

**UNIVERSITY OF PITEȘTI**  
**Faculty of Economic Sciences**

# **SCIENTIFIC BULLETIN**

**- ECONOMIC SCIENCES -**

**(BULETIN ȘTIINȚIFIC - SERIA ȘTIINȚE ECONOMICE)**

**Volume 11 / Issue 2**  
**PITEȘTI - 2012**

**ISSN: 1583 – 1809**



## CONTENTS

<b>1. HABITS, SAVING PROPENSITY, AND ECONOMIC GROWTH .....</b>	<b>3</b>
<i>Wei-Bin ZHANG.....</i>	<i>3</i>
<b>2. FROM EFFICIENT MARKET HYPOTHESIS TO BEHAVIOURAL FINANCE: CAN BEHAVIOURAL FINANCE BE THE NEW DOMINANT MODEL FOR INVESTING? .....</b>	<b>16</b>
<i>Anastasios KONSTANTINIDIS, Androniki KATARACHIA, George BOROVAS and Maria Eleni VOUTSA.....</i>	<i>16</i>
<b>3. IMPLEMENTATION OF STATE AID POLICY FROM THE EUROPEAN UNION IN ROMANIA.....</b>	<b>27</b>
<i>Cristina BÂLDAN.....</i>	<i>27</i>
<b>4. THE IMPACT OF TRUST ON KNOWLEDGE TRANSFER IN INTERNATIONAL BUSINESS SYSTEMS.....</b>	<b>39</b>
<i>Yannis A. HAJIDIMITRIOU, Nikolaos S. SKLAVOUNOS and Konstantinos P. ROTSIOS..</i>	<i>39</i>
<b>5. USING THE SWOT MODEL IN ESTABLISHING THE STRATEGY AT AUTOMOBILE DACIA GROUPE RENAULT COMPANY .....</b>	<b>50</b>
<i>Puiu GRĂDINARU, Doruleț GRĂDINARU .....</i>	<i>50</i>
<b>6. THE ACCURACY OF UNEMPLOYMENT RATE FORECASTS IN ROMANIA AND THE ACTUAL ECONOMIC CRISIS.....</b>	<b>56</b>
<i>Mihaela BRATU (SIMIONESCU).....</i>	<i>56</i>
<b>7. INTERNET ADDICTION IN BALKAN AND SOUTH-EASTERN EUROPEAN COUNTRIES .....</b>	<b>68</b>
<i>Stavros VALSAMIDIS, Athanasios MANDILAS, Ioannis PETASAKIS, Elena CARAMAN... 68</i>	
<b>8. RECRUITMENT PRACTICES AND CRITERIA OF THE SUPPLIERS OF THE AUTOMOTIVE INDUSTRY.....</b>	<b>82</b>
<i>Mădălina BRUTU, Daniela MIHAL.....</i>	<i>82</i>
<b>9. SOCIAL, ECONOMIC AND ACCOUNTING SUMMARY OF THE GREEK AGRICULTURAL SECTOR 1950-2010: CENTRAL GREECE REGION .....</b>	<b>90</b>
<i>Michail Th. PAPAILIAS .....</i>	<i>90</i>
<b>10. A STRUCTURAL MODEL DESCRIBE CHINESE TRADESMEN ATTITUDES TOWARDS GREEK STUDENTS CONSUMPTION BEHAVIOR .....</b>	<b>102</b>
<i>Sofia D. ANASTASIADOU .....</i>	<i>102</i>
<b>11. SOLVENCY II – THE NEW EU SOLVENCY REGIME ON THE INSURANCE MARKET</b>	<b>112</b>
<i>Emilia CLIPICI.....</i>	<i>112</i>

### Scientific Committee

- Professor Ionel DIDEA – Ph.D., Rector of University of Pitesti
- Professor Constantin DRĂGHICI - Ph.D., Vice Rector of University of Pitesti
- Professor Woodrow H. Sears, Ed.D. College of Social Sciences, Vilnius, Lithuania
- Professor Anastasios KARASAVVOGLOU – Ph.D., Kavala Institute of Technology, School of Business and Economics, Greece
- Professor Marta Christina SUCIU - Ph.D., Academy of Economic Studies, Bucharest
- Professor Constanta IACOB - Ph.D., Faculty of Economics and Business Administration, University of Craiova
- Professor Stavros VALSAMIDIS - Ph.D., Kavala Institute of Technology, Greece
- Professor Mihaela DIACONU – Ph.D., Faculty of Economic Sciences, University of Pitesti
- Professor Gheorghe BARBU - Ph.D., Faculty of Mathematics and Computer Science, University of Pitesti
- Professor Emilia UNGUREANU - Ph.D., Faculty of Economic Sciences, University of Pitesti
- Associate Professor Luminita SERBANESCU - Ph.D., Faculty of Economic Sciences, University of Pitesti
- Associate Professor Magda RADULESCU - Ph.D., Faculty of Economic Sciences, University of Pitesti
- Associate Professor Doruleț GRADINARU - Ph.D., Faculty of Economic Sciences, University of Pitesti
- Associate Professor Gheorghe SĂVOIU, Faculty of Economic Sciences, University of Pitesti
- Assistant Professor Amalia PANDELICA – Ph.D., Faculty of Economic Sciences, University of Pitesti
- Assistant Professor Daniela Melania MIHAL – Ph.D., Faculty of Economic Sciences, University of Pitesti
- Assistant Professor Emilia CLIPICI – Ph.D., Faculty of Economic Sciences, University of Pitesti

### Editorial Board

- ♦ Assistant Professor Daniela PIRVU - Ph.D., Dean of Faculty of Economic Sciences (MANAGING EDITOR)
- ♦ Professor Bertrand Pauget, European Business School Paris, France (ASSOCIATE EDITOR)
- ♦ Professor Vasilica CIUCĂ - Ph.D., General Manager of INCSMPS, Bucharest (ASSOCIATE EDITOR)
- ♦ Professor Rodica Milena ZAHARIA – Ph.D., Academy of Economic Studies, Bucharest (ASSOCIATE EDITOR)
- ♦ Professor Pavlos DELIAS – Ph.D., Kavala Institute of Technology, Greece
- ♦ Professor Ion LUNGU – Ph.D., Academy of Economic Studies, Bucharest
- ♦ Assistant Professor Ion Lucian CATRINA, “Dimitrie Cantemir” Christian University, Bucharest
- ♦ Assistant Professor Violeta DOMANOVIC (TERZIC) - Ph.D., Faculty of Economics, University of Kragujevac, Serbia (ASSOCIATE EDITOR)
- ♦ Associate Professor Claudia BURTESCU – Ph.D., Faculty of Economic Sciences, University of Pitesti (EDITOR)
- ♦ Associate Professor Victoria FIRESCU - Ph.D., Faculty of Economic Sciences, University of Pitesti (EDITOR)
- ♦ Associate Professor Emil BURTESCU – Ph.D., Faculty of Economic Sciences, University of Pitesti (EDITOR)
- ♦ Assistant Professor Cristina BALDAN, Faculty of Economic Sciences, University of Pitesti (EDITOR)
- ♦ Assistant Professor Consuela NECSULESCU, Faculty of Economic Sciences, University of Pitesti (EDITOR)
- ♦ Assistant Professor Tiberiu AVRAMESCU - Ph.D., Faculty of Economic Sciences, University of Pitesti
- ♦ EDITOR-IN-CHIEF - Associate Professor Logica BĂNICĂ - Ph.D., Faculty of Economic Sciences, University of Pitesti
- ♦ EDITORIAL SECRETARY - Assistant Professor Ramona POPESCU - Ph.D., Faculty of Economic Sciences, University of Pitesti
- ♦ EDITORIAL SECRETARY - Assistant Alina HAGIU - Ph.D., Faculty of Economic Sciences, University of Pitesti

## HABITS, SAVING PROPENSITY, AND ECONOMIC GROWTH

Wei-Bin ZHANG

Ritsumeikan Asia Pacific University, Japan

[wbz1@apu.ac.jp](mailto:wbz1@apu.ac.jp)

***Abstract:** The purpose of this paper is to study economic growth with preference change on the basis of the Solow one-sector growth model, Zhang's alternative approach to household behavior, the Ramsey growth theory with time preference, and the traditional growth model with habit formation. The propensity to save is dependent on wealth and current income and the propensity to consumption is related to the habit stock. We simulate the model and demonstrate the motion of the economic dynamics with endogenous preference. We also examine effects of changes in some parameters on the motion of the economic system.*

***Keywords:** habit stock, propensity to save, endogenous preference, economic growth*

**Jel Classification Codes: O41**

### 1. INTRODUCTION

Different people have different preferences. For instance, according to the empirical study by Lawrance (1991), nonwhite families without a college education have time preference rates that are higher than those of white. Becker and Mulligan (1997) showed that expenditures in health and education tend to make people more patient and increase savings (e.g., Fuchs, 1982; Shoda *et al.*, 1990; Olsen, 1993; Kirby *et al.* 2002; and Chao *et al.*, 2009). Preferences are changeable and many factors may attribute to these changes. In *The Theory of Moral Sentiments*, Adam Smith illustrates: "The man who lives within his income is naturally contented with his situation, which, by continual, though small accumulations, is growing better and better every day. He is enabled gradually to relax, both in the rigour of his parsimony and in the severity of his application; and he feels with double satisfaction this gradual increase of ease and enjoyment, from having felt before the hardship which attended the want of them." Fisher (1930: 72) emphasizes the influence of wealth and income on preference difference: "Poverty bears down heavily on all portions of a man's expected life. But it increases the want for immediate income even more than it increases the want for future income." Fisher (1930: 81) also points out connections between culture and preference: "In the case of primitive races, children, and other uninstructed groups in society, the future is seldom considered in its true proportions." He also mentions cultures and other factors such as self-control, habit, concerns for the lives of other people, and fashion. Many empirical studies also show preference changes in association with other changes in social and economic conditions. For instance, Horioka (1990) and Sheldon (1997, 1998) attributed Japan's high saving rates partly to the government's efforts in promoting the virtues of patience and thrift.

In the literature of economic growth and development, the Ramsey model has played the role of a core model in the development of theoretical dynamic model. As observed by Becker and Mulligan (1997: 729), "Time preference plays a fundamental role in theories of saving and investment, economic growth, interest rate determination and asset pricing, addiction, and many other issues that are getting increasing attention from economists. Yet, since Samuelson's [1937] discounted utility model, rates of time preference are almost invariably taken as "given" or

exogenous, with little discussion of what determines their level.” In fact, there are many studies on growth with preference change. A main approach is the approach of the so-called endogenous time preference. Strotz (1956) argued that discount functions are formed by teaching and social environment. The formal modeling in continuous time formation starts with Uzawa’s seminal paper (Uzawa, 1968). Like Uzawa, Lucas and Stokey (1984) and Epstein (1987) relate change in time preference to consumptions. From their analysis, Becker and Mulligan (1997: 745) conclude: “persons who are richer because they have more assets would be more patient than persons with fewer assets. It also implies that higher incomes due to greater earnings may have a different effect on the degree of patience than higher income due to greater assets, although the existence of a time cost does not necessarily allow us to rank the magnitude of the two effects.” They also point out the possibility “to distinguish a “wealth causes patience” hypothesis from a “patience causes wealth” hypothesis.” (Becker and Mulligan, 1997: 746). Becker and Barro (1988) assumes that a parent’s generational discount rate is connected to their fertility. Many other studies on the implications of endogenous time preference for the macroeconomy have been conducted, for instance, Epstein and Hynes (1983), Obstfeld (1990), Shin and Epstein (1993), Palivos *et al.* (1997), Drugeon (1996, 2000), Stern (2006), Meng (2006), and Dioikitopoulos and Kalyvitis (2010). These studies have shown theoretically that it is important to take account of the endogeneity of time preference in explaining economic growth and development. The idea of analyzing change in impatience in this study is influenced by the literature of time preference. We introduce changes in impatience in an alternative utility proposed by Zhang (2005, 2009).

Another aspect in modeling preference change is related to the so-called habit formation or habit persistence model, which was introduced to formal economic analysis by Duesenberry (1949). The concept implies that individuals tend to get accustomed to a given “standard of living” which they like to keep. Becker (1992) explains the influence of habit on human behavior as follows: “the habit acquired as a child or young adult generally continue to influence behavior even when the environment changes radically. For instance, Indian adults who migrate to the United States often eat the same type of cuisine they had in India, and continue to wear the same type clothing.” Habit formation is also applied to financial economics to explain the equity premium puzzle first identified in the seminal work of Mehra and Prescott (1985) (See also Sundaresan, 1989; Constantinides, 1990; and Campbell and Cochrane, 1999). Using the concept of habit, de la Croix (1996) explains oscillations in economic dynamics in a competitive economy. In the model, the aspirations of the new generation are so high at some point of an expansion that savings are depressed to maintain consumption standards, which leads to a contraction. The contraction ends when aspirations became lower. Boldrin *et al.* (2001) use the habit formation model to explain asset prices and business cycles with inflexibilities in some factor markets. There are also studies to explain the observed behavior at business-cycle frequency of a large number of macroeconomic variables (Christiano *et al.* 2005). In some models habit is treated external to the consumer (Pollak, 1970). The stock of habit depends on the history of aggregate past consumption rather than the consumer’s own past consumption. Since the work of Abel (1990), ‘catching up with the Joneses’ is often used exchangeable with external habit formation. This assumption often simplifies the optimal problem because the evolution of habit is exogenous by the representative agent. Ravn *et al.* (2006) build a general equilibrium model of habit formation on a good-by-good basis. This type of habit formation is referred as ‘deep habits’. In this model, consumers can form habits independently over narrowly defined categories of goods, such as housing, clothing, tourist resorts and cars. Huang (2012) builds a two-sector dynamic model with deep-habits of nondurable and housing goods. The housing deep-habit model allows agents to form their habits from individual housing goods and nondurable goods, with a higher level of the habit for housing goods than nondurable goods primarily because housing goods have higher transaction costs than nondurable goods. The model explains counter-cyclical markups of housing goods.

As preferences are important for determining household saving, education, time distribution, family formation, and choice of goods and services, it is important to properly take account of the motion of preference in explaining economic growth. The purpose of this paper is to study economic growth with preference change on the basis of the Solow one-sector growth model, Zhang's approach to household behavior, the literature of time preference and the literature of habit formation. Section 2 introduces the basic model with wealth accumulation and preference dynamics. Section 3 examines dynamic properties of the model and simulates the model, identifying the existence of a unique equilibrium and checking the stability conditions. Section 4 studies effects of changes in some parameters on the system. Section 5 concludes the study.

## 2. THE BASIC MODEL

The economy has one production sector. Most aspects of the production sector are similar to the Solow one-sector growth model (see Solow, 1956; Burmeister and Dobell 1970; Barro and Sala-i-Martin, 1995). It is assumed that there are only one (durable) good. Households own capital of the economy and distribute their incomes to consume the commodity and to save. Exchanges take place in perfectly competitive markets. We assume a homogenous and fixed population. Labor market is perfectly competitive. We select commodity to serve as numeraire (whose price is normalized to 1), with all the other prices being measured relative to its price.

### The production sector

We assume that production is to combine labor force,  $N$ , and physical capital,  $K(t)$ . The production function is specified as follows

$$F(t) = AK^\alpha(t)N^\beta, \quad A, \alpha, \beta > 0, \quad \alpha + \beta = 1, \quad (1)$$

where  $F(t)$  is the output level of the production sector at time  $t$ , and  $A$ ,  $\alpha$  and  $\beta$  are parameters. Markets are competitive; thus labor and capital earn their marginal products. The rate of interest,  $r(t)$ , and wage rate,  $w(t)$ , are determined by markets. The marginal conditions are given by

$$r(t) + \delta_k = \frac{\alpha F(t)}{K(t)}, \quad w(t) = \frac{\beta F(t)}{N}, \quad (2)$$

where  $\delta_k$  is the fixed depreciation rate of physical capital.

### Consumer behaviors

Consumers choose how much to consume and how much to save. We apply an alternative approach to behavior of the household. We denote per capita wealth by  $k(t)$ , where  $k(t) \equiv K(t)/N$ . Per capita current income from the interest payment  $r(t)k(t)$  and the wage payment  $w(t)$  is given by

$$y(t) = r(t)k(t) + w(t).$$

We call  $y(t)$  the current income in the sense that it comes from consumers' payment for efforts and consumers' current earnings from ownership of wealth. The total value of wealth that consumers can sell to purchase goods and to save is equal to  $k(t)$ . Here, we assume that selling and buying wealth can be conducted instantaneously without any transaction cost. The disposable income per head is given by

$$\hat{y}(t) = y(t) + k(t). \quad (3)$$

The disposable income is used for saving and consumption. At each point of time, a consumer would distribute the total available budget among saving,  $s(t)$ , and consumption of the commodity,  $c(t)$ . The budget constraint is given by

$$c(t) + s(t) = \hat{y}(t). \quad (4)$$

At each point of time, consumers decide  $s(t)$  and  $c(t)$ . For simplicity of analysis, we specify the utility function as follows

$$U(t) = c^{\xi_0(t)}(t) s^{\lambda_0(t)}(t), \quad \xi_0(t), \lambda_0(t) > 0,$$

where  $\xi_0(t)$  is called the propensity to consume and  $\lambda_0(t)$  the propensity to save. A detailed explanation of the approach and its applications to different problems of economic dynamics are provided in Zhang (2005, 2009).

For the representative consumer, wage rate  $w(t)$  and rate of interest  $r(t)$  are given in markets and wealth  $k(t)$  is predetermined before decision. Maximizing  $U(t)$  subject to budget constraint (4) yields

$$c(t) = \xi(t) \hat{y}(t), \quad s(t) = \lambda(t) \hat{y}(t), \quad (5)$$

where

$$\xi(t) \equiv \rho(t) \xi_0(t), \quad \lambda(t) \equiv \rho(t) \lambda_0(t), \quad \rho(t) \equiv \frac{1}{\xi_0(t) + \lambda_0(t)}.$$

### Wealth accumulation

According to the definition of  $s(t)$ , the change in the household's wealth is given by

$$\dot{k}(t) = s(t) - k(t). \quad (6)$$

This equation says that the change in wealth is equal to the saving minus dissaving.

### Demand and supply balance

As output of the production sector is equal to the sum of the level of consumption, the depreciation of capital stock and the net savings, we have

$$C(t) + S(t) - K(t) + \delta_k K(t) = F(t), \quad (7)$$

where  $C(t)$  is the total consumption,  $C(t) = c(t)N$ , and  $S(t) - K(t) + \delta_k K(t)$  is the sum of the net saving and depreciation,  $S(t) = s(t)N$ .

### The time preference and the propensity to hold wealth

In this study, we introduce preference change through making the propensity to own wealth and propensity to consume endogenous variables. The propensity to save measures patience of the household. In modeling motion of the propensity to save, we will base our approach on the traditional approach to preference change in economic theory. As reviewed in the introduction, the



traditional way of preference change is to make the discounting utility rate endogenous. According to Chang *et al.* (2011), the representative household maximizes the following discounted lifetime utility with perfect foresight

$$\int_0^{\infty} u(c, m) e^{-\rho(t)} dt,$$

subject to the budget constraint. Here,  $u$  is the utility function,  $c$  is consumption, and  $m$  is holdings of real money balances. In their study, the time preference  $\rho(t)$  is endogenous determined (see also, Uzawa, 1968; Epstein, 1987; Obstfeld, 1990; and Shi and Epstein, 1993). The cumulated subjective discount rate is specified as follows

$$\rho(t) = \int_0^t \Delta(u(s)) ds,$$

where  $\Delta > 0$  is an instantaneous subjective discount rate at time  $s$ , which satisfies  $\Delta' > 0$ ,  $\Delta'' > 0$ , and  $\Delta - u \Delta' > 0$ . We have

$$\dot{\rho}(t) = \Delta(u(t)).$$

The time preference change is a generalization of Uzawa's study on endogenous rate of time preference. According to Uzawa (1968), the rate of time preference is an increasing function of instantaneous utility, which itself depends positively on current consumption. An implication of this assumption is that rich people are more impatient. Some economists consider  $\Delta' > 0$  improper (Blanchard and Fischer, 1989; Das, 2003; and Hirose and Ikeda, 2008). Persson and Svensson (1985: 45) consider Uzawa's idea as "arbitrary and even counterintuitive" as it contradicts the evidence of savings as decreasing function of real wealth. Turnovsky (2000: 357) also cautions against using Uzawa's preference change: "... the requirement that the rate of time discount ... must increase with the level of utility and therefore consumption, is not particularly appealing. It implies that, as agents become richer and increase their consumption levels, their preference for consumption over future consumption increases, whereas intuitively, one would expect the opposite to be more likely." To avoid this limitation, the rate of time preference is assumed to be an increasing function of real wealth (rather than current consumption), for instance, in studies by Dornbusch and Frenkel (1973), Orphanides and Solow (1990), Smithin (2004), and Kam and Mohsin (2006).

Although this study does not follow the Ramsey approach in modeling behavior of household, the ideas about time preference within the Ramsey framework are important for us to understand importance and issues related to formally modeling preference change. In Zhang's approach to household behavior, the preference for patience is directly measured by the propensity to save,  $\lambda_0(t)$ . The time preference is assumed to be influenced by real wealth or/and current consumption in the literature. In this study we consider that the propensity to save is influence by the current income and wealth. It should be noted that instead of the current consumption we use the current income. We use the current income to measure how the current economic condition affects the preference towards the future. We propose the dynamics of the propensity to save as follows

$$\lambda_0(t) = \bar{\lambda} + \lambda_y y(t) + \lambda_w k(t), \tag{8}$$

where  $\bar{\lambda} > 0$ ,  $\lambda_y$ , and  $\lambda_w$  are parameters. When  $\lambda_y = \lambda_w = 0$ , the propensity to hold wealth is constant. If we follow Uzawa's idea, then it is reasonable to assume  $\lambda_y > 0$  and  $\lambda_w = 0$ .

If we follow the assumption that the rate of time preference is positively related to wealth, for instance, accepted by Smithin (2004) and Kam and Mohsin (2006), then  $\lambda_y = 0$  and  $\lambda_w > 0$ .

### The habit formation and the propensity to consume

To formally illustrate the basic ideas in the habit formation approach, we consider a model by Corrado and Holly (2011). The infinitely lived representative consumer maximizes its expected utility

$$U = E_t \left\{ \sum_{j=1}^{\infty} \beta^j U_{t+j}(\cdot) \right\},$$

where  $U_{t+j}(\cdot)$  is the instantaneous utility function,  $\beta = 1/(1 + \theta)$  measures the impatience to consume and  $\theta$  is the subjective rate of time preference. The utility function is the standard constant relative risk aversion utility function with the coefficient of relative risk aversion  $\alpha$  as follows

$$U_t = \frac{(C_t \bar{h}_t^{-\nu})^{1-\alpha}}{1-\alpha},$$

where  $C_t$  is consumption at time  $t$  and  $\bar{h}_t$  is the stock of habit. The parameter  $\nu$  indexes the importance of the habit stock. If  $\nu = 0$ , habit does not matter. If  $\nu = 1$ , consumption relative to the stock of habit is all that matters. The above form of the utility function is called multiplicative, in contrast to the subtractive formation  $(C_t - \bar{h}_t)$ . The implications of multiplicative form is referred to Carroll (2000); Amano and Laubach (2004), while those of the subtractive formation to Deaton and Muellbauer (1980). The habit formation is specified as follows

$$\bar{h}_t = \lambda F(\bar{h}_{t-1}) + (1 - \lambda)F(C_{t-1}), \quad 0 < \lambda < 1,$$

where  $\lambda$  is the relative importance of consumption and  $F$  is a habit function. It should be noted that Fuhrer (2000) uses a linear (additive) form, and Kozicki and Tinsley (2002) uses a logarithmic (geometric) form. Another approach of habit formation is to take account of internal habits and external habits within the same framework (Carroll *et al.* 1997). We now consider a habit formation in continuous time (e.g., Alvarez-Cuadrado *et al.*, 2004; and Gómez, 2008)

$$\dot{h}(t) = \rho \int_{-\infty}^t e^{\rho(s-t)} C^\phi(s) \bar{C}^{1-\phi}(s) ds, \quad \rho > 0, \quad 0 \leq \phi \leq 1,$$

where  $C(t)$  is the consumer's consumption and  $\bar{C}(t)$  is the economy-wide average consumption. A larger value for  $h_0$  would involve lower weights given to more distant values of the levels of consumption. It measures the relative weights of consumption at different times. Differentiating the equation with respect to time yields

$$\dot{h}(t) = h_0 [C^\phi(s) \bar{C}^{1-\phi}(s) - h(t)].$$

If  $\phi = 0$ , the habit formation corresponds to the model with external habits. If  $\phi = 1$ , the habit formation corresponds to the model with internal habits. If  $0 < \phi < 1$ , habits arise from both the consumer's and average past consumption.

In our model, the preference for consumption is measured by the propensity to consume. We also apply the concept of habit stock to analyze how the past consumption affects the current preference. Following the traditional way of modeling the habit formation, we assume the following habit formation

$$\dot{h}(t) = h_0 [c(t) - h(t)]. \quad (9)$$

Equation (9) corresponds to the model with internal habits. If the current consumption is higher than the level of the habit stock, then the level of habit stock tends to rise, and vice versa. The propensity to consume is assumed to be a function of the habit stock in the following way

$$\xi_0(t) = \bar{\xi} + \xi_y y(t) + \xi_h h(t), \quad (10)$$

where  $\bar{\xi} > 0$ ,  $\xi_y$  and  $\xi_h \geq 0$  are parameters. If  $\xi_y = 0$  and  $\xi_h = 0$ , the propensity is constant. The term  $\xi_y y(t)$  implies that the propensity to consume is affected by the current income. If  $\xi_y > (<) 0$ , then a rise in the current income raises (reduces) the propensity to consume. It is reasonable to assume  $\xi_y \geq 0$ . The term  $\xi_h h(t)$  implies that if the habit stock is increasing, the propensity to consume tends to rise, and vice versa.

We have thus built the dynamic model. We now examine dynamics of the model.

### 3. THE MOTION OF THE ECONOMIC SYSTEM

We now show that the dynamics can be expressed by two differential equations. From (2), we obtain

$$r + \delta_k = \frac{\alpha f(k)}{k}, \quad w = \beta f(k), \quad (11)$$

where  $f \equiv Ak^\alpha$  and  $k \equiv K/N$ . We omit time index. We see that  $r$  and  $w$  are functions of  $k$ . From their definitions,  $y$ ,  $\hat{y}$  and  $\lambda_0$  are functions of  $k$ . From  $c = \xi \hat{y}$  and (8)-(10), we have

$$c = \Omega(k, h) \equiv \frac{(\bar{\xi} + \xi_y y + \xi_h h) \hat{y}}{\bar{\xi} + \xi_y y + \xi_h h + \lambda_0}. \quad (12)$$

Substituting (12) and  $s = \hat{y} - c$  into (6) and (9) yields

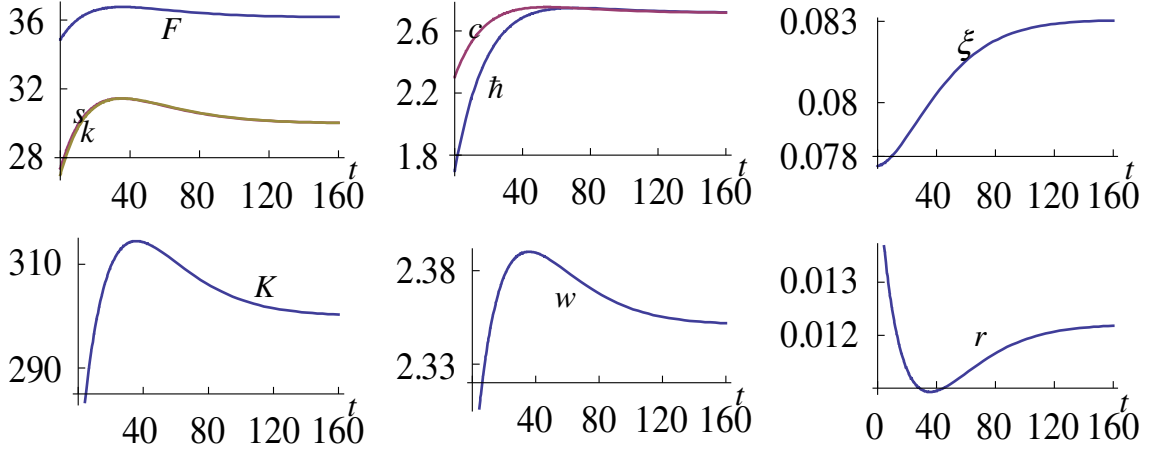
$$\begin{aligned} \dot{k} &= \hat{y} - \Omega(k, h) - k, \\ \dot{h} &= h_0 [\Omega(k, h) - h]. \end{aligned} \quad (13)$$

From (13), we determine  $k(t)$  and  $h(t)$ . The rest variables are determined as functions of  $k(t)$  and  $h(t)$  as follows:  $r$  and  $w$  by (11)  $\rightarrow K = kN \rightarrow y$  and  $\hat{y}$  by the definitions  $\rightarrow \xi_0$  by (10)  $\rightarrow \lambda_0$  by (8)  $\rightarrow c$  by (12)  $\rightarrow s = \hat{y} - c \rightarrow F = fN$ .

As the expressions are too complicated, we simulate the model to illustrate behavior of the system. In the remainder of this study, we specify the depreciation rates by  $\delta_k = 0.03$ . We specify the other parameters as follows

$$N = 10, A = 1.1, \alpha = 0.35, \bar{\lambda} = 0.5, \lambda_y = -0.01, \lambda_k = 0.04, \bar{\xi} = 0.07, \xi_y = 0.01, \xi_h = 0.02, \bar{h}_0 = 0.1. \quad (14)$$

The population is 10. The population size has no impact on the per-capita variables, even though it affects the aggregate variable levels. The total productivity is 1.1. We now specify the initial conditions to see how the gender-related variables change over time. To follow the motion of the system, we specify initial conditions:  $k(0) = 27$  and  $h(0) = 1.7$ . The simulation result is plotted in Figure 1. The population and human capital rise initially and then fall. The birth rate falls. The mortality rate falls initially and then rises. Most of the labor force is employed by the industrial sector. The motion of the rest variables is plotted in Figure 1. The per capita level of consumption rises over time. The stock of habit also rises over time. Initially the level of habit stock is lower than the consumption level. As the household consumes more, the level of habit stock is increased till the habit stock achieves the level of consumption level in the long term. The (relative) propensity to consume rises over time in association of the rise in the habit stock. As  $\xi(t) + \lambda(t) = 1$  holds at any point of time, the propensity to save falls over time. The national wealth and output levels rise and then fall. It should be noted that the change patterns of the per capita wealth, national wealth and output level cannot be observed in the Solow model (Zhang, 2005). In the Solow model, these variables change monotonically over time.



**Figure 1. The Motion of the Economic System**

From Figure 1, we observe that the system approaches an equilibrium point. Our simulation demonstrates that the dynamic system has a unique equilibrium point. We list the equilibrium values of the variables as follows

$$k = 30, \bar{h} = c = 2.72, K = 300, F = 36.17, \xi_0 = 0.152, \lambda_0 = 1,673, w = 2.35, r = 0.012.$$

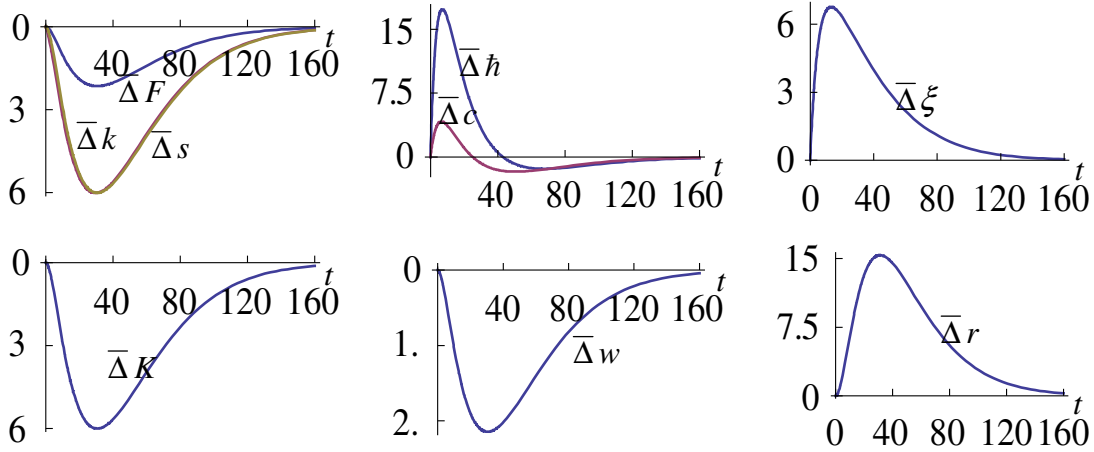
We calculate the two eigenvalues as follows:  $-0.04 + 0.01i$  and  $-0.04 - 0.01i$ . As the real parts of the two eigenvalues are negative, the unique equilibrium is locally stable. Hence, the system always approaches its equilibrium if it is not far from the equilibrium.

#### 4. COMPARATIVE DYNAMIC ANALYSIS IN SOME PARAMETERS BY SIMULATION

This section studies impact of changes on dynamic processes of the system. We examine effects of changes in  $\bar{h}_0$ ,  $\bar{\xi}_h$ , and  $\bar{\lambda}_k$ .

##### *The past consumption weighs less in affecting the current consumption*

First, we study the case that the weight of the past consumption is changed as follows:  $\bar{h}_0 : 0.1 \Rightarrow 0.3$ . The simulation results are plotted in Figure 2. In the plots, a variable  $\bar{\Delta}x(t)$  stands for the change rate of the variable,  $x(t)$ , in percentage due to changes in the parameter value. We will use the symbol  $\bar{\Delta}$  with the same meaning when we analyze other parameters. In order to examine how each variable is affected over time, we should follow the motion of the entire system as each variable is related to the others in the dynamic system. When  $\bar{h}_0$  is increased, the consumer weighs less the past influence on the decision of consumption. First, we note that the system is not affected in the long term. The reason is that a change in  $\bar{h}_0$  only affects how fast the current consumption adapts to the habit stock. If the economic system operates long and the other parameters are not affected, the current consumption is equal to the habit stock in the long term. The transitional processes from the initial conditions to the equilibrium point are affected by the shift in  $\bar{h}_0$ . As the past consumption weighs less in affecting the current consumption, the habit stock accumulates faster, which also stimulates the current consumption through affecting the propensity to save. As the consumption is increased, the wealth and total capital stocks are reduced. The reduction in the capital stocks raises the rate of interest and reduces the wage rate. As the household has less for consumption, the consumption level will fall after it is increased for a while. As the consumption level falls, the habit stock also begins to fall. The pattern of the change is similar for the other variables.

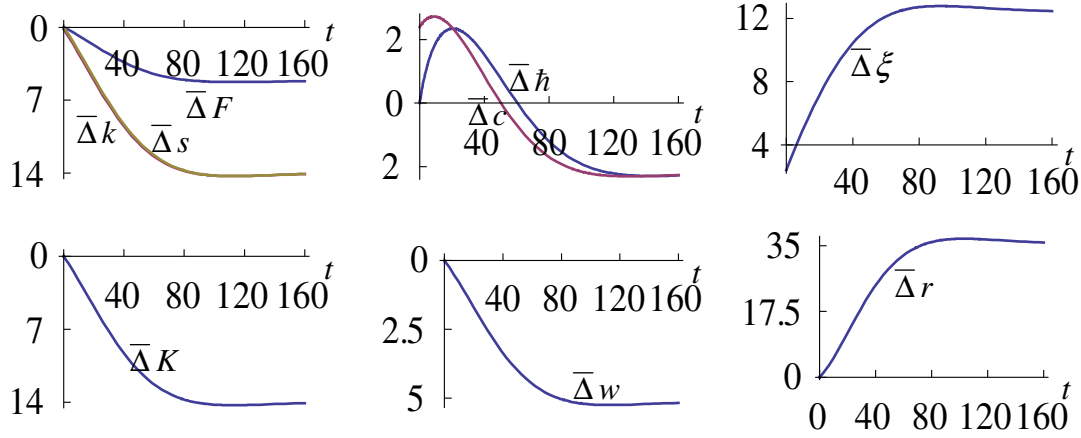


**Figure 2. The Past Consumption Weighs Less**

The impact of habit stock on the propensity to consume becomes stronger.

We now examine what will happen to the dynamic system if  $\bar{\xi}_h : 0.02 \Rightarrow 0.022$ . As this parameter value is increased, the (relative) propensity to save tends to rise. As more disposable income is spent on consumption, the level of consumption tends to rise initially. As the income is increased, the habit stock is also increased. The rise in the consumption reduces the wealth. As less saving is made, the capital stock falls. The fall in the capital stock raises the rate of interest

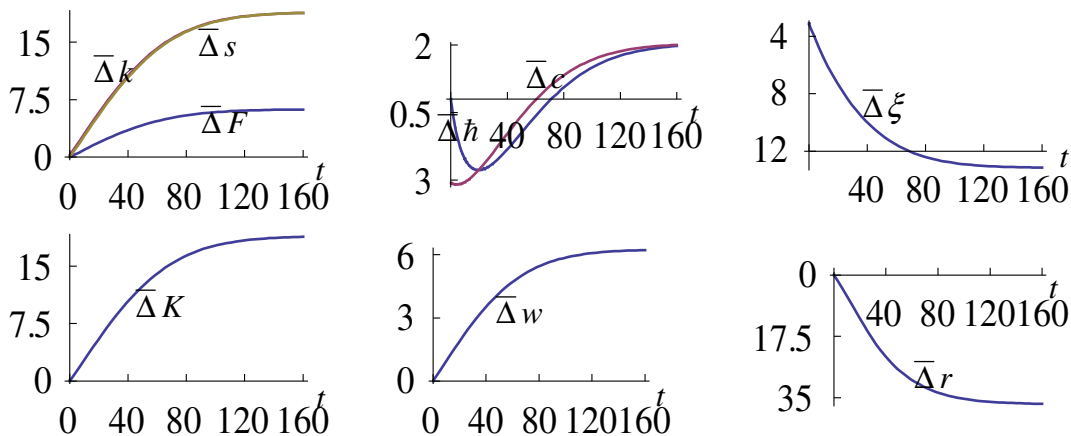
and reduces the wage rate. As a net result of the rises in the propensity to save and the falls in the wage income, the consumption level is reduced in the long term. The strengthened impact of the habit stock on the propensity to save has negative effects on the living conditions and economic performances in the long term.



**Figure 3. The Impact of Habit Stock on the Propensity to Consume Becomes Stronger**

*The impact of wealth on the propensity to save becomes stronger*

We now examine the impact of the following change:  $\lambda_k : 0.04 \Rightarrow 0.042$ . As the impact of wealth on the propensity to save becomes stronger, the propensity to save is increased. As more disposal income is devoted to saving, consumption is reduced initially. In association with the initial fall in consumption, the habit stock is also reduced. As the economy accumulates more wealth, the wage rate is increased and the rate of interest is reduced. The disposable income is increased. The long-run net result of the fall in the propensity to consume and the rise in the disposable income is that the consumption level and habit stock are increased.



**Figure 4. The Impact of Wealth on the Propensity to Save Becomes Stronger**

## 5. CONCLUDING REMARKS

This paper studied economic growth with preference change on the basis of the Solow one-sector growth model, Zhang's alternative approach to household behavior, the Ramsey growth theory with time preference, and the traditional growth model with habit formation. The propensity

to save is dependent on wealth and current income and the propensity to consumption is related to the habit stock. We simulate the model and demonstrate the motion of the economic dynamics with endogenous preference. We also examine effects of changes in some parameters on the motion of the economic system. For instance, when the consumer weighs less the past influence on the decision of consumption, the system is not affected in the long term. Nevertheless, the transitional processes from the initial conditions to the equilibrium point are affected by the shift in the parameter. The habit stock accumulates faster, which also stimulates the current consumption through affecting the propensity to save. As the consumption is increased, the wealth and total capital stocks are reduced. The reduction in the capital stocks raises the rate of interest and reduces the wage rate. As the household has less for consumption, the consumption level will fall after it is increased for a while. As the consumption level falls, the habit stock also begins to fall. The pattern of the change is similar for the other variables.

## REFERENCES

1. Abel, A. (1990) Asset Prices under Habit Formation and Catching up with the Joneses. American Economic Review 80, 38-42.
2. Alvarez-Cuadrado, F., Montero, G., and Turnovsky, S.J. (2004) Habit Formation, Catching-Up with the Joneses, and Economic Growth. Journal of Economic Growth 9, 47-80.
3. Amato, J.D. and Laubach, T. (2004) Implication of Habit Formation for Optimal Monetary Policy. Journal of Monetary Economics 51, 305-25.
4. Barro, R.J. and X. Sala-i-Martin (1995) Economic Growth. New York: McGraw-Hill, Inc.
5. Becker, G. (1992) Habits, Addictions and Traditions. Kyklos 45, 327-45.
6. Becker, G.S. and Barro, R.J. (1988) A Reformation of the Economic Theory of Fertility. Quarterly Journal of Economics 103, 139-71.
7. Becker, G.S. and Mulligan, C.B. (1997) The Endogenous Determination of Time Preference. The Quarterly Journal of Economics 112, 729-58.
8. Blanchard, O.J. and Fischer, S. (1989) Lectures on Macroeconomics. Cambridge, MA: MIT Press.
9. Boldrin, M., Christiano, L., and Fisher, J. (2001) Habit Persistence, Asset Returns, and the Business Cycle. American Economic Review 91, 149-66.
10. Burmeister, E. and Dobell, A.R. (1970) Mathematical Theories of Economic Growth. London: Collier Macmillan Publishers.
11. Campbell, J. and Cochrane, J. (1999) By Force of Habit: A Consumption-Based Explanation of Aggregate Stock Market Behavior. Journal of Political Economy 107, 205-51.
12. Carroll, C.D. (2000) Solving Consumption Models with Multiplicative Habits. Economics Letters 68, 67-77.
13. Carroll, C.D., Overland, J., and Weil, D.N. (1997) Consumption Utility in a Growth Model. Journal of Economic Growth 2, 339-67.
14. Chang, W.Y., Tsai, H.F., and Chang, J.J. (2011) Endogenous Time Preference, Interest-Rate Rules, and Indeterminacy. The Japanese Economic Review 62, 348-64.
15. Chao, L.W., Szrek, H., Pereira, N.S., and Paul, M. (2009) Time Preference and Its Relationship with Age, Health, and Survival Probability. Judgment and Decision Making 4, 1-19.
16. Christiano, L., Eichenbaum, M., and Evans, C. (2005) Nominal Rigidities and the Dynamic Effects of a Shock to Monetary Policy. Journal of Political Economy 113, 1-45.
17. Constantinides, G. (1990) Habit Formation: A Resolution of the Equity Premium Puzzle. Journal of Political Economy 98, 519-43.
18. Corrado, L. and Holly, S. (2011) Multiplicative Habit Formation and Consumption: A Note. Economics Letters 113, 116-19.

19. Das, M. (2003) Optimal Growth with Decreasing Marginal Impatience. Journal of Economic Dynamics and Control 27, 1881-98.
20. De la Croix, D. (1996) The Dynamics of Bequeathed Tastes. Economics Letters 51, 89-96.
21. Deaton, A. and Muellbauer, J. (1980) Economics and Consumer Behavior. Cambridge: Cambridge University Press.
22. Dioikitopoulos, E.V. and Kalyvitis, S. (2010) Endogenous Time Preference and Public Policy: Growth and Fiscal Implications. Macroeconomic Dynamics 14, 243-57.
23. Duesenberry, J. (1949) Income, Saving, and the Theory of Consumer Behavior. Cambridge, MA.: Harvard University Press.
24. Dornbusch, R. and Frenkel, J. (1973) Inflation and Growth: Alternative Approaches. Journal of Money, Credit and Banking 50, 141-56.
25. Druegeon, J.P. (1996) Impatience and Long-run Growth. Journal of Economic Dynamics and Control 20, 281-313.
26. Druegeon, J.P. (2000) On the Roles of Impatience in Homothetic Growth Paths. Economic Theory 15, 139-61.
27. Epstein, L.G. (1987) A Simple Dynamic General Equilibrium Model. Journal of Economic Theory 41, 68-95.
28. Epstein, L.G. and Hynes, J.A. (1983) The Rate of Time Preference and Dynamic Economic Analysis. Journal of Political Economy 91, 611-35.
29. Fisher, I. (1930) The Theory of Interest. New York: Macmillan.
30. Fuhrer, J. (2000) Habit Formation in Consumption and Its Implications for Monetary Policy Models. American Economic Review 90, 367-90.
31. Fuchs, V.R. (1982) Time Preference and Health: An Exploratory Study, in Economic Aspects of Health, edited by Fuchs, V.R. Chicago: University of Chicago Press.
32. Gómez M.A. (2008) Convergence Speed in the AK Endogenous Growth Model with Habit Formation. Economics Letters 100, 16-21.
33. Hirose, K.I. and Ikeda, S. (2008) On Decreasing Marginal Impatience. Japanese Economic Review 59, 259-74.
34. Horioka, C. (1990) Why Is Japan's Households Saving So High? A Literature Survey. Journal of the Japanese and International Economics 4, 49-92.
35. Huang, M.M. (2012) Housing Deep-Habit Model: Mutual Implications of Macroeconomics and Asset Pricing. Economics Letters (forthcoming).
36. Kam, E. and Mohsin, M. (2006) Monetary Policy and Endogenous Time Preference. Journal of Economic Studies 33, 52-67.
37. Kirby, K.N., Godoy, R., Reyes-Garcia, V., Byron, B., Apaza, L., Leonard, W., Perez, B., Vadez, V., and Wilkie, D. (2002) Correlates of Delay-Discount Rates: Evidence from Tsimane Amerindians of the Bolivia Rain Forest. Journal of Economic Psychology 23, 291-316.
38. Kozicki, C. and Tinsley, P. (2002) Dynamic Specifications in Optimizing Trend-Deviation Macro Models. Journal of Economic Dynamics Control 26, 1586-611.
39. Lawrance, E.C. (1991) Poverty and the Rate of Time Preference: Evidence from Panel Data. Journal of Political Economy 99, 54-77.
40. Lucas, R.E. Jr. and Stokey, N.L. (1984) Optimal Growth with Many Consumers. Journal of Economic Theory 32, 139-71.
41. Mehra, R. and Prescott, E. (1985) The Equity Premium: A Puzzle. Journal of Monetary Economics 15, 145-61.
42. Meng, Q. (2006) Impatience and Equilibrium Indeterminacy. Journal of Economic Dynamics and Control 30, 2671-92.



43. Obstfeld, M. (1990) Intertemporal Dependence, Impatience, and Dynamics. Journal of Monetary Economics 26, 45-75.
44. Olsen, J.A. (1993) Time Preference for Health Gains: An Empirical Investigation. Health Economics 2, 257-65.
45. Orphanides, A. and Solow, R. (1990) Money, Inflation and Growth, in Handbook of Monetary Economics, edited by Friedman, B. and Hahn, F. North-Holland: Amsterdam.
46. Palivos, T., Wang, P., and Zhang, J. (1997) On the Existence of Balanced Equilibrium. International Economic Review 38, 205-24.
47. Persson, T. and Svensson, L. (1985) Current Account Dynamics and the Terms of Trade: Harberger-Laursen-Metzler Two Generations Later. Journal of Political Economy 93, 43-65.
48. Pollak, R. (1970) Habit Formation and Dynamic Demand Functions. Journal of Political Economy 78, 745-63.
49. Ravn, M., Schmitt-Grohe, S., and Uribe, M. (2006) Deep Habits. Review of Economic Studies 73, 195-218.
50. Sheldon, G. (1997) Molding Japanese Minds: The State in Everyday Life. Princeton NJ: Princeton University Press.
51. Sheldon, G. (1998) Fashioning a Culture of Diligence and Thrift: Savings and Frugality Campaigns in Japan, 1990-1931, Honolulu: University of Hawaii Press.
52. Shi, S. and Epstein, L.G. (1993) Habits and Time Preference. International Economic Review 34, 61-84.
53. Shin, S. and Epstein, L.G. (1993) Habits and Time Preference International Economic Review 34, 61-84.
54. Shoda, Y., Mischel, W., and Peake, P.K. (1990) Predicting Adolescent Cognitive and Self-Regulatory Competencies from Preschool Delays of Gratification: Identifying Diagnostic Conditions. Developmental Psychology 26, 978-86.
55. Smithin, J. (2004) Controversies in Monetary Economics. Cheltenham: Edward Elgar.
56. Solow, R. (1956) A Contribution to the Theory of Growth. Quarterly Journal of Economics 70, 65-94.
57. Stern, M.L. (2006) Endogenous Time Preference and Optimal Growth. Economic Theory 29, 49-70.
58. Strotz, R. (1956) Myopia and Inconsistency in Dynamic Utility Maximization. Review of Economic Studies 23, 165-80.
59. Sundaesan, S.M. (1989) Intertemporally Dependent Preferences and the Volatility of Consumption and Wealth. Review of Financial Studies 2, 73-89.
60. Uzawa, H. (1968) Time Preference, the Consumption Function, and Optimum Asset Holdings, in Value, Capital and Growth: Papers in Honor of Sir John Hicks, edited by Wolfe, J.N. Chicago: Aldine, 485-504.
61. Zhang, W.B. (2005) Economic Growth Theory. Hampshire: Ashgate.
62. Zhang, W.B. (2009) Monetary Growth Theory: Money, Interest, Prices, Capital, Knowledge, and Economic Structure over Time and Space. London: Routledge.

## FROM EFFICIENT MARKET HYPOTHESIS TO BEHAVIOURAL FINANCE: CAN BEHAVIOURAL FINANCE BE THE NEW DOMINANT MODEL FOR INVESTING?

Anastasios KONSTANTINIDIS<sup>1</sup>, Androniki KATARACHIA<sup>2</sup>, George BOROVAS<sup>3</sup> and Maria Eleni VOUTSA<sup>4</sup>

<sup>1</sup>Technological Education Institute of Western Macedonia, Greece  
[anastasioskonstantinidis@gmail.com](mailto:anastasioskonstantinidis@gmail.com)

<sup>2</sup>Technological Education Institute of Western Macedonia, Greece  
[akatarac@pme.duth.gr](mailto:akatarac@pme.duth.gr)

<sup>3</sup>University of Western Macedonia, Greece  
[gborovas@uowm.gr](mailto:gborovas@uowm.gr)

<sup>4</sup>University of Thessaly, Greece  
[marialena\\_voutsas@yahoo.gr](mailto:marialena_voutsas@yahoo.gr)

***Abstract:** the present paper reviews two fundamental investing paradigms, which have had a substantial impact on the manner investors tend to develop their own strategies. specifically, the study elaborates on efficient market hypothesis (emh), which, despite remaining most prominent and popular until the 1990s, is considered rather controversial and often disputed, and the theory of behavioural finance, which has increasingly been implemented in financial institutions. based on an extensive survey of behavioural finance and emh literature, the study demonstrates, despite any assertions, the inherent irrationality of the theory of efficient market, and discusses the potential reasons for its recent decline, arguing in favor of its replacement or co-existence with behavioural finance. in addition, the study highlights that the theory of behavioural finance, which endorses human behavioral and psychological attitudes, should become the theoretical framework for successful and profitable investing.*

***Keywords:** Efficient Market Hypothesis; Behavioural finance; investor psychology; investment portfolio.*

**JEL Classification Codes:** G1, G2, N2

### 1. INTRODUCTION

The supremacy of the Efficient Market Hypothesis (EMH) as a theoretical framework of investing ends with the emergence of Behavioural Finance (BF). Since then, the traditional mainstream approach has been in a constant conflict against this new and increasingly accepted paradigm of investing behaviour. The inherent weaknesses of the Hypothesis have become the investing weapons of the new scientific approach. Investing rationality and efficient market processes over time contradict investors' psychology, biased behavioural rules and market bubbles. Information efficiency and the reconciling approach of arbitrage have conflicted the inefficient access to investment information and long-term market anomalies.

Based on an extensive survey, the first part of the present paper attempts to provide a comprehensive discussion of both EMH and BF. The second part discusses the reasons why the traditional paradigm has already become an ineffective model which discourages inefficient investment; furthermore, it makes a thorough analysis of the new theory of investing behaviour,

which is constantly incorporating new theoretical components and is characterized as an emotional, most comprehensive and open-minded market approach (Thaler, 1993). The conclusion emphasizes that the winner of the battle is Behavioural Finance, the new dominant model for investing.

## 2. AN OVERVIEW OF BASIC INVESTMENT THEORIES

### 2.1 Efficient Market Hypothesis

The Efficient Market Hypothesis is considered as the backbone of contemporary financial theory and has been the dominant investing theory for more than 30 years (from the early 60s to the mid 90s). Needless to say, a generation ago, it was the most widely accepted approach by academic financial economists.

Efficient markets, according to economists, *'do not allow investors to earn above-average returns without accepting above-average risks'* (Malkiel, 2003). The argument is commonly illustrated by the following well-known story: a professor of Economics and a student come across a \$100 bill. While the student is picking it up, the professor tries to prevent him saying *'Don't bother - if it were really a \$100 bill, it wouldn't be there'*.

In detail, Efficient Market Hypothesis advocates the efficiency of the financial market in terms of the overwhelming information, news, or communication involved. According to Fama (1970), efficient markets are markets where *'there are large numbers of rational profit maximizers actively competing, with each trying to predict future market values of individual securities, and where important current information is almost freely available to all participants'*. In effect, both individual stocks and the aggregate stock market are characterized as efficient when they *'fully reflect'* available information and can integrate it in current stock prices. In Malkiel's (2003) terms, *'the accepted view was that when information arises, the news spreads very quickly and is incorporated into the prices of securities without delay'*.

In Efficient Market Hypothesis, the terms *efficiency, integration, reflection, market and information* are key words. The first reference to market efficiency is found in George Gibson's (1889) book *'The Stock Markets of London, Paris and New York'*, in which he states that *'when shares become publicly known in an open market, the value which they acquire may be regarded as the judgment of the best intelligence concerning them'*. Efficient Market Hypothesis, however, was acknowledged as a prestigious financial model in Eugene Fama's Ph.D dissertation in the 1960s. Karz (2012) states that *'Fama persuasively made the argument that in an active market that includes many well-informed and intelligent investors, securities will be appropriately priced and reflect all available information'*. Apart from Fama, the specific model is also associated with P. Samuelson. It is worth noting that both researchers have independently developed the concept of the efficient market, which remained the only dominant theory in financial studies until 1990.

According to Fama, efficiency is distinguished in three different forms:

- *Strong-form*. Information (public, personal, even confidential) contributes to stock pricing, and, therefore, does not enable investors to achieve a competitive advantage in investing processes.
- *Semi-strong form*. Stock prices reflect public financial information (announcements of listed companies, balanced sheets, assets etc.)
- *Weak efficiency*. All past stock prices are integrated in current prices; therefore, they cannot be used for future predictions.

Clearly, the classification of market efficiency enables the understanding of the fundamental principles of Efficient Market Hypothesis. The argument that investors are able to

prevail over markets by employing information as a major investment device-weapon seems to be rather unsubstantiated. Investors cannot outperform markets and, as a result, they cannot achieve high returns, in view of the fact that information is not exclusive, but available to everybody. Thus, individuals cannot be characterized as investment experts or market specialists as the specific attributes can be equally applied to all investors.

On the other hand, any new information cannot elicit abnormal profit, as it is directly available to markets and is easily reflected on stock prices. Fama (1965) postulates that *'in an efficient market, on the average, competition will cause the full effects of new information on intrinsic values to be reflected "instantaneously" in actual prices'*.

The information which is rapidly integrated in market prices is not only public, but also available. Even active managers are not able to achieve a high-return performance by means of exploiting the available confidential information. The market anticipates, in an unbiased manner, future movements and, therefore, information is integrated and evaluated into market price in a much more objective and informative way than insiders. Maximized returns from non-stop trading are prevented when all information (either public or insider) is reflected on stock prices.

Overall, within the framework of EMH, the fundamental analysis of company stocks is conducive to stock assessment rather than prediction or future movements, whereas technical analysis cannot be employed for encountering future changes over time. Graph representation analysis and study based on past stock prices do not produce extra profits for investors because past pricing is integrated in current prices.

To reduce the significance of technical analysis, academics and critics employed the Random Walk Hypothesis. The fundamental principle of the specific investing model involves the non-predictability of stock prices as these prices are perceived as taking a random walk. According to Kendall (1953), *'stock price fluctuations are independent of each other and have the same probability distribution'*. Stock prices are commonly perceived as random and unpredictable (Lo & Hasanhodzic, 2010). Malkiel (1973) advocates that *'the market and stocks could be just as random as flipping a coin'*, whereas Shiller (2000) states that *'stock prices approximately describe random walks through time: the price changes are unpredictable since they occur only in response to genuinely new information, which by the very fact that it is new, is unpredictable'*.

Market efficiency is also contingent upon the investment method employed by individual investors. According to Efficient Market Hypothesis, the individuals who tend to invest in stock markets, are characterized by rationality. Rational investors are concerned with expected-utility characteristics, which direct to high return performance, combined with rational expectations. Lucas (1978) argues that *'in markets, in which all investors have 'rational expectations', prices fully reflect all available information and marginal-utility weighted prices follow martingales'*. In effect, rationality and consistent beliefs lead towards equilibrium (Nash Equilibrium).

Efficient Market Hypothesis asserts that the investors' rational attitude is assumed in all investing actions. Investors may sometimes act with a view to achieving easy and quick profits. When they do not act rationally and their investing decisions are random, equilibrium prices deviate. This is a provisional and short-term deviation since irrational actions are counterbalanced with each other. In effect, the actions taken by irrational investors are offset on account of the fact that there is no communication between investors and their transactions are not interdependent. In addition, due to the fact that irrational investors proceed to overpriced or underpriced investments, they seem to achieve lower returns than rational investors; thus, they are bound to lose money, their assets are likely to diminish, and, consequently, their status in the stock market will diminish, as well (Spyrou, 2003). On the other hand, the involvement of rational investors in arbitrage incurs price equilibrium and efficiency, which implies that markets

continue to be efficient, and, therefore, profit maximizing. In terms of EMH, despite the fact that all investors do not act rationally, markets are always rational and efficient.

Samuelson (1965) holds that EMH can be better applied in cases of individual stocks rather than the aggregate market. Observing the movement of individual stocks, it becomes evident that stock prices are more efficient than the aggregate stock market. Thus, markets are micro-efficient and also macro-inefficient.

In terms of duration (long-term, short-term market efficiency), long-term markets are considered more efficient. Graham (1965) states that *'the stock market in the short run may be a voting mechanism, in the long run it is a weighing mechanism'*; however, according to Malkiel (2003) *'true value will win out in the end'*. Any possible uncertainty about how efficient a market can be is abolished over time. In the long run, stocks and markets function on the basis of the EMH principles, and equilibrium is finally achieved. As Lo (2007) argues, *'the general thrust is the same: individual investors form expectations rationally, markets aggregate information efficiently, and equilibrium prices incorporate all available information instantaneously'*.

To conclude the discussion on Efficient Market Hypothesis, it is also worth noting that the Hypothesis, apart from the stock market, has expanded to include further areas of financial activity, such as efficiency of funding, efficiency of human resources, prediction, dividends and portfolio construction.

## 2.2 Behavioural Finance

Efficient Market Hypothesis lost prestige among scholars and financial markets with the emergence of B.F. in the early 90s. The theory of the impact of human behaviour on investing decision making emerged not as a supplementary assumption, but as a contradictory and surrogating approach. In Shefrin's (2001) terms, Behavioural Finance is *'the study of how psychology affects financial decision making and financial markets'*, and, according to Thaler (1993) it is *'simply 'open-minded' finance'*. Endorsed by other disciplines, such as Statistics, Mathematics, Sociology, Psychology, Anthropology, Behavioural Finance attempts to describe how human psychology, and in particular, human behaviour, affects investing decision making. Sewell (2005) states that *'Behavioural finance is the study of the influence of psychology on the behaviour of financial practitioners and the subsequent effect on markets'*. In this respect, some financial effects are likely to depend upon the investors less rational behaviour (Barberis, 2007), which results from biases, psychological variables, and heuristics. Investors are not optimal decision makers, on account of the psychological processes affecting their financial-investing decision making (Alexakis.& Xanthakis, 2008).

Stock markets were first associated with human psychology in 1912, when Selder published his work *'Psychology of the Stock Market'*. However, the forefathers of BF are the prominent psychologists Kahneman and Tversky, who advocate that heuristics and biases affect judgment under uncertainty (1974) and formulated Prospect Theory in their work *'Analysis of Decision under Risk'* in 1979. Thaler has also contributed to the establishment of the new emerging paradigm and, in his work *'Mental Accounting and Consumer Choice'* (1985), suggested that Prospect Theory be the basis of an alternative descriptive model. Subsequently, interest in investors' psychology and behaviour increased and generated a great number of studies and works, which established BF as the dominant paradigm in finance.

Apart from framing and market anomalies, a major premise in Behavioural Finance is heuristics (Shefrin, 2001), which are perceived as patterns regarding how people behave (Ritter, 2003). Heuristics derives from the ancient Greek work *εὐρίσκω* (= discover) and refers to acquiring knowledge or a desirable result by employing smart guesswork rather than specified formulas. Heuristics involve simple experience-based techniques for problem solving, known as

rules-of-thumb or shortcuts, which have been proposed to explain how investors make decisions, particularly during periods when, due to poor information, complex investing circumstances and market instability, it is hard to make judgments. Cognitive heuristics work by a process called attribute substitution which happens without conscious awareness (Kahneman & Frederick, 2002).

Typically, the most common cognitive heuristics, which best explain the meaning of these rules and provide evidence of the investors' irrational behaviour are:

**Representativeness:** people's attempt to fit a new and unknown event into an existing one and, therefore, discover common elements in completely different events. Tversky and Kahneman (1974) maintain that people often judge probabilities *'by the degree to which A is representative of B, that is, by the degree to which A resembles B.'*

**Anchoring:** it is a cognitive heuristic which involves decision making based on an initial *'anchor'*. In many situations, people tend to make estimates *'by starting from an initial value that is adjusted to yield the final answer. The initial value, or starting point, may be suggested by the formulation of the problem, or it may be the result of a partial computation. In either case, adjustments are typically insufficient'* (Slovic, & Lichtenstein, 1971).

**Herding:** it describes that, typically, individuals feel the need to join in groups (herds) and, consequently, develop herd behaviour in decision making situations. In other words, in the same context, *'people will be doing what others are rather than using their information'* (Banerjee, 1992).

**Overconfidence:** it is defined as people's tendency to overestimate their skills or abilities, that is, to be too confident of their abilities, knowledge and received information, and, as result, to make incorrect investing options; it also implies people's arrogant attitude towards stock markets. Plous (1993) asserts that *'no problem in judgment and decision making is more prevalent and more potentially catastrophic than overconfidence'*, and DeBonds and Thaler (1995) argue that overconfidence is *'perhaps the most robust finding in the psychology of judgment'*.

Apart from the above heuristics, investors' decisions are also affected by a number of illusions, which are discussed within the theoretical framework of Prospect Theory. The specific theory emerged as a model that enhanced and supplemented Behavioural Economic Theory. It was developed by Kahneman and Tversky, in 1979, and advocated that people value gains and losses differently and, as such, will base decisions on perceived gains rather than perceived losses. It demonstrates that when individuals develop investing behaviour systematically, they violate the axioms of expected utility theory (Kahneman & Tversky, 1979).

By asking questions to which the research subjects had to answer, the specific theory demonstrated that investors are dominated by fallacies, which prevent them from making correct decisions. Among the most common fallacies affecting investors' behaviour are:

**Loss aversion:** people's tendency to be risk-averse for losses rather than gains. In Kahneman and Tversky's (1984) terms, *'losses loom larger than gains'*. Prior gains reduce risk, whereas prior losses increase it.

**Mental accounting:** Mental accounting is the set of cognitive operations used by individuals and households to organize, evaluate, and keep track of financial activities (Thaler, 1999). In other words, it involves people's tendency to generate, depending on their special traits, different mental accounts, and register events they have experienced.

**Regret aversion:** It involves the investors' desire to avoid the pain incurred by a poor investment decision, and, as a result to postpone selling stocks so as not to finalize their loss. According to Pieters and Zeelenberg (2004), *'people can anticipate emotions such as regret, because they compare possible outcomes of a choice with what the outcomes would have been, had a different choice been made'*.

In addition to the above considerations, it is also worth emphasizing that, within the framework of Behavioural Finance, judgment and investing options are greatly affected by people's cognitive biases, the generation and development of which depend on personality, culture and the socio-economic environment. These biases are argued to lead people to logical fallacy. In this respect, the rationality of the traditional mainstream approach is challenged, and irrational investing processes are likely to lead to dangerous paths; investing opportunities are open only to a part of the so called '*smart money*' (Shiller, 2000).

In the context of Behavioural Finance, irrationality and the failure to encounter it by employing arbitrage is corroborated by market anomalies, among which calendar anomalies (weekend effect, January effect), defined as time in a year period during which the investors' behaviour is arbitrarily differentiated. Calendar anomalies are effects that are not discussed in Efficient Market Hypothesis.

Behavioural Finance also demonstrates a concern with investment time and suggests that stock market bubbles are not short-term; thus, the losses bubbles are likely to incur are not easily and immediately reimbursed. It also maintains that information and news are inefficient as they may often be deceptively communicated to investors, who are frequently incapable of exploiting them, since they have already been exploited by other investors (confidential information).

In conclusion, Behavioural Finance emerged as a model which, not only enhanced stagnating finance theories, but also refuted them. In a very short time, it managed to challenge academic and scientific attention and be recognized not simply as an alternative theoretical framework, but as the new dominant model for investing.

### **3. BEHAVIOURAL FINANCE VS. EFFICIENT MARKET HYPOTHESIS: FUNDAMENTAL CONSIDERATIONS**

#### **3.1 Access to information**

According to the Efficient Market Hypothesis, investing markets are '*informationally efficient*'. All individuals can have access to available information, and, as a result, investment news cannot be exploited merely by those who are involved in a specific investment process. Remarkably, however, the specific theoretical model has generated considerable debate in terms of two concepts: *access* and *availability*. From a theoretical point of view, all people are able to have access to investing information; in practice, however, they are not. Daily routine and different lifestyles imply different available time and method to have access to information. The rapid movement of events in time, globalized markets and the increasing number of the available investing methods make people incapable of catching up with changes. Information is disseminated through a huge number of different information channels (web sites, blogs, radio, TV), but people are incapable not only of assimilating, but also elaborating on available information. Even individuals or groups of people who are involved in stock market analysis and monitoring are not completely (100%) competent. In effect, constant information on continuously changing investing contexts is commonly perceived as an investing battle with winners and losers, gains and losses.

#### **3.2 Available information**

Information availability is an additional weakness of EMH. Frequently, in investment processes, information is available only to a limited group of investors or it is available to speculators long before it becomes available to the general public. It is argued that, in the case of the Greek financial crisis, the appeal to the International Monetary Fund took place before spreads had increased. Therefore, the individuals who had access to such information (if this is

true) were also able to take full advantage of it. Clearly, when a financial services company, which aims at high-than-average-profits or speculation, analyzes the economic status of countries and is able to downgrade or upgrade economies, it does not exploit the available research-information before it makes it available to investment markets.

Apart from the importance of availability, however, emphasis should also be placed on the method available information is communicated. At this point, the role of impartial financial journals or market analysts is significant. Remarkably, stock ratings have frequently been a part of an expensive promotion project on behalf of a specific investors company. In this context, Behavioural Finance holds that stock markets (both in terms of access and availability) are '*informationally*' inefficient.

### **3.3 Fundamental Analysis**

The methods used to analyze securities and make investment decisions fall into two very broad categories: *fundamental* and *technical* analysis.

In investment processes, in order to develop a most profitable and valid relationship with a company to included in a portfolio, investors should employ an analysis of its fundamental components. In detail, when attempting to assess financial data, investors tend to form a picture of the company to be included in their portfolios, and they, subsequently, foster a confidence relationship with it.

In the context of EMH, the fundamental analysis, which is considered an old and most widely accepted model by economists, has been marginalized and replaced by the model of 'semi-strong form efficiency'. In the relevant literature, the potential of fundamental analysis and its contribution to successful investment projects are strongly highlighted. Proponents of the E.M.H. have often generated serious disputes over the specific analysis by employing tenuous and unsubstantiated arguments, which evidently have led to characterizing EMH as paradoxical, and, have, therefore, triggered arguments in favour of refuting it.

### **3.4 Technical Analysis**

Technical Analysis has produced similar criticism as to its efficacy (*weak efficiency form*), but has increasingly gained recognition in contemporary Western stock markets. Efficient Market Hypothesis contradicts the emphasis placed by technical analysis on forecasting the direction of prices through the study of past market data, and suggests that investment processes should be associated with current information and prices. In effect, the historical direction and development of a company or investment process are definitely reflected on their impact on investment decision making. Charts and past market data should not be the principal focus of research or the means to achieve high returns, but they should not be simply treated as memories.

Nevertheless, the premise that 'history repeats itself' and '*economy is running in a circle*' has been strongly highlighted by people, and, in particular, by investors. It is far from clear, therefore, that traditional financial paradigms, such as EMH and the Random Walk Theory have frequently been disputed and scorned by economists.

### **3.5 Uniformity of Investment**

According to EMH, the individuals who are involved in investment and stock market processes are treated as uniform, colourless groups of investors sharing common investing traits, attitudes, methods and scope. Experience, gender, family and friends do not seem to have a decisive impact on investing behaviour. Components, such as personality, different investing culture, personal details and individual investment attitudes contribute to rendering efficient markets ideal, but, nevertheless, utopian.



### 3.6 Investment machines

Efficient Market proponents postulate that the individuals who invest in stock markets are characterized as rational. As already mentioned above, they are concerned with expected-utility outcomes, and, therefore, for profit maximizing endorsed by rational expectations.

In this context, the specific implication creates a picture of investors resembling well-preserved machines. Investors, who faithfully abide by the same investing rule, that is, rationality, are compared to stock market soldiers marching in a parade. They are perceived as comics superheroes. Remarkably, in investment processes, rationality is a destination, which is not always reached by investors, and which creates a competitive advantage. However, investors should not be perceived as robots investing in *'war stocks'*.

### 3.7 Investment and emotion

Investors form beliefs and attitudes on the basis of their emotional involvement. Happy or sad feelings, optimistic or pessimistic attitudes, over- or underreaction encourage or discourage them from investing processes. As emotions are considered a control factor in every form of investment during an individual's life (investment in family, knowledge, career), they must not be excluded from financial investments themselves. In combination with biases, emotions are vital to influencing rational investing attitudes. Contrary to the belief of EMH proponents that emotions have no place in rational decision making processes, Behavioural Finance emphasizes the correlation of emotional reactions with market events and asserts that emotions are the backbone of its theoretical framework.

### 3.8 Investing bubbles or the bubble of efficient market hypothesis

As long as markets are efficient and investors act rationally, the question remains why investing bubbles have a regular appearance and a longer duration in the stock market. Stiglitz, the prominent Nobel award winner, has stated that *'this crisis has provided numerous examples of markets that cannot be described as efficient in any reasonable way'*.

The dot-com bubble (also known as the Internet bubble and the Information Technology Bubble), which involves the stock market bubble of Internet-based companies that enjoyed a stock price boom by simply adding a *'com'* to the end, and the collapse of the real estate market are two of the many examples that corroborate the arguments in favour of the dominance of Behavioural Finance over the Efficient Market Hypothesis. Needless to say, the emphasis placed by BF not only on serious financial anomalies, but also on the less harmful but nevertheless significant calendar effect anomalies (weekend effect, January effect etc.) corroborates its supremacy over EMH.

An additional consideration against arguments in favour of EMH is the fact that the participation of rational investors in arbitrage processes is not efficient and the adjustment of stock prices is slow and rather detrimental.

Ultimately, if we remain proponents of the traditional financial theory, we are likely to believe that recent collective investment in gold and its soaring prices is a rational action, which is not bound to generate a new investing bubble. However, if this action is encountered as an investing behaviour anomaly, we should definitely be more suitably prepared to avoid the detrimental impact of an imminent crisis.

### 3.9 Contemporary investing and traditional financial theories

Investing has dramatically changed over the last few years and has been modernized by introducing new rules, new investment tools, and a new investing culture, which greatly affected investing profiles, as well. However, Efficient Market Hypothesis has remained rather

unmodified over time, and has not been affected, as far as its approach to investment is concerned. Contemporary and old stock markets, that is, markets fifty years ago, seem to share common features in relation to the investing strategy applied. The concepts of efficiency and rationality are definitely not differentiated in different periods of time. Nevertheless, market efficiency cannot remain the same, and contemporary investors cannot be as irrational as investors in the past, as investing activities have been significantly modified in time.

On the other hand, EMH and the new investing tools cannot share the same territory and significance. Credit default swaps would not have existed in an efficient market; however, the fact that they have become the principal focus of global stock markets and their increasing popularity as investing tools invalidate the Hypothesis.

Needless to say, should we accept that investing markets are becoming efficient in the long run, we are contradicted by the new emerging facts in investment processes. The term 'long-run' has completely changed in the recent years as the investing horizon has become shorter. Investments may be frequently encountered as long-term despite their rather short duration. Investors are concerned with short-term returns due to the fact that market stability is rather disputed.

In conclusion, the conventional considerations of EMH have to be reinforced and amplified with new elements, or preferably, substituted with a new theoretical investing framework, such as Behavioural Finance. Since the focus of BF is investors' behaviour, the theory is perceived as an evolutionary model which is constantly being accommodated in terms of it. In this perspective, it will be always a state-of-the-art and dominant paradigm.

### **3.10 A naive hypothesis**

As already been stated, Behavioural Finance is an interdisciplinary framework combining elements from history, sociology, psychology and anthropology. Therefore, its theoretical perspectives are more complicated, in contrast to Efficient Market Hypothesis, which is characterized as a rather simplified or naive approach. It is far from clear, however, that, to generate successful and profitable outcomes, investing decision making has to combine a number of different aspects; thus, it must be established on a sound and comprehensive theoretical basis.

Efficient Market Hypothesis, despite being a naive paradigm, has been more popular among investors for a long time, as it is characterized by optimism and emphasizes the positive outcomes of investing decision making. The potential consequences for investors, however, are rather serious. In contrast, Behavioural Finance, on account of its complicated and innovative nature, does not seem to be widely accepted by the majority of the investing community as a whole. However, the fact that investing decision making is considerably facilitated by various considerations encompassed in BF from other disciplines is conducive to enhancing its status and establishing its dominance over traditional financial paradigms.

## **4. CONCLUSION**

The new theoretical approach accepts people's behavioural weaknesses and asserts that investing failures are a natural consequence of the special traits of human behaviour. The key element of the emerging theory is the investor-human being rather than investors as machines. Within this framework, Behavioural Finance treats investors as individuals and highlights that emotions, biases, and illusions cannot be rationalized; in addition, it emphasizes that information is inefficient. Stock prices are not random; they are rather unpredictable as people's reaction to new information is unpredictable, as well.

Furthermore, Behavioural Finance posits that investors cannot be cut off from their own investing past as they are human beings and, for human beings, past actions are a vital part of

one's own history. In this perspective, past prices and fundamental values of previous years affect and guide their decision making.

Based on a number of disciplines, B.F. enables investors to encounter a number of investing conditions. Efficient markets and investing rationality are perceived as imaginary constructs and ideal or utopian settings which reassure conscience. When profit making is the cause, the effect is envy and avarice, at least for a part of investors.

Remarkably, the weak points of the Efficient Market Hypothesis, which is perceived as a conservative and non-evolutionary paradigm, are the fundamental theoretical principles of BF. Market functions provide evidence against the efficacy of EMH and the new investors' profile seems to encourage a new theoretical perspective.

To conclude, the new paradigm of Behavioural Finance emerged as a model that successfully attempted to challenge and refute the traditional financial theory. In a very short time, it attracted the academia's attention and established itself as the new dominant theory rather than simply an alternative model for investing. By focusing on individual investors, Behavioural Finance, is generally acknowledged as a new, more comprehensive and evolutionary theoretical framework, which is not a mere rival of the conventional theory, but a fundamental approach that enables enhancing investing processes and propositions.

## REFERENCES

### Book

1. Alexakis, Ch. and Xanthakis, M., 2008. *Behavioral Finance*, Stamoulis Publications, Greece
2. Barberis, N. and Huang M., 2007. *The Loss Aversion / Narrow Framing Approach to the Equity Premium Puzzle*, in Mehra R. ed., *Handbook of Investments: The Equity Risk Premium*. Elsevier. Amsterdam.
3. Brealey, R. and Myers S., 1996. *Principles of Corporate Finance*.5th edition, Irwin-McGraw-Hill, New York.
4. Gibson G., 1889. *The Stock Exchanges of London Paris and New York*, G. P. Putnman & Sons, New York.
5. Graham, B., 1965.*The Intelligent Investor*, Harper & Row, New York.
6. Lo, A. and Hasanhodzic, J., 2010. *The Evolution of Technical Analysis: Financial Prediction from Babylonian Tablets to Bloomberg Terminals*, Bloomberg L.P. New York.
7. Malkiel, B., 1973. *A Random Walk Down Wall Street: The Time-tested Strategy for Successful Investing*. W.W. Norton & Company. New York.
8. Plous, S., 1993. *The psychology of judgment and decision making*. McGraw-Hill, New York.
9. Selder, G., 1912. *Psychology of Stock Market*. Ticker, New York.
10. Sewell, W., 2005. *Logics of History: Social Theory and Social Transformation*. The University of Chicago Press, Chicago.
11. Shefrin, H., 2000. *Beyond greed and fear. Understanding behavioral finance and the psychology of investing*, Harvald Business School Press, U.S.A.
12. Shiller R., 2000. *Irrational Exuberance*. Princeton University Press, New Jersey.
13. Spyrou, S., 2003. *Introduction to Behavioral Finance*, Benou Publishing Company, Greece.
14. Stiglitz, J., 2010. *Freefall. America Free markets, and the Singing of the Word Economy*, W. W. Norton & Company, New York.
15. Thaler, R., 1993.*Advance in Behavioral Finance*.Princeton University Press. New Jersey. USA.

### Journal

1. Banerjee A., 1992. A simple model of herd behavior. *Quarterly Journal of Economics*, Vol.107, No.3, pp. 797-817.

2. De Bondt, W. and Thaler, R., 1995. Financial decision-making in markets and firms: A behavioral perspective. *Handbooks in Operations Research and Management Science*, Vol. 9, pp. 385-410.
3. Fama, E., 1965. The Behavior of Stock- Market Prices, *The Journal of Business*, Vol.38, No.1, pp. 35-105.
4. Fama, E., 1970. Efficient capital markets: A review of theory and empirical work, *The Journal of Finance*, Vol.25, No 2, pp. 383-417.
5. Fischhoff, B., 1977. An early history of Hindsight Research, *Social Cognition*, Vol.25, No.1, p 10-13.
6. Han, A., 2012. Efficient Market Hypothesis, <http://www.alvinhan.com/Efficient-Market-Hypothesis.htm> (accessed 16/02/2012).
7. Kahneman, D. and Frederick, S., 2002. Representativeness revisited: Attribute substitution in intuitive judgment. p.p. 48-81 in Gilovich, T., Griffin, D., Kahneman D., Heuristics and biases: The psychology of intuitive judgment, *Cambridge University Press*. New York.
8. Kahneman, D., Knetsch, J. and Thaler, R., 1991. Anomalies: The Endowment Effect, Loss Aversion and Status Quo Bias. *The Journal of Economic Perspectives*, Vol. 5, No 1, pp. 193-206.
9. Kahneman, D. and Tversky, A., 1979. Prospect Theory. An analysis of decision under risk. *Econometrica*, Vol. 47, No.2 , pp.263-291.
10. Kahneman, D. and Tversky, A., 1984. Choices, values, and frames, *American Psychologist*. Vol. 39, No 4, pp. 341-350.
11. Karz, G., 2012. The Efficient Market Hypothesis and Random Walk Theory, <http://www.investorhome.com/emh.htm> (accessed 24/02/2012).
12. Kendall, M. and Branford H., 1953. The Analysis of Economic Time Series, Part 1: Prices. *Journal of the Royal Statistical Society*, Vol. 116, No 1, pp. 11-34.
13. Lo, A., 2007. Efficient Market Hypothesis. p.p. 3-14. in Blume L., Durlauf S., *The New Palgrave: A Dictionary of Economics, 2o Edition, Palgrave MacMillan*, New York.
14. Lucas, R., 1978. Asset prices in an exchange economy, *Econometrica*, Vol. 46, p.p. 1429-46.
15. Malkiel, B., 2003. The Efficient Market Hypothesis and Its Critics, *Journal of Economic Perspectives*, Vol.17, No 1, pp. 59-82.
16. Ritter J., 2003. Behavioral Finance, *Pacific-Basin Finance Journal*, Vol. 11, No. 4, p.p. 429-437.
17. Samuelson, P., 1965. Proof That Properly Anticipated Prices Fluctuate Randomly, *Industrial Management Review*, Vol.6, No. 2, pp. 42.
18. Shefrin, H., 2001. Behavioral Corporate Finance. *National Bureau of Economic Research*, Vol.14, No 3. pp 21-33.
19. Slovic, P. and Lichtenstein, S., 1971. Comparison of Bayesian and Regression Approaches to the Study of Information Processing in Judgment. *Organizational Behavior and Human Performance*, Vol. 6, No. 6, pp. 649-744.
20. Thaler, R., 1985. Mental Accounting and Consumer Choice, *Marketing Science*, Vol 4, No 3, pp. 199-214.
21. Thaler R., 1999. Mental Accounting Matters, *Journal of Behavioral Decision Making*, Vol. 12, pp. 183-206.
22. Tversky, A. and Kahneman, D., 1973. Availability: A heuristic for judging frequency and probability. *Cognitive Psychology*, Vol. 5, No 2, pp. 207-232.
23. Tversky, A. and Kahneman, D., 1974. Judgement under uncertainty: Heuristics and biases. *Science, New series*, Vol. 185, No 4157, pp. 1124-1131.
24. Tversky A. and Kahneman. D., 1981. The Framing of Decisions and the Psychology of Choice. *Science, New series*, Vol. 211, No. 4481, pp. 453-458.
25. Zeelenberg, M. and Pieters, R., 2004. Consequences of regret aversion in real life: The case of the Dutch postcode lottery, *Organizational Behavioral and Human Decision Processes*, Vol. 93, pp. 155-168.

## IMPLEMENTATION OF STATE AID POLICY FROM THE EUROPEAN UNION IN ROMANIA

Cristina BÂLDAN

Faculty of Economic Sciences, University of Pitești, Romania

[cristina.baldan@upit.ro](mailto:cristina.baldan@upit.ro)

***Abstract:** In 2009, the Competition Council's activity regarding the state aid field has considered Romania's obligations as a member state, and the fulfillment of some specific tasks by the competition authority acquired after January 1, 2007. In this regard, the Competition Council has encouraged the collaboration between institutions to develop projects of state aid schemes. In 2010 there were six major investment projects approved, four of them being in the photovoltaic sector in which three are in Germany, one is in Spain and the rest concern the mechanical industry in Germany and Italy. Also, there were approved five ad hoc aid measures in favor of individual enterprises, for investments in areas that are on the regional aid maps for the period 2007-2013, and ten aid schemes, of which five related to the outermost regions. In accordance with the guidelines on national regional aids for 2007-2013, the Commission developed a statistical evaluation of the situation of state aid and regional aid ceiling which received a transitional assisted area status under Article 107 paragraph 3 letters (a) by the end of 2010. The Commission accepted the changes introduced by the three member states (France, Ireland and Italy) in state aid maps for certain regions eligible for regional aid under Article 107 paragraph 3 letter (c).*

***Keywords:** State aid, state scheme aid, regional state aid, intensity of state aid, investment project.*

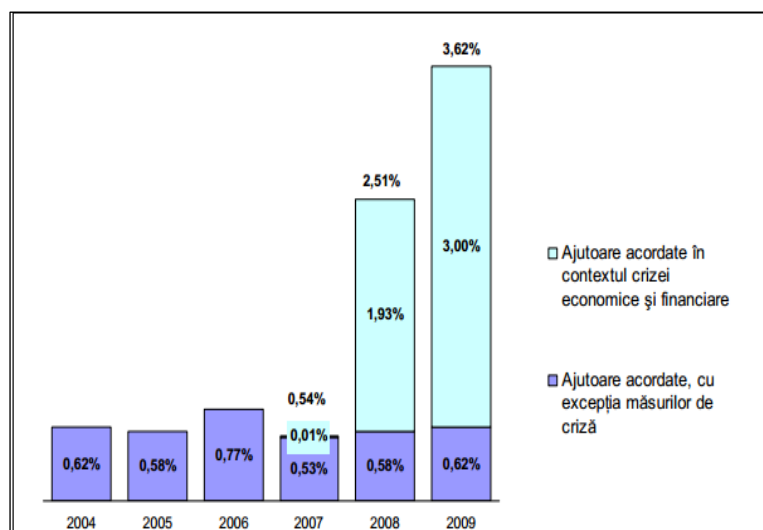
**JEL Classification Codes:** E22, F35, L4, R58

### 1. INTRODUCTION

In 2010, most aid approved targeted horizontal objectives of common European interest, such as culture and heritage preservation, regional cohesion, environmental protection, research, development and innovation and compensation for the damages caused by natural disaster, in addition to the aid given in economic and financial crisis. Member states have widely used the possibilities offered by the General Block Exemption on categories, under which the aids fulfilling the established criteria may be granted without prior notification to the Commission. Thus in 2010 the member states have introduced 414 new measures on aid allowance (Bâldan, 2011).

The total amount for aids, with the exception of the measures related to crisis, arose in 2009 to 0.62% of GDP or 73.2 billion EUR, while in 2008 this value was 0.58% of GDP. On average, 84% of aid granted to industry and services were directed towards horizontal objectives of common interest.

Package was introduced in 2010 to simplify it, including a Code of Good Practices and a Communication on a simplified procedure, both aimed at improving the efficiency, transparency and predictability of State aid procedures. The first results of the Code of Good Practice have been encouraging, especially in the management of complaints, a growing number of applicants than being informed about the situation of their applications.



**Figure 1. The evolution of the total amount of state aid granted by member states in 2004-2009, expressed as a percentage of EU GDP**

Source: Report on Competition Policy for the year 2010, [http://ec.europa.eu/competition/publications/annual\\_report/2010/part1\\_ro.pdf](http://ec.europa.eu/competition/publications/annual_report/2010/part1_ro.pdf)

## 2. STATE AID CONTROL IN E.U.

### ➤ Regional aid

In accordance with the guidelines on national regional aid for 2007-2013, the Commission conducted a statistical evaluation of the situation of state aid and regional aid limit which received a transitional assisted area status under Article 107 paragraph 3 letter (a) by the end of 2010. The Commission accepted the changes introduced by the three member states (France, Ireland and Italy) in state aid maps regarding certain regions eligible for regional aid under Article 107 paragraph 3 letter (c).

In 2010 six major investment projects were approved, four of them being in the photovoltaic sector in which three are fulfilled in Germany and one in Spain and the rest for the mechanical industry in Germany and Italy. Also, five ad hoc aid measures were approved in favor of individual enterprises for investments in areas under the regional aid maps for the period 2007-2013, and ten aid schemes, of which five related to the outermost regions.

#### • Aid for environmental protection

In this area, the Commission approved several measures in order to support the energy savings and the production of energy from renewable sources. An increasing number of notifications of this type have debated over the relatively high individual aid (investment aid exceeding 7.5 million per enterprise) and have been the subject of a detailed economic evaluation. Basically, the approved schemes were related to the aids for renewable energy and for carbon capture and storage.

#### • Research, development and innovation

The concept of innovation has been placed in the center of Europe's 2020 strategy, and the emblematic initiative "A Union of Innovation" highlights the need for better financing of innovation in Europe, in order to increase the performance.

The Community for Research, Development and Innovation supports the concept by facilitating better guidelines to aid market problems in the member states. In 2010, the Commission approved twelve aid schemes with a budget of over 5 billion EUR, of which five

measures were schemes for research and development, four aid schemes were aimed at innovation, and four were mixed.

After a detailed economic evaluation the Commission decided not to raise any objections against ten of the notified individual aids for major Research and Development projects, allocated for developing new processes of producing bio methane, for the use of materials into manufacturing specific components of aero structures and the lithography for making semiconductor devices. Also, the Commission monitored the information submitted by other 52 aids for research and development projects, which exceeded 3 million EUR, although these projects were not under the incidence of individual notification obligation (However, at the Commission were presented 40 aid schemes specialized on basic research, 91 for industrial research and 86 for experimental development, all based on GBER. Regulation (EC) no. 800/2008 of the Commission dating August 6, 2008 of declaring certain categories of aids compatible with the common market, applying Articles 87 and 88 from the Treaty (of the general exemption on categories of aids)). Also the GBER was used by the member states for issuing certain measures of innovation, of which 42 were related to industrial property rights for SMEs, 21 to young innovative enterprises, 21 to consulting services and assistance in implementing innovation and 11 to the temporary availability of the highly qualified personnel.

• **State aid to promote the risk capital**

In this area, the Commission approved seven measures with an overall budget of 380 million EUR. Of these, three were not compliant with the "safe harbor" provisions and were the subject to a detailed evaluation. There have also been implemented eleven additional aid schemes under GBER that countries have used in the favor of the risk capital measures.

• **State aid granted to the coal sector and to the agricultural sector**

Following the Commission's proposal made in July 2010, the Council adopted on December 10, 2010, a decision regarding the state aids meant to facilitate the closing of the uncompetitive coal mines. Thereby aids to support the coal production are granted with the condition that there must exist a closure plan whose deadline would be not later than 31 December 2018, and to cover exceptional costs associated with closure of mines, by the year 2027.

The Commission assesses the state aids in the agriculture and forestry sectors based on some new guidelines on state aids for the agriculture and forestry sectors for the period 2007-2013. In 2010 there were registered 214 state aid cases and 161 decisions were adopted.

## **2. STATE AID - ASSUMED OBLIGATIONS AND ACHIEVEMENTS DURING THE PERIOD 2004-2009 IN ROMANIA**

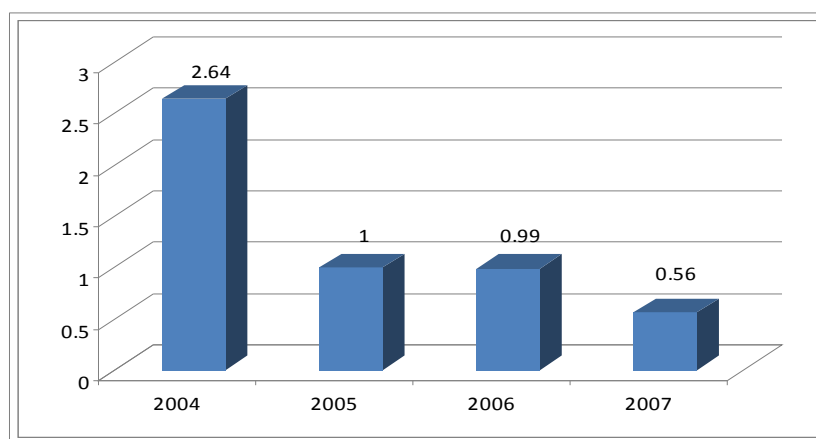
In 2009, the Competition Council's activity in the field of state aid has considered Romania's obligations as a member state and obligations to fulfill specific tasks acquired after the competition authority on January 1, 2007. In this regard, the Competition Council has encouraged the collaboration between institutions to develop projects of state aid schemes, so there were presented the following reports (2009 Yearly Report, published by the Competition Council, [http://www.renascce.eu/documente/Raport%202009\\_619ro.pdf](http://www.renascce.eu/documente/Raport%202009_619ro.pdf)):

a) Reports on Romania's obligations when joining the European Union in 2009, issued by the Competition Council and regarding:

- The situation of the existing state aids;
- Half-yearly reports on monitoring the state aid beneficiaries from the field of motor vehicles and which are operating in disadvantaged areas and open zones;
- Report on monitoring the state aids granted to businesses operating in open zones;

- Report on fulfilling all the conditions for granting state aids in the disadvantaged areas and measures imposed for the cases of breaches of award criteria;
  - Situation of the state aids for research - development - innovation.
- b) Reports made according to the running national legislation.

During 2009, the Competition Council elaborated the Report for the state aids granted in Romania in the period 2004-2007, in accordance with the provisions of Art. 19 of O.U.G. no. 117/2006 on national procedures for state aids, approved with amendments and addendums by Law no. 137/2007. The report shows that, in 2004-2007, national aid recorded a downward trend that continued with 2.08 percentage points from 2.64% (2004) to 0.56% (2007) (2009 Yearly Report, published by the Competition Council, [http://www.renascsc.eu/documente/Raport%202009\\_619ro.pdf](http://www.renascsc.eu/documente/Raport%202009_619ro.pdf))



**Figure 2. The evolution of the state aid balance in GDP during the period 2004-2007**

Source: 2009 Annual Report of the Competition Council, [http://www.renascsc.eu/documente/Raport%202009\\_619ro.pdf](http://www.renascsc.eu/documente/Raport%202009_619ro.pdf)

It was found that the amount of state aid granted in 2007 represented a quarter from the percentage of the year 2004 (24.7%).

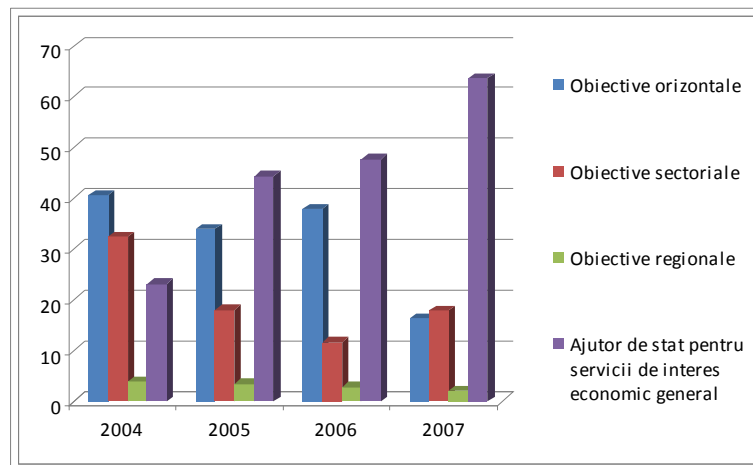
The high level recorded in 2004 was due, in particular, to the increasing process of restructuring and privatization of companies owned by the state and also due to the fact that it was the last year when the steel industry in Romania received state aids. As regards 2006 the explanation for the high level of state aids, compared with the year 2007, comes from the fact that it was last year when state aid measures could be authorized by the Competition Council.

In terms of objectives, the state aid report highlighted the following conclusions (2009 Yearly Report, published by the Competition Council, [http://www.renascsc.eu/documente/Raport%202009\\_619ro.pdf](http://www.renascsc.eu/documente/Raport%202009_619ro.pdf)):

- In 2007, the state aids granted for services of general economic interest had the highest value, this being due to the investments made by public local authorities and to the subsidies given in this area (thermal heat, drain water – sewage), which increased year over year;
- State aids granted for horizontal objectives in 2007 had a low share of 16.45% as a result of a reduction of the rescue aids - restructuring, which had a higher degree in the distortion of competition, and due to the fact that most part of the state aids given to small and medium enterprises were granted in the form of the minimum aids, aids that were easier obtained by business agents;
- State aids granted for sectorial objectives decreased, accordingly to the EU public policy in this field;



• Share in the case of national state aids for regional development has recorded a steady decline because of the smaller number of business agents eligible for a tax relief in the disadvantaged areas, by reaching a maximum intensity or ceasing the existing period of the disadvantaged areas.



**Figure 3. The evolution of the state aid structure as a percentage from GDP/target during the period 2004-2007**

Source: 2009 Annual Report of the Competition Council, [http://www.renascce.eu/documente/Raport%202009\\_619ro.pdf](http://www.renascce.eu/documente/Raport%202009_619ro.pdf)

In 2009 was issued by the Competition Council "The report on monitoring rescue and restructuring aids granted to companies in difficulty", containing data and information on the implementation of restructuring programs completed during 2007 -2008, and also reviewing the progress of those programs implementing restructuring with deadline in 2009.

Its purpose was to evaluate the implementation of the measures foreseen in the restructuring plans which constituted the reason of authorizing the respective state aid; another purpose was to analyze the economic and financial developments of the 62 beneficiary companies, and the measures that had to be taken for those companies that have not implemented the plans in question (2009 Yearly Report, published by the Competition Council, [http://www.renascce.eu/documente/Raport%202009\\_619ro.pdf](http://www.renascce.eu/documente/Raport%202009_619ro.pdf)).

In 2009 there were recovered illegal state aids in the amount of 15,021.00 LEI and the value of the total cumulative recoveries made during 2005 to 2009 was of 256,742,945.81 LEI.

### 3. GUIDELINES ON REGIONAL STATE AIDS FOR PERIOD 2007-2013

#### 3.1. Aids for regional investment

##### A) Form of aids

Regional investment aid represents an aid given for an initial investment project. an initial investment supposes an investment in tangible and intangible assets related to (Guidelines on regional state aids for 2007-2013, <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=DD:08:04:52006XC0304%2802%29:RO:PDF>):

- starting a new unit;
- Extension of an existing establishment;
- Diversification of the production of an establishment by manufacturing new, additional products;
- Fundamental change in the overall production process of an existing establishment.

- Acquisition of assets directly linked to an establishment, which was closed and purchased by a foreign investor;

Regional investment aid is calculated based on the costs of investment in tangible and intangible assets derived from the initial investment or (estimated) wage costs for jobs created by the investment project.

Support may take the following forms:

- Subsidies;
- Low-interest loans or interest discounts;
- Public warranty;
- Purchase of shares or other capital contributions on favorable terms;
- Tax exemptions or reductions;
- Contributions to social security or to other compulsory charges;
- Supply of land, goods or services at favorable prices.

It is important to ensure that the regional aid produces a real stimulating effect on the undertaken investments that otherwise would not be made in the assisted areas.

If the aid is calculated on the basis of investments in tangible and intangible assets, the beneficiary must have a contribution of at least 25% of eligible costs in order to ensure the reliability of the investment.

In order to be sure that the investment offers a real and lasting contribution to the development of the region, the aid must be conditioned by the provisions attached to the aid or by the methods of its payment, so that the respective investment in the region concerned be maintained for a minimum period of five years from the completion.

Also, if the aid is calculated on the basis of labor costs, it is required a period of three years after the project's completion for occupation of the employment places.

All jobs created by the investment must be maintained in the respective region for a period of five years from the date of first the job occupied. In the case of SMEs, the member states may reduce the period of five years of maintaining the investment or the jobs created at a minimum of three years.

Consequently, it is not considered as initial investment the mere acquisition of shares by a company with legal personality.

To the calculation of aids it is taken into consideration the gross subsidy. The aid's intensity in the gross grant equivalent (GGE) represents the present value of the aid expressed as a percentage of the present value of the eligible investment costs. For the individual aids notified to the Commission, the gross subsidy equivalent is calculated at the time of notification. In other cases, the eligible investment costs are updated to their value at the time of the grant (Guidelines on regional state aids for 2007-2013, <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=DD:08:04:52006XC0304%2802%29:RO:PDF>).

Payable aids in several installments shall be calculated at their value at the time of the notification or at the time of granting the respective service, as appropriate. The interest rate to be used for discounting purposes and for calculating the aid amount in a soft loan case shall be the reference rate applicable at the time of the grant. Where aid is awarded in the form of tax exemptions or reductions based on future taxes due, discounting of aid installments is based on the reference rates applicable at various times when the tax advantages become effective.

#### **B) The limits of the aids granted to large enterprises**

In establishing the extent of the aid that is given the nature and seriousness of the regional problems are taken into consideration. Because of the expansion of the EU certain inequalities have arisen in what regional prosperity is concerned, and as a result a considerable number of member states have a GDP per citizen lower than the 45% of the EU average. Taking these

matters into consideration the Committee has introduced a more detailed classification of the concerned regions.

As a result the Committee believes that in the case of the regions that fall under article 87 paragraph (3), letter (a) the extent of the aid given should not be more than (Guidelines on regional state aids for 2007-2013, <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=DD:08:04:52006XC0304%2802%29:RO:PDF>):

- 30% BSE for regions with a GDP per citizen lower than 75% of the EU-25 average, for the ultra-peripheral regions with a higher GDP and till 1 of January 2011 for the regions with statistical effect;
- 40% BSE for regions with a GDP lower than 60% of the EU-25 average;
- 50%BSE for regions with a GDP lower than 45% of the EU -25 average.

Considering the specific deficiencies, the ultra-peripheral regions may benefit of a supplemental bonus of 20% BSE if the GDP drops under 75% of the EU average and of 10% BSE in the other cases.

The regions with statistical effect that fall under the purview of the waiver in article 87 paragraphs 3 letter (c) can benefit from an increase of aid of 20% from January 1, 2011.

In the case of the other regions that fall under the purview of article 87 paragraph (3) letter (c) the amount of the aid should not be more than 15% BSE. In the case of the regions with a GDP higher than 100% the EU average and an unemployment rate lower than the EU average aid is reduced to 10% BSE.

In the case of regional aid for small and medium businesses, the limits of the aid previously presented can be increased by 20% BSE, in the case of small businesses, and by 10 %BSE in the case of the aid given to medium businesses.

### **C) Eligible expenses for government aids**

#### **• The aid calculated according to the costs of the investment**

When giving aid for an initial investment the expenses regarding the terrain, constructions and facilities or equipment are taken into consideration.

In the case of small and medium businesses the following costs are considered (Guidelines on regional state aids for 2007-2013, <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=DD:08:04:52006XC0304%2802%29:RO:PDF>):

- the costs for the initial studies and the consulting services relating to the investment can be granted aid in the amount of 50% of the actual cost;
- the costs involving leasing goods, other than terrains and buildings, only if the leasing contract is a financial one, involving the obligation of purchasing the respective good at the end of the leasing contract;
- the costs pertaining to the leasing of terrain and buildings, only if it continues for at least five years after the investment is completed in the case of large businesses and for three years in the case of SME
- the complete cost of investments in non-corporate goods through technology transfer by acquisition of patents, licenses, know-how or non-patented technical knowledge.

With the exception of SME and take-overs the goods acquired must be brand new.

In any case the eligible non-corporate goods must respect all necessary terms to remain associated to the region eligible for regional aid, and, as a result cannot be surrendered to another region, especially to those that are not eligible for regional aid. For this purpose the eligible non-corporate goods must especially respect the following terms:

- ✓ to be exploited exclusively in the unit the benefits of regional aid;
- ✓ to be considered redeemable capital;

- ✓ to be amongst the enterprise capital and remain in the unit that receives regional aid for at least five years (three years for SME).

- **Aids calculated in relation to wage costs**

Regional aid as previously presented can be calculated in relation to the wage costs estimated for the jobs created by an initial investment project.

Creating jobs represents a net increase of the number of employees working directly in a specific unit by comparison to the average of the previous 12 months. As a consequence, the jobs that cease to exist in the course of those 12 months must be reduced from the apparent number of jobs created in the same period of time.

The amount of the aid must not be higher than a certain percentage of the wage costs of a hired individual, calculated for an extent of two years. The percentage is equal to the allowed extent of the investment aid specific to that area.

### 3.1 Aid for large investment projects

Considering present guidelines a “large investment project” represents an “initial investment” of an eligible amount higher than 50 million euros. The authorities consider being a large investment project one where the initial investment is made by one or more enterprises over a period of three years and consists of combined permanent capital indivisible from an economical point of view. The expenses taken into consideration are either the usual investment costs, either the wage costs.

The Committee, by previous terms of reference concerning large investment projects, has reduced the maximum levels of aid, in order to avoid disloyal competition. For reasons of simplification and transparency, the Committee has decided to include the instructions of the Multisectorial Frame of 2002 in the Guidelines regarding regional government aids for the period 2007-2013 (Guidelines on regional state aids for 2007-2013, <http://eurlex.europa.eu/LexUriServ/LexUriServ.do?uri=DD:08:04:52006XC0304%2802%29:RO:PDF>).

- **Increasing transparency and monitoring large investment projects**

The aids given to investment projects are individually notified by the Committee's member states, in the occasion when the proposed aid from all sources is higher than the maximum aid amount allowed, for an investment with eligible expenses higher than a hundred million euros.

**Table 1. Presentation of the amount of government aid in correlation to the notification level**  
-EUR-

The amount of the aid	10%	15%	20%	30%	40%	50%
The notification level	7,5 mil.	11,25 mil.	15 mil.	22,5 mil.	30 mil.	37,5 mil.

Source: *The Guidelines regarding government regional aids for the period 2007-2013*  
<http://eurlex.europa.eu/LexUriServ/LexUriServ.do?uri=DD:08:04:52006XC0304%2802%29:RO:PDF>

The table represents the notification levels for granting government aids with the most common amount based on present Guidelines.

In the case when regional aid is granted on the basis of existent aid schemes for investment projects that do not require notification, the member states must present the Committee the information required in the standard form within 20 working days from the date when the aid was granted by the qualified authority.

Member states must keep detailed files regarding the aids granted for all large investment projects. These files that need to contain all the necessary information to ascertain that the maximum amount of allowed aid has been respected, must be kept for 10 years since the aid was granted.

- **The evaluation standards for large investment projects**

Regional aids granted for large investment projects have limited levels, adjusted according to the following grid:

**Table 2. The presentation of the grid for granting regional aids**

Eligible expenses	Adjusted level of aid
Up to 50 000 000 EUR	100% of the adjusted level
Between 50 000 000 and 100 000 000 EUR	50% of the regional level
Over 100 000 000 EUR	34% of the regional level

Source: Guidelines regarding government regional aids for the period 2007-2013, <http://eurlex.europa.eu/LexUriServ/LexUriServ.douri=DD:08:04:52006XC0304%2802%29:RO:PDF>

The calculations are based on the official exchange rates at the time the aid was granted or, in the case of an aid conditioned by an individual notification, at the time of the notification. Investment projects that are individually notified are evaluated according to the norms in appliance at the time of the notification. The investment projects that are individually notified are evaluated according to the norms in appliance at the time of the notification. Ad-hoc individual aids must be notified to the Committee without exception. Because of the obvious impact on commercial exchanges and competition, the individual ad-hoc aid for large investment projects require a special justification of its connection with regional development.

In the case of large enterprises the maximum allowed amount is always considered.

The Committee demands a detailed presentation of the investment in order to authorize regional aids so that they do not undermine the competition and the aid is necessary to stimulate the investment if the overall value of the aid is more than 75% of the maximum amount of the aid that can be granted to an investment with eligible expenses of a 100 million EUR and only if (Guidelines on regional state aids for 2007-2013, <http://eurlex.europa.eu/LexUriServ/LexUriServ.do?uri=DD:08:04:52006XC0304%2802%29:RO:PDF>):

- the beneficiary of the aid does more than 25% of the sales of the product in question on the respective market or markets before the investment or more than 25% after the investment is complete
- the production capacity created by the project represents more than 5% of the market, measured using data referring to the apparent consumption of the questioned product, except for the case when the medium annual average of apparent consumption over the previous five years is higher than the GDP annual average of growth for the European Economical Space.

The questioned product is usually the product that is the object of the investment project. When the project is for an intermediary product and a large part of the production is not sold on the market, the questioned product can be the downstream product. The relevant market for the product includes the product itself and its substitutes, viewed so by the buyers (for reasons pertaining to the product's characteristics, prices and purposes) or by the manufacturer (because of the flexibility of the production facilities).

- **Norms regarding the addition of aids**

Total aid is applied in the following cases:

- ✓ assistance is given at the same time based on multiple regional grids or combined with ad-hoc aid;
- ✓ the aid comes from local, regional, national or community resources.

When the aid calculated on investment costs of the corporate or non-corporate capital is combined with the aid based on wage costs, the limit amount established for the respective region must be respected.

When the expenses eligible for regional aids are completely or partially eligible for another type of aid, the more preferable limit, established on the norms in appliance, is set for the common part.

Regional aids for investments are not added to the minimum aids in regards to the same eligible expenses in order to elude the maximum amount of the aids established by the present guidelines.

### **3.2 Operating aids**

Operating aid is represented by the regional aid granted for the decrease of the enterprises current expenses. Normally these aids are forbidden. Yet, they are still granted to eligible regions according to the waiver present in article 87 paragraph (3) letter (a) of the treaty as long as they are justified by their contribution to regional development and their nature and as long as their level is proportional to the handicap it is trying to compensate. The member states must prove the existence and the importance of all handicaps. Also in regions with low population and less populated areas specific forms of operating aid can be accepted.

Basically, operating aid should be granted only to a pre-set number of expenses or eligible expenses and should be limited to a certain part of these costs.

Because these aids can severally undermine competition they are not granted in the sector of financial services or of inter-group activities according to present guidelines, with the exception of the cases when these aids are granted based on general grids that are open to all sectors and serve to compensate supplemental transport or wage costs. Operating aids for promoting exports are also excluded.

Because these aids are meant for the recovery of delays and removing obstacles in regional development, operating aids must be temporary, decrease over time and cease when the questioned regions reach a real convergence with more prosperous zone in the European Union.

Operating aids that do not decrease gradually and are not time limited can be authorized only in the following cases:

- ✓ ultra-peripheral regions, as long as they are not used to compensate supplemental costs that involve in the economic activities because of the factors identified in article 299, paragraph(2) of the treaty, whose permanent character and involvement severally limit the development of these regions(remote, islands, small seize, geographical and climate difficulties, and economical dependence on several products);

- ✓ in regions with a continually decreasing population, as long as they are meant to prevent or reduce the depopulation of the area.

Also, in ultra-peripheral regions and in regions with a low population density aids that do not decrease progressively, are not time-limited and are meant to partially compensate supplemental transport costs can be authorised in the following situations:

- aids meant to compensate supplemental transport costs taking into consideration other transport aid grids;
- aids that can only be granted for supplemental transport costs of merchandise made in ultra-peripheral regions and in low density population areas inside the questioned country;
- aids can be granted for the transport of primary products, raw materials, or intermediary products from their production site to the place of final transformation in the questioned area;

- aids have to be objectively quantifiable ex ante, based on the report aid per passenger or kilometer, or aid per ton or kilometer and have to be the object of an annual report that describes, amongst other matters how the report is calculated;
- supplemental costs must be made based on the cheapest means of transportation and the shortest route between the production or transformation site and the selling one.

In the case of the operating aids the member states must do an annual report containing a presentation of the total expenses or of the loss of income estimated for each region. This report is necessary to verify the changes these aids have on the competition and commercial exchanges. This report must also resent the major 10 beneficiaries of the operational aids in the questioned region, specifying the activity sector of each beneficiary and the amount of aid each has received.

### 3. CONCLUSIONS

Considering the difficulties that small businesses face all over the European Union, it is necessary to introduce a new form of aids that can be granted supplemental to the regional investment aids, in order to encourage the founding of new enterprises and the incipient phases of small enterprises in assisted areas (Bâldan, 2011).

As a result, the Committee will authorize aid grids that provide granting aids of up to two million euros per enterprise for small enterprises that undertake their economic activity in regions eligible for the waiver in article 87 paragraph (3), letter (a) and of up to one million euros for the waiver in article 87 paragraph (3) letter (c). The annual amount of the aids granted for newly created small enterprises should not be higher than 33% of the total amount of aids per enterprise previously mentioned.

Eligible expenses are represented by judicial, assistance, consultancy and administrative costs, as well as the following costs, as long as they are really paid in the first five years from the beginning of the enterprise:

- the interest of external financing and equities of their own used capital that is not higher than the reference rate;
- the taxes for renting facilities and production equipment;
- electrical power, water, heat, administrative taxes and expenses;
- the redemption and the expenses of acquiring through leasing facilities and production equipment, as well as wage costs, the mandatory contributions to social insurance, that can also be included as long as the basic investments and the steps taken in providing new jobs and personnel recruitment did not benefit from other forms of aid.

The amount of the aid must be between the following limits:

- ✓ in the regions under the purview of article 87 paragraph (3) letter (a), 35% of the eligible expenses in the first three years from the beginning of the enterprise and 25% in the next two years;
- ✓ in the regions under the purview of article 87 paragraph (3) letter (c), 25% of the eligible expenses in the first three years from the beginning of the enterprise and 15% in the following two years;

These amounts are increased by 5% in the regions under the purview of article 87 paragraph (3) letter (a) with a GDP per citizen lower than 60% the community average in the regions with a population lower than 12.5 inhabitants/km and on the small islands with a population lower than 5 thousand inhabitants, as well as in other communities that are similarly isolated.

The member states are those that have to create the system that ensures that the higher limits of the total amount of aid by comparison with the questioned eligible costs are respected. Especially the aids presented in this chapter are not cumulative with other aids (including the minimize aid) to elude the maximum amount of aid or the maximum sums established.

The aids for newly created small enterprises can have an undesirable effect on those enterprises because they can be created only to cash in the aid and then dissolved, therefore the member states must create a system to fight this risk, for example by restricting requests from the owners with recently dissolved enterprises.

## REFERENCES

1. Bâldan Cristina, *European policies for competition*, Sitech Publishing, Craiova, 2011.
2. Bâldan Cristina, Ungureanu Emilia, *Competition and Prices*, Sitech Publishing, Craiova, 2008.
3. Gavrilă Ilie, Gavrilă Tatiana, *Competitiveness and competition environment. Promotion and competition protection in EU*, Economic Publishing, Bucharest, 2008.
4. Pascal Ileana, Deaconu Ștefan, Fabian Nicolae, *Policies in competition domain*, Economic Publishing, Bucharest, 2003.
5. Prisecaru Petre, *Common Policies of European Union*, Economic Publishing, Bucharest, 2004.
6. \*\*\*, *Collection of Profile Paper: Competition, 2004 - 2011*.
7. \*\*\*, *Yearly Report 2009 of Competition Council*, [http://www.renascce.eu/documente/Raport%202009\\_619ro.pdf](http://www.renascce.eu/documente/Raport%202009_619ro.pdf)
8. \*\*\*, *Report concerning policy in competition domain for 2010*, [http://ec.europa.eu/competition/publications/annual\\_report/2010/part1\\_ro.pdf](http://ec.europa.eu/competition/publications/annual_report/2010/part1_ro.pdf)
9. \*\*\*, *Guidelines for regional public aids for the period 2007-2013*, <http://eurlex.europa.eu/LexUriServ/LexUriServ.do?uri=DD:08:04:52006XC0304%2802%29:RO:PDF>
10. \*\*\*, *Yearly 2009 Report of Competition Council*, [http://www.renascce.eu/documente/Raport%202009\\_619ro.pdf](http://www.renascce.eu/documente/Raport%202009_619ro.pdf)



## THE IMPACT OF TRUST ON KNOWLEDGE TRANSFER IN INTERNATIONAL BUSINESS SYSTEMS

Yannis A. HAJIDIMITRIOU<sup>1</sup>, Nikolaos S. SKLAVOUNOS<sup>2</sup> and Konstantinos P. ROTSIOS<sup>3</sup>

<sup>1</sup>Department of Business Administration, University of Macedonia, Thessaloniki, Greece  
e-mail: [hajidim@uom.gr](mailto:hajidim@uom.gr)

<sup>2</sup>Department of Business Administration, University of Macedonia, Thessaloniki, Greece  
e-mail: [sklavounosnikos@yahoo.gr](mailto:sklavounosnikos@yahoo.gr)

<sup>3</sup>Department of Business Administration, University of Macedonia, Thessaloniki, Greece  
e-mail: [krotsi@afs.edu.gr](mailto:krotsi@afs.edu.gr)

**Abstract:** *Over the last decade, international business alliances have emerged as one of the most important strategies for firms to expand in international markets. In addition, knowledge transfer has been determined as one of the key factors that lead to the creation of sustainable competitive advantage for firms and to the success of learning alliances. Furthermore, trust enhances the effectiveness of this process. The growing volume of published research in recent years has indubitably revealed the significant role of trust on knowledge transfer in International Business (IB) Systems and in particular in International Strategic Alliances (ISAs) and International Joint Ventures (IJVs). This paper consists of an in depth review of the most recent literature about the impact of trust on transfer of various types of knowledge in IB Systems with reference to the relevant theoretical models and the applications in the international context. The first section contains the theoretical background of the concept of trust, the different types of knowledge and the process of knowledge transfer. The main section refers to a few contemporary and distinguished scientific articles about the impact of trust as a determinant factor of knowledge transfer from the most recent international literature. The conclusions of the literature review and testable propositions related to the creation of trust among IJV partners and their impact on knowledge transfer are presented at the final section of the paper.*

**Keywords:** *Trust, knowledge transfer, international business (IB) systems, international strategic alliances (ISAs), international joint ventures (IJVs)*

**JEL Classification Codes:** M16

### 1. INTRODUCTION

In recent years international strategic alliances (ISAs) have swept powerfully onto the global business landscape. As economies become more globalized, more and more firms are participating in foreign markets. Cross border alliances and particularly International Joint Ventures (IJVs) have become one of the most common means of international expansion because they enable firms to compete in complex environments (Ernst & Halevy, 2004). Strategic alliances are enduring interfirm cooperative agreements or linkages created by two or more autonomous organizations for sharing equity, resources, know-how, expertise or technology to accomplish mutually beneficial objectives (Yoshino & Rangan, 1995). The formation of strategic alliances is considered a significant strategy for achieving global competitiveness in many industries (Gulati et al., 2000). An alliance is considered international when at least one of the partner – firms originates from a country different than the one that the alliance determines as a

target market (Hajidimitriou, 2003). Moreover, in the last decades, IJVs have become a favoured form of international collaboration (Anvy & Anderson, 2008) and the establishment of IJVs has become a major strategy for firms entering international markets (Duan, 2007; Meschi & Riccio, 2008; Le & Jorma, 2009). An international joint venture (IJV) is a separate legal organization that represents the joint equity holdings of two or more partners, in which the headquarters of at least one partner is located outside the country of the venture operation (Chung & Beamish, 2012). The increasing number of international publications in recent years has indisputably revealed the importance of trust and knowledge transfer in the field of International Business (IB) Systems. In our previous work we examined the significant role of the constructs of trust and knowledge transfer respectively (Hajidimitriou & Sklavounos, 2006, 2007, 2008; Hajidimitriou & Rotsios, 2009; Sklavounos & Hajidimitriou, 2011).

In this paper we will attempt to highlight the knowledge transfer process and trust and their relation in the context of ISAs and IJVs. We first present a brief theoretical background of the two notions under research. Then, we propose a number of testable propositions related to the creation of trust among IJV partners and their impact on knowledge transfer will be for further research.

## **2. THEORETICAL BACKGROUND OF KNOWLEDGE AND KNOWLEDGE TRANSFER**

### **2.1 Knowledge of the firm**

Today, organizational knowledge is regarded as the basis for the firms' sustainable competitive advantage, due to the turbulence and uncertainty of the global business environment (Van Wijk et al., 2008). The availability of physical resources to practically all firms, resulted to a greater need for intangible resources, which are more complicated and difficult to copy and imitate; the result was a shift to knowledge based resources. Knowledge constitutes an important factor in the companies' attempt to preserve their valuable culture, to learn new things, to solve new problems and create competitive advantages and new situations in the present and in the future (Liao et al., 2010).

As Anh et al. (2006) indicate, Davenport and Prusak (1998, p5) give a complete definition of knowledge. According to the two researchers, "*Knowledge is a fluid mix of framed experience, values, contextual information and expert insight that provides a framework for evaluating and incorporating new experiences and information. It originates and is applied in the minds of the knowers. In organizations, it often becomes embedded not only in documents and repositories but also in organizational routines, processes, practices and norms.*"

Gao et al. (2008) indicate that the two most common types of knowledge, defined in the literature, are tacit and explicit knowledge and Polanyi (1969) was the first to make this distinction.

*Explicit knowledge* is the formal, systemic and transparent knowledge (Lei et al., 1997) that can be documented and recorded easily and is embedded in formal and standardized procedures (Martin & Solomon, 2003a). For the above reasons, it can be disseminated and transferred relatively easily with systematic and standardized procedures (Nonaka & Takeuchi, 1995). As an example, one can state the standards and specifications of a product, a scientific formula or a software program. Explicit knowledge can be codified and included in manuals, databases and procedures. Its acquisition is relatively easy and its practical implications can be observed in the short run (Polanyi, 1966). Because of its objective nature, explicit knowledge is easier to transfer and disseminate. The measurement of explicit knowledge is relatively easy and is based on quantitative measurements, such as the increase of production and productivity, the reduction of production costs and the increase of the return of investments (Nonaka, 1987).

*Tacit knowledge* is more complicated and challenging to explain and define since, as Polanyi (1969) stated, individuals often know more than what they can explain. Kogut and Zander (1992), paraphrasing Polanyi (1966), argued that organizations know more than what their contracts state. They argue that, contrary to organizational learning, the amount of explicit knowledge companies possess can be observed in the “operating rules, manufacturing technologies and customer data banks”. Tacit knowledge however is embedded in the actions and activities of the individuals, and its dissemination requires more time and active involvement from the “teacher’s” part (Lei et al., 1997). Tacit knowledge consists of techniques and informal practices which determine the “know how”. It is obtained by experience and has a cognitive dimension. Tacit knowledge has a personal quality and it consists of the models of behavior, the beliefs and the perspectives with which individuals analyze situations. These parameters are integrated in the actions which most of the times are taken for granted and are very difficult to adjust (Kogut & Zander, 1992). According to Polanyi (1966), tacit knowledge is more valuable than the implicit for firms, although there are different opinions and findings on the subject. As Hau and Evangelista (2007) note, tacit knowledge is often “non-verbalized or even non verbalizable” and cannot be documented or recorded in formulas or data bases.

## **2.2 Knowledge transfer in IJVs.**

The concept of knowledge transfer is not easily defined since there is no clear distinction between knowledge transfer and the creation of new knowledge (Sahal, 1981). According to Easterby-Smith et al. (2008), knowledge transfer can be defined as the “process during which, one organization learns from the experience of the other”. Beamish and Berdrow (2003) define knowledge transfer as the “migration” of knowledge from one partner to the other, either directly or indirectly through the IJV. They have concluded that often, even in cases in which learning is not a primary factor for IJV formation, knowledge is created and transferred in the IJV system. In order to be considered successful, knowledge transfer needs to add value to the firm and lead to the accumulation of new knowledge (Zander, 1992). Park et al. (2011) suggest that collaboration between the parties is required for successful knowledge transfer.

The participation in IJVs is considered to be one of the most effective means for firms to acquire new tacit knowledge and “know how” which is embedded in the organizations (Kandemir & Hult, 2005). The IJVs’ ability to take advantage of their international relations depends on their effectiveness to learn. Despite the benefits of successful knowledge transfer, effective knowledge transfer is not easily achieved (Argote, 1999). Empirical evidence shows that companies that can transfer knowledge effectively have a greater chance to succeed than the less effective and experienced ones (Argote, 1999). Szulanski (1996) argues that individuals with no clear understanding of the reasons why some processes are particularly effective, will not succeed in transferring their knowledge to others. Nonaka and Takeuchi (1995) argue that often the transfer of tacit and explicit knowledge takes place at the same time. However, as Hau and Evangelista (2007) suggest, the transfer of the two types should be examined separately, since the factors that affect the transfer of tacit knowledge might not have an impact on the transfer of implicit knowledge and “vice versa”. As the same authors indicate, the acquisition of both types of knowledge has not yet been researched in depth (Cavusgil et al., 2003). One of the most frequently investigated factors that facilitate knowledge transfer in IJVs is the level of trust between partners, which will be analyzed in the following section.

## **3. THEORETICAL BACKGROUND OF TRUST**

Trust is a highly abstract and multidimensional concept that has been adopted from many different scientific disciplines like Psychology (Rousseau, 1995), Sociology (Fukuyama, 1995), Social Psychology (Sorrentino et al., 1995), Neurobiology (Kosfeld et al., 2005), Economics

(Williamson, 1993), Marketing (Castaldo, 2003), Strategic Management (Barney and Hansen, 1994), Organizational Behaviour (Zaheer et al., 1998) and last but not least International Business (Inkpen & Currall, 1997). Each discipline has approached the concept with a different theoretical background which led to diverse conceptualizations that put the emphasis on different trustworthy components. Thus, comparison of the different propositions and outcomes is difficult (Endrissat & Kühlmann, 2003).

Conceptually and methodologically, trust is a complex subject area. As a result of this complexity, numerous definitions of trust have been proposed in the literature “*resulting in a confusing potpourri of definitions applied to a host of units and levels of analysis*” (Shapiro, 1987). According to Sabel (1993), “*trust is the mutual confidence that no party to an exchange will exploit another’s vulnerabilities*”. Lewicki and Wiethoff (2000) describe trust as “*an individual’s belief in, and willingness to act on the basis of, the words, actions, and decisions of another*”. Because IJVs often involve complex interpersonal, intergroup and interfirm dynamics, it is particularly important to apply a multilevel approach to IJV trust research (Luo, 2008; Ren et al., 2009). Extensive research of international literature reveals that trust has two primary dimensions: interpersonal and inter - organizational or inter – firm trust. Currall and Inkpen (2001) were able to identify within the existent literature wrongful attributions such as “*trust at the individual level was taken to be isomorphic with the inter-firm trust*”.

Sako (1992) and Boersma et al. (2003) make a clear distinction between three different dimensions of trust in inter - firm relationships: contractual – based or promissory – based trust, which is defined as “*an expectation that a party can be relied upon to carry out a verbal or written promise*”, competence – based trust, which refers to “*an expectation that a party will perform its role competently*” and goodwill – based trust, which is “*a less self - interested, non egotistic form of trust*”.

Dissecting trust into its individual components is useful, because such analysis permits a deeper understanding of its distinct, interrelated elements. Ultimately, however, trust is a complex integration of the psychological, sociological and economic dimensions into an irreducible whole experience (Hajidimitriou & Sklavounos, 2006). As Parkhe (1998) clearly notes, “*trust in an alliance partner is the overall outcome not of the summation of component parts, but of a holistic assessment of the past, present and future of the relationship with that partner*”.

#### **4. THE ROLE OF TRUST ON KNOWLEDGE TRANSFER**

Becerra et al. (2008) indicate that researchers in the past have reported on the positive role trust plays on knowledge transfer in organizations, specially for the transfer of tacit knowledge (Hansen, 1999). Trust facilitates knowledge transfer since it increases the partners’ willingness to assist each other to understand external knowledge (Lane et al., 2001). According to Dhanaraj et al. (2004), a feeling of trust can develop due to the partner’s status without the presence of strong social ties and common systems and procedures. The level of trust between partners also varies from case to case. Park (2008) also concluded that trust has a strong impact on knowledge acquisition, since it facilitates the exchange of information and resources and leads to common problem solving. The impact of trust on processes, as a social control mechanism and on the decrease of risks, is essential (Lane et al., 2001). As Boersma et al. (2003) suggest, the development of trust in a relationship is a “*sequential*” process. For this reason, when trust is examined, it is very important to consider the time factor, since the relationship between partners develops and changes over time (Ren et al., 2009). According to researchers, prior close relationships between partners foster the development of a feeling of comfort and trust over time (Kale et al., 2000). In addition, trust has an impact on the way partners work together in the IJV

(Dyer & Singh, 1998; Inkpen & Curral, 2004). As a result, trust determines the degree of knowledge transfer and the efficiency and effectiveness of the process, since it decreases the perceived risk of opportunistic behaviour from the partners. Li (2005), in his study of Western MNCs in China, found trust to be the most important factor for the management of knowledge transfer. According to Park et al. (2011), the role of trust in IJVs is “paramount”, since it has an impact on the opportunistic behaviour that is common in IJVs.

Trust plays an important role mostly in the transfer of tacit knowledge (Dhanaraj et al., 2004). Similarly, Beccera et al. (2008) suggest that trust is more important for the transfer of tacit knowledge than the transfer of explicit knowledge. Surprisingly, however, in their research on Norwegian IJVs they found that, “*transfer of explicit knowledge requires greater willingness to take risks*”, than the transfer of tacit knowledge. A possible explanation, as they note, is that since explicit knowledge can be easily identified and has a more immediate and direct impact on processes and performance, managers feel they need to protect more explicit than tacit knowledge. However, even if most researchers agree that trust facilitates knowledge transfer, some have concluded that a high degree of trust might suspend knowledge transfer, since it might lead to “*collective blindness*” (Yli-Renko et al., 2001). It is also important to note that others failed to show a significant relationship between trust, knowledge transfer and IJV performance (Sarkar et al., 2001; Curral & Inkpen, 2002).

Nielsen and Nielsen (2009) draw upon social capital theory (Nahapiet & Ghoshal, 1998) in arguing that trust, not only directly facilitates learning, but also conditions the effect of knowledge tacitness on performance (innovative outcomes). Similar to Simonin (1999), Nielsen and Nielsen (2009) focus on knowledge tacitness as a key attribute that influences both the access to – and application of – relevant external knowledge. In addition, consistent with the relational view of competitive advantage (Dyer & Singh, 1998), Nielsen and Nielsen (2009) focus on how trust affects the firm’s ability to acquire new knowledge and apply it for innovative purposes (Nahapiet & Ghoshal, 1998; Steensma et al., 2005). Relational capital is likely to affect conditions for the transfer of knowledge (Dyer & Singh, 1998). As such, it serves as a coordinating mechanism that ensures repeated intense interaction conducive to knowledge transfer. Trust is a particularly important aspect of relational quality in alliances because it facilitates social interaction, increases transparency, and reduces transaction costs and uncertainty. Nielsen and Nielsen (2009) contend that the ability of a firm to absorb external knowledge from its alliance partner depends on the quality of the relationship in terms of the level of trust between parties. Trust functions as an ongoing social control mechanism and a risk reduction device (Gulati, 1995). It influences both the extent of knowledge exchanged in ISAs (Inkpen, 1997) and the efficiency with which it is exchanged (Parkhe, 1998).

Das and Teng (1998) suggest that trust and control are complementary and that control may foster trust. Because contracts narrow the domain and severity of risk to which an exchange is exposed (Poppo & Zenger, 2002), contracts with implicit and explicit rules establish a formal basis of assurance for mutual trust and provide an institutional basis for future cooperation. With such formal assurance, parties are more likely to transfer tacit knowledge. By establishing safe boundaries for knowledge flows, contracts, in conjunction with trust, promote greater acquisition of tacit knowledge than trust alone. Because localized, tacit knowledge disappears when specific persons change jobs, formal operating procedures are necessary to preserve and improve the efficient use of resources. These operational routines complement the social mechanism of trust by creating a structure for coordination, facilitating processes, and establishing safe boundaries for knowledge flows (Li et al., 2010).

One important contingency, which has largely been overlooked in the alliance literature, is the interaction of trust with the characteristics of knowledge. To the extent that explicit and tacit knowledge are inherently different and are shared through different verbal and social processes,

they may likely be associated with different levels of trust (Becerra et al., 2008). Trust acts as a governance mechanism of embedded relationships in facilitating tacit knowledge utilization (Uzzi, 1996). Nielsen and Nielsen (2009) propose and test an integrated framework in which tacitness and trust are key mechanisms that mediate the relationships between partner characteristics and alliance outcomes. In addition, consistent with the extant alliance learning literature, they find trust to be significantly associated with knowledge transfer and learning (Muthusamy & White, 2005).

The formation of an alliance is based on the acknowledgement that an alliance partner possesses the useful knowledge, experience, and capabilities. The trustworthy behaviors of a partner are a precondition for an enriched, meaningful, and continued exchange of knowledge between alliance managers. Trust can enhance openness and accessibility toward each other in an alliance. Such openness motivates the partners to be much more transparent, increases the scope of the relationship, and enhances mutual knowledge transfer between firms in the alliance (Muthusamy & White, 2005). There are several reports which suggest that there is a positive relationship between trust and partners' collaborative behaviors in the form of self-disclosures, information exchange, and cooperative problem-solving (Lazaric, 1998). For instance, Zaheer and Venkatraman (1995) found that trust increased the scope of joint planning and action by partners in strategic alliances. Through relational processes, partners learn about each other's competency and develop confidence in one another (Muthusamy & White, 2005).

The results of Muthusamy and White (2005) indicate that relational social exchanges between partners have strong influence on the extent of interfirm learning accomplished in a strategic alliance. Their results indicate that trust in the partner's abilities (ability-based trust) is positively linked to new knowledge, skills and competencies gained through the alliance. The study of Muthusamy and White (2005) also conjectures that partner trustworthiness is central to smooth functioning of the alliance. Without exhibiting social competency in terms of integrity and goodwill, it would be difficult for the partners to have meaningful and productive exchanges of information, knowledge and skills.

Furthermore, trust establishes a basis of intimacy, predictability and reliability, which leads parties to be more open and receptive to the transfer and acquisition of knowledge (Dyer & Hatch, 2006; Inkpen & Tsang, 2005). When trust exists, the recipient is more likely to be open and receptive to the knowledge offered by another (Inkpen & Tsang, 2005). This intimacy is also associated with frequent communication (Szulanski, 1996) and coordination flexibility, because parties are more willing to respond quickly to interfirm requests (Das & Teng, 1998). A major obstacle to interfirm knowledge transfer is the potential leakage of valuable knowledge (Dyer & Singh, 1998; Inkpen, 2000). Trust helps overcome this obstacle by establishing a level of behavioral predictability and reliability through the accumulation of exchange experiences. Moreover, trust enables greater cooperation between the recipient and the knowledge source by creating the mutual understanding that both parties will consider the interests of the other (Lane et al., 2001). Trust may foster knowledge transfer by establishing idiosyncratic sharing routines to facilitate learning of specified information and know-how (Dyer & Singh, 1998) and increasing the overall level of information exchange between parties (Tsai & Ghosal, 1998).

Li et al. (2010) suggest that trust fosters the acquisition of greater levels of tacit than explicit knowledge. For exchanges characterized by interfirm trust, the adjoining behavioral processes are more akin to those that support the transfer of tacit knowledge than those that enable explicit knowledge transfer. Whereas transferring tacit knowledge across organizational boundaries is generally difficult because of its sticky and hard-to-codify nature, close and intense interactions between exchange partners constitute an effective mechanism to transfer such knowledge. Not only does exposure to the source unit's work environment and socialization process greatly encourage the transfer of tacit knowledge, but the willingness to spend

significant time together and maintain stable relationships also facilitates tacit knowledge transfer (Kotabe et al., 2003; Nonaka & Takeuchi, 1995). Li et al. (2010) also predict and empirically show that trust is associated with a greater acquisition of tacit than explicit knowledge. Because trust reduces perceptions of unfair play, such as knowledge leakage and appropriation, and supports close, intimate connections, it is used most effectively to acquire tacit knowledge. These results confirm that trust lies at the heart of tacit knowledge exchange (Adler, 2001).

## 5. IMPLICATIONS FOR FURTHER RESEARCH

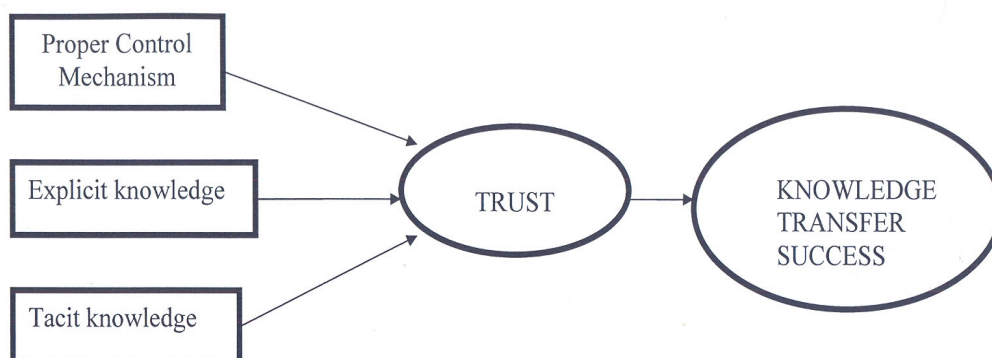
After the theoretical background of the concepts of knowledge transfer and trust and the review of the most recent scientific articles about the impact of trust as a determinant factor of knowledge transfer, and taking under consideration the particularities of the business environment of Eastern Europe countries, we conclude with the following propositions:

*P1. The establishment of a proper control mechanism with implicit and explicit rules in an alliance, will result in more trust among partners; as a result there will be a positive impact on knowledge transfer*

*P2. When knowledge is explicit, trust plays no role in the knowledge transfer*

*P3. When knowledge is tacit, trust has a positive impact on the knowledge transfer*

Our conceptual model about the impact of trust on knowledge transfer in IB systems is portrayed in Figure 1:



**Figure 1. Conceptual Model of the impact of trust on knowledge transfer in IB systems**

## 6. CONCLUSION

The aim of this paper is to present an in depth review of the most recent literature about the impact of trust as a determinant factor of knowledge transfer and to propose a number of propositions for further research. The first section contains the theoretical background of the concept of trust and the process of knowledge transfer. The main section refers to a few contemporary and distinguished scientific articles about the impact of trust as a determinant factor of knowledge transfer from the most recent international literature. The final section of the paper contains the authors' propositions for future research in the South – Eastern European IB systems context.

These propositions will be tested empirically as hypotheses during our future research in which we intend to interview Greek managers involved in international strategic alliances. We strongly believe that our findings would constitute a valuable addition in the international literature on the complex concepts of trust and knowledge transfer, and will have practical implications for managers of firms operating in an international environment.

## REFERENCES

1. Adler, P.S., 2001. Market, hierarchy, and trust: the knowledge economy and the future of capitalism. *Organization Science*, 12: p.p. 215-234.
2. Ahn, P.T.T. et al., 2006. Knowledge Acquisition from Foreign Parents in International Joint Ventures: An Empirical Study in Vietnam. *International Business Review*, Vol. 15, No. 5, pp.463-487.
3. Anvy, G. and Anderson, A.R., 2008. Organisational culture, national culture and performance in International Joint Ventures based in Israel. *International Journal of Business and Globalisation*, Vol. 2, No. 2, p.p. 133-145.
4. Argote, L., 1999. *Organizational learning: Creating, retaining, and transferring knowledge*. Kluwer, Academic Publishers, Boston, MA.
5. Barney, J.B. and Hansen, M.H., 1994. Trustworthiness as a source of competitive advantage. *Strategic Management Journal*, 15, p.p. 175-190.
6. Becerra, M. et al., 2008. Trustworthiness, risk, and the transfer of tacit knowledge between alliance partners. *Journal of Management Studies*, 45 (4), June, p.p. 691-713.
7. Berdrow, I. and Lane, H.W., 2003. International Joint Ventures: Creating Value through Successful Knowledge Management. *Journal of World Business*, Vol. 38, No. 1, pp. 15-30.
8. Boersma, M.F. et al., 2003. Trust in international joint venture relationships. *Journal of Business Research*, 56, p.p. 1031-1042.
9. Castaldo, S., 2003. Trust Variety-Conceptual Nature, Dimensions and Typologies. *Proceedings of IMP Conference 2003*, Lugano, Switzerland.
10. Cavusgil, S. et al., 2003. Tacit knowledge transfer and firm innovation capability. *Journal of Business and Industrial Marketing*, Vol. 18, No. 1, pp. 6-21.
11. Chung, C.C. and Beamish, W., 2012. Multi-party international joint ventures: Multiple post-formation change processes. *Journal of World Business* (forthcoming).
12. Currall, S.C. and Inkpen, A.C., 2001, Joint-Venture trust: Interpersonal, Inter-group, and Inter-firm Levels. In: Faulkner, D.O. and M. De Rond (eds.): *Cooperative Strategy. Economic, Business, and Organizational Issues*. Oxford: University Press, pp. 324-340.
13. Currall, S.C. and Inkpen, A.C., 2002. A Multilevel Approach to Trust in Joint Ventures. *Journal of International Business Studies*, Vol. 33, No. 3, pp. 479-495.
14. Das, T.K. and Teng, B.S., 1998. Between trust and control: developing confidence in partner cooperation in alliances. *Academy of Management Review*, 23: p.p. 491-512.
15. Davenport, T.H. and Prusak, L., 1998. *Working knowledge*. Harvard Business School Press.
16. Dhanaraj, C. et al., 2004. Managing tacit and explicit knowledge transfer in IJVs: The role of relational embeddedness and the impact on performance. *Journal of International Business Studies*, 35(5): p.p. 428-442.
17. Duan J. and Chuanmin, S., 2007. Ownership, control, and performance of U.S.-China joint ventures: A longitudinal study. *Journal of Applied Management and Entrepreneurship*, 12(1), p.p. 25-35.
18. Dyer, J.H. and Singh, H., 1998. The relational view: cooperative strategy and sources of interorganizational competitive advantage. *Academy of Management Review*, 23, p.p. 660-679.
19. Dyer, J.H. and Hatch, N.W., 2006. Relation-specific capabilities and barriers to knowledge transfers: creating competitive advantage through network relationships. *Strategic Management Journal*, 27(8): pp. 701-719.



20. Easterby-Smith, M. et al., 2008. Inter-Organizational Knowledge Transfer: Current Themes and Future Prospects. *Journal of Management Studies*, Vol. 45, No. 4, pp. 677-690.
21. Endrissat, N. and Kühlmann, T.M., 2003. Trust in foreign business partners. A six country study, *Proceedings of European Academy of Management Conference 2003*. SDA Bocconi Milan, Italy.
22. Ernst, D. and Halevy, T., 2004. Not by M&A Alone. *The McKinsey Quarterly*, 1, p.p. 6-10.
23. Fukuyama, F., 1995. *Trust: The social virtues and the creation of prosperity*. New York: Free Press.
24. Gao, F. et al., 2008. Knowledge, Management, and Knowledge Management in Business Operations. *Journal of Knowledge Management*, Vol. 12, No. 2, pp. 3-17.
25. Gulati, R., 1995. Does familiarity breed trust? The implications of repeated ties for contractual choice in alliances. *Academy of Management Journal*, 38, p.p. 85-112.
26. Gulati, R. et al., 2000. Strategic networks. *Strategic Management Journal*, 21(3): p.p. 203-217.
27. Hajidimitriou, Y.A., 2003. *International Business*. Anikoula Publishing, Thessaloniki, Greece.
28. Hajidimitriou, Y.A. and Sklavounos, N.S., 2006. The Importance of Trust for the Success of International Strategic Alliances. *Proceedings of Management of International Business and Economics Systems Conference (MIBES) 2006*. Larissa, Greece.
29. Hajidimitriou, Y.A. and Sklavounos, N.S., 2007. The Creation of Trust in International Strategic Alliances. *Proceedings of Management of International Business and Economics Systems Conference (MIBES) 2007*. Larissa, Greece, p.p. 675-689.
30. Hajidimitriou, Y.A. and Sklavounos, N.S., 2008. The Trust Dimension in International Business Systems. *Proceedings of Management of International Business and Economics Systems Conference (MIBES) 2008 e-Book*. Larissa, Greece.
31. [Hajidimitriou, Y.A. and Rotsios, K.P., 2009. Effective Knowledge Transfer and Knowledge Acquisition in International Joint Ventures. \*Proceedings of Management of International Business and Economics Systems Conference \(MIBES\) 2009\*. Florina, Greece, pp. 58-71.](#)
32. Hansen, M.T., 1999. The search-transfer problem: The role of weak ties in sharing knowledge across organization subunits. *Administrative Science Quarterly*, 44: p.p. 82-111.
33. Hau, L. and Evangelista F., 2007. Acquiring Tacit and Explicit Marketing Knowledge from Foreign Partners in IJVs. *Journal Business Research*, Vol. 60, No. 11, pp. 1152-1165.
34. Inkpen, A.C., 1997. An Examination of Knowledge Management in International Joint Ventures. In Beamish, P.W. and Killing, J.P. (eds.), *Cooperative Strategies. North American Perspectives*. San Francisco: The New Lexington Press 1997, pp. 337-371.
35. Inkpen, A.C., 2000. Learning through joint ventures: a framework of knowledge acquisition. *Journal of Management Studies*, 37(7): p.p. 1019-1043.
36. Inkpen, A.C. and Currall, S.C., 1997. International joint venture trust: An empirical examination. In P.W. Beamish and J.P. Killing, (eds.), *Cooperative strategies: North American perspectives*. San Francisco: New Lexington Press.
37. Inkpen, A.C., and Currall, S.C., 2001. Joint-venture trust: Inter-personal, inter-group and inter-firm levels. In D.O. Faulkner and M. De Rond, (eds.), *Cooperative Strategy. Economic, Business and Organizational Issues*. Oxford University Press.
38. Inkpen, A.C. and Currall, S.C., 2004. The coevolution of trust, control, and learning in joint ventures. *Organization Science*, Vol. 15, No. 5, pp. 586-599.
39. Inkpen, A.C. and Tsang, E.W.K., 2005. Social capital, networks, and knowledge transfer. *Academy of Management Review*, 30(1): p.p.146-165.
40. Kale, P. et al., 2000. Learning and protection of proprietary assets in strategic alliances: building relational capital. *Strategic Management Journal*, 21, p.p. 217-237.
41. Kandemir, D. and Hult, G.T.M., 2005. A Conceptualization of Organizational Learning Culture in International Joint Venture. *Industrial Marketing Management*, Vol. 34, No. 5, pp. 430-439.
42. Kogut, B. and Zander, U., 1992. Knowledge of the Firm, Combinative Capabilities, and the Replication of Technology. *Organization Science*, Vol. 3, No. 3, pp. 383-397.
43. Kosfeld, M. et al., 2005. Oxytocin Increases Trust in Humans. *Nature*, June 2, p.p. 673-676.

44. Kotabe, M. et al., 2003. Gaining from vertical partnerships: knowledge transfer, relationship duration and supplier performance improvement in the U.S. and Japanese automotive industries. *Strategic Management Journal*, 24(4): p.p. 293-316.
45. Lane, P.J. et al., 2001. Absorptive Capacity, Learning, and Performance in International Joint Ventures. *Strategic Management Journal*, 22: p.p. 1139-1161.
46. Lazaric, N., 1998. Trust and organizational learning during inter-firm cooperation. In Lazaric, N. and Lorenz, E. (eds), *Trust and Economic Learning*. Cheltenham: Edward Elgar.
47. Le, N.H. and Jorma, L., 2009. Foreign Parent Strategies, Control and International Joint Venture Performance. *International Business Research*, Vol.2, No.1, p.p. 3-15.
48. Lei, D. et al., 1997. Building Cooperative Advantage: Managing Strategic Alliances to Promote Organizational Learning. *Journal of World Business*, Vol. 32, No. 3, pp. 203-223.
49. Lewicki, R.J. and Wiethoff, C., 2000. Trust, Trust Development, and Trust Repair. In. M. Deutsch and P.T. Coleman (Eds.), *The handbook of conflict resolution: Theory and practice*. San Francisco, CA: Jossey-Bass.
50. Li, J.J. et al., 2010. Relational mechanisms, formal contracts, and local knowledge acquisition by international subsidiaries. *Strategic Management Journal*, 31, p.p. 349-370.
51. Liao, S.H. et al., 2010. An Integrated Model for Learning Organization with Strategic View: Benchmarking in the Knowledge-Intensive Industry. *Expert Systems with applications*, Vol. 37, No. 5, pp. 3792-3798.
52. Luo, Y., 2008. Procedural fairness and interfirm cooperation in strategic alliances. *Strategic Management Journal*, 29: pp. 27-46.
53. Martin, X. and Salomon, R., 2003, Knowledge Transfer Capacity and its Implications for the Theory of the Multinational Corporation. *Journal of International Business Studies*, Vol. 34, No. 4, pp. 356-373.
54. Meschi, P. and Riccio, E.L., 2008. Country risk, national cultural differences between partners and survival of international joint ventures in Brazil. *International Business Review*, 17 (3), p.p. 250-266.
55. Muthusamy, S.K. and White, M.A., 2005. Learning and knowledge transfer in strategic alliances: a social exchange view. *Organization Studies*, 26, p.p. 425-441.
56. Nahapiet, J. and Ghoshal, S., 1998. Social capital, intellectual capital, and the organizational advantage. *Academy of Management Review*, 23, p.p. 242-266.
57. Nielsen, B.B. and Nielsen, S., 2009. Learning and innovation in international strategic alliances: An empirical test of the role of trust and tacitness. *Journal of Management Studies*, 46(6): pp. 1031-1056.
58. Nonaka, I., 1987. Managing the firm as information creation process. Working paper, Institute of Business Research, Hitotsubashi University, Hitotsubashi, Japan.
59. Nonaka, I. and Takeuchi, H., 1995. *The Knowledge-Creating Company: How Japanese Companies Create the Dynamics of Innovation*. Oxford University Press: New York.
60. Park, B.I. et al., 2008. Knowledge Acquisition and Performance: The Role of Foreign Parents in Korean IJVs. *Asian Business & Management*, Vol. 7, No. 1, pp. 11-32.
61. Park, B., 2011. Knowledge Transfer Capacity of Multinational Enterprises and Technology Acquisition in International Joint Ventures. *International Business Review*, Vol. 20, No. 1, pp. 75-87.
62. Park, J. et al., 2011. The role of IT human capability in the knowledge transfer process in IT outsourcing context. *Information & Management*, Vol. 48, No. 1, pp. 53-61.
63. Parkhe, A., 1998. Building Trust in International Alliances. *Journal of World Business*, 33 (4), pp. 417-437.
64. Polanyi, M., 1966. *The Tacit Dimension*. London: Routledge & Kegan Paul.
65. Polanyi, M., 1969. *Knowing and being: Essays by Michael Polanyi*. Chicago: University of Chicago Press.
66. Poppo, L. and Zenger, T. 2002. Do formal contracts and relational governance function as substitutes or complements?. *Strategic Management Journal*, 23, p.p. 707-725.
67. Ren, H. et al., 2009. Performance of International Joint Ventures: What Factors Really Make a Difference and How?. *Journal of Management*, Vol.35, No.3, p.p. 805-832.

68. Rousseau, D.M., 1995. *Psychological contracts in organizations, Understanding written and unwritten agreements*. Thousand Oaks: Sage.
69. Sabel, C., 1993. Studied Trust: Building New Forms of Cooperation in a Volatile Economy. *Human Relations*, 46, 9, p.p. 1133-1170.
70. Sahal, D., 1981. *Patterns of Technological Innovation*. Reading, MA, Addison-Wesley Publ. Co.
71. Sako, M., 1992. *Prices, quality and trust: inter – firm relations in Britain and Japan*. Cambridge University Press.
72. Sarkar, M.B. et al., 2001. Alliance entrepreneurship and firm market performance. *Strategic Management Journal*, Vol. 22, No. 6-7, pp. 701-711.
73. Shapiro, S., 1987. The social control of impersonal trust. *American Journal of Sociology*, 98, pp. 623-658.
74. Simonin, B.L., 1999. Ambiguity and the process of knowledge transfer in strategic alliances. *Strategic Management Journal*, 20, p.p. 595-623.
75. Sklavounos, N.S. and Hajidimitriou, Y.A., 2011. The Contextual Factors that Affect the Development of Trust at the Initial Stages of International Joint Ventures. *Management of International Business and Economics Systems (MIBES) Transactions*, Vol. 5(2), p.p. 125-135.
76. Sorrentino, R.M. et al., 1995. Uncertainty Orientation and Trust in Close Relationships: Individual Differences in Cognitive Styles. *Journal of Personality and Social Psychology*, 68(2): p.p. 314-327.
77. Steensma, H.K. et al., 2005. The evolving value of foreign partnerships in transitioning economies. *Academy of Management Journal*, 48, p.p. 213-235.
78. Szulanski, G., 1996. Exploring internal stickiness: impediments to the transfer of best practice within the firm. *Strategic Management Journal*, Winter Special Issue, 17: p.p. 27-43.
79. Tsai, W. and Ghoshal, S., 1998. Social capital and value creation: the role of interfirm networks. *Academy of Management Journal*, 41(4): p.p. 464-476.
80. Uzzi, B., 1996. The sources and consequences of embeddedness for the economic performance of organizations: the network effect. *American Sociological Review*, 61, p.p. 674-698.
81. Van Wijk, R. et al., 2008. Inter- and intra-organizational knowledge transfer: a meta-analytic review and assessment of its antecedents and consequences. *Journal of Management Studies*, Vol. 45, No. 4, pp. 830-853.
82. Williamson, O.E., 1993. Calculativeness, trust, and economic organization. *Journal of Law and Economics*, 36 (1), p.p. 453-486.
83. Yli-Renko, H. et al., 2001. Social Capital, Knowledge Acquisition, and Knowledge Exploitation in Young Technology Based Firms. *Strategic Management Journal*, Vol. 22, No. 6-7, pp. 587-613.
84. Yoshino, M.Y. and Rangan, U.S. 1995. *Strategic alliances: An entrepreneurial approach to globalization*. Boston, MA: Harvard Business School Press.
85. Zaheer, A. et al., 1998. Does trust matter? Exploring the effects of interorganizational and interpersonal trust on performance. *Organization Science*, 9 (2), p.p. 141-159.
86. Zaheer, A. and Venkatraman, N., 1995. Relational governance as an interorganizational strategy: An empirical test of the role of trust in economic exchange. *Strategic Management Journal*, 16: p.p. 373-392.

## USING THE SWOT MODEL IN ESTABLISHING THE STRATEGY AT AUTOMOBILE DACIA GROUPE RENAULT COMPANY

Puiu GRĂDINARU<sup>1</sup>, Doruleț GRĂDINARU<sup>2</sup>

<sup>1</sup>Faculty of Economic Sciences, University of Pitești, Romania  
[gradinarupuiu@yahoo.com](mailto:gradinarupuiu@yahoo.com)

<sup>2</sup>Faculty of Economic Sciences, University of Pitești, Romania  
[gradinaru\\_dorulet@yahoo.com](mailto:gradinaru_dorulet@yahoo.com)

**Abstract:** SWOT analysis is a tool of the strategic management and it is used by the companies in the following situations: when they want to make ultimate decisions based on a complete analysis, in the strategic forecasting on three – five years, in the annual planning, when the company want a renewal or a radical change in its activity, or, each time when the company faces major difficulties which has to be solved as fast as possible. The SWOT model is also known as the Great strategy or the main strategy, being a part of the corporative strategies.

**Keywords :** strategy, evaluation matrices, strategic management, strengths, weaknesses, opportunities, threats

**JEL Classification Codes :** M10, M20, M21

### 1. SWOT ANALYSIS – THEORETICAL ASPECTS

SWOT analysis highlights the strengths and the weaknesses of a company, as the opportunities and threats presented by its environment of activity. The strengths and the weaknesses refer to the internal environment of the institution, the opportunities and threats result from the action of the external factors. The opportunities are related to the agents that ease the exploitation of the challenging benefits of the institution, while the threats come from the external agents, which could produce the company’s collapse.

	<b>Positive</b>	<b>Negative</b>
Internal environment	Strengths	Weaknesses
External environment	Opportunities	Threats

**Fig. 1 SWOT Invention matrix**

*Source: Russu, C., Albu, M.- Diagnosis and the Company’s Strategy, Tribuna Economică Publishing House, Bucharest, 2005, page 103 [5][9]*

SWOT matrix can be used in two ways [4]:

- the qualitative model, which allows a faster and more intuitive use, being applied at the level of the small companies;

- the quantitative model, which carries some scores which, brought together, result a coordinate pair in a certain quadrant. A group of persons with power of decision will establish a strategy on the ground of this quadrant.

## 2. THE IMPLEMENTATION OF SWOT ANALYSIS FOR A CAR PRODUCER

The use of the quantitative model involves two stages [1][2]

- A. identification of SWOT quadrant
- B. specification of the concrete strategy

Stage A. **The elaboration of the evaluation matrix of the internal agents (MEFI)** involves the following steps:

1. Identification of the internal factors (the strengths and the weaknesses).
2. The attribution of indices of importance  $K_j$  to the factors with values between 0 and 1 in accordance with the influence of the factors on the company's success, so that:

$$\sum (K_j) = 1$$

3. The attribution of a grade  $N_j$  to each factor with values between 1 and 4:

- $N_j = 1$   very weak factor
- $N_j = 2$   weak factor
- $N_j = 3$   strong factor
- $N_j = 4$   major factor

4. The establishment of the global internal power of the company (PGIF)

$$PGIF = \sum (K_j \times N_j)$$

- If PGIF is:
- $1 < PGIF < 1,5 \Rightarrow$  company's potential is very small
  - $1,5 < PGIF < 2 \Rightarrow$  company's potential is small
  - $2 < PGIF < 2,5 \Rightarrow$  company's potential is between small and medium
  - $2,5 < PGIF < 3 \Rightarrow$  company's potential is between medium and high
  - $3 < PGIF < 3,5 \Rightarrow$  the company's potential is high
  - $3,5 < PGIF < 4 \Rightarrow$  the company's potential is very high

**Table no.1: Internal factors evaluation matrix (MEFI)**

Crrt. No.	Internal factor name	Importance coefficient $C_i$	Awar ded Note $N_j$	Average score $P = \sum C_i * N_j$
1.	Offered product's quality	0,15	4	0,60
2.	Market section owned	0,15	4	0,60
3.	Distribution network	0,05	3	0,15
4.	Price policy	0,1	4	0,4
5.	Products promotion	0,05	3	0,15
6.	Lucrativeness	0,05	3	0,15

7.	Debts payment	0,05	3	0,15
8.	Technologies used	0,05	3	0,15
9.	Production capacity	0,05	4	0,2
10.	Staff experience	0,05	4	0,2
11.	Labor qualification level	0,05	3	0,15
12.	Decisional system	0,05	3	0,15
13.	Informational system	0,05	3	0,15
14.	Motivation and innovation capacity	0,05	3	0,15
15.	Structural organization	0,05	3	0,15
<b>Total</b>		<b>1</b>		<b>3,50</b>

Source: Stăncioiu, I., Militaru, Gh. - Management. Basic Elements, Teora Publishing House, Bucharest, 1998, page 243

From the analyzes results we conclude that Automobile Dacia Groupe Renault Company at the 3,50 value, is considered a company that has a strong internal strategy.

*The elaboration of the matrix for the assessment of the external factors (MEFE)* involves the following steps [3][7]:

1. The identification of the main external factors;

2. The allocation of the indices of importance  $K_j$  to the factors in accordance to their influence on the company's. The bigger indices are given to the factors that are more important, no matter if they are opportunities of threats for the company's activity.

$$\sum (K_j) = 1$$

3. The allocation of a grade  $N_j$  to each factor with values between 1 and 4:

$N_j = 1$  □ the factor represents great danger

$N_j = 2$  □ medium exposure to that factor

$N_j = 3$  □ company's feedback under the average

$N_j = 4$  □ the company behaves adequate to the factory that is given

4. The establishment of the global external power of the company (PGEF)

$PGEF = \sum (K_j \times N_j)$
--------------------------------

If PGEF is:

a)  $1 < PGEF < 1,5$  => very low possibilities for the company to adapt to the environment

b)  $1,5 < PGEF < 2$  => low possibilities for the company to adapt to the environment

c)  $2 < PGEF < 2,5$  => marks out a capacity of adaptation to the requests of the external environment

d)  $PGEF = 3$  => high possibilities for the company to respond to the requests of the external factors

e) PGEF = 4 => major possibilities for the company to respond to the requests of the external factors, taking advantage of the opportunities for development and avoiding the dangers.

**Table no. 2: External factors evaluation matrix (MEFE)**

<b>Crrt. No.</b>	<b>External factor name</b>	<b>Importance coefficient Ci</b>	<b>Awarded Note Nj</b>	<b>Average Score P = <math>\Sigma Ci * Nj</math></b>
1.	Product diversification	0,15	4	0,6
2.	Increased demand on internal market	0,05	3	0,15
3.	Market expansion	0,1	4	0,4
4.	Decreased purchasing power	0,05	2	0,1
5.	Highly skilled labor migration	0,1	2	0,3
6.	Danger of competing products	0,05	3	0,15
7.	New competitors appearance	0,1	3	0,3
8.	Wages and taxes level	0,1	4	0,4
9.	Economic development level	0,1	4	0,4
10.	Habits, beliefs, values, standards of living	0,2	3	0,6
<b>Total</b>		<b>1</b>		<b>3.40</b>

Source: Stăncioiu, I., Militaru, Gh.- Management. Basic Elements, Teora Publishing House, Bucharest, 1998, page 244

Score 3.40, means that Automobile Dacia Groupe Renault Company has great possibilities which help to answer to external environment requests, meaning evaluate the opportunities and avoid dangers, threats.

### Stage B. The elaboration of the concrete strategy

#### **SWOT model and the global strategies:**

Quadrant I - growth strategies;

Quadrant II – propulsive strategies in conditions of risk;

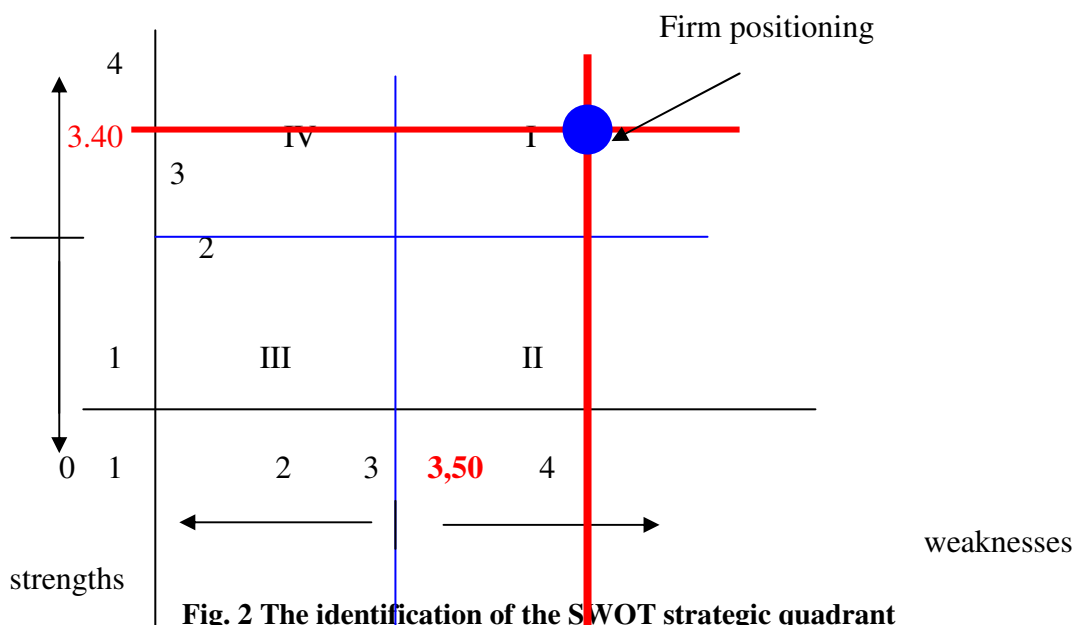
Quadrant III – limitation strategies;

Quadrant IV – strategies to overcome the weaknesses;

Identification of Automobile Dacia Groupe Renault Company in strategic quadrant(fig. 2) gives the possibility to formulate a concrete strategy, related to growth strategy, this one refers focusing on specific market segments, launching new products and services, penetration of new market.

After some market research GAMA Company managed to meet the target market with a wide range of models for 2012, such as:

- SANDERO STEPWAY 2: is generally preferred by young people, 18-25 years old, with average income; this model being on the low-cost level.
- LOGAN 2: is preferred by older people, with families, this model being on the middle level;
- SANDERO 2: is designed for females because it is a small and stylish car.
- DOKKER and DOKKER Van: for mixed use having a boot volume and modularity at the best level of category.



**Fig. 2 The identification of the SWOT strategic quadrant**

Source: Stăncioiu, I., Militaru, Gh.- Management. Basic Elements, Teora Publishing House, Bucharest, 1998, page 244

### 3. CONCLUSIONS

The SWOT model is in the scope of the strategic management which analyzes both the action of the external factors to notice the changes that produce within it, and the internal environment, in order to realize if the company is competitive on the market.

The company must develop a system for the search and systematic exploitation of the external pieces of information, which may have a significant influence on its future on short, medium or long term. These elements are used by the company to establish the strategy and to plan its activities in order to have a successful activity on the existing and potential markets.

The SWOT analysis determines a company to be both an introvert entity, centered on itself, and an extrovert one, being open to the global environment where it has to adapt quickly through permanent feedbacks. This analysis gives to the company a status of wakefully economic actor [8].



According to the placing of the point located in one of the four quadrants, settled by the two coordinates associated with the external and internal global power, the concrete strategies are established. The concrete strategies are a part of the generic strategies. The strategies start from the quadrant I which provides to the companies a position of expansion on the market, reaching to quadrant IV, where the companies activate in unfavourable market positions.

In order to apply the SWOT analysis, the company must have a mission as clear as possible, highly detailed, and a very precise and exhaustive assessment of the external and internal environment.

While the qualitative model of the SWOT analysis is based on a specification of the external and internal factors and a combination between them which allows the establishment of an aggregated strategy by a sole individual policy maker, the quantitative model involves the use of some indices of importance and grades, which, through their aggregation, will give as a result the pair of coordinates that places the company in one of the four quadrants, giving to a group that make decisions the possibility to choose the strategy [4].

## REFERENCES

1. Stăncioiu, I., Militaru, Gh. - *Management. Basic Elements*, Teora Publishing House, Bucharest, 1998
2. Militaru, Gh. - *Management of Services*, C.H. BECK Publishing House, Bucharest, 2010
3. Nicolescu, Ov. (coordinator) - *Systems, Methods and Managerial Techniques of the Organization*, Economică Publishing House, Bucharest, 2000
4. Băcanu, B. - *Practices of strategic management. Methods and Case Studies*, Polirom Publishing House, Iași, 2006
5. Russu, C. - *Strategic Management*, ALL BECK Publishing House, Bucharest, 1999
6. Wheelen, T., Hunger, D. - *Strategic Management and Business Policy*, Tenth edition, Prentice Hall Publishing House, Upper Saddle River, New York, 2006
7. Heizer, J., Render, B. - *Operations Management*, Prentice Hall Publishing House, New Jersey, 2006
8. Mereuță, C. - *Decisional Simulations. Course for master*, University of Pitesti, 2004
9. Russu, C., Albu, M. - *Diagnosis and the Company's Strategy*, Tribuna Economică Publishing House, Bucharest, 2005

## THE ACCURACY OF UNEMPLOYMENT RATE FORECASTS IN ROMANIA AND THE ACTUAL ECONOMIC CRISIS

Mihaela BRATU (SIMIONESCU)

Faculty of Cybernetics, Statistics and Economic Informatics

Academy of Economic Studies, Bucharest, Romania

[mihaela\\_mbl@yahoo.com](mailto:mihaela_mbl@yahoo.com)

**Abstract:** *In this study, the problem of forecasts accuracy is analysed on three different forecasting horizons: during the actual economic crisis, in few years before the crisis and on a large horizon. The accuracy of the forecasts made by European Commission, National Commission for Prognosis (NCP) and Institute for Economic Forecasting (IEF) for unemployment rate in Romania is assessed. The most accurate predictions on the forecasting horizons 2001-2011 and 2009-2011 were provided by IEF and the less accurate by NCP. These results were gotten using U1 Theil's statistic and a new method that has not been used before in literature in this context. The multi-criteria ranking was applied to make a hierarchy of the institutions regarding the accuracy and five important accuracy measures were taken into account at the same time: mean errors, mean squared error, root mean squared error, U1 and U2 statistics of Theil. In few years before crisis (2006-2008) another hierarchy of institutions were gotten using the accuracy criterion: NCP, IEF and EC. The combined forecasts of institutions' predictions are the best strategy to improve the forecasts accuracy on overall and before the crisis. During the economic crisis IEF provided the most accurate predictions, the combined forecasts being a good strategy of improving only the forecasts made by NCP and EC using inversely MSE scheme and equally weighted scheme. The assessment and improvement of forecasts accuracy have an important contribution in growing the quality of decisional process.*

**Key words:** forecasts, predictions, accuracy, multi-criteria ranking, combined forecasts, combining schemes.

**JEL Classification Codes:** E21, E27, C51, C53

### 1. INTRODUCTION

The evaluation of forecasts accuracy is necessary for establishing the decisional process. When more institutions in a country provide forecasts for the same macroeconomic variable, the deciders have to choose the one with the highest accuracy. The term of “accuracy” is put in correlation with the errors that affect the forecasting process, because only by hazard the predicted value of an indicator is exactly equal with its real value.

The original contribution of this research is related to the proposal of a new method of assessing the forecasts accuracy, taking into account more accuracy measures at the same time. The multi-criteria ranking let us make a classification of the institution according to more accuracy indicators.

On the other hand, the literature reports the necessity of improving the forecasts accuracy. We proposed as strategy of getting better predictions than the original ones the combined forecasts and we made comparisons with the original predictions to measure the degree of improvement.

## 2. LITERATURE

The forecasts accuracy evaluation is one of the current concerns of many researchers. One purpose of this assessment is related to the need of improving the predictions. The current economic and financial crisis emphasized the struggles of uncertainty reduction. The forecasts accuracy is a very large domain of research, an exhaustive presentation of it being impossible. But, some of the recent results will be described.

To assess the forecast accuracy, as well as their ordering, statisticians have developed several measures of accuracy. For comparisons between the MSE indicators of forecasts, Granger and Newbold proposed a statistic. Another statistic is presented by Diebold and Mariano (1995) for comparison of other quantitative measures of errors. Diebold and Mariano test proposed in 1995 a test to compare the accuracy of two forecasts under the null hypothesis that assumes no differences in accuracy. The test proposed by them was later improved by Ashley and Harvey, who developed a new statistic based on a bootstrap inference. Subsequently, Diebold and Christoffersen have developed a new way of measuring the accuracy while preserving the co-integration relation between variables.

Meese and Rogoff's paper, " Empirical exchange rate models of the seventies", remains the starting point for many researches on the comparing of accuracy and bias. Recent studies target accuracy analysis using as comparison criterion different models used in making predictions or the analysis of forecasted values for the same macroeconomic indicators registered in several countries.

Allan (2012) obtained a good accuracy for the OECD forecasts combined with outturn values of GDP growth for G7 countries between 1984 and 2010. The same author mentioned two groups of accuracy techniques used in assessing the predictions: quantitative forecasts accuracy statistics and qualitative accuracy methods.

Dovern and Weisser (2011) used a broad set of individual forecasts to analyze four macroeconomic variables in G7 countries. Analyzing accuracy, bias and forecasts efficiency, resulted large discrepancies between countries and also in the same country for different variables.

Most international institutions provide their own macroeconomic forecasts. It is interesting that many researchers compare the predictions of those institutions (Melander for European Commission, Vogel for OECD, Timmermann for IMF) with registered values and those of other international organizations, but it is omitted the comparison with official predictions of government.

Abreu (2011) evaluated the performance of macroeconomic forecasts made by IMF, European Commission and OECD and two private institutions (Consensus Economics and The Economist). The author analyzed the directional accuracy and the ability of predicting an eventual economic crisis.

In Netherlands, experts made predictions starting from the macroeconomic model used by the Netherlands Bureau for Economic Policy Analysis (CPB). For the period 1997-2008 was reconstructed the model of the experts macroeconomic variables evolution and it was compared with the base model. The conclusions of Franses, Kranendonk and Lanser (2011) were that the CPB model forecasts are in general biased and with a higher degree of accuracy.

Gorr (2009) showed that the univariate method of prediction is suitable for normal conditions of forecasting while using conventional measures for accuracy, but multivariate models are recommended for predicting exceptional conditions when ROC curve is used to measure accuracy.

Ruth (2008), using the empirical studies, obtained forecasts with a higher degree of accuracy for European macroeconomic variables by combining specific sub-groups predictions in comparison with forecasts based on a single model for the whole Union.

Heilemann and Stekler (2007) explain why macroeconomic forecast accuracy in the last 50 years in G7 has not improved. The first explanation refers to the critic brought to macroeconomics models and to forecasting models, and the second one is related to the unrealistic expectations of forecast accuracy. Problems related to the forecasts bias, data quality, the forecast process, predicted indicators, the relationship between forecast accuracy and forecast horizon are analyzed.

### 3. COMPARISONS BETWEEN UNEMPLOYMENT FORECASTS MADE BY DIFFERENT INSTITUTIONS USING THE ACCURACY CRITERION

In this study we used the forecasted values of the annual registered unemployment rate made for Romania by European Commission, National Commission for Prognosis and Institute for Economic Forecasting. The forecasting horizon is 2001-2011. The objective is to assess the accuracy, the biasness and the efficiency of these predictions and determine the best institution with the highest performance.

Armstrong and Fildes (1995) showed that it is not sufficient to use a single measure of accuracy. Therefore, more accuracy indicators were computed for the three types of forecasts on the specified horizon.

To make comparisons between forecasts we propose to determine the hierarchy of institutions according to the accuracy of their forecasts using multi-criteria ranking.

Two methods of multi-criteria ranking (ranks method and the method of relative distance with respect to the maximal performance) are used in order to select the institution that provided the best forecasts on the horizon 2001-2011 taking into account at the same time all computed measures of accuracy. The multi-criteria ranking can be applied to make a hierarchy of institutions taking into account the performance of forecasts in all its dimensions: accuracy, unbiasedness and efficiency.

If we consider  $\hat{X}_t(k)$  the predicted value after  $k$  periods from the origin time  $t$ , then the error at future time  $(t+k)$  is:  $e_t(t+k)$ . This is the difference between the registered value and the predicted one.

The indicators for evaluating the forecasts accuracy that will be taken into consideration when the multi-criteria ranking is used are:

- Root Mean Squared Error (RMSE)

$$RMSE = \sqrt{\frac{1}{n} \sum_{j=1}^n e_x^2(T_0 + j, k)} \quad (1)$$

- Mean error (ME)

$$ME = \frac{1}{n} \sum_{j=1}^n e_x(T_0 + j, k) \quad (2)$$

The sign of indicator value provides important information: if it has a positive value, then the current value of the variable was underestimated, which means expected average values too small. A negative value of the indicator shows expected values too high on average.

- Mean absolute error (MAE)

$$MAE = \frac{1}{n} \sum_{j=1}^n | e_x(T_0 + j, k) | \quad (3)$$

These measures of accuracy have some disadvantages. For example, RMSE is affected by outliers. Armstrong and Collopy stresses that these measures are not independent of the unit of measurement, unless if they are expressed as percentage. If we have two forecasts with the same mean absolute error, RMSE penalizes the one with the biggest errors.

A common practice is to compare the forecast errors with those based on a random-walk. “Naïve model” method assumes that the variable value in the next period is equal to the one recorded at actual moment. Theil proposed the calculation of U statistic that takes into account both changes in the negative and the positive sense of an indicator:

U Theil’s statistic can be computed in two variants, specified also by the Australian Treasury.

The following notations are used:

- a- the registered results
- p- the predicted results
- t- reference time
- e- the error (e=a-p)
- n- number of time periods

$$U_1 = \frac{\sqrt{\sum_{t=1}^n (a_t - p_t)^2}}{\sqrt{\sum_{t=1}^n a_t^2} + \sqrt{\sum_{t=1}^n p_t^2}} \quad (4)$$

A value close to zero for  $U_1$  implies a higher accuracy.

$$U_2 = \sqrt{\frac{\sum_{t=1}^{n-1} \frac{(p_{t+1} - a_{t+1})^2}{a_t}}{\sum_{t=1}^{n-1} \frac{(a_{t+1} - a_t)^2}{a_t}}} \quad (5)$$

If  $U_2 = 1 \Rightarrow$  there are not differences in terms of accuracy between the two forecasts to compare

If  $U_2 < 1 \Rightarrow$  the forecast to compare has a higher degree of accuracy than the naive one

If  $U_2 > 1 \Rightarrow$  the forecast to compare has a lower degree of accuracy than the naive one

**Table 1: The accuracy of forecasts made by European Commission, National Commission for Prognosis and Institute for Economic Forecasting for the unemployment rate in Romania (2001-2011)**

ACCURACY MEASURE	INSTITUTION		
	European Commission (EC)	National Commission for Prognosis (NCP)	Institute for Economic Forecasting (IEF)
ME	-0.5455	-0.5636	-0.7273
MAE	1.2364	1.6364	1.0909
RMSE	1.4948	1.7633	1.3052
U1	0.1066	0.1240	0.0920
U2	1.1575	1.0966	0.9977

Source: own computations using Excel

According to all accuracy indicators for forecasts made on the horizon 2001-2011, excepting the mean error, the Institute for Economic Forecasting that used Dobrescu macromodel, provided the most accurate predictions for the unemployment rate. Only the forecasts of this institution outperformed the naïve predictions based on the random walk. The negative values of the mean error imply too high in average predicted values for all institutions. The less accurate forecasts are made by the National Commission for Prognosis.

We are interested to see the forecasts accuracy during the actual financial and economic crisis and the accuracy in pre-crisis period. In Romania the crisis started in 2009, so the accuracy will be assessed on the forecasting horizon 2009-2011(in **Table 3**) and before the crisis during 2006-2008 (in **Table 2**).

**Table 2: The accuracy of forecasts made by European Commission, National Commission for Prognosis and Institute for Economic Forecasting for the unemployment rate in Romania (2006-2008)**

ACCURACY MEASURE	INSTITUTION		
	European Commission (EC)	National Commission for Prognosis (NCP)	Institute for Economic Forecasting (IEF)
ME	-1.9	-0.1333	-1.7
MAE	1.9	1.2	1.7
RMSE	1.9070	1.4353	1.7369
U1	0.1705	0.1518	0.1579
U2	0.3943	0.4920	0.4477

*Source: own computations using Excel*

In pre-crisis period, the best forecasts were provided by NCP, the institutions with the lowest value for U1. The NCP predictions have the lowest values for the other indicators (ME, RMSE and MAE). The negative values for ME indicators show that all the institutions overestimated the unemployment rate. The multi-criteria ranking methods and U1 will give the same hierarchy of institutions: NCP, IEF and EC.

**Table 3: The accuracy of forecasts made by European Commission, National Commission for Prognosis and Institute for Economic Forecasting for the unemployment rate in Romania (2009-2011)**

ACCURACY MEASURE	INSTITUTION		
	European Commission (EC)	National Commission for Prognosis (NCP)	Institute for Economic Forecasting (IEF)
ME	-1.1333	1.0333	-0.3667
MAE	1.333333333	1.833333333	0.966666667
RMSE	1.6713	1.8877	1.2179
U1	0.1018	0.1319	0.0777
U2	1.0931	1.4908	1.4698

*Source: own computations using Excel*

Surprisingly, the U1 indicators shows a higher degree of accuracy in crisis period. But the U2 measure indicates that the forecasts during the crisis are not better than the naïve ones, while in pre-crisis years the predictions based on random walk were less accurate. Excepting U2, all

the other accuracy indicators registered lower values during the crisis for EC and IEF. This means that the two institutions anticipated well the crisis effects, because it started in 2008 in USA and at mid 2007 in Euroa Area. This time NCP underestimated the unemployment rate and provided the higher values for all the accuracy measures. The IEF provided the most accurate predictions during the crisis, this result being gotten even if we apply the multi-criteria ranking.

**Ranks method** application supposes several steps:

1. Ranks are assigned to each value of an accuracy indicator (the value that indicates the best accuracy receives the rank 1);

The statistical units are the four institutions that made forecasts. The rank for each institution is denoted by:  $(r_{i,ind_j})$ ,  $i=1,2,3$  and  $ind_j$  –accuracy indicator j. We chose 5 indicators: mean error, mean absolute error, root mean squared error, U1 and U2.

2. If the ranks assigned to each institution are sum up, the score to each of them is computed.

$$S_i = \sum_{j=1}^5 (r_{i,ind_j}), \quad i=1,2,3 \quad (6)$$

3. The institution with the lowest score has the highest performance and it will get the final rank 1.

**Table 4: The ranks of institutions according to the accuracy measures for the predictions during 2001-2011 (ranks method)**

ACCURACY MEASURE	INSTITUTION		
	European Commission	National Commission for Prognosis	Institute for Economic Forecasting
ME	1	2	3
MAE	2	3	1
RMSE	2	3	1
U1	2	3	1
U2	3	2	1
Sum of ranks	10	13	7
Final ranks	2	3	1

Source: own computations using Excel

The results of the ranks method are the same as those provided by most accuracy measures, especially U1 used in making comparisons between forecasts. Actually, if all the calculated accuracy indicators are taken into account at the same time, the following hierarchy was gotten: Institute for Economic Forecasting, European Commission and National Commission for Prognosis.

The method of relative distance with respect to the maximal performance is the second way of ranking.

For each accuracy indicator the distance of each statistical unit (institution) with respect to the one with the best performance is computed. The distance is calculated as a relative indicator of coordination:

$$d_{i\ ind_j} = \frac{ind_i^j}{(\min abs(ind_i^j))_{i=1,2,3}}, i=1,2,3 \text{ and } j=1,2,\dots,5 \quad (7)$$

The relative distance computed for each institution is a ratio, where the denominator is the best value for the accuracy indicator for all institutions.

The geometric mean for the distances of each institution is calculated, its significance being the average relative distance for institution i.

$$\bar{d}_i = \sqrt[5]{\prod_{j=1}^5 d_{i\ ind_j}}, i=1,2,3 \quad (8)$$

According to the values of average relative distances, the final ranks are assigned. The institution with the lowest average relative distance will take the rank 1. The position (location) of each institution with respect to the one with the best performance is computed as: its average relative distance over the lowest average relative distance.

$$loc_i^{96} = \frac{\bar{d}_i}{\min(\bar{d}_i)_{i=1,2,3}} \cdot 100 \quad (9)$$

**Table 5: The ranks of institutions according to the accuracy measures for the predictions made in the period 2001-2011 (method of relative distance with respect to the best institution)**

ACCURACY MEASURE	European Commission	National Commission for Prognosis	Institute for Economic Forecasting
ME	1	1.0332	1.3333
MAE	1.1334	1.5000	1
RMSE	1.1453	1.3510	1
U1	1.1587	1.3478	1
U2	1.1602	1.0991	1
Average relative distance	1.1178	1.2541	1.0592
Ranks	2	3	1
Location (%)	105.5286	118.3964	100

Source: own computations using Excel

The method of relative distance with respect to the best institution gave the same results as the previous methods. The lowest average relative distance was registered by the Institute for Economic Forecasting (1.0592).

The Diebold-Mariano test (DM test) is utilized to check if two forecasts have the same accuracy. The following steps are applied:

✓ The difference between the squared errors of forecasts ( $e^2$ ) to compare and the squared errors of reference forecasts ( $e^{*2}$ ):  $d_{t,t} = (e_{t,t}^2) - (e_{t,t}^{*2})$  (10)



✓ The following model is estimated:  $d_{t,t} = \alpha + \varepsilon_t$  (11)

✓ We test if “a” differs from zero, where the null hypothesis is that  $\alpha=0$  (equal forecasts). A p-value less than 0.05 implies the rejection of the null hypothesis for a probability of 95% in guaranteeing the results.

The following variables are computed: d1, d2 and d3 to make comparisons between EC and NCP forecasts, EC and IEF predictions, respectively NCP and IEF expectations. All the parameters are zero from statistical point of view, so there are not significant differences between the forecasts provided by the three institutions in terms of accuracy. The regression models are estimated in EViews and the results are presented in **Appendix 1**. So, the accuracy test showed that there are not significant differences between the forecasts provided by the three institutions. If we take into account the results based on accuracy indicators and those of the DM test, we conclude the best predictions are those of IEF, followed by EC and NCP, but the differences between the unemployment rate forecasts are not too big.

By applying qualitative tests for directional accuracy we check if there is a correct prediction of the change. A test of independence between the effective values and the direction of change can be applied in this situation, the null hypothesis showing the independence. A probability less than 0.05 implies the rejection of null hypothesis. All the asymptotic significances are greater than 0.05, according to **Appendix 2**, fact that makes us to conclude that the directional changes in the outturn are independent from the predictions.

We can conclude that we have different hierarchies depending on the forecasting horizon. The results are systematized in the following table (**Table 6**).

**Table 6: The hierarchy of institutions depending on the forecasting horizon and the accuracy criterion**

Forecasting horizon	Hierarchy of institutions according to accuracy criterion
2001-2011	IEF, EC and NCP
2006-2008 (pre-crisis period)	NCP, IEF and EC
2009-2011 (crisis period)	IEF, EC and NCP

As the table shows the same hierarchy was gotten for pre-crisis period and for overall period. In the few years before the crisis NCP succeeded in providing the forecast with best accuracy for the unemployment rate. The IEF seems to adapt more quickly to the changes in the economic environment, making a better anticipation of the economic crisis, despite the assumptions made in literature regarding the failure of Dobrescu macromodel in predicting the actual economic crisis.

#### 4. COMBINED FORECASTS TO IMPROVE THE ACCURACY OF UNEMPLOYMENT RATE PREDICTIONS

Bratu (2012) utilized some strategies to improve the forecasts accuracy (combined predictions, regressions models, historical errors method, application of filters and exponential smoothing techniques).

The combined forecasts are another possible strategy of getting more accurate predictions. The most utilized combination approaches are:

- optimal combination (OPT);
- equal-weights-scheme (EW);
- inverse MSE weighting scheme (INV).

Bates and Granger (1969) started from two forecasts  $f_{1;t}$  and  $f_{2;t}$ , for the same variable  $X_t$ , derived  $h$  periods ago. If the forecasts are unbiased, the error is calculated as:  $e_{i,t} = X_{i,t} - f_{i,t}$ .

The errors follow a normal distribution of parameters 0 and  $\sigma_i^2$ . If  $\rho$  is the correlation between the errors, then their covariance is  $\sigma_{12} = \rho \cdot \sigma_1 \cdot \sigma_2$ . The linear combination of the two predictions is a weighted average:  $c_t = m \cdot f_{1t} + (1-m) \cdot f_{2t}$ . The error of the combined forecast is:  $e_{c,t} = m \cdot e_{1t} + (1-m) \cdot e_{2t}$ . The mean of the combined forecast is zero and the variance is:

$\sigma_c^2 = m^2 \cdot \sigma_1^2 + (1-m)^2 \cdot \sigma_2^2 + 2 \cdot m \cdot (1-m) \cdot \sigma_{12}$ . By minimizing the error variance, the optimal value for  $m$  is determined ( $m_{opt}$ ):

$$m_{opt} = \frac{\sigma_2^2 - \sigma_{12}}{\sigma_1^2 + \sigma_2^2 - 2 \cdot \sigma_{12}} \tag{12}$$

The individual forecasts are inversely weighted to their relative mean squared forecast error (MSE) resulting INV. In this case, the inverse weight ( $m_{inv}$ ) is:

$$m_{inv} = \frac{\sigma_2^2}{\sigma_1^2 + \sigma_2^2} \tag{13}$$

Equally weighted combined predictions (EW) are gotten when the same weights are given to all models.

The U Theil's statistics were computed for the combined forecasts based on the three schemes, the results being shown in the following table (Table 7):

**Table 7: The accuracy of combined forecasts for unemployment rate (2001-2011)**

Accuracy indicator	EC+NCP forecasts	EC+IEF forecasts	NCP+IEF forecasts
U1 (optimal scheme)	<b>0.0846</b>	<b>0.0666</b>	0.1254
U2 (optimal scheme)	<b>0.9867</b>	<b>0.7130</b>	1.1063
U1 (inverse MSE scheme)	<b>0.0864</b>	<b>0.0553</b>	<b>0.1105</b>
U2 (inverse MSE scheme)	1.0026	<b>0.5888</b>	1.0116
U1 (equally weighted scheme)	<b>0.0861</b>	<b>0.0739</b>	<b>0.0888</b>
U2 (equally weighted scheme)	<b>0.9207</b>	<b>0.7933</b>	<b>0.9134</b>

*Author's computations using Excel*

The combined forecasts proved to be a good strategy of improving the accuracy when EC and NCP forecasts, respectively EC and IEF predictions are combined using OPT and INV schemes. Only if equally weighted scheme is utilized we got better forecasts for the combined predictions of NCP and IEF. The most accurate forecasts are those resulted from combining EC

and IEF expectations. All the combined predictions are better than the naïve ones excepting those of NCP and IEF using OPT scheme.

We tested if the combined forecasts are a good strategy of getting better forecasts in pre-crisis period and during the crisis. The results are presented in **Table 8** and **Table 9**.

**Table 8: The accuracy of combined forecasts for unemployment rate (2006-2008)**

Accuracy indicator	EC+NCP forecasts	EC+IEF forecasts	NCP+IEF forecasts
U1 (optimal scheme)	0.0877	0.2426	0.0823
U2 (optimal scheme)	1.3903	1.0410	1.4318
U1 (inverse MSE scheme)	0.0872	0.0999	0.0824
U2 (inverse MSE scheme)	1.3574	1.5877	1.4115
U1 (equally weighted scheme)	0.0996	0.0842	0.0918
U2 (equally weighted scheme)	1.5073	1.5651	1.5199

*Author's computations using Excel*

All the combined predictions are less accurate than the naïve forecasts in pre-crisis period, but a great improvement in accuracy was made. Excepting the combined forecasts of EC and IEF using OPT scheme, all the forecasts are more accurate than the ones made independently by the three institutions.

**Table 9: The accuracy of combined forecasts for unemployment rate (2009-2011)**

Accuracy indicator	EC+NCP forecasts	EC+IEF forecasts	NCP+IEF forecasts
U1 (optimal scheme)	0.1212	0.1560	0.1738
U2 (optimal scheme)	0.9457	1.3833	0.6926
U1 (inverse MSE scheme)	0.0988	0.1209	0.0919
U2 (inverse MSE scheme)	1.1237	1.5339	1.2004
U1 (equally weighted scheme)	0.0898	0.0905	0.0878
U2 (equally weighted scheme)	1.4375	1.5862	1.4451

*Author's computations using Excel*

Only in some cases the combined predictions are better than those made by IEF: the combined forecasts based on equally weighted scheme, the combined predictions of EC and NCP, respectively NCP and IEF when INV scheme is used. None of the combined forecasts outperformed the predictions made by IEF during the crisis. Excepting the combined forecasts of EC and NPC using OPT scheme, all the other predictions are less accurate than the naïve ones.

## 5. CONCLUSIONS

In addition to economic analysis, the elaboration of forecasts is an essential aspect that conducts the way of developing the activity at macroeconomic level. But any forecast must be accompanied by macroeconomic explanations of its accuracy. The purpose of this evaluation is related to different aspects: the improvement of the model on which the forecast was based, adjustment of government policies, the planning of results. Basically, accuracy evaluation in this context refers directly to the degree of trust conferred to the prediction. Although the literature on forecasting methods and techniques used in describing the evolution of an economic phenomenon is particularly rich, surprisingly, few researchers have dealt with the methods used to improve the measurement of forecast uncertainty. The aspect is important, because the macroeconomic predictions must not be easily accepted, taking into account the negative consequences of macroeconomic forecasts failures, consequences that affect the state policies. The decisions of economic policy are based on these forecasts. Hence, there is an evident interest of improving their accuracy.

In our study, we assessed the unemployment forecasts performance for the predictions provided during 2001-2011 by three institutions: European Commission, National Commission for Prognosis and Institute of Economic Forecasting. The best accuracy is provided by IEF, followed by EC and NCP. This hierarchy resulted from the application of the multi-criteria ranking, but also from the measurement of accuracy indicators, as U1, used in making comparisons between forecasts. The same hierarchy was gotten during the crisis period, while in the few years before it

The combined forecasts using the three classical schemes are a good strategy of improving the accuracy, most of the combined predictions being better than the initial ones. In crisis period only some of the combined forecasts are better than the NCP and EC ones, none of them succeeded in outperforming the IEF predictions. Before the crisis the combined predictions are a very good way of improving almost all the forecasts made by the three institutions.

The forecasts accuracy should be a priority for the public that uses these predictions in underlying the decisional process. The combined forecasts are a very good strategy of getting improvements in accuracy for the unemployment rate predictions.

## REFERENCES

1. Abreu I., *International organisations' vs. private analysts' forecasts: an Evaluation*, Banco de Portugal, 2011 article available at: <http://www.bportugal.pt/en-US/BdP%20Publications%20Research/wp201120.pdf>
2. Allan G., *Evaluating the usefulness of forecasts of relative growth*, Strathclyde, Discussion Papers in Economics, No. 12-14, 2012
3. Armstrong, J. S., Fildes, R., *On the selection of Error Measures for Comparisons Among Forecasting Methods*, Journal of Forecasting, 14, pp. 67-71, 1995
4. Bates, J., Granger C. W. J. (1969), *The Combination of Forecasts*, *Operations Research Quarterly*, 20(4), pp. 451-468, 1969
5. Bratu M., *Strategies to Improve the Accuracy of Macroeconomic Forecasts in USA*, LAP LAMBERT Academic Publishing, ISBN-10: 3848403196, ISBN-13: 978-3848403196, 2012
6. Diebold, F.X., Mariano, R., *Comparing Predictive Accuracy*, Journal of Business and Economic Statistics, 13, pp. 253-265, 1995
7. Dovern, J. and Weisser J., *Accuracy, unbiasedness and efficiency of professional macroeconomic forecasts: An empirical comparison for the G7*, *International Journal of Forecasting*, 27 (2), pp. 452-465, 2011
8. Franses, P.H. , McAleer, M., Legerstee, R., *Evaluating Macroeconomic Forecasts: A Concise Review of Some Recent Developments*, Working paper/ Department of Economics and Finance, University of Cantenbury, 2012

9. Gorr, W. L., *Forecast accuracy measures for exception reporting using receiver operating characteristic curves*, International Journal of Forecasting, Volum 25, Issue 1, pp. 48-61, 2009
10. Heilemann, U., Stekler, H., *Introduction to "The future of macroeconomic forecasting"*, International Journal of Forecasting, 23(2), pp. 159-165, 2007
11. Ruth, K., *Macroeconomic forecasting in the EMU: Does disaggregate modeling improve forecast accuracy ?*, Journal of Policy Modeling, Volume 30, Issue 3, pp. 417-429, 2008

**APPENDIX 1**

**The results of Diebold-Mariano test in EViews**

Dependent Variable: D1  
 Method: Least Squares  
 Date: 11/22/12 Time: 13:02  
 Sample: 2001 2011  
 Included observations: 11

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.874545	1.187738	0.736312	0.4785

Dependent Variable: D2  
 Method: Least Squares  
 Date: 11/22/12 Time: 13:02  
 Sample: 2001 2011  
 Included observations: 11

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.530909	0.624816	0.849704	0.4154
Log likelihood	23.09927	stat	Durbin-Watson	1.521367

Dependent Variable: D3  
 Method: Least Squares  
 Date: 11/22/12 Time: 13:03  
 Sample: 2001 2011  
 Included observations: 11

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	1.405455	0.886219	1.585900	0.1438

**APPENDIX 2**

**The results of tests for directional accuracy**

**Test Statistics**

	ur	Ec
Chi-Square	.818 <sup>a</sup>	1.273 <sup>b</sup>
Df	9	8
Asymp. Sig.	1.000	.996

**Test Statistics**

	ur	Ief
Chi-Square	.818 <sup>a</sup>	1.273 <sup>b</sup>
Df	9	8
Asym	1.0	.99
p. Sig.	.00	.6

**Test Statistics**

	ur	Ncp
Chi-Square	.818 <sup>a</sup>	.000 <sup>b</sup>
Df	9	10
Asymp. Sig.	1.000	1.000

## INTERNET ADDICTION IN BALKAN AND SOUTH-EASTERN EUROPEAN COUNTRIES

Stavros VALSAMIDIS<sup>1</sup>, Athanasios MANDILAS<sup>2</sup>, Ioannis PETASAKIS<sup>3</sup>, Elena CARAMAN<sup>4</sup>

<sup>1</sup>Department of Accountancy, Kavala Institute of Technology, Greece  
[svalsam@teikav.edu.gr](mailto:svalsam@teikav.edu.gr)

<sup>2</sup>Department of Accountancy, Kavala Institute of Technology, Greece  
[smand@teikav.edu.gr](mailto:smand@teikav.edu.gr)

<sup>3</sup>Department of Accountancy, Kavala Institute of Technology, Greece  
[jpetasakis@teikav.edu.gr](mailto:jpetasakis@teikav.edu.gr)

<sup>4</sup>Department of Accountancy, Kavala Institute of Technology, Greece

**Abstract:** *The use of Internet has increased dramatically in recent years. Although there is no standardized definition of Internet addiction, there is acknowledgement among researchers that this phenomenon does exist.*

*In this study, we identify various similarities and differences among people in the Balkan and South-Eastern European countries about Internet addiction. There are many factors such as cultural differences, gender differences, psychosocial variables, computer attitudes and time.*

*We present the experience from studies concerning Internet addiction in all over the world. A specific research with the use of Young's 20-scale was also conducted in five Balkan and South-Eastern European countries (Republic of Moldova, Romania, Republic of Bulgaria, Hellenic Republic, Republic of Cyprus).*

*The findings are interesting. Although there is a need for Internet using, there are also cases where the addiction, dependence and abuse is apparent.*

**Keywords:** *Internet addiction, Internet dependence, Young's test.*

**JEL Classification Codes:** L86, M51

### 1. INTRODUCTION

Nowadays, the Internet is very important factor in people's life, so as many researchers say that it changes our life, it changes the society. Even though the Internet is the most universal way of communication used by us, it greatly affects human relations, constrains our imagination, we also reduce the incentive to go to libraries, to buy a book or to go to the theatre. Internet creates dependency, although it is the most used means of communication, extremely useful and helpful. It is like a "fairy" that satisfies all our desires for free or for cost.

Nowadays, most people have a computer and Internet at home, they spend much time in front of the monitor, so as begin to forget to satisfy basic needs even to communicate to their friends and their relatives. For us it is enough to have a computer that has access to Internet.

Last years, the Internet had changed the way, we communicate each other. The Internet is a means with a unique ability to facilitate meeting people that are far away from each other.

As the number of Internet users increases, so does the number of Internet addicts. Some addicts fail in school, lose their jobs and divorce their spouses. The contribution of this study is the

possible identification of candidates for addiction, so that their behaviour can be interdicted and treated.

In some Balkan and South-Eastern European countries (Bulgaria, Cyprus, Greece, Republic of Moldova, Romania), the growth of Internet and technology are almost similar to the same as in other European countries according to the legislation, but compared to countries such as China, Russia, USA or Iraq things are totally different.

*For example*

- In China: The access to the Internet is controlled from government-owned centralized routers that direct traffic across their borders and within the country. This permits government to block access to U.S. or European web sites. China uses its powers of censorship to block dissent and publishes propaganda that cultivates a virulent form of nationalism.
- In Russia: The Government controls the Internet in a smarter way. They don't block all the "bad sites" right away. They hire hackers to put down the independent online news media, opposition groups' web sites and individual bloggers. More and more bloggers have been sentenced for "extremism", have paid amendments etc.
- In USA: The Internet in the U.S. is highly regulated, supported by a complex set of legally binding mechanism. At present, the 5 core areas of I-net infrastructure are monopolized by US IT giants, including high-performance computers, operating systems, database technologies and information resource libraries. The US government has adopted macro-control to actively use IT giants to create a global Internet infrastructure which could be manipulated by the US.
- In Iraq: All Web sites that glorify terrorism and incite violence and sectarianism, or those that violate social morals with content such as pornography are banned.

So, in Balkan and South-Eastern European countries are not applied such laws as in the countries given above by example. People can use Internet freely, almost unlimited in matter of web pages that can be accessed and this makes them to get even more desire of staying in front of the computer.

Among many phenomena which are related to specific patterns of human behaviour on the Internet, i.e. in the virtual environments, probably the most important, from both theoretical and practical perspectives, is the one that started a decade and a half ago – it is devoted to psychological qualification of the special type of human dependence, most often called Internet addiction and also known under a multitude of names, such as Internet addiction disorder (IAD), Internet Dependency, Netaholism, Internet overuse, Internet abuse, Problematic Internet use, Pathological Internet use, Excessive Internet use, Compulsive Internet use, Disturbed Internet use, Elevated Internet use, or Internet misuse, as well as less general names stemming from the most popular online services including for example Twitter addiction or Facebook addiction. The references are numerous, among the latest is an exhaustive and competent review paper by Morahan-Martin (2008).

This paper is not the place to discuss the nature, phenomenology, genesis and status of the Internet related addictions and/or dependencies. We take "addictions" as a generic term, covering all the enumerated types of the Internet misuse. Thus, the Internet addiction refers to every particular web service, such as online gaming, online pornography, online interaction, online romance, online surfing, online gambling, online exploratory behaviour, online shopping. An addiction is a sort of an escape from personal problems and a decrease in the quality of life, which are opposite to feelings associated with positive psychological phenomena, including the flow experience. Thus, both theoretically and practically analogies between flow and addiction are inadequate, and any idea to correlate the symptoms of the optimal, experience and the Internet addiction will hardly seen justified. Most often the attempts to establish such correlations refer to the parameters of the online/video/computer gaming experience. Indeed,

gaming is one of the most addictive of the variety of the IT related behaviours, partly due to the fact that game developers and providers try hard to hook the devoted addicts to their newest products, using for instance some “principles in behavioural conditioning” (Yee, 2006). Section 2 describes the background theory, sections 3 describes the methodology used in our study. Section 4 presents the results from research and section 5 discusses the results and refers to the main conclusions of the study.

## 2. BACKGROUND THEORY

How can Internet addiction be assessed? Early research into the phenomenon of Internet addiction focused on articulating criteria by which Internet addiction could be described and diagnosed, such as the well described set of diagnostic criteria provided by Goldberg (1996) and six criteria developed by Griffiths (1998). As research into Internet addiction continued, checklists were developed whereby data could be collected from willing, self-reporting respondents about their patterns of Internet use. For example, Young (1996a) developed an eight-item Internet Addiction Diagnostic Questionnaire (DQ) used both in online surveys as well as in telephone interviews. DQ is simply a set of eight Yes/no questions about such things as the user’s preoccupation with the Internet, amount of time spent on the Internet, and effects of the Internet in the user’s life. Young asserted that five or more Yes responses to the eight questions indicate a dependent user. Another questionnaire includes a checklist of 10 clinical symptoms developed by Scherer (1997).

Although some argue that the term “addiction” should be applied only to cases involving chemical substances (e.g., Bratter and Forrest, 1985), similar diagnostic criteria have been applied to a number of problematic behaviours such as pathological gambling (Young, 1996a). Popular use of the term may associate “addiction” with almost any substance or activity (Hatterer, 1994). People are said to be “addicted” to food, smoking, gambling, shopping, work, play and sex (Truan, 1993). Early research, such as that conducted by Shotten (1991), studied the “computer addiction” of some computer scientists and technicians. The typical research participant was a Young “solitary male loner” with a long-standing interest in technology and science. The explosive growth of the Internet over the past decade has almost certainly changed the profile of the “computer addict” (Brenner, 1997; Young, 1996b). With its convenient communication options and the World Wide Web, the Internet provides remote access to other people and abundant information in all areas of interest. It is an environment that could be abused by virtually anyone, regardless of their interest in technology and science (Griffiths, 1998).

Although there is no standardized definition of Internet addiction, there is acknowledgement among researchers that this phenomenon does exist. As Griffiths (1998) notes, “excessive use of the Internet may not be problematic in most cases but the limited case study evidence suggests that for some individuals, excessive Internet use is a real addiction and of genuine concern” (p. 73). Griffiths (1998) further considers Internet addiction to be a kind of technological addiction (such as computer addiction), and one in a subset of behavioural addictions (such as compulsive gambling). Kandell (1998) defined Internet addiction as “a psychological dependence on the Internet, regardless of the type of activity once logged on” (p. 12). Maladaptive patterns of Internet use do indeed constitute behavioural addiction when considered in terms of these definitions (Chou et al., 1999).

However, terminology remains a problem,. Some refer to particular Internet-related behaviours as Internet addiction (e.g., Chou and Hsiao, 2000; Young, 1996a), whereas others prefer Internet Addiction Disorder (Goldberg, 1996), Internet pathological use (e.g., Davis, 2001; Morahan-Martin and Schumacker, 2000), or Internet dependency (e.g., Scherer, 1997).



In this article, the term Internet addiction is used to cover the collective phenomenon. However, the terminology preferred by the respective researchers is used in the discussion of their work. The work to develop instruments with which computer users could be surveyed for information about their habits of Internet use continued and became more sophisticated. The number of questions on the surveys increased and statistical analyses were applied to identify Internet addiction.

For example, in Morahan-Martin (1997) and Schumacker's (2000) studies, a 13-question "Pathological use scale" was developed to assess whether heavy Internet use negatively affects academic and other work, interpersonal relations, individual stress levels, social withdrawal, and mood alteration. Brenner (1997) also developed an Internet-Related Addictive

Behaviour Inventory (IRABI). The IRABI has 32 true-false questions that assess users' Internet experiences. Further development and refinement of self-reported instruments for the identification of Internet addiction took place largely in Taiwan. Researchers created surveys on which participants could report their Internet behaviours by degree using 5-point Likert scales rather than giving absolute Yes or no responses. Taiwanese researchers also increased the numbers of Internet users they surveyed in their respective studies. Examples included Chinese Internet Addiction Scale (CIAS) by Chen and Chou (1999), revised-IRABI (in Chinese) by Chou and Hsiao (2000), and Internet Addiction Scale for Taiwan High School Students (IAST) by Lin and Tsai (1999).

In summary, assessment instrument for Internet addiction was presented in various formats (criteria, checklists, or scales), with different item numbers (ranging from 6 to 40), using a variety of methods (paper-and pencil survey, online survey, telephone interviews, case studies, etc.) and aimed at different types of research participants (college students, high school students, general populations).

Table 1 provides a summary of assessment instruments detailing their item number, scale, reported reliability, and number of respondents/methods and using criteria, checklists, or scales with information about items such as, scale, reported reliability, number of respondents, and methods.

**Table 1: Internet Addiction Assessment Instruments**

Researchers	Instrument	Items	Scale	Reported reliability (a)	Respondents (method)
<b>Criteria</b>					
Goldberg (1996)	Internet Addiction Disorder (IAD) Diagnostic criteria	7	-	-	-
Griffiths (1996, 1998, 2000)	Criteria (core components) for addiction	6	-	-	7 case studies (in 2000 study)
<b>Checklists</b>					
Young (1996a, 1998)	Diagnostic Questionnaire (DQ)	8	Yes/no	-	396 dependents, 100 non-dependents (in 1998 study)
Scherer (1997)	Clinical symptoms of Internet dependency	10	Yes/no	-	531 college students (online survey and telephone interview)
<b>Scales</b>					

Researchers	Instrument	Items	Scale	Reported reliability (a)	Respondents (method)
Morahan-Martin and Schumacker (1997, 2000)	Pathological use scale	13	Yes/no	.88	277 college students (paper-and-pencil survey)
Brenner (1997)	Internet-Related Addictive Behavior Inventory (IRABI)	32	Yes/no	.87	563 online survey respondents
Chen and Chou (1999)	Chinese Internet Addiction Scale (CIAS)	28	4-point Likert	.93	1336 students from National Taiwan University (paper-and-pencil survey)
Chou and Hsiao (2000)	Chinese IRABI version II (C-IRABI-II)	40	4-point Likert	.93	910 Taiwan college students (paper-and-pencil survey)
Lin and Tsai (1999)	Internet Addiction Scale for Taiwan High Schoolers (IAST)	20	4-point Likert	.85	615 Taiwan high school students (paper-and-pencil survey)

Table 2 provides a summary of empirical research studies and their major findings by issues.

**Table 2: Summary of empirical research studies and their major findings by issues**

Study	Major findings
Internet use and time	
Chen and Chou (1999)	Students' addiction scores were correlated with their weekly Internet-use hours
Chou and Hsiao (2000)	Internet addicts spent triple the number of hours than non-addicts The addict group spent more time on Bulletin Board System and email than a non-addicted group
Morahan-Martin and Schumacker (2000)	Pathological Internet users spent more time online per week than users with limited or no symptoms
Young (1998)	Internet dependents predominately used two-way communication functions; non-dependents more used information-gathering functions
Chou et al. (1999)	Addicts used the chat and talk functions of electronic BBSs the most
Related problems	
Scherer (1997)	13% of respondents reported that Internet use had interfered with their academic work, professional performance, or social lives 2% of respondents perceived the Internet to have had an overall negative effect on their daily lives
Young (1998)	Dependents reported excessive use of the Internet resulted in personal, family, and occupational problems Time distortion was the major consequence of Internet use Students may experience academic problems

Study	Major findings
Chou and Hsiao (2000)	Taiwan college addicted students reported Internet has negative impacts on their studies and daily life routines No differences between addicted groups' assessment and non-addicted groups' assessment of impacts on relationships with friends/schoolmates, parents, and teachers.
Lin and Tsai (1999)	Taiwan high schools students reported that the Internet had slightly negative influences on their studies and daily routines, but strong positive influences on their peer relations
Gender difference	
Chou and Hsiao (2000)	Gender is one of the predicting factors in Internet addiction; males are more likely to become Internet addicts
Scherer (1997)	Among 49 identified Internet dependents, 35 are men and 14 are women
Morahan-Martin and Schumacker (2000)	Males were more likely than females to be pathological users
Young (1998)	Among 496 Internet dependents, 157 were males and 239 were females
Internet addiction and other psychosocial variables	
Lavin et al. (1999)	Dependent Internet users' scored lower on the overall sensation-seeking scale, and on the thrill- and adventure-seeking and the excitement-seeking subscales
Lin and Tsai (2002)	Internet dependents users scored higher on overall SSS and the disinhibition subscale than non-dependents
Chou et al. (1999)	Students' addiction scores correlated positively with their escape pleasure scores, interpersonal relationship pleasures scores, and total communication pleasure scores
Chou and Hsiao (2000)	Addict group found the Internet entertaining, interesting, interactive, and satisfactory The communication pleasure scores are the most powerful predictors of Internet addiction
Young and Rogers (1998)	Increased levels of depression were associated with those who became addicted to the Internet
Morahan-Martin and Schumacker (2000)	22 pathological users were more lonely than 251 non-pathological users
Attitude toward computers	
Morahan-Martin and Schumacker (2000)	Pathological users were more likely than non-pathological users to have higher social confidence and social liberating scores
Tsai and Lin (2001)	Students perceiving that they can control Internet interactions and those who highly value its usefulness claimed they needed more time online to achieve desired satisfaction

How to get to addiction? Just as with substances or certain behaviours (smoking, gambling, bulimia, shopping). First is a curiosity, a "fun", an escape from monotony, "something new", nice, exciting. Over time we are "stolen", we are "caught" a little today, tomorrow more, the pleasure with it increases but all the time we need more. Entry into this world means, of course, leaving the ordinary world, abandoning the old activities, people in our lives. What happens when there is access to the Internet? Events like withdrawal of alcohol or drugs: any it irritates,

can do nothing else, are sad, depressed, not knowing what to do with themselves and with their time, do not have pleasure or interest.

The use of the Internet presents advantages and disadvantages. Advantages consist in that the Internet has increasingly more attractive offers. Disadvantages are the decrease of physical activity and social interaction with others. Internet is addictive, even leading to sleep deprivation.

### 3. APPROACH

#### 3.1 Data sample

The self administrative questionnaire was chosen to collect the data for research. A 27-item questionnaire was used in this survey which was conducted from March to May 2012. It is consisted of two components: (1) demographic data and (2) Internet Addiction Test.

*Demographic information:* Questions 1 – 7 asked about the responders country of origin, monthly net income, age category, gender, marital status and level of education.

*Internet Addiction Test (IAT):* Questions 8 – 27 is a 20-item questionnaire on which the participants rate the items on a 5-point Likert scale (where a score of 1 is defined as “not at all” and a score of 5 as “always” respectively), covering the degree to which their Internet use affects their daily routine, social life, productivity, sleeping pattern and feelings. This test was first developed and used by Dr. Kimberly Young (Young, K. 1996b, Young, K. and Rodgers, R. 1998, Widyanto, L. and Mcmurran, M. 2004). Hence, the total IAT’s score is the sum of the score in this 20-item questionnaire, which may range from 20 to 100, where higher total score reflect a greater tendency toward Internet addiction. The 20 items of the IAT is presented in Table 3 below.

**Table 3: Items that the IAT consists of.**

1. How often do you find that you stay on-line longer than you intended?
2. How often do you neglect household chores to spend more time on-line?
3. How often do you prefer the excitement of the Internet to intimacy with your partner?
4. How often do you form new relationships with fellow on-line users?
5. How often do others in your life complain to you about the amount of time you spend on-line?
6. How often do your works suffer because of the amount of time you spend on-line?
7. How often do you check your e-mail before something else that you need to do?
8. How often does your job performance or productivity suffer because of the Internet?
9. How often do you become defensive or secretive when anyone asks you what you do on-line?
10. How often do you block out disturbing thoughts about your life with soothing thoughts of the Internet?
11. How often do you find yourself anticipating when you will go on-line again?
12. How often do you fear that life without the Internet would be boring, empty, and joyless?
13. How often do you snap, yell, or act annoyed if someone bothers you while you are on-line?
14. How often do you lose sleep due to late-night log-ins?
15. How often do you feel preoccupied with the Internet when off-line, or fantasize about being on-line?
16. How often do you find yourself saying "just a few more minutes" when on-line?
17. How often do you try to cut down the amount of time you spend on-line and fail?
18. How often do you try to hide how long you've been on-line?
19. How often do you choose to spend more time on-line over going out with others?

The questionnaire was given to 600 random people in Bulgaria, Cyprus, Greece, Moldavia and Romania. They were asked to complete it anonymously. The answers were collected from 452 people (75% responder rate). All statistical analysis was conducted with the application of the SPSS version 18 software package.

### 3.2. Variables

The main variables of this research are Country of Origin, Monthly net income, Age Category, Gender, Marital Status, Level of Education and Young's score that measure the Internet addiction.

### 3.3. Hypotheses

We pose the following hypotheses:

1. Monthly net income does not affect the impact of Internet addiction.
2. The impact of Internet addiction is different for each country of origin.
3. Male users are more subject to Internet addiction than female users.
4. Younger users are more subject to Internet addiction than older users.
5. Married people are less subject to Internet addiction than other people.
6. Level of education affects Internet addiction.

## 4. RESULTS

### 4.1 Sample description/allocation

The sample consists of citizens of five countries. Its allocation from each country and the monthly net income is presented in the table 4.

**Table 4: Sample allocation as to country of origin and monthly net income**

Country	Monthly net income						Total
	<500	501 - 800	801- 1200	1201-1500	1501-	>2001	
REPUBLIC OF MOLDOVA	76	22	6	2	0	0	106
ROMANIA	44	26	6	4	4	10	94
BULGARIA	38	48	30	4	2	2	124
GREECE	46	26	10	2	6	2	92
CYPRUS	6	4	8	4	2	4	28
Total	210	126	60	16	14	18	444

Tables 5, 6 and 7 show the allocation of the sample as to their age group, marital status and level of education.

**Table 5: Sample allocation as to age allocation**

	Frequency	Percent
15-18	28	6,2
19-25	166	36,7
26-35	78	17,3
36-45	88	19,5
46+	92	20,3
Total	452	100,0

**Table 6: Sample allocation as to marital status**

	Frequency	Percent
Married	164	36,5
Unmarried	242	53,7
Divorced/ Widow-er	44	9,7
Total	450	100,0

**Table 7: Sample allocation as to level of education**

	Frequency	Percent
I didn't finish Elementary	8	1,8
Elementary School	24	5,3
Gymnasium School	20	4,4
Lycee School	64	14,3
Technical School	68	15,1
Student	92	20,7
Higher Education	144	32,3
PostGraduate	28	6,2
Total	448	100,0

We observe that the majority of the sample has completed or studying in the higher levels of education. Table 8 presents the sample's occupation and gender.

**Table 8: Sample allocation as to occupation and gender**

		Male	Female	Total
Occupation	Freelancer	50	42	92
	Private sector	52	32	84
	Civil servant	52	42	94
	Laborer	40	26	66
	Student	44	44	88
	Household	4	12	16
	Unemployed	4	6	10
	Total	246	204	450

The results from the question "Do you use Internet?" are presented in table 9. 8% of the sample has not access to Internet, so they did not participate in the rest of the survey.

**Table 9: Sample allocation as to use of internet**

		Frequency	Percent
Internet use	Yes	414	91,6
	No	38	8,4
Total		452	100,0

## 4.2 Results

Apart from the demographic information, the responders had to answer to a 20-item questionnaire that includes the Internet Addiction Test (IAT). Answers in each item correspond to score between 1 and 5. IAT's score is the sum of IAT's 20 questions. The higher the score, the greater the level of addiction and the problems which Internet usage causes. As established in the scientific literature (Young, K. 1996b, Young, K. and Rodgers, R. 1998, Bradley, K. 2005, Kim, K. et al 2006), the following cut-off points were applied to the total IAT's scores:

20 - 49 points: Corresponds to an average on-line user who may surf the web a bit too long at times, but has control over his usage.

50 -79 points: Corresponds to a user who experiences occasionally or frequently problems because of the Internet. The user should consider their full impact on his life.

80 - 100 points: Corresponds to a user that his/her Internet usage causes significant problems in his life. S/he should evaluate the impact of the Internet on his/her life and address the problems directly caused by his/her Internet usage.

Figures 1 to 6 present the distribution of IAT's score (Young score) as to country of origin, gender, age category, marital status, level of education and monthly net income.

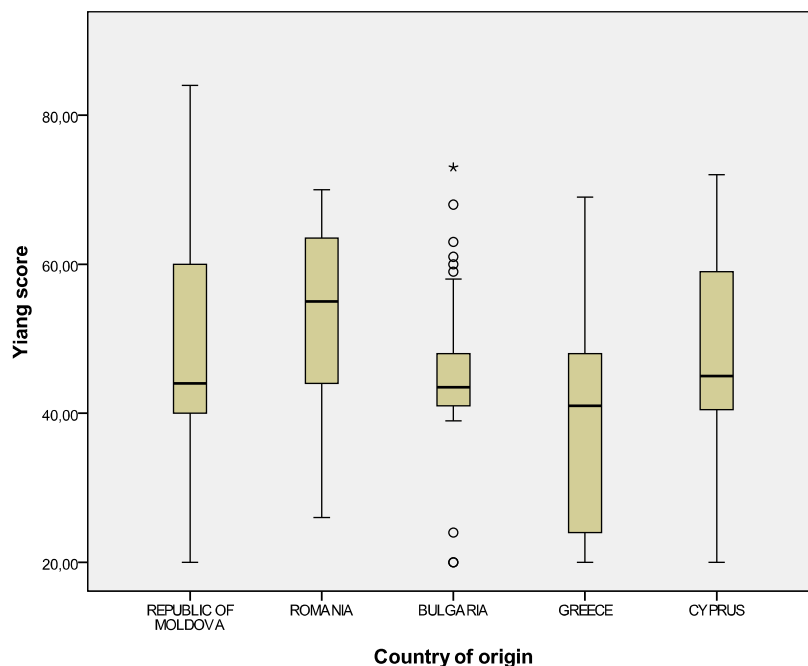


Figure 1: Comparison of Young's score among different countries of origin

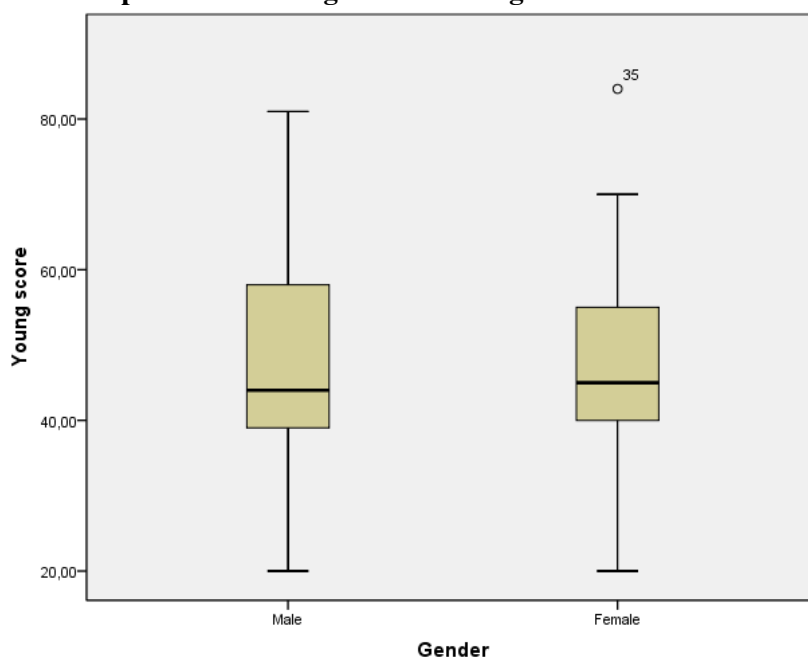
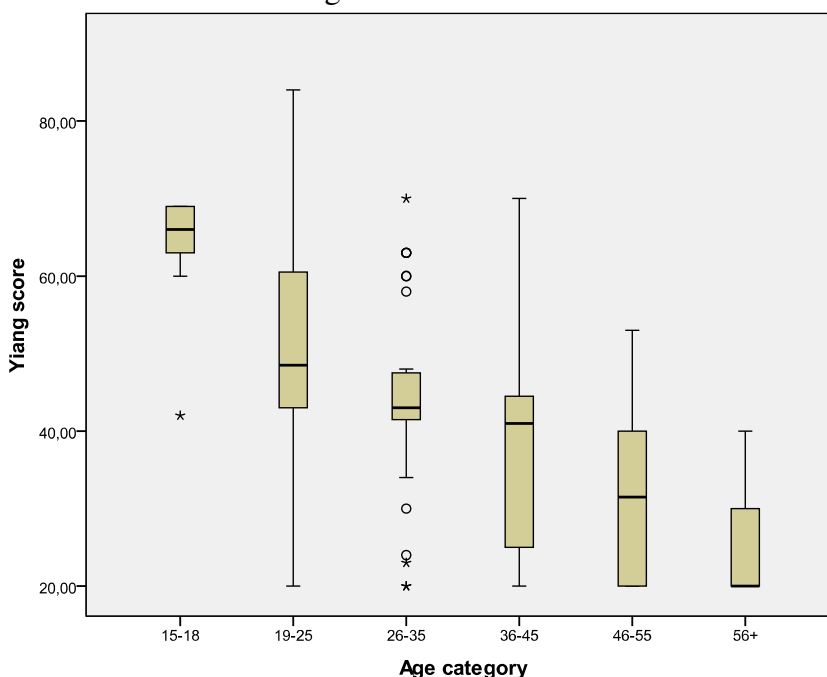


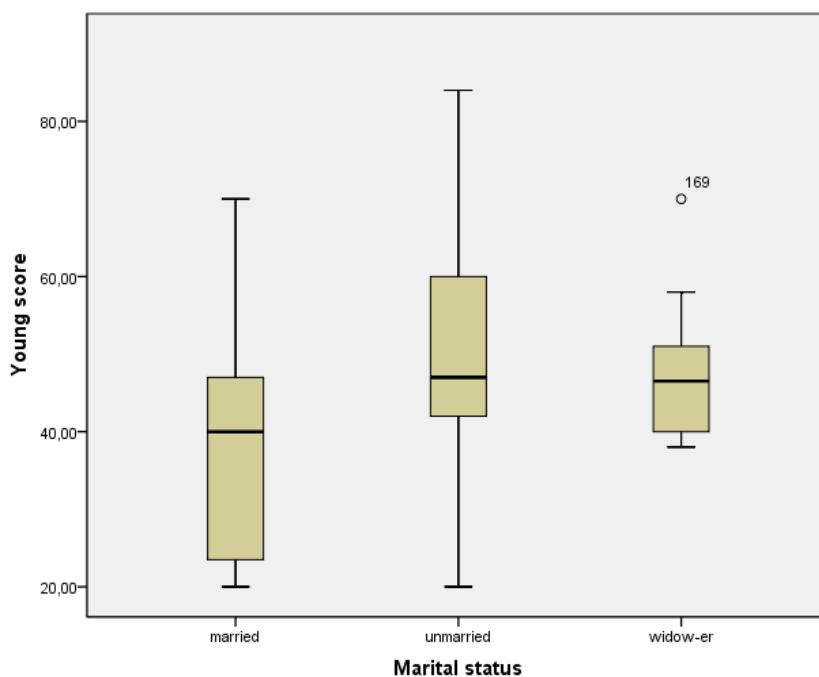
Figure 2: Comparison of Young's score between men and women

Citizens of Romania that participate in the survey, seems to have little higher score and these from Greece lower than these from Republic of Moldavia, Bulgaria and Cyprus. In our survey IAT's score does not seem to differ among males and females.



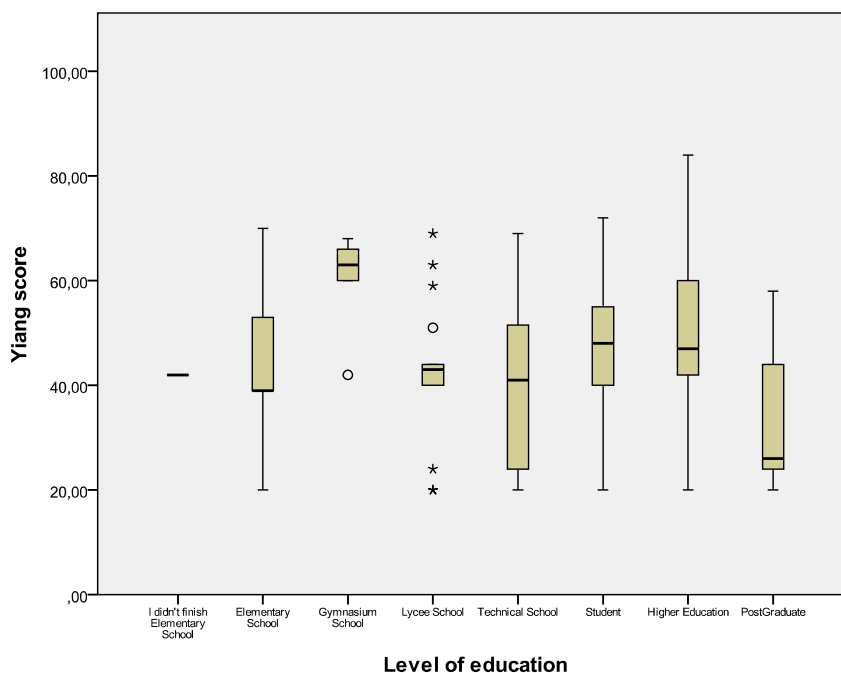
**Figure 3: Comparison of Young's score among age categories**

Figure 3 shows that in our survey, the younger the participant, the higher their IAT's score. More specific responders younger than 25 years old have a remarkable higher score than older ones. Married participants seems to have lower score than both unmarried and divorced or widow/er (Figure 4).

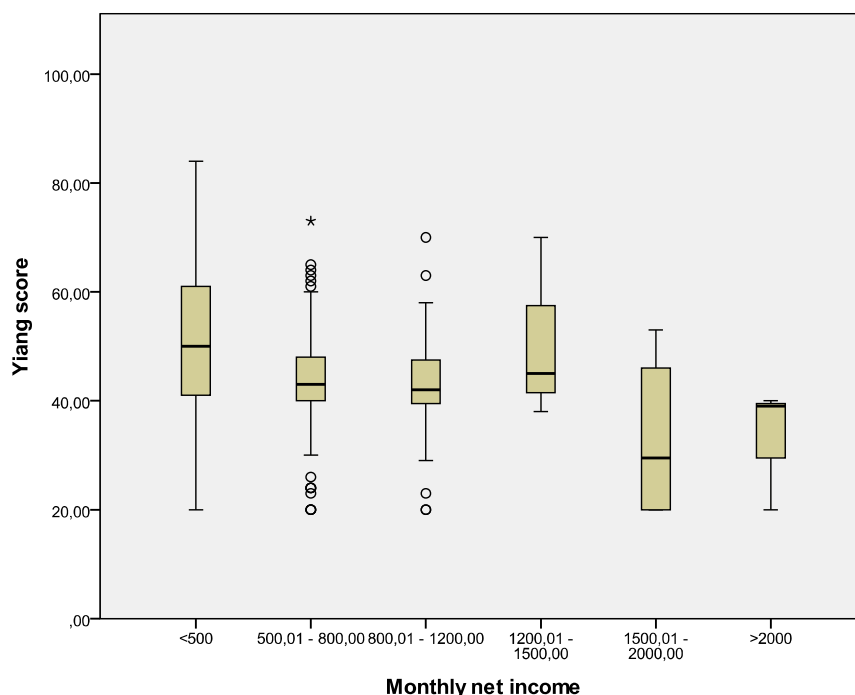


**Figure 4: Comparison of Young's score among different marital status**





**Figure 5: Comparison of Young's score among different levels of education**



**Figure 6: Comparison of Young's score among responders with different monthly net income**

Figure 6 shows that participants with monthly net income higher than 1500€ have lower IAT's score than these with lower income.

In order to answer our six hypothesis we use a regression model with dependent variable the IAT's score and as independent variables dummy for country of origin, monthly net income, age category, gender, marital status and level of education. Initially we confirm the normality of the residuals ( $p$ -value > 0.05). Then we found that Durbin Watson value is 1.83, so we accept that the residuals are uncorrelated.

The results of regression are presented in Table 10. Participants younger than 18 years old and these among 19 and 25 years have in average 28.9 and 7.3 units respectively higher score in IAT's test than these older than 46 years. Also unmarried and divorced/widow-er have in average 2.6 and 3.1 units respectively higher score in IAT's test than married participants.

**Table 10: Factors that affect Young's score**

Regression Model	Coefficients	Significance
Constant	31.1	<0.001
15-18 years old	28.9	<0.001
19-25 years old	7.3	0.007
26-35 years old	3.3	0.074
36-45 years old	1.2	0.387
unmarried	2.6	0.047
Divorced/widow-er	3.1	0.035

## 5. DISCUSSION AND CONCLUSIONS

The main goal of the study via this questionnaire was to investigate whether there are some similarities and some differences among people from different countries but from the same part of the world, if we look. We wanted to study how much some categories of people are addicted, according to their age, gender, occupation, education and probably net income.

As we know each country has millions of people and for a more effective research it would be better to ask more than 50% of population but unfortunately it is impossible to ask so many people in such short period of time and of course it needs also some financial resources.

Our research in the future will be continued including more countries with more people.

The problem of Internet addiction is more and more actual, so as we have to pay attention to it and do not neglect it.

## REFERENCES

1. Bradley K., 2005, *Internet lives: social context and moral domain in adolescent development*, New Dir Youth Dev 108: pp.57–76.
2. Bratter, T. E., and Forrest, G. G., 1985, *Alcoholism and Substance Abuse: Strategies for Clinical Intervention*, Free Press, New York.
3. Brenner, V., 1997, *Psychology of computer use: XLVII. Parameters of Internet use, abuse and addiction: The first 90 days of the Internet usage survey*. Psychol. Rep. 80, pp. 879–882.
4. Chou, C., and Hsiao, M. C., 2000, *Internet addiction, usage, gratifications, and pleasure experience—The Taiwan college students' case*, Comput. Educ. 35(1): pp. 65–80.
5. Chou, C., Chou, J., and Tyan, N. N., 1999, *An exploratory study of Internet addiction, usage and communication pleasure—The Taiwan's case*. Int. J. Educ. Telecommun. 5(1): 47–64.
6. Davis, R. A., 2001, *A cognitive-behavioral model of pathological Internet use*, Comput. Human Behav. 77: 187–195.
7. Goldberg, I., 1996, *Internet Addiction Disorder*, Retrieved November 24, 2004.
8. Griffiths, M. D., 1998, *Internet addiction: Does it really exist?* In Gackenbach, J. (ed.), *Psychology and the Internet: Intrapersonal, Interpersonal, and Transpersonal Implications*, Academic Press, New York.
9. Hatterer, L. J., 1994, *Addictive process*, In *Encyclopedia of Psychology*, Wiley, New York.

10. Kandell, J. J., 1998, *Internet addiction on campus: The vulnerability of college students*, *Cyberpsychol. Behav.* 1(1): 11–17.
11. Kim K, Ryu E, Chon MY, Yeun EJ, Choi SY, Seo JS, Nam BW, 2006, *Internet addiction in Korean adolescents and its relation to depression and suicidal ideation: a questionnaire survey*, *Int J Nurs Stud* 43:185–192.
12. Lin, S. S. J., and Tsai, C. C., 1999, *Internet Addiction among High Schoolers in Taiwan*. Poster presented at the 107th American Psychology Association (APA) Annual Convention, Boston, USA.
13. Morahan-Martin, J., 2008, *Internet Abuse: Emerging Trends and Lingering Questions*, In. A. Barak (Ed.), *Psychological Aspects of Cyberspace: Theory, Research, Applications* (pp. 32-69). Cambridge, UK: Cambridge University Press.
14. Morahan-Martin, J. M., 1999, *The relationship between loneliness and Internet use and abuse*, *Cyberpsychol. Behav.* 2(5): 431–439.
15. Morahan-Martin, J. M., and Schumacker, P., 2000, *Incidence and correlates of pathological Internet use*. *Comput. Human Behav.* 16: 13–29.
16. Scherer, K., 1997, *College life online: Healthy and unhealthy Internet use*, *J. College Stud. Dev.* 38(6): 655–665.
17. Shotten, M. A., 1991, *The costs and benefits of computer addiction*. *Behav. Inform. Technol.* 10: 219–230.
18. Truan, F., 1993, *Addiction as a social construction: A post empirical view*. *J. Psychol.* 127(5): 489–499.
19. Yee, N., 2006, *The Labor of Fun: How Video Games Blur the Boundaries of Work and Play*, *Games and Culture*, 1, 68-71.
20. Young, K., 1996a, *Internet addiction: the emergence of a new clinical disorder*, *CyberPsychology & Behavior* 3: 237-244.
21. Young, K., 1996b, *Psychology of computer use: XL. Addictive use of the Internet: A case that breaks the stereotype*. *Psychol. Rep.* 79: 899–902.
22. Young, K and Rodgers, R., 1998, *The relationship between depression and Internet addiction*. *CyberPsychology & Behavior*, 1(1), 25-28, 1998.
23. Widyanto, L. and McMurrin, M., 2004, *The psychometric properties of the Internet addiction test*, *CyberPsychology & Behavior* 7(4):443-450.

## RECRUITMENT PRACTICES AND CRITERIA OF THE SUPPLIERS OF THE AUTOMOTIVE INDUSTRY

Mădălina BRUTU<sup>1</sup>, Daniela MIHAI<sup>2</sup>

<sup>1</sup>Faculty of Economic Sciences, University of Pitești, Romania  
[madalinabrutu@yahoo.com](mailto:madalinabrutu@yahoo.com)

<sup>1</sup>Faculty of Economic Sciences, University of Pitești, Romania  
[dana\\_mihai2005@yahoo.com](mailto:dana_mihai2005@yahoo.com)

**Abstract:** *The paper has as a purpose the analysis of the recruitment activity, from a theoretical and a practical point of view, at the level of a multinational company that carries on its activity in the automotive industry. In order to reach this purpose, we have studied the Romanian and foreign literature of the field and we have taken an in-depth interview to the human resources manager. The recruitment activity is extremely important for the automotive industry suppliers, especially at the level of the county of Argeș, because here we can find the greatest concentration of such companies. Because of the problematic economic and financial situation, at the level of the county of Argeș it is difficult to recruit in this industry. In order to be able to do it, the multinational companies have to manage their activity correctly and to design successful practices!*

**Keywords:** *recruitment activity, multinational company, human resources management.*

**JEL Classification Codes:** F23, J24

### 1. INTRODUCTION

The purpose of our research consisted in presenting the recruitment activity of a multinational company. The objectives of the research had in view the theoretical presentation of the recruitment activity and the identification of the main recruitment practices and criteria specific to the Valeo Group. The starting point was represented by the Romanian and foreign literature of the field. Starting from the opinions of some renowned authors, we have made a theoretical analysis of the recruitment activity. Recruitment is arguably the most important of Human Resource functions. For economic activity to take place, the sourcing of people to provide energy, creativity and international activity is essential [5]. The importance of the research is given by its practical part, namely by the correct identification of the recruitment practices and criteria of the Valeo Group. In the future, the research can be extended to include the entire branch, by identifying the common recruitment practices and criteria of the suppliers of the automotive industry in Romania.

### 2. THE METHODOLOGY OF THE RESEARCH

The purposes and objectives of the research could be reached to a great extent due to the use of an appropriate methodology. In this respect, we have studied the Romanian and foreign literature of the field of human resources, preserving the most important ideas that formed a solid basis for the presentation of the recruitment activity in a personal manner. For the practical part, the main tool used was the interview with the human resources manager. We have also made documentation visits and studied the documents made available by the managers of the Group.

### 3. RECRUITMENT IN THE LITERATURE OF THE FIELD

The first steps in ensuring a high quality work force are represented by the recruitment and selection of the employees. We can define **recruitment** as the process of looking for and finding a sufficient number of candidates qualified to occupy certain positions, from whom the most appropriate can then be selected. **Recruitment** is also “the process of generating a pool of qualified candidates for a particular job. The firm must announce the job’s availability to the market (inside and outside the organization) and attract qualified candidates to apply” [2]. In the process of selection there occurs a collection and an evaluation of the information obtained from these recruited candidates, so that, in the end, the decision of hiring the most competent of them could be made.

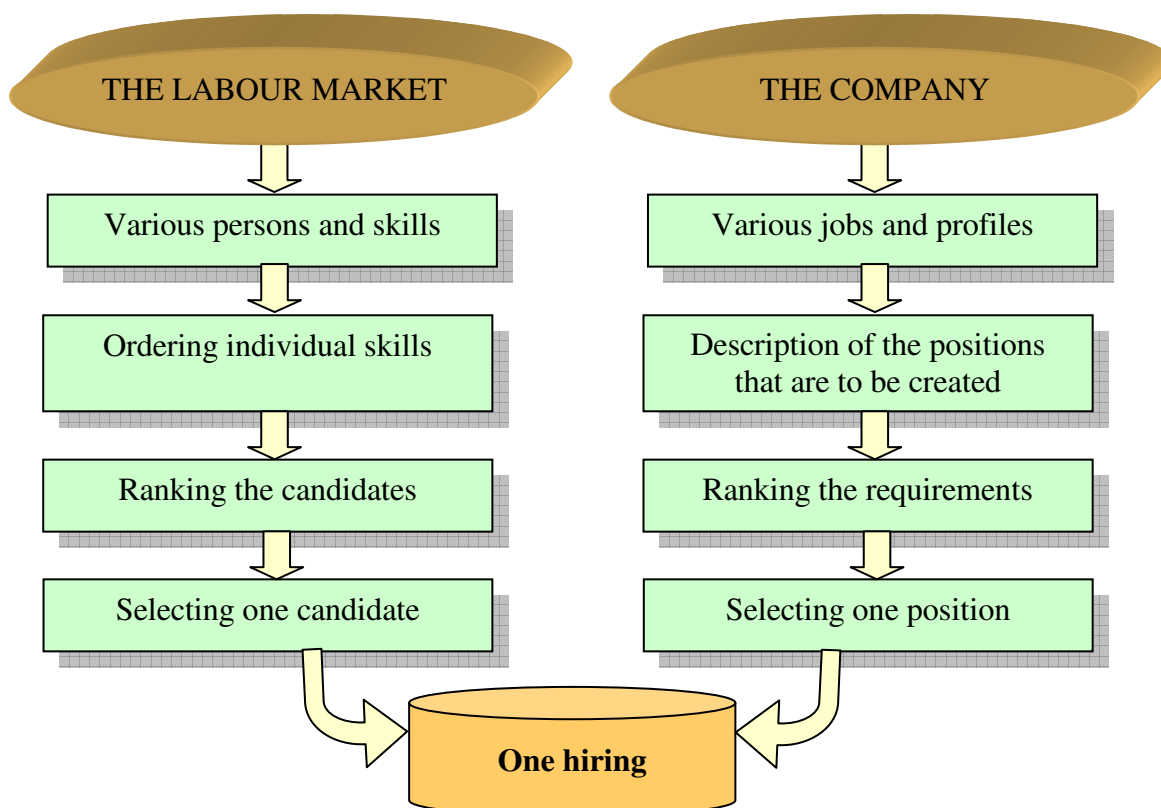
As many specialists in the field of human resources, like, for instance, George T. Milkovich și John W. Boudreau [4], mention, **the recruitment of the staff represents, in general, the first contact between the employers and those that want to be employed, being, at the same time, a public activity.**

That is why the recruitment of the staff is by no means a simple activity, as it is considered sometimes, because the recruitment policies and the managerial practices in this field are influenced by a series of constraints or by numerous external and internal factors like [3]:

- the conditions and changes on the labour market;
- the capacity of the systems that train and develop human resources, as well as the educational models that have a special impact on the recruitment process;
- the attractiveness of the region or of the country, as well as the local facilities such as accommodation, transport, shops;
- the legislative or legal framework;
- the image or reputation of the organization;
- the preferences of the potential candidates for certain fields of activity, for certain organizations or positions;
- the organizational culture;
- the managerial policies and practices in the field of human resources;
- the political, ethnical or other criteria that can condition the recruitment;
- the economic and financial situation of the organization;
- other factors, like: the necessity of identifying and attracting some of the potential candidates confidentially and without advertising, the existence of certain special or especially complex positions for which potential candidates are difficult to find or locate, to identify or attract.

A good recruitment allows the company to employ persons whose skills are very close to or even overlap with the job requirements. It entails that the company offers one or more jobs of a certain profile and the labour market offers individuals with various skills, capable of being hired any time. The company submits proposals regarding the job requirements and the necessary skills, which the future employee does not always possess. This aspect is very well presented in Figure no. 1.

The adaptable nature of their knowledge, skills and personalities makes the chosen persons adapt to their positions and even improve them, in the sense that they may have other qualities that will be taken into consideration in case the job is advertised again. The system job-jobholder proves to be especially dynamic and adaptable, and the employment always entails a compromise between requirements of an ideal nature and resources that are actually available, with various qualities, that do not correspond to the initial descriptions.



**Figure no. 1. The relationship between the company and the labour market.**

Generally speaking, the process of recruitment includes all steps that the organization intends to take in its search for the candidate that is appropriate for a vacant position. The presentation of these steps in a logical and structured way is rather difficult because nowadays the intellectual knowledge becomes actually the number 1 raw material of the organizations that intend to remain on top [1]. The recruitment implies the use of certain techniques and procedures that can be organized in a series or in parallel in view of carefully examining the candidates' profiles. The continuous improvement of the recruitment techniques and the search for new ones make the very clear presentation of the recruitment process difficult.

Taking these difficulties into consideration, there appeared several ways of structuring the recruitment process that try to get over the handicap of parallelisms and present this complex activity as clearly as possible.

After we have seen how the process of selection is made from the point of view of the applicants, it is important to see the recruitment practices specific to the company as well. The recruitment process refers to any organizational activity that is meant to affect:

- ✓ the number of applicants for a vacant job;
- ✓ the type of people that apply for them;
- ✓ the probability that those that apply for the vacant positions will also accept the position offered.

The purpose of a recruitment program is to ensure that the organization has a reasonable number of qualified applicants (that would find the job acceptable) so that it has the possibility to choose when a vacant position appears.

The purpose of the recruitment is not only to find a great number of applicants. If the process generates a lot of unqualified applicants, the organization will have to pay lots of money, but that will lead to the filling of only few vacant positions.

#### 4. RECRUITMENT PRACTICES AND CRITERIA SPECIFIC TO THE VALEO GROUP

The Valeo Group has specific criteria for the recruitment of the staff. For the recruitment they usually resort to the following criteria [6]:

- ✓ *competence;*
- ✓ *length of service;*
- ✓ *the candidates' development potential;*
- ✓ *foreign languages learning skills;*
- ✓ *geographic mobility;*
- ✓ *international conception;*
- ✓ *team leader;*
- ✓ *the ability to anticipate.*

**Competence** has a broad acceptance, including, besides the capacity of fulfilling the tasks, other qualities required by the respective job, such as: intelligence, creativity, easiness in becoming integrated in the work groups, as well as the results obtained in the present position or in the previous ones.

**Length of service.** The recruitment policy adopted by the Valeo Group regarding the length of service is that of recruiting young people because they can be more easily trained and formed. Only for the executive top management positions does the company recruit persons with a certain experience, with a certain length of service.

**The candidates' development potential.** The group recommends the recruitment of those persons that wish to participate in the prosperity of the company, and not of those that are interested only in their salary. They look for enterprising persons that consider the clients almost their friends and do not hesitate to work an extra hour or two, or to work on their days off if this is necessary.

**Foreign languages learning skills.** In addition to knowing their mother tongue, the candidates for executive positions have to have a conversational knowledge of the English language because this is the official language of the Valeo Group. If the candidate's mother tongue is English, then the knowledge of another foreign language, namely French, is not a selection criterion.

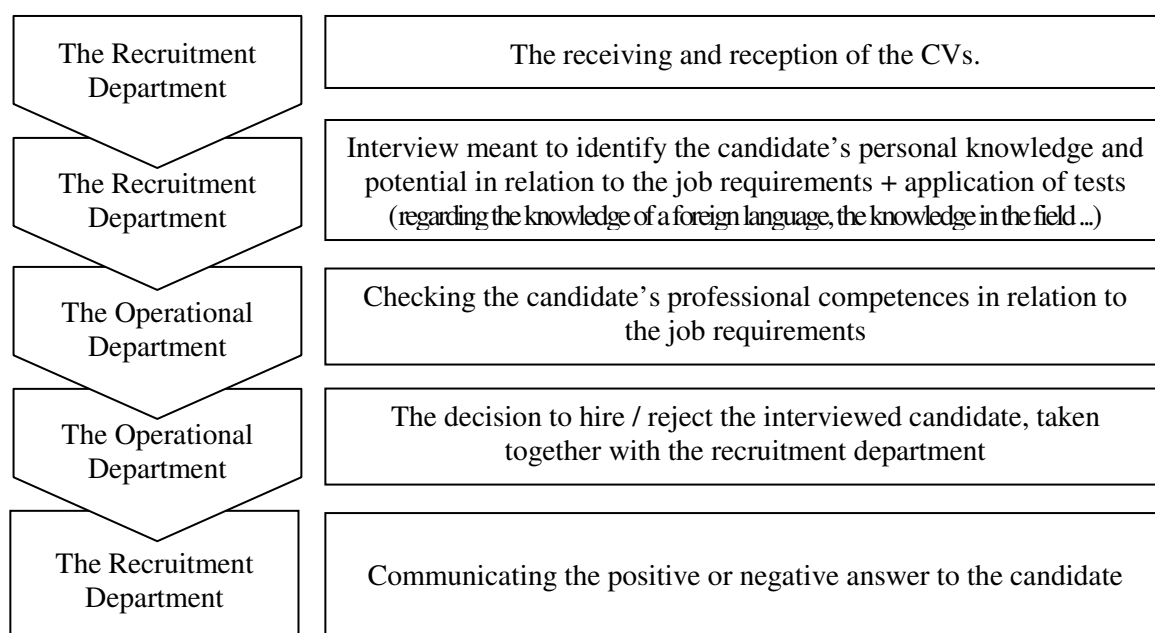
**Geographic mobility.** The group recommends the recruitment of those persons that sooner or later are willing to relocate in the country or abroad, in order to take advantage of the opportunities that might appear in the group.

**International conception.** This criterion refers to the ability of working with people belonging to different cultures, of listening and of assuming new responsibilities.

**Team leader.** The criterion refers to how capable the candidate is of assuming the role of a leader in his/her working environment, what his/her skills are in all management aspects: leadership, training, rewarding, discipline, empowering teams etc., namely: does s/he have skills and competences in training other persons?; is s/he capable of adapting his/her level of communication in such a way as to be close to any member of the company?; can s/he transmit a negative, but constructive feedback?

**The ability to anticipate.** This selection criterion refers to the ability to understand the problems at a deep level, to notice and listen, to identify and implement solutions.

After the recruitment criteria have been established, the process is carried on in the steps presented in Figure no. 2.



**Figure no. 2 – The process of staff recruitment in the Valeo Group.**

**The four key-rules of the recruitment charter** that the Valeo Group has in view:

➤ ***Confidentiality of the candidacies:***

The candidacy will be exploited only by the recruitment team and the personal data will not be communicated to any third party.

➤ ***Systematic response:***

In the case of each candidacy sent via e-mail, the candidates are informed immediately about its registration in the data base. Each of the candidates invited to an interview will receive an answer in maximum 10 days from the date of the interview.

➤ ***Mutual commitment to transparency:***

The responsibilities and requirements of the job are presented clearly, and the candidate is also expected to offer correct information regarding his/her personal and professional situation.

➤ ***Respect for other persons and lack of discrimination.***

Any type of discrimination is excluded, be it direct or indirect, against a candidate or an employee, for reasons connected to his/her sex, sexual orientation, genetic characteristics, age, nationality, race, colour, ethnic group, political preferences, social origin, handicap, family situation or responsibility, membership of a trade union or trade union activity.

During the selection stage, besides physical tests and medical examinations, they also apply:

- physical aptitudes tests;
- colour identification tests;
- tests meant to determine the memorizing capacity of the candidates;
- tests meant to determine their perception speed;
- personality tests.

**The work tests** are eliminatory during the stage of selecting candidates.

**The Valeo Group chooses to combine the two recruitment sources, internal and external.** All vacant positions are published on Valeo Opportunities, on the intranet network to which all employees of the Valeo Group have access. The job requirements, the competences



required and the minimum level of qualification necessary to obtain the job are presented in detail. Thus, the possibility for the employees to have unrealistic expectations or perspectives or to become disappointed or dissatisfied with the organization is much reduced.

The Valeo Group also works with a temporary work force, often used in the case of the seasonal activities, as well as during the trial period, a period in which they test the employee's skills and degree of adaptation to the employer's industrial environment.

In conceiving the career plans, the possibility of horizontal (interdepartmental) promotion as well as of horizontal promotion, at the level of the division or branch, are always taken into consideration.

Because of the economic and financial crisis, the number of unemployed people in the county of Argeş increased by 4,49% in October 2012 as compared to September 2012 and by 0,87 % as compared to October 2011. These aspects make the activity of selection and recruitment a lot easier.

Table no. 1 presents statistical data regarding the structure of the unemployed people registered in the county of Argeş in October 2012.

**Table no. 1: The structure of the unemployed people registered with A.J.O.F.M. (The County Agency for the Occupancy of the Work Force) Argeş on age groups and educational levels on 31.10.2012**

	Age Groups						
	TOTAL	Under 25 years old	25-29 years old	30-39 years old	40-49 years old	50-55 years old	over 55 years old
<b>Total, of whom:</b>	<b>14,126</b>	<b>3,018</b>	<b>1,115</b>	<b>3,211</b>	<b>3,681</b>	<b>1,682</b>	<b>1,419</b>
<b>- women</b>	<b>6,319</b>	<b>1,287</b>	<b>472</b>	<b>1,544</b>	<b>1,797</b>	<b>762</b>	<b>457</b>
- graduates of primary, secondary, vocational schools, of whom	9,139	802	726	2,420	2,700	1,290	1,201
- women	3,605	212	220	1,017	1,181	564	411
- graduates of high school and post-high school educational institutions, of whom	3,773	1,770	187	514	821	314	167
- women	1,933	781	114	325	514	161	38
- graduates of universities, of whom	1,214	446	202	277	160	78	51
- women	781	294	138	202	102	37	8

(Source: [www.arges.anofm.ro/statistica.html](http://www.arges.anofm.ro/statistica.html))

From the statistical data of October 2012 we can notice that the total number of unemployed people registered with A.J.O.F.M. Argeş was of 14,126 persons (5,329 paid unemployed people and 8,797 unpaid unemployed people), higher by 607 persons (+4.49 percentage points) as compared to September 2012 and slightly higher, by 117 persons (+0.84 percentage points), as compared to October 2011.

At the end of October 2012 the rate of unemployment registered in the county of Argeş was of 5.51%, on the increase by 0.32 percentage points as compared to the previous month and by 0.13 percentage points as compared to October 2011.

The analysis of the situation of the beneficiary of the rights according to Law 76/2002 showed that the highest percentage in the total of the registered persons was still that of persons between 30 - 39 years old (22.73%) and 40 - 49 years old (26.06%), while, for the category of

persons under 25 years old the value of 21.36% was registered. From the point of view of their professional training, these persons are structured in the following manner: graduates of primary, secondary, vocational schools – 64.7%, graduates of high school and post-high school educational institutions – 26.7% and graduates of universities – 8.6%.

Analysing the structure of the unemployed people on sexes, the women represent an average of 44.73% (6,319 persons) out of the total number of the registered unemployed people, registering a slight decrease, by 0.27 percentage points, as compared to the percentage from the total number of unemployed people registered in the previous month.

In the present situation, when the economy witnesses a restructuring process, radical changes have appeared in the situation of the occupancy of the work force. Because the great economic agents in the county of Argeş have diminished their demand of work force, the private sector has remained the main demander of work force.

**Table no. 2: The situation of persons registered with The County Agency for the Occupancy of the Work Force Argeş in the year 2012**

Year 2012	Total Number of Persons	Rate of Unemployment %
January	14,616	5.61
February	14,563	5.59
March	13,891	5.33
April	12,795	4.91
May	12,460	4.78
June	12,311	4.72
July	12,985	4.98
August	13,730	5.27
September	13,519	5.19
October	14,126	5.51

(Source: [www.arges.anofm.ro/statistica.html](http://www.arges.anofm.ro/statistica.html))

In April 2012, 1,105 newly created vacant positions were made available to the applicants, of which 744 positions (67,3%) for workers.

## 5. CONCLUSIONS AND FUTURE DIRECTIONS

The paper had as a purpose the presentation of the recruitment activity from a theoretical and a practical point of view. The importance of the paper is given by the correct identification of the main recruitment practices and criteria used by this multinational company. Thus, the Valeo Group prefers young people, with a development potential, capable of learning foreign languages and willing to relocate. The employees of Valeo have to have the capacity of working in a team, with people belonging to various cultures and have to prove their ability to anticipate. The Valeo Group has four key-rules for recruitment: *confidentiality of the candidacies, systematic response, mutual commitment to transparency, respect for other persons and lack of discrimination.*

Under these circumstances, **we suggest:**

1. **Direct recruitment.** The transmission of the information regarding the vacant positions for the directly productive staff in the villages that are close to the places where the company opened its factory because the expectations of those who live in a town are higher than those of the people who live in villages and, implicitly, their motivation is higher;

2. **Advertising the vacant jobs in the local newspapers;**

3. **Advertising the vacant jobs with The County Agency for the Occupancy of the Work Force**, because that is the place where all applications of the people who need a job are collected;

4. **Participating in the job fairs** advertised at the county, national and international level, in order to form a database with potential candidates for the future jobs available;

5. **Distributing information among the employees regarding the newly created jobs**, granting bonuses for the employees that recommend candidates that are subsequently recruited in the company.

In the future, the research can be extended to include the entire branch, by identifying the common recruitment practices and criteria of the suppliers of the automotive industry in Romania.

## REFERENCES

1. Devers, T., Tiberghien, G., *Guide des recrutements et mutations*, Les Editions d'Organisations, Paris, 1995, p. 223.
2. Gómez-Mejía, Luis R. - Texas A&M University; Balkin, David B. - University of Colorado, Boulder; Cardy, Robert L. - University of Texas at San Antonio, *Managing human resources*, Pearson Ltd, 2010, p. 171.
3. Manolescu, A., *Managementul Resurselor Umane*, 3rd edition, Economic Publishing House, București, 2001., pp. 230-231.
4. Milkovich, G.T.; Boudreau, J.W., *Human Resources Management*, 6th Edition Irwin, Boston, 1991, p. 218.
5. Tyson, Shaun, *Essentials of HRM*, 5th edition, Elsevier, USA, 2006, p. 156.
6. \*\*\* Recruitment Procedure of the Valeo Group.

## **SOCIAL, ECONOMIC AND ACCOUNTING SUMMARY OF THE GREEK AGRICULTURAL SECTOR 1950-2010: CENTRAL GREECE REGION**

Michail Th. PAPAILIAS

Panteion University, Agricultural Bank of Greece, Athens Branch, Greece  
[papailiasmichail@hotmail.com](mailto:papailiasmichail@hotmail.com)

***Abstract:** Usually, the analysis of the economic and social development of a country or a region can be achieved either by using macroeconomic theories, or through a microeconomic approach (Sakellaropoulos, 1993). The innovation of this paper lies in the use of accounting techniques for capturing the relevant developments and in the fact that there are no similar studies in the Greek bibliography, except some fragmentary approaches of the 1950's (Euelpides, 1953). Specifically, the objective of this article is the presentation of the social and economic development in a major region in Greece with the use of accounting statements. For this purpose the balance sheets and the income statements of the specific region were estimated per decade throughout the postwar period and the social-economic facts are tried to associate with the figures. The article is structured in three parts. The first refers to the methodology of the research. In the second, balance sheets and profit/loss accounts are presented in detail with the use of financial statement analysis methods and are attempted to correlate with the social-economic incidents. In the third the findings are evaluated.*

***Keywords:** Balance-sheets, income statements, accounting, agricultural, region development, Central Greece*

**JEL Classification Codes:** M410, M490, Q140

### **1. METHODOLOGY**

The specific article estimates the financial statements of the agricultural sector in U.S. dollars, in order to be widely comparable. This displays for certain categories of capital (because of the way it is calculated) a distortion image. First, it is obvious that changing the current price in foreign currency is not the best deflator. Moreover, the dollar, especially after the collapse (1971) of the treaty of Bretton Woods (1944), stopped possess it's previous stability.

On the other hand, the use of fixed price when the base year is many years ago is not to facilitating the understanding of figures. Several times, developments are presented in fixed prices 1970, which was used by the Hellenic Statistical Authority (EL.STAT) and all the organizations until 1996. Lately, it was often used as the base year 1988, when figures reformed. However, the use of the system ESA 95, canceled this attempt. Finally, the entrance of the country in the Eurozone from the February 2002 complicated the things. For these reasons, the financial figures were estimated in U.S. dollars.

#### **1.1 BALANCE SHEET - PROFIT/ (LOSS) ACCOUNT**

##### **a. Fixed capital**

The fixed capital concerns only the primary sector (farm products), therefore it was not estimated the expenditures which related to transformation, marketing, etc. The fixed capital was split in two (depending on the entity which made the investments) in public and private.

a.1 Public fixed capital specified as the accumulated investment of public, which concern according Agricultural Bank of Greece (ATE) and the Hellenic Statistical Authority (EL.STAT)

seven categories: agriculture<sup>1</sup>, buildings of livestock<sup>2</sup>, forests<sup>3</sup>, fishery<sup>4</sup> - aquaculture, agricultural electrification<sup>5</sup>, agricultural road construction<sup>6</sup> and land reclamation work<sup>7</sup>. Data obtained from the ATE

a.2 Private fixed capital considered as the investments of farmers, regardless whether they were with equity, government's loans or the European Union. Data drawn from the ATE and the Hellenic Ministry of Rural Development and Food (MINAGRIC)

b. Plant nominated the value of systematic plantation (minus non-productive plantations, such as new trees). In the value of plant were included orchards (vegetables), citrus, vines, raisins olive groves and tree nuts. Data collected from the ATE and the Pan-hellenic Confederation of Unions of Agricultural Cooperatives (PASEGES)

c. Livestock is related to working animals, production and reproduction. The number of livestock populations calculated, such as of ungulates, cattle, sheep and goats, pigs, rabbits, chickens, bees. Data obtained from the ATE and the PASEGES

d. Land is the value of land other than plantations. The estimation performed statistical inventory. Of the cultivated land plantations were removed because they were the vegetable section. The greenhouse plantations were not calculated, since their value was measured in the private fixed capital. Data drawn from the ATE

e. The calculation of liabilities in order to avoid inaccuracies, covering only two basic components: the equity and the liabilities (information was drawn from the Agricultural Bank). It should be mentioned that until 2000 (when the entrance of private capital in rural areas had allowed) 90% of all the farms were lend from the ATE. The short-term loans of the Bank accounted for 98% of foreign capital. Equity estimated from sample surveys, which were conducted by the geotechnical services of ATE (Papailias, 2004). This data, in order to be similar, were originally converted to fixed prices 1970 and 1988. For greater comparability the financial statements were converted into U.S. dollars

f. Data for the figure of profit/(loss) account gross value product obtained from the EL.STAT

g. The intermediate imports estimated by EL.STAT only for the year 2000 and included expenses such as seeds, reproductive material, energy, fertilizers and soil conditioners, veterinary expenses, feed, maintenance of materials, maintenance of buildings, agricultural services etc

h. Depreciation calculated on specific rates depending on the asset category

j. Wages estimated with the case that farmers work 250 days approximately each year multiplied by the average cost of payday

k. Interests short/long term relates data from ATE.

## 1.2 VERTICAL – HORIZONTAL ANALYSIS

In order to compare more properly and accurate (reducing the problems from inflation and exchange rates) the financial statements through the decades a vertical analysis is used. The calculation of financial figures as percentage on the absolute rates size of a figure received as a base (total assets, total liabilities/equity or gross income), revealed the relative size and significance of each figure relative to the amount of base (a common basis of comparison between them is created).

---

1 Depreciation calculated with fixed rate of 3% (these rates ranged from 10% for nurseries, greenhouses to 2% for buildings)

2 The depreciation rates ranged between 2% (storage, stables) and 10% (veterinary stations). The average rate was 3,5%

3 The average depreciation rate estimated at 3% (2,5 - 3% for torrents and 15% for cleaning projects of forest roads)

4 The average rate was at 4,5%. The rates ranged from 2,5% in fishing shelters, fishing stations to 10% equipment at fish hatcheries

5 The average depreciation rate estimated at 4%

6 Rates was estimated between 10% to 25%

7 The depreciation rate was calculated at 3%, from 2% (for various contractors) to 10% (commissions technical rain pipes, ducts, small canal etc)

On the other hand, a horizontal analysis is revealing how much figures have changed from one period to the next. The horizontal resolution is highlighted when data concern a long period, so it is possible to identify the trends. (Kantzos, 2002).

## 2. FINANCIAL STATEMENTS

### 2.1 INTRODUCTION

Table 1 quotes the agricultural population for the period 1950-2010 both for the country and for the region presented by the paper. The percentage through the decades presents small fluctuations and it tends towards 8%, but it is evident that the population both for the country and the region diminished approximately 3 times. This trend confirms that the country's workforce moves to larger cities, avoiding to work in the primary sector. Some of the reasons are the low prestige of the social and economic life in the countryside.

**Table 1**  
**Agricultural population 1950-2010**

	Total Greece	Central Greece	% of total	% change Central
1951*	1.366.864	113.016	8,27	
1961	1.953.900	169.900	8,70	0,5
1971	1.312.340	98.452	7,50	-0,4
1981	971.828	71.156	7,32	-0,3
1991	671.147	46.334	6,90	-0,3
2001	617.453	48.681	7,88	0,1
2011 <sup>8</sup>	510.000	43.000	8,43	-0,1

Source: EL.STAT

### 2.2 FIGURES

Table 2 shows that the public fixed capital constituted the 57,7% of the total. This appears that private investment in the beginning of the period was relatively small (low mechanization of farming). The total fixed capital (public and private activity) throughout the previous period was too small as it was only 3,5% of total invested capital and 3,4% of assets.

The largest component of the assets was the value of land. The current was extremely small because of low rural incomes and consisted mainly of ATE funding (short term). The general picture that emerges is that the accumulation of capital was relatively low resulting in rural incomes to be small, which had not allowed a rapid development of the sector. The equity constituted the 81% of liabilities, the rest was loans of ATE (which later became available to farmers for free) from various organisms (eg UNRRA).

<sup>8</sup> Provisional assessment

**Table 2**  
**Balance sheet 1950**

Current prices - million dollars

<b>Assets</b>	<b>764</b>	<b>100,0%</b>	<b>Total liabilities/equity</b>	<b>764</b>	<b>100,0%</b>
Public fixed assets	15	1,9%	Liabilities	145	19,0%
Private fixed assets	11	1,5%	Equity	619	81,0%
<i>Total Fixed assets</i> <sup>9</sup>	26	3,4%			
Plant	199	26,1%			
Livestock	65	8,5%			
<i>Capital Reserves</i> <sup>10</sup>	290	37,9%			
Land	461	60,4%			
<i>Total investment capital</i> <sup>11</sup>	751	98,4%			
<i>Current</i>	13	1,6%			

From table 2.1 it appears that gross rural income was relatively small, only 75,5 million dollars, but due to small depreciation (small fixed capital) net income appeared high. Wages due to the overcrowding were low and as a result the farms shown remarkable result, which was 43% of gross rural income. As we will show below, it was a special year because of the following period the profit shrank and agricultural enterprises began to show damages.

**Table 2.1**

<b>Net Profit/(Loss) 1950</b>	Current prices - million dollars	%
Gross value product	75,5	100,0%
Intermediate imports	-	-
Gross agricultural income <sup>12</sup>	75,5	100,0%
Minus: Depreciation	0,8	1,1%
Wages	41,5	55,0%
Interest short/long term	1,1	1,4%
Net Profit/(Loss) <sup>13</sup>	32,9	43,5%

In 1960 the public fixed capital constituted the 34% of the total capital invested in assets of 2,9% (Table 3). This reduction results to the rapid increase of private capital due to the extensive investments resources of the farmers (mainly borrowing from the ATE). The consequence was the indebtedness of farms resulting in liabilities to constitute 50% of the total liabilities and equity. Remarkable also was the reduction in land value (52% of assets) due to rural depopulation from the extensive immigration held during the period 1950 onwards. The indebtedness the farmers have led to an increase in interest short and long term. The abandonment of the countryside has led to an increase of wages resulting in all the agricultural enterprises to show a marginal profit (3,6% of gross agricultural product).

<sup>9</sup> Total Fixed assets = Public fixed assets + Private fixed assets

<sup>10</sup> Capital Reserves = Total fixed assets + Plant + Livestock

<sup>11</sup> Total Investment capital = Capital Reserves + Land

<sup>12</sup> Gross agricultural income = Gross value product – Intermediate imports

<sup>13</sup> Net Profit/(Loss) = Gross agricultural income – Depreciation – Wages – Interest short/long term

**Table 3**  
**Balance sheet 1960**

Current prices - million dollars

<b>Assets</b>	<b>558</b>	<b>100,0%</b>	<b>Total liabilities/equity</b>	<b>558</b>	<b>100,0%</b>
Public fixed assets	16	2,9%	Liabilities	284	51,0%
Private fixed assets	31	5,5%	Equity	273	49,0%
<i>Total Fixed assets</i>	47	8,4%			
Plant	150	26,9%			
Livestock	47	8,4%			
<i>Capital Reserves</i>	244	43,8%			
Land	292	52,3%			
<i>Total investment capital</i>	536	96,1%			
<i>Current</i>	22	3,9%			

**Table 3.1**

<b>Net Profit/(Loss) 1960</b>	Current prices - million dollars	
		%
Gross value product	80,7	100,0%
Intermediate imports	-	-
Gross agricultural income	80,7	100,0%
Minus: Depreciation	3,1	3,8%
Wages	72,8	90,2%
Interest short/long term	1,9	2,4%
Net Profit/(Loss)	2,9	3,6%

The transfer of funding to help other countries (such as Korea) resulted in a gradual reduction of the financial assistance of the Marshall plan from 1951 onwards. This decline has forced the Greek economy being reconstructed to take effective measures in order to eliminate the deficit of payment's balance, such as the sharp devaluation in 1953 against the dollar (Sapounas, 1991).

In 1970 (Table 4) it is appeared a parallel increase in private and public investments resulting in a significant increase in total fixed capital (the public fixed was the 27% of total). The importance of land continued to decrease constituting just 36% of assets in 1970. In contrast a significant increase showed in plant forming the 30% of assets. Because of the gift of debts by the dictatorship liabilities reduced with the consequence equity to constitute 63% of total liabilities and equity.

Profit/(loss) statement (Table 4.1) shows a significant increase in depreciation and showed a smaller increase in wages. The net profit was recorded by the farms was 28%. This is explained by the loss of interest due to the elimination of agricultural debts last year.



Social, Economic and Accounting Summary of the Greek Agricultural Sector 1950-2010:  
Central Greece Region

**Table 4**  
**Balance sheet 1970**

Current prices - million dollars

<b>Assets</b>	<b>882</b>	<b>100,0%</b>	<b>Total liabilities/equity</b>	<b>882</b>	<b>100,0%</b>
Public fixed assets	42	4,8%	Liabilities	555	63,0%
Private fixed assets	114	13,0%	Equity	326	37,0%
<i>Total Fixed assets</i>	157	17,8%			
Plant	266	30,2%			
Livestock	90	10,2%			
<i>Capital Reserves</i>	512	58,1%			
Land	323	36,7%			
<i>Total investment capital</i>	836	94,8%			
<i>Current</i>	46	5,2%			

**Table 4.1**

Net Profit/(Loss) 1970	Current prices - million dollars	
	dollars	%
Gross value product	155,4	100,0%
Intermediate imports	-	-
Gross agricultural income	155,4	100,0%
Minus: Depreciation	11,0	7,1%
Wages	96,6	62,1%
Interest short/long term	5,0	3,2%
Net Profit/(Loss)	42,9	27,6%

According to Table 5 the fixed public capital continued to decrease constituting the 24% of total capital and 6,6% of assets. The value of the land continued to be the largest component of assets constituting the 33%. The equity increased significantly representing 84% of the total. In equity are added all subsidies. The profit/(loss) were positive (14,6%) in contrast to what is happening across the country because of the proximity of the area in Athens and the easy availability of agricultural products.

**Table 5**  
**Balance sheet 1980**

Current prices - million dollars

<b>Assets</b>	<b>3.029</b>	<b>100,0%</b>	<b>Total liabilities/equity</b>	<b>3.029</b>	<b>100,0%</b>
Public fixed assets	201	6,6%	Liabilities	2.544	84,0%
Private fixed assets	611	20,2%	Equity	485	16,0%
<i>Total Fixed assets</i>	811	26,8%			
Plant	834	27,5%			
Livestock	215	7,1%			
<i>Capital Reserves</i>	1.860	61,4%			
Land	1.012	33,4%			
<i>Total investment capital</i>	2.872	94,8%			
<i>Current</i>	156	5,2%			

**Table 5.1**

<b>Net Profit/(Loss) 1980</b>	Current prices - million	
	dollars	%
Gross value product	693,1	100,0%
Intermediate imports	-	-
Gross agricultural income	693,1	100,0%
Minus: Depreciation	56,8	8,2%
Wages	479,2	69,1%
Interest short/long term	55,9	8,1%
Net Profit/(Loss)	101,1	14,6%

In 1973, with the "politicization" of the military regime there was a significant change in the prices of all products (government intervention). The parliamentary regime was installed in 1974 to face completely new situations. The economic crisis continues, the democratic freedoms since 1936 restored to unprecedented levels for the Greek society (legalization of the Communist Party) and the association with the European Economic Community change the economic conditions, as of 1974 there should be no duties on the Community products, which were not produced in Greece (Maravegias, 1992).

From Table 6, the private fixed capital is reached to 61% of total assets, while the percentage of land value dropped further, reaching 31% slightly higher than in plantations (28,4%). Equity due to high subsidies was maintained at 80% of liabilities.

**Table 6**  
**Balance sheet 1990**

Current prices - million dollars

<b>Assets</b>	<b>4.300</b>	<b>100,0%</b>	<b>Total liabilities/equity</b>	<b>4.300</b>	<b>100,0%</b>
Public fixed assets	382	8,9%	Liabilities	3.440	80,0%
Private fixed assets	612	14,2%	Equity	860	20,0%
<i>Total Fixed assets</i>	994	23,1%			
Plant	1.221	28,4%			
Livestock	528	12,3%			
<i>Capital Reserves</i>	2.742	63,8%			
Land	1.348	31,4%			
<i>Total investment capital</i>	4.090	95,1%			
<i>Current</i>	209	4,9%			

The net profit/(loss) according to Table 6.1 were negative due to labor shortages and rising wages. The deficit rose to 4% of the agricultural product.

The implementation of the Common Agricultural Policy during the period 1981-1982 was combined with a significant improvement in the degree of mechanization of livestock farms as well as significant support to the farm in the mountainous and disadvantaged areas. Accompanied by a slight increase in the size of livestock farms and small decrease of the fragmentation. Community practices followed in the period 1981-1992 had the effect of increasing the number of producer groups, and have not resulted in significant improvement in the level of education of Greek farmers. The fall in employment occurred in this period, created the need for a new or additional employment in rural residents, such as agrotourism, part timing agriculture, etc (Sapounas & Miliakos, 1996).

Social, Economic and Accounting Summary of the Greek Agricultural Sector 1950-2010:  
Central Greece Region

**Table 6.1**

<b>Net Profit/(Loss) 1990</b>	Current prices - million dollars	%
Gross value product	715,5	100,0%
Intermediate imports	-	-
Gross agricultural income	715,5	100,0%
Minus: Depreciation	62,6	8,8%
Wages	511,5	71,5%
Interest short/long term	171,0	23,9%
Net Profit/(Loss)	-29,7	-4,1%

In 2000 (Table 7) private fixed capital was 62% of the total and 8.6% of assets. The land formed 38% of the value of assets compared to 37,8% of plant. In essence, that the vegetable section and the earth were more than  $\frac{3}{4}$  of assets. Shareholders' equity reduced to 71% of total liabilities/equity. The reasons for this were the significant reduction in grants and the loan markets with the most unfavorable terms (abolition of the monopoly of the ATE). Regarding net profit/(loss) the calculation of the intermediate imports, the amount of wages and the high cost of money because of interest led to the agricultural enterprises present losses of 6%.

**Table 7**

**Balance sheet 2000**

Current prices - million dollars

<b>Assets</b>	<b>8.554</b>	<b>100,0%</b>	<b>Total liabilities/equity</b>	<b>8.554</b>	<b>100,0%</b>
Public fixed assets	444	5,2%	Liabilities	6.073	71,0%
Private fixed assets	739	8,6%	Equity	2.481	29,0%
<i>Total Fixed assets</i>	1.183	13,8%			
Plant	3.230	37,8%			
Livestock	539	6,3%			
<i>Capital Reserves</i>	4.952	57,9%			
Land	3.301	38,6%			
<i>Total investment capital</i>	8.252	96,5%			
<i>Current</i>	302	3,5%			

**Table 7.1**

<b>Net Profit/(Loss) 2000</b>	Current prices - million dollars	%
Gross value product	745,1	100,0%
Intermediate imports	163,9	22,0%
Gross agricultural income	581,2	78,0%
Minus: Depreciation	72,2	9,7%
Wages	466,3	62,6%
Interest short/long term	86,9	11,7%
Net Profit/(Loss)	-44,2	-5,9%

Table 8 and 8.1 presents some provisional assessment for the year 2010. The figure of land stabilized at the same level of the previous decade. Liabilities presented a slight decreased because banks did not enforce the primary sector, so farmers could not use foreign capital. Regarding net profit/(loss) the figure appeared a little higher, due to the rising payday and the high cost of money because of the interest.

**Table 8**

**Balance sheet 2010<sup>14</sup>**

Current prices - million dollars

<b>Assets</b>	<b>9.667</b>	<b>100,0%</b>	<b>Total liabilities/equity</b>	<b>9.667</b>	<b>100,0%</b>
Public fixed assets	497	5,1%	Liabilities	6.187	64,0%
Private fixed assets	842	8,7%	Equity	3.480	36,0%
<i>Total Fixed assets</i>	1.339	13,9%			
Plant	3.488	36,1%			
Livestock	520	5,4%			
<i>Capital Reserves</i>	5.347	55,3%			
Land	3.700	38,3%			
<i>Total investment capital</i>	9.047	93,6%			
<i>Current</i>	620	6,4%			

**Table 8.1**

<b>Net Profi/(Loss) 2010<sup>15</sup></b>	Current prices - million dollars	%
Gross agricultural income	560,0	100,0%
Minus: Depreciation	78,0	13,9%
Wages	430,0	76,8%
Interest short/long term	100,0	17,9%
Net Profit/(Loss)	-48,0	-8,6%

### 3. CONCLUSION

#### 3.1 BALANCE SHEET

Looking at the period 1950-2000 the following are observed:

At the beginning and at the end of the period the value of land was quite high (higher in the beginning). The lowest percentage of land in the assets was in the middle of the season, due to the continuous abandonment by the migration. Thereafter, especially after the country's accession to the European Union immigration reduced or disappeared and the value of land began to rise again. Steady increase presented by the plant, because of the result of changes in land use. The fixed assets increased during the period 1960-1980 and the private fixed assets were the most important factor in the overall asset (Table 9).

Exploring liabilities seems that the first years the growing costs covered by the income of farmers. After 1955 and until 1980 there was extensive bank financing of the sector leading up to the bank debt and over indebtedness of rural households. The dictatorship of 1968-1969 wrote

<sup>14</sup> Provisional assessment

<sup>15</sup> Provisional assessment

Social, Economic and Accounting Summary of the Greek Agricultural Sector 1950-2010:  
Central Greece Region

off farmers' debts to avoid bankruptcy. Then, low interest loans were given and emphasis on the long term rather than short term borrowing was given.

**Table 9**  
**Balance sheet in summary**

Year	Current prices - million dollars	% of 1950
1950	763,7	100,0%
1960	557,6	73,0%
1970	881,7	115,5%
1980	3.028,6	396,6%
1990	4.299,6	563,0%
2000	8.554,2	1120,1%

After 1980 the major subsidies from the European Union played a crucial factor in maintaining the same high levels of capital and reduce the debt of farmers (Table 10).

**Table 10**

Current prices - million dollars												
	1950		1960		1970		1980		1990		2000	
Assets	764	100,0%	558	100,0%	882	100,0%	3.029	100,0%	4.300	100,0%	8.554	100,0%
Public fixed assets	15	1,9%	16	2,9%	42	4,8%	201	6,6%	382	8,9%	444	5,2%
Private fixed assets	11	1,5%	31	5,5%	114	13,0%	611	20,2%	612	14,2%	739	8,6%
<i>Total Fixed assets</i>	26	3,4%	47	8,4%	157	17,8%	811	26,8%	994	23,1%	1.183	13,8%
Plant	199	26,1%	150	26,9%	266	30,2%	834	27,5%	1.221	28,4%	3.230	37,8%
Livestock	65	8,5%	47	8,4%	90	10,2%	215	7,1%	528	12,3%	539	6,3%
<i>Capital Reserves</i>	290	37,9%	244	43,8%	512	58,1%	1.860	61,4%	2.742	63,8%	4.952	57,9%
Land	461	60,4%	292	52,3%	323	36,7%	1.012	33,4%	1.348	31,4%	3.301	38,6%
<i>Total investment capital</i>	751	98,4%	536	96,1%	836	94,8%	2.872	94,8%	4.090	95,1%	8.252	96,5%
<i>Current</i>	13	1,6%	22	3,9%	46	5,2%	156	5,2%	209	4,9%	302	3,5%

**Table 10.1**

Current prices - million dollars												
	1950		1960		1970		1980		1990		2000	
<b>Total liabilities/equity</b>	<b>764</b>	<b>100,0%</b>	<b>558</b>	<b>100,0%</b>	<b>882</b>	<b>100,0%</b>	<b>3.029</b>	<b>100,0%</b>	<b>4.300</b>	<b>100,0%</b>	<b>8.554</b>	<b>100,0%</b>
Liabilities	145	19,0%	284	51,0%	555	63,0%	2.544	84,0%	3.440	80,0%	6.073	71,0%
Equity	619	81,0%	273	49,0%	326	37,0%	485	16,0%	860	20,0%	2.481	29,0%

In 1950 Greece was a very rural country. The financial results were positive despite the low accumulation of capital that exists. The extensive migration has led to rural depopulation increase in lending (over indebtedness) of farmers and as a result negative figures. It should be noted that the Central Greece because of the proximity to Attica, which was directed towards the great mass of farmers continued to show for many years positive results in contrast to most

regions of the country that gave negative results. The consequence was the emigration from the solid or Greece would be small compared to other regions.

In 1970 net results are shown positive as the previous year the dictatorship donates the debts of farmers resulting in disappear damage. In 1980 a significant increase is shown due to the fact that the period 1977-1980 was the pre-accession period in which there have been major increases in the prices of agricultural products. From 1990 and then the results in Central Greece shown the same image with the other regions of the country. The reasons must be found in fundamental turn that occurred crop and rising labor costs due to lack of labor force.

### 3.2 PROFIT/(LOSS)

In 1950 Greece was a very rural country. The financial results were positive despite the low accumulation of capital that exists. The extensive migration has led to rural depopulation increase in lending (over indebtedness) of farmers and as a result negative figures (Table 11). It should be noted that the Central Greece because of the proximity to Attica, which was directed towards the great mass of farmers continued to show for many years positive results in contrast to most regions of the country that gave negative results. The consequence was the emigration from the solid or Greece would be small compared to other regions.

**Table 11. Net Profit/ (Loss) in summary**

Year	Current prices - million dollars	% of 1950
1950	32,88	100,0%
1960	2,92	8,9%
1970	42,88	130,4%
1980	101,14	307,6%
1990	-29,67	-90,3%
2000	-44,17	-134,4%

In 1970 net results are shown positive as the previous year the dictatorship donates the debts of farmers resulting in disappear damage (Table 12). In 1980 a significant increase is shown due to the fact that the period 1977-1980 was the pre-accession period in which there have been major increases in the prices of agricultural products.

**Table 12**

Net Profi/(Loss) - m. dollars - %	1950		1960		1970		1980		1990		2000	
	Gross value product	75,5	100,0%	80,7	100,0%	155,4	100,0%	693,1	100,0%	715,5	100,0%	745,1
Indermediate imports	-	-	-	-	-	-	-	-	-	-	163,9	22,0%
Gross agricultural income	75,5	100,0%	80,7	100,0%	155,4	100,0%	693,1	100,0%	715,5	100,0%	581,2	78,0%
Minus: Depreciation	0,8	1,1%	3,1	3,8%	11,0	7,1%	56,8	8,2%	62,6	8,8%	72,2	9,7%
Wages	41,5	55,0%	72,8	90,2%	96,6	62,1%	479,2	69,1%	511,5	71,5%	466,3	62,6%
Interest short/long term	1,1	1,4%	1,9	2,4%	5,0	3,2%	55,9	8,1%	171,0	23,9%	86,9	11,7%
Net Profit/(Loss)	32,9	43,5%	2,9	3,6%	42,9	27,6%	101,1	14,6%	-29,7	-4,1%	-44,2	-5,9%

From 1990 and then the results in Central Greece shown the same image with the other regions of the country. The reasons must be found in fundamental turn that occurred crop and rising labor costs due to lack of labor force.

## REFERENCES

### Books

1. ATE, 1973. *Structural and Financial Data Household Agricultural Enterprises*. ATE, Athens, Greece
2. Bank of Greece (1978), *The first fifty years of the Bank of Greece*. Athens, Greece
3. Euelpides, Ch., 1953. *Chronic agricultural crisis in Greece*. Papazisis, Athens, Greece  
Relief and Rehabilitation Organization of the United Nations (UNRRA), 1947. *Plan for recovery productive resources of Greece*. Athens, Greece
4. Georgakopoulos, T. A., 1991. *The Greek agriculture in the EEC: Impact of accession*. ATE, Athens, Greece
5. Hellenic Statistical Authority (EL.STAT), Censuses 1951-2011, Annual Publication
6. Kantzos, K., 2002. *Financial Statements Analysis*. Interbooks Publishers, Athens, Greece
7. Klimis, A., 1961. *The rural economy before and after the foundation of ATE*. ATE, Athens, Greece  
Maravegias, N. 1992. *Agricultural Policy and Economic Growth in Greece*. New Frontiers, Athens, Greece  
Ministry of Rural Development and Food (MINAGRIC), Annual Publication, 1950-2011  
Ministry of Finance, Public Investment Program, annual editions 1948-1987
8. Papailias, T., 1996. *Aquaculture Current Situation and Prospects 1980-1996*. Studies of Rural Economy,
9. Sakellaropoulos, T., 1994. *Crises in Greece, 1830-1857 - Economic, Social and Political Aspects*. Kritiki, Athens, Greece
10. Sapounas, G., et al, 1996. *The Greek agriculture in the postwar period. Impact of EU membership and lessons for the future*. ATE, Athens, Greece.
11. Sapounas, G., 1991. *Rural development problems and prospects*. Agricultural Economics Studies, Research & Planning Division, No. 42, ATE, Athens, Greece

### Journals

12. Liidakis, G., 1985. The impact of Greece's accession to the EEC foreign trade in agricultural products. *Journal of Agricultural Research*, Volume 1, Issue 1, pp. 79-98

## A STRUCTURAL MODEL DESCRIBE CHINESE TRADESMEN ATTITUDES TOWARDS GREEK STUDENTS CONSUMPTION BEHAVIOR

Sofia D. ANASTASIADOU

Western Macedonia University, Greece

[sanastasiadou@uowm.gr](mailto:sanastasiadou@uowm.gr)

***Abstract:** This study tests evaluates 43 Chinese tradesmen opinios describe the main factors that influnce Greek consumers' behavior. A structural model was constructed to represent the relationship between consumer components. The model was tested for its Convergent and Discriminant Validity. Moreover it was tested for its reliability and construct reliability. The findings from this study may be used by Chinese tradesmen to develop their marketing campains and customers.*

**Keywords:** *Validity, reliability, attitudes, Chinese products, Loyalty*

**JEL Classification Codes:** C52, D12

### 1. THEORETICAL FRAMEWORK

In the new era of globalization of business an increased competition among domestic and multinational firms in both foreign and domestic markets has appeared (Netemyer, 1991). In Europe, there is a trend of street illegal merchants of Chinese products and this strongly influences the local markets. In Greece, these Chinese merchants have a bad impact on the local economy, especially in recent economic crisis period, because they sell their products in extremely cheap prices and hence, they create problems to Greek merchants who cannot overcome this kind of competition. Nowadays, a new scene is emerged as many Chinese people started their own businesses in Thessaloniki and as a result a serious decrease of Greek products' sales appeared. Internationally, many studies had been made aiming to determine the predictors of consumers' behavioral intention to buy imported and domestic products (Chung and Pysarchik, 2000). According to Han and Vem (1988) products from developing countries were perceived to be of quite high quality (Han 1988) but consumers in all countries can have plenty choices of purchase options (Netemyer, 1991).

In the market literature many studies have study the influences brand name, trust, and brand equity on perceptions of customer loyalty (Gommans et al., 2001; Taylor et al., 2004). In addition, the concept of brand loyalty has been studied in every detail in traditional marketing literature concerning two different dimensions of the concept that are behavioral and attitudinal loyalty (Gommans et al., 2001, Baldinger and Rubinson, 1996). Laurent and Kapferer (1985) and Hunter et al. (2004) argued that the concept of risk perception as a construct that includes risk importance and risk probability is also a major factor that has influence to a market behavior. Perceived risk was initially defined by Bauer (1960) and includes two components, namely, uncertainty and adverse consequences. Perceived risk is another important factor related to consumer behaviour (Cox, 1967; Jøsang and Lo Presti, 2004). Jøsang and Lo Presti argued that both risk and trust are factors for making decisions in an uncertain environment. Moreover, the conceptualisation of perceptions of quality is among the most important issues in the marketing literature (Brady and Cronin, 2001).



Thus the present study evaluates the relations between Intention to buy, Trust, Risk, Product price, Perceived quality Perceived quality, Satisfaction and Loyalty in relation to Chinese products and Chinese market in Greece from 43 Chinese tradesmen point of view.

## **2. PURPOSE OF THE STUDY**

The present study examines the validity and reliability of an instrument (a structural equation model) designed for measuring Chinese tradesmen attitudes for Greek customers' consumption behavior towards Chinese products. Specifically, it evaluates construct validity by estimating both convergent and discriminate validity, while evaluating the internal consistency of the instrument itself. In addition another aim of the study is to estimate how the instrument determines the reasonable relations among the latent factors, describes the reasonable results and assigns the quality of data fit within it. The instrument has five dimensions- factors named Perceived quality (F1) Product price (F2) Trust in buying Chinese products (F3) Intention to buy Chinese products (F4) Loyalty (F5).

## **3. RESEARCH GOALS**

The present study is the ascertainment of the questinnaires validity which was designed to measure factors that have an impact on loyalty toward Chinese products as well as the investigation of relationship between the structures constactures of the model.

For this reason and more specifically for the examination of the importance of each possible and feasible relationship that can be investigated at this model the following 7 hypotheses are examined:

- H1. Perceived quality (F1) has a positive direct effect on Trust in buying Chinese products (F3)
- H2. Perceived quality (F1) has a positive direct effect on Loyalty (F5).
- H3. Product price (F2) has a positive direct effect on Loyalty (F5).
- H4. Product price (F2) has a positive direct effect on Intention to buy Chinese products (F4).
- H5. Trust in buying Chinese products (F3) has a positive direct effect on Intention to buy Chinese products (F4).
- H6. Trust in buying Chinese products (F3) has a positive direct effect on Loyalty (F5).
- H7. Intention to buy Chinese products (F4) has a positive direct effect on Loyalty (F5).

## **4. RESEACH SAMPLE**

The sample consists of 43 Chinese tradesmen, storeowners from Thessaloniki in Greece.

## **5. METHODOLOGY**

A. *Principal Components analysis*: This paper attempts to measure Chinese tradesmen attitudes for Greek students cosumption behavior towards Chinese products toward e-Book. Principal components analysis with Varimax Rotation produces the dimension of these attitudes. The calculations of Principal components analysis were based on variance- covariance matrix because the research variances took prices from the same measurement scale, and more specifically Likert seven-rank scale. The method that was chosen as a choice of missing variables treatment was the method listwise, which excludes from the analysis any case which will reveal a cell, on one or more variables, of the same observed unit, without value, i.e. without information. To define if the sub-scales were suitable for factor analysis, two statistical tests were used. The first is the Bartlet Test of Sphericity, in which it is examined if the subscales of the scale are inter-independent, and the latter is the criterion KMO (Kaiser-Meyer Olkin Measure

of Sampling Adequacy, KMO) (Kaiser, 1974), which examines sample sufficiency. The main method of extracting factors is the analysis on main components with right-angled rotation of varimax type (Right-angled Rotation of Maximum Fluctuation), so that the variance between variable loads be maximized, on a specific factor, having as a final result little loads become less and big loads become bigger, and finally, those with in between values are minimized (Hair, 2005).

This means that the factors (components) that were extracted are linearly irrelevant. The criterion of eigenvalue or characteristic root (Eigenvalue)  $\geq 1$  was used for defining the number of the factors that were kept (Kaiser, 1960, Sharma, 1996, Hair et al., 1995). Essentially, the eigenvalue is the sum of the squares of variable loads on each factor. Actually, it is a measurement of fluctuation quantity that is relevant to the factor. Model acceptance was based on two criteria: a) each variable, in order to be included in the variable cluster of a factor, must load to it more than 0.50 and b) less than 0.40 to the rest of the factors) (Schene, et al., 1998). Moreover, each factor must have more than two variables. In addition, it was considered, on the basis of common variable Communalities ( $h^2$ ), that the variables with high Communality ( $h^2$ ) imply great contribution to the factorial model (Dafermos, 2009). The evaluation of questionnaire reliability- internal consistency is possible by Cronbach's index alpha ( $\alpha$ ) (Cronbach, 1984), which is considered the most important reliability index and is based on the number of the variables/items of the questionnaire, as well as on the correlations between the variables (Nunnally, 1978).

*B. Confirmatory Factor Analysis and Latent Class Analysis:* In order to investigate the structure of the factors measured with the questionnaire a confirmatory factor analysis (CFA) was models of structural equations and the development of a model indicating the relationship between the various factors was attempted and in particular the relationship between the observed variable and the factors. The aim of this confirmatory analysis was to reveal if the questionnaire is actually valid and suitable for the measurement of the variables it investigates. It is noted that an instrument of evaluation has valid if the existence of variation is justified in its statements (Anastasiadou et al., 2006). In order to test the model the goodness-of-fit of the research model is estimated.

It is noted that the criteria of acceptance of a model is the comparative fit index (CFI) which is not dependent on the size of the sample and taken values from 0 – 1 (Bentler, 1993, Joreskog et al., 1996) and it must, by agreement, be  $CFI \geq 0.9$ , the index  $X^2/df$  ( $X^2/df = \text{chi-square to its degrees of freedom ratio}$ ) and it must be  $X^2/df < 2$ . Since the ratio  $X^2/df$  depends on the size of the sample the ratio NNFI (Non-Normed Fit Index) is used, which is independent on the size of the sample (Bentler, 1993) and it must (by agreement) be  $NNFI > 0.95$ . GFI (Goodness of Fit) is used and it must be  $GFI > 0.80$ , AGFI (Comparative Fit Index) is used and it must be  $AGFI > 0.8$  and NFI (Normed Fit Index) is used and it must be  $NFI > 0.9$ . In addition, the indexes RMSR (Root Mean Square Residuals) are used and it must (by agreement) be  $RMSR < 0.06$  and the RMSEA (RMSEA=root mean-square error of approximation) and it must be  $RMSEA < 0.06$ .

For the purposes of the data analysis adaptation to the regular distributions of all the variables that participated in the analysis (Multivariate Normality) was checked and it was shown that all the univariate distributions are normal distributions, all the joint distributions of all combinations of variables are also normal and all the bi-variable scatter plots are linear and homoskedastik and finally there were no outliers. Moreover the data were evaluated for their linearity and the examination of variance charts for each variable was shown that there was not any problem of linearity.

## 6. RESEARCH TOOL

As a research tool a questionnaire measuring Chinese tradesmen attitudes for Greek people consumption behavior towards Chinese products (CTAGSCBCs) was used that it was created on the basis of five subscales as follows: Perceived quality (F1), Product price (F2), Trust in buying Chinese products (F3), Intention to buy Chinese products (F4), Loyalty (F5) which were confirmed after the application of Principal component analysis to the research data. Especially, Chinese tradesmen attitudes for Greek people consumption behavior towards Chinese products scale (CTAGSCBCs) consisted of 25 items referring to five different attitude subscales, as follows: (a) Perceived quality- positive and negative emotions concerning the quality of Chinese products (Pq1, Pq2, Pq3, Pq4, Pq5); (b) Product price- positive and negative attitudes the price of Chinese products (Pr1, Pr2, Pr3, Pr4, Pr5); (c) Trust in buying Chinese -positive and negative attitudes concerning a student's trust to buy Chinese products (Tr1, Tr2, Tr3, Tr4, Tr5); (d) Intention to buy -positive and negative attitudes concerning a student's intention to buy Chinese products (In1, In2, In3, In4, In5) and finally (e) Loyalty in Chinese products- positive and negative attitudes decides their loyalty to Chinese market (Lo1, Lo2, Lo3, Lo4, Lo5).

Each item of the instrument used a 5-point Likert scale that ranged from 1- Strongly Disagree to 5-Strongly Agree. The value of the Cronbach's  $\alpha$  coefficient for this instrument in this study's sample was 0.8713.

## 7. RESULTS

*A. Results of Principal components analysis application:* The estimates of the application of Principal component analysis was based on covariance matrix due to the fact the research variances took values from the same measurement scale, and more specifically Likert five-rank scale. The 25 items were items of a five Likert scale. The indicator of the sample adequacy  $KMO=0.856>0.60$  indicated that the sample data are suitable for the undergoing of factor analysis. Bartlett Test of Sphericity, in which it is examined if the subscales of the scale are inter-independent (Bartlett's  $sign<0.01$ ) proved that the principal component analysis has a sense. Through this analysis, data grouping was based on the inter-correlation of items; with the aim of imprinting identifying those factors which best describe completely and with clarity the participants' attitudes.

Based on analysis resulted five uncorrelated factors explained 72.348% of the total inertia of the data and are described separately afterwards. The index of internal consistency Cronbach's  $\alpha$  is statistically significant and equal to 87,13% for the total number of the questionnaire items and therefore the scale of 25 items was considered as reliable with the meaning of internal consistency.

The reliability coefficient (Cronbach's  $\alpha$ ) is statistically significant and equal to 89.04%, 87.35%, 81.86%, 79.18% and 80.24% for the 1<sup>st</sup>, 2<sup>nd</sup>, 3<sup>rd</sup>, 4<sup>th</sup>, and 5<sup>th</sup> factorial axis respectively. Finally, from the values of common factor variance (Communality) for each item we realise that most of them have value more than 0.50 fact that declare satisfactory quality of measurement from the sample model, model of 5 factors- components.

The results of the present research confirm the presence of five components- constructs named: Perceived quality (F1), Product price (F2), Trust in buying Chinese products (F3), Intention to buy Chinese products (F4), and Loyalty (F5).

*Reliability:* Reliability refers to what extent an instrument gives constant results from the measurements and every deviation, which is presented between two different measurements, is due to measurement's error (Nunnally, 1978).

The evaluation of a model (includes) counts in the reliability assessment, which measures the internal consistency of factors. Internal consistency can be calculated with the use of the Cronbach's  $\alpha$  coefficient (Cronbach, 1984) with acceptable values over 0.7 and with the composite reliability of Formell and Larcker (1981), which is a measure of internal consistency of the structure indexes. These represent the level of the latent structure and they are based on the correlations between the variables that compose the factor.

Values of the Cronbach's  $\alpha$  coefficient over 0.7 is considered as satisfactory (Spector, 1992; Nunnally, 1978). The composite reliability should be over 0.7 in order to be satisfactory (Formell & Larcker, 1981). The extracted variance is another measure of reliability that represents the total amount of structure's variance which is due to the variance of the determining variables.

Table 1 presents the results of reliability test. Table 1 shows that the reliability of each construct is above 0.79, fact that implies that the internal consistency of the constructs is high. Moreover Composite Reliability (CR: Composite Reliability) was also estimated. As shown in Table 1 Composite Reliabilities are above the threshold of 0.79. In conclusion, the measures in this study are reliable and valid and indicate a good fit model.

**Table 1: Reliability and Validity**

Factors	Number of items	Loadings	Cronbach's $\alpha$	Eigenvalue	Ερμηνευόμενη διασπορά	Composite Reliability (CR)	AVE
Perceived quality	5	0,728-0,869	0,8904	14,743	0,768	0,8905	0,737
Product price	5	0,634-0,815	0,8735	13,946	0,749	0,8737	0,725
Trust in buying	5	0,612-0,793	0,8186	8,554	0,771	0,8189	0,739
Intention to buy	5	0,625-0,762	0,7918	5,607	0,813	0,7919	0,782
Loyalty	5	0,557-0,741	0,8024	4,114	0,811	0,8024	0,796

*Validity:* The term validity refers to how well the instrument (questionnaire) measures what is intended to measure (Cohen et al., 1988). Convergent and discriminant validity are both considered subcategories and subtypes of construct validity.

*Test of convergent validity:* The convergent validity is related to the level at which many different methods of variable measurements lead to the same results (Spector, 1992).

Wixom & Watson (2001) state that the *convergent validity* is acceptable when the loadings of all the variables are over 0.50 while Kim (2008) supports that the items of all the structures should load on one factor with eigenvalue over 1 (eigenvalue >1) in order the *convergent validity* be acceptable. Chin (1998) suggests that the *convergent validity* should be controlled by the evaluation of the Composite reliability with the cutoff of .7 and the variance extracted with the cutoff of 0.5 (Fornell & Larcker, 1981).

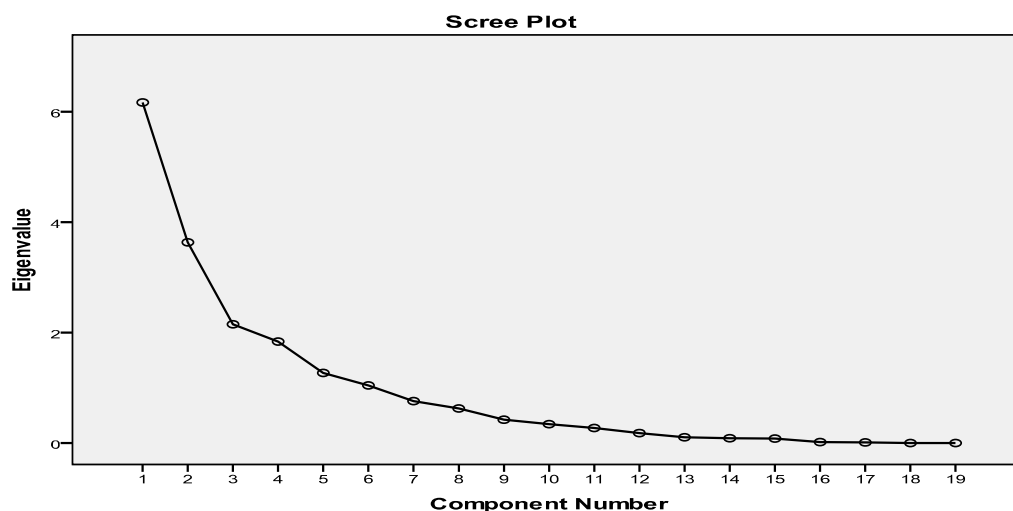
*Test of discriminant validity:* The *discriminant validity* refers to the hypothesis that dissimilar structures should be different (Burns & Bush, 1995). Bagozzi (1990) describes the as the level where the factors of a scale evaluate different issues. The evaluation of the *discriminant validity* takes place under the examination of the correlations of the latent factors through the Confirmatory Factor Analysis, (CFA), that has the advantage that the examining factors is free from the measurement's error.

The *discriminant validity* can be checked with the examination of the correlations between factors that should be lesser than the root of the mean extracted variance (Kim et al., 2008). An indication of the *discriminant validity* exists when the coefficient of the correlation between the factors is lesser than the Cronbach's a coefficient of each factor (Churchill, 1979). The *discriminant validity* can be also checked by examining whether the correlations between the variables are lesser than the the root of the mean variance extracted (Kim et al., 2008).

Fornell & Lacker (1981) propose the *discriminant validity* to be evaluated with the examination of the correlation between the variables. Indeed, *discriminant validity* exists when one variable is correlated to the rest variables of the same structure (construct) at a higher extent than to any other variable of a different structure (construct) (Chin, 1998).

Average Variance Extracted (AVE) was estimated in order convergent validity to be confirmed because AVE can also evaluate convergent validity. In table 1 AVE is adove 0,725, that meachs that convergent validity of the instrument was satisfied.

*Scree plot graph:* The scree test produces (Figure 1) the following graph, which shows a representation of eigenvalues, leads us to determine the number of the vital factorial axes.



**Figure 1: Scree Plot**

The above graph (Graph 2) shows a distinct break up to the fourth factor, whereas, after the fourth one, it follows a linear part of the eigenvalue curve. So, taking under consideration eigenvalues, which are higher than 1 for the five factors (14.743, 13.946, 8.554, 5.607 and 4.114 for the 1<sup>st</sup>, 2<sup>nd</sup>, 3<sup>rd</sup> 4<sup>th</sup> and 5<sup>th</sup> correspondingly) and decide whether they interpret data in a satisfactory way and thus Convergent Validity exists.

In addition, the values of eigenvalues, which are higher than 1 for the five factors implies Convergent Validity of the instrument (Spector, 1992, Churchill, 1979) which refers to the extent to which items under each construct, are actually measuring the same construct.

In addition the average extracted variances are all above the recommeded 0.5 level (Hair et al. 1998), that implies convergent validity (Table 1).

Compared to Cronbach's alpha equal to 89.04%, 87.35%, 81.86%, 79.18% και 80.24% for the 1<sup>st</sup>, 2<sup>nd</sup>, 3<sup>rd</sup>, 4<sup>th</sup>, 5<sup>th</sup> factorial axis respectively, which assumes equal loadings of all the items of a construct and it is influenced by the numbers of items, Composite Reliability relies on actual loadings toncompute the factors scores and thus provides a better indicator for measuring internal consistency. As shown in Table 1 Composite Reliabilities are for all the constructes above the threshold of 0.7.

Table 2 provide the descriptive statistical elements and the constructs collerations. Moreover, items loadings on the constructs were abone the cutoff point of 0.50 (Table 1), fact that conforms the questionnaire quality and its validity.

**Table 2: Convergent Validity Analysis (SEM correlations<sup>a</sup>)**

	F1	F2	F3	F4	F5
<b>Factors</b>					
<b>Perceived quality (F1)</b>	0,737				
<b>Product price (F2)</b>	0,956	0,725			
<b>Trust in buying Chinese products (F3)</b>	0,823	0,815	0,739		
<b>Intention to buy Chinese products (F4)</b>	0,802	0,811	0,819	0,782	
<b>Loyalty (F5)</b>	0,898	0,824	0,836	0,812	0,796

Note: <sup>a</sup>: All te correlationw are statistically sugnhificant at the level of  $\sigma p < 0,05$  <sup>b</sup>: The elements in the in the main diagonal are AVE's value.

In addition, the good fit indices were estimated, that they showed that the estimated model has a very good fit to data after their analysis with the aim of Confirmatory factor Analysis and the results are presented in table 3.

**Table 3: Good Fit Indices**

Good Fit Indices	THRESHOLD	Perceived quality	Product price (F2)	Trust	Intention to buy	Loyalty
<b>RMSEA</b>	< = 0,05	0,05	0,05	0,05	0,05	0,05
<b>CFI</b>	> = 0,90	0,91	0,94	0,95	0,94	0,95
<b>GFI</b>	> = 0,90	0,92	0,93	0,92	0,91	0,93
<b>AGFI</b>	> = 0,80	0,86	0,85	0,82	0,82	0,81
<b>RMR</b>	< = 0,05	0,02	0,04	0,03	0,02	0,02
<b>SRMR</b>	< = 0,08	0,05	0,05	0,04	0,05	0,04

*Model Confirmation and Hypotheses testing:* The hypotheses are tested through structural equation modelling technique (SEM) by LISREL 8.5, software. Model estimation was done using the Maximum Likelihood Estimation, with the item covariance matrix used as input. The results are presented in Table 4. In summary, the various measures of the overall model goodness-

of-fit lend sufficient support to deeming the results an acceptable representation of the hypothesized constructs (Table 4). In addition, the overall model goodness-of-fit results and the measurements model assessments lend substantial support for confirmation of the proposed 5-factor model (Hair, 2005) (Table 3).

In relation to factors paths, presented in Table 4, it results that factors F1 (perceived Quality) and F2 (Product Price) have a significant direct effect on F5 (Loyalty) and factor F4 (Intention to buy) has a quite significant direct effect on F2 (Product price) and F5 (Loyalty). In addition, factor F3 (Trust in buying) has a relative significant direct effect on F4 (Intention to buy). Furthermore, the effect of F4 (Intention to buy) on F5 (Loyalty) is significant, too.

**Table 4: Theoretical Estimation of Model**

	<b>Theoretical Estimation of</b>	<b>Model t-value</b>
<b>H1: F1 →F3</b>	<b>0,78</b>	<b>5,78*</b>
<b>H2: F1 →F5</b>	<b>0,81</b>	<b>6,13*</b>
<b>H3: F2 →F5</b>	<b>0,79</b>	<b>6,09*</b>
<b>H4: F3 →F4</b>	<b>0,25</b>	<b>3,13*</b>
<b>H5: F3 →F4</b>	<b>0,63</b>	<b>4,29*</b>
<b>H6: F3→F5</b>	<b>0,49</b>	<b>4,13*</b>
<b>H7: F4 →F5</b>	<b>0,61</b>	<b>5,76*</b>
<b>Fit statistics</b>	<b>The model has an</b>	<b>Excellent Fit</b>

*Note: Perceived quality (F1), Product price (F2), Trust in buying Chinese products (F3), Intention to buy Chinese products (F4), Loyalty (F5); \*p<0,05.*

## 8. CONCLUSIONS/ DISCUSSION

The main aim of this study is to examine the validity and reliability of an instrument (a structural equation model). The proposed research tool questionnaire entailed five subscales as follows: Perceived quality (F1), Product price (F2), Trust in buying Chinese products (F3), Intention to buy Chinese products (F4), Loyalty (F5).

The results satisfied Discriminant Validity, Convergent Validity and Composite Reliability. In addition the overall model goodness-of-fit results and the measurements model assessments lend substantial support for confirmation of the proposed 5-factor model.

Results showed that Perceived Quality and Product Price have a significant influence on Loyalty in buying Chinese Products. Furthermore Intention to buy is related to Product price. In addition, it is the Intention to buy that influences Loyalty.

This instrument can be useful to any company, Chinese or not, or organization that wants to find whether the mentioned factors leads to consumption of the specific products. For this reason, as a starting point it is useful for any company or organization to recognize whether their customers are pay attention and be influenced by Perceived quality, Product price, Trust in buying and lead them to buy and stay Loyal to their product and brand. At the same time, it has to find out what is the orientation towards customer loyalty and the emotional identity and

behavior of every group of customers in order to be ready for any future investment with the aim of achieving further development.

## 9. IMPLICATIONS FOR FURTHER STUDY

In addition to this study a follow-up research in which in-depth interviews will be conducted to explore Chinese traders' views about their Greek customers' habits and behaviours, positive or negative should complement the present's findings. A qualitative research can complement and enrich this quantitative research study and the same research may take place with other different samples as the comparison of those seems to have huge interest and create new discussions and implications. Furthermore another crucial factor named Greