2001 and Morris *et al.* 2003). Board gender diversity can help an audit process (Molero, 2011) and increase the operating efficiency of the company (Dwyera, Richard and Chadwick 2003, Krishnan and Parsons 2008). Moreover, in 2012, it caused the improvement of the corporate governance of the listed companies in the Stock Exchange of Thailand and led the companies to have its board with a diversity of genders (Center of Corporate Governance 2014). This is the same as the national organization with a tendency in having more gender diversity on board. The study of Petpairote and Chancharat (2015) found that gender diversity on the board has relationship with the firm performance (ROA) in an overview of the companies listed on the Stock Exchange of Thailand.

#### *Leadership Structure*

Normally, the chairman should be selected from the independent board and should not be the same person as the Chief Executive Officer (CEO) so that there is the division of responsibilities in determining policies, governance and management (The Stock Exchange of Thailand 1999). This is a management system that balances the power (Pannarong 2010). The company positions can be structured in accordance with the principles that the positions of President and CEO should not combined. Moreover, the chairman should be independent, not the representative of the major shareholders or stakeholders because this may affect the company's operations. If the CEO and Chairman is the same person, this provides the executive freedom in operating the company without shareholders and stakeholders' interest consideration. It may cause damage to the company and the operation outcomes. (Bupakaraku 2008)

The study of Coleman (2007) indicates the combination of the CEO and Chairman has the relationship in the opposite direction on the value of the shareholders in listed companies in the Stock Exchanges of South Africa, Ghana, Kenya and Nigeria. This is consistent with the study of Haniffa and Hudaib (2006) illustrating the same connection (Tachapichaya 2007, Jiamasakul 2007 and Bupakaraku 2008). This is the same as the studies of Noor and Iskandar (2012) finding that there is a relationship in the opposite direction between administration by CEO and Chairman as the same person, and the company survival.

It is also in line with the study of Susan *et al.* (2002) and Abdullah (2006) finding that the companies with separation of Chairman and CEO lead to better operations than those with merge of the positions mentioned. The management by the committee with the administrative positions has a relationship in the opposite direction from financial problems.

However, the study conducted by Abdullah (2006) did not find the relationship between CEO and Chairman positions' consolidation and the risk of financial problems.

#### *Ownership Concentration*

According to agency theory, which plays a role in optimizing the company management and supervision (Arthur *et al.* 1993), this could allow an agent with the major shareholder who have the sufficient right to vote, to take the company controls (Controlling Shareholder) as can be seen in the case of a family business. Ownership concentration may raise conflicts of interests between the major and minority shareholders instead of the conflicts between the board and shareholders. This causes the actions of the board in taking into account of the interests of the major shareholders as important.

Ownership concentration has resulted in the opposite direction to the efficacy of the company (Hu, Tam and Tan 2010) and also increases the bankruptcy risk of the listed companies in Thailand before the bankruptcy crisis (Thanida, Robert and Theo 2011). The ownership concentration structure tends to be dominated by the major

shareholders with sufficient voting rights in controlling the company (Hutchinson and Gul 2004). If there is suitability of stockholding proportion, it reduces the risk of financial problems. (Hui and Jing-Jing 2008)

#### Number of Meetings

Audit committee is the major mechanism to be established to provide the companies with good corporate governance. Qualifications of audit committee, meeting regulations, duties and responsibilities must ensure that financial reports released are reasonably accurate. ) Kanyakiti 2010) The number of meetings each year is depended on the size of the company and duties assigned. Four meetings per year may subject to a special meeting of the audit committee when there is the issues needed to be discussed together, if requested by the audit committee, auditors, internal auditors or the chairman (The stock exchange of Thailand 1999). Although there are no guidelines set for the number of meetings each year, the companies have to disclose the number of meeting attendance of each director. (NCGC 2005)

The meeting becomes very important in exchange of information and the interaction of the committee. It enhances the quality and quantity of useful information to take care of the company and reduces reliance on external data. This also increases independence of the committee (Martin 2005). The study of Xie *et al.* (2003) found that the number of meetings of the audit committee is associated with earning management in the opposite direction. If there are too many meetings (Abnormal Board Activity) or special meetings, it may reflect the company problems and bankruptcy. (Vafeas 1999, Hu, Tam and Tan 2010)

#### Audit Committee

Audit committee works in monitoring the business so that the company possibly has good internal controls and creates a quality audit (Al- Ajmi 2009), including making the company activities to meet the requirements of the Stock Exchange of Thailand because it is an independent organization that provides support and acts on behalf of the board to check the financial information presented to the shareholders and stakeholders, and to examine a risk management system, an internal control system, an internal audit system as well as communications with the company auditors to make the company adhere to the governance principles.

Accordingly, the organization with an audit committee will prepare a more reliable report on the financial statements ) Beasley and Salterio 2001 and Vafeas 2005). The audit committee has a direct responsibility for the appointment, remuneration determination and control of the external auditor performance. In Thailand, the audit committee should include independent members apart from those involving with company administration at least three in five people )Center of Corporate Governance 2014). This regulation reduces the likelihood in the way that the audit committee might be interrupted the major shareholder.

#### Company Ages

The old companies usually have much more experience in developing a learning model for the company survival than the new companies that have high risk of bankruptcy due to lack of experience in the business. Therefore, ages of the company can indicate a financial failure (Rommer 2005, Hensher and Jones and Greene 2007). However, the study of Joo (2009) finds that the companies with a long period of its business operation has tendency in conflict occurrence between the current stockholders and the original ways of administration.

#### Company size

The size of the company may influence the company's bankruptcy. The big companies are likely to have higher advantage over the smaller companies as they have the business power and channels of goods distribution and services.

The study of Bupakarakul )2008( said that the company size is correlated with the performance in the same direction. Similarly, the research of Szep (2007) indicated that because large companies can access to the capital easier, it causes lower financial cost. However, the small companies are mostly owned by a company executive, this makes the benefits of ownership relevant to the shareholders. It results in increased agent problems. This is also consistent with the study of Beiner *et al.* (2004) finding that the company size is related to the performance of listed companies in Switzerland in the same direction; similarly, the study of Niyomtrong )2007), Noor and Iskandar (2012) found that the size of the listed company has a correlation with company performance resulting in the company survival.

## 4.2. External characteristics

### *Independent Board*

One important mechanism of board structure is the composition of the board (George and Karibo 2014). Which is the board that does not directly involve with the finance and family; it is not connected to the administration. (Hermalin and Weisbach, 2003)

More effectively than the dependent board, the independent boards have a primary duty to check and balance the executive power, to control decisions and eliminate conflicts of interests between shareholders and administration department, in accordance with executive' agency theory, as the theory states that people are motivated to focus on the personal benefits. )Letza *et al.* 2008)

The board appointed by external people will work to protect the interests of all shareholders. Not likely, it depends the top executives yet it will monitor the executives' performance effectively (Hu, Tam and Tan 2010, Apadore and Zainol 2014) because of the need in its reputation protection. This causes the independent board become an important variable in corporate governance in reducing the problems caused by the agents. This is consistent with the studies of Adams and Ferreira, 2007 and Suleiman, 2014 indicating that that the independent board has the relationship in the same direction with the account reporting which can reflect the capacity of business performance of the company. In other words, the independent board does not gain benefits from the company, the board therefore can work in accordance with its duties assigned.

Moreover, the study by Jiamsakul (2007) describes that a higher proportion of independent board reduces the problem of agents and improves operation results (Ho and Wong 2001, Tachapichaya 2007, Roberto *et al.* 2008 and Pupanit 2010).

This is inconsistent with the studies of Shamsul Nahar (2006), Adams and Mehran (2011) finding that there is no relationship between the proportion of the independent board and financial problems.

### *Audit Committee's Reputation*

The opinion of the auditor can give reliability of the financial reports to the data users. Theoretically, the auditor will mainly act for the benefit of the shareholders in order to alleviate agency problems between the principles and agents. It is therefore necessary that the executives hire the auditors serving with the high quality standards of service. Hiring large audit firms such as Deloitte & Touche, Ernst & Young (EY), KPMG and Pricewaterhouse Coopers (PwC) (Big four firm network, 2015) has a relation resulting in quality auditing over hiring small audit firms (Al – Ajmi 2009). This can attract investment. It is said the large audit firms provide high quality audit, this is one of the ways in preventing profit management.

Based on the literature review of the relevant studies related to relationship between corporate governance and bankruptcy, it is found that there are many factors and methods used to study such relationship as shown in Table 1.

## **Conclusion**

This paper has conducted a literature review and synthesized the structural variables of corporate governance related to firm performance in order to create the model used to predict survival or failure of the business. It also has collected the samples in many countries such as China, Italy, the United States, Malaysia, Australia, New Zealand, Spain, France and Thailand, and a variety of both quantitative and qualitative statistical studies such as analytical methodologies of multiple regression, the pooled, ordinary least squares, Altman's z-score, the interest coverage ratio (ICR), t-test, ordinary least squares regression, survival analysis, cox proportional hazard technique, questionnaires (Likert scale), probit regression, generalized least square, McKinsey approach and competing-risks model and etc.

According to the literature review, it was found that each research used similar variables such as board size; positions combination of Chairman and CEO; and shareholders' concentration etc. Based on agency theory, there are important people including the audit committee and independent board involved in monitoring the management and power balance to avoid conflicts of interests. However, it is to be noted here that there is no previous research investigating in this following contexts such as a relationship between the proportion of female board and firm performance. This is a new studied context in Thailand. In the year 2009, the female board caused a variety of ideas, consistent with the improvement of corporate governance for listed companies.

Table 1 - Literature review of the relevant studies related to relationship between corporate governance and bankruptcy

No.	Researchers	Nations	Study Period	Variables	Methods of study
1	Xie <i>et al.</i> (2003)	USA	1992, 1994, 1996	Positions' combination of Chairman and CEO, Board structure, Board size, Number of meetings, Number of audit committee	Ordinary Least Squares
2	Fich and Slezak (2008)	USA	1992- 2000	Number of independent board, Board size, Institution shareholders, Company size, Board shareholders, Length of service, CEO, Age of CEO, Number of meeting, Growth opportunity, Board resignation	Altman's Z-score, the interest coverage ratio (ICR)
3	Pietra <i>et al.</i> (2008)	Italy	1993- 2000	Market share, Financial assets, Operational assets, Board size, Proportion of independent board	The pooled Ordinary Least Squares
4	Chancharat <i>et al.</i> (2012)	Australia	1994- 2002	Board size, Proportion of independent board, Structure of positions' combination, Ownership concentration, Offered price, Difference of companies' ages, Difference of marketing costs during and after selling, Auditor reputation, Risk factors, Financial ratio, Company size	Survival Analysis by Cox Proportional Hazard Technique
5	Beasley and Salterio (2001)	Canada	1994	Board positions, Position separation of Chairman, Board size, Audit committee, Board experience, Company size	Probit Regression
6	Lamberto and Rath (2008)	Australia	1995-1997	Length of service, Offered prices, Company size, Ownership concentration, Audit company reputation, Earning ratio, Number of risk factors in reports, Positions' combination of Chairman and CEO, Board number, Proportion of independent board, Financial ratio	Cox Proportional Hazard
7	Haniffa and Hudaib (2006)	Malaysia	1996- 2000	Financial ratio, Board size, Board positions, Positions' combination of Chairman and CEO, Five levels of ownership concentration, Board shareholders, Company size, Types of industry, Costs	Multiple Regression model
8	Szep (2007)	Romania	1997- 2007	Proportion of ownership concentration	Ordinary Least Squares
9	Ponnu (2008)	Malaysia	1999- 2005	Positions' combination of Chairman and CEO, Independent board proportion	T-test
10	Chitnomrath <i>et al.</i> (2011)	Thailand	1999- 2002	Independent board size, Company shareholder proportion, Types of industry, Types of company	Ordinary Least Squares Regression
11	Rommer (2005)	Italy, Spain, France	2000- 2002	Financial ratio, Company size, Length of service, Number of shareholders, Types of industry	Competing-Risks model

No.	Researchers	Nations	Study Period	Variables	Methods of study
12	Elsayed (2007)	Egypt	2000- 2004	Positions' combination of Chairman and CEO, Board size, Institute Shareholders, Board shareholders, Business size, Ratio of debt to total assets, Fixed assets to total assets ratio, Business ages	Multiple Regression model
13	Maran and Indraah (2009)	Malaysia	2000- 2006	Gender, Racial diversity, Company size, Length of service, Financial ratio	Ordinary Least Square
14	Chiang and Chia (2005)	Taiwan	2001	Board structure, Proportion of independent board, Positions' combination of Chairman and CEO, Shareholder structure, Proportion of board shareholders, Proportion of institution Shareholders	Multiple Regression model
15	Hu, Tam and Tan ( 2010)	China	2003- 2005	Ownership concentration, Independent board size, Internal committee, External committee, Company Size, Board size, Number of meetings	Multiple Regression model
16	Bathul (2008)	New Zealand	2004- 2007	Board size, Ownership concentration, Positions' combination of Chairman and CEO, Gender diversity, Education, Number of meetings, Company size, Length of service	Generalized Least Square
17	Jiamsakul (2007)	Thailand	2005	Board positions, Board leadership, Board size, Number of board meetings, Number of audit committee meetings	Multiple Regression model
18	Luckerath-Rovers (2011)	Netherland	2005- 2007	Asset size, Board size, Size of female board, Financial ratio, Share price, With or without female board	McKinsey Approach
19	Noor and Iskandar (2012)	Malaysia	2005- 2011	Financial ratio, Structure of leaders, Committee activities, Equality of shareholders, Company size, Audit company reputation	Survival Analysis by Cox Proportional Hazard Technique
20	Minguez-Vera and Lopez-Martinez (2010)	Spain	2007	Financial ratio, Proportion of female board, Number of female board (Less than one or not), Risk management, Length of service, Company size, Board size	Logit Regression
21	Velnampy (2013)	Sri Lanka	2007- 2011	Board structure, Board size, Independent board, Number of meetings, Audit committee	Multiple Regression Analysis
22	Chaghadari (2011)	Malaysia	2007	Proportion of independent board, Positions' combination of Chairman and CEO, Board shareholders, Board size, Company size, Financial ratio	Linear Multiple Regression
23	Azmi and Barrett (2013)	Malaysia	2011	Women on board, International board, Board ages, Length of service, Positions' combination of Chairman and female CEO, Business ages, Types of industry, Technology usage, Financial efficacy	Questionnaire, Likert scale

Source: Review Literature.



Consequently, there is a study of these variables for creating a better model to predict the survival of business. The research methods of the past studies such as those of Xie *et al.* (2003), Chiang and Chia (2005), Minguez-Veraand Lopez- Martinez (2010), Hu, Tam and Tan (2010) and Chitnomrath *et al.* (2011) were the long term studies, which may give inaccurate results because when the businesses were experiencing financial failure or were closed down, the samples studied would have incomplete information used as predictive information. While there will be the survival analysis of the business with Cox proportional hazard technique, such samples can be used to study perfectly.

The only limitation of this study included a review of the variables governance structure which is non-financial variable, and a lack of the literature review relating to the financial variables such as Profitability Ratios, Liquidity Ratios, Activity Ratios and Leverage Ratios as the financial variables can be used to explain the relationship between corporate governance and bankruptcy. If there is a study of both variables, this research will be more complete and will indicate the more complete information. (Hensher, Jones and Green 2007)

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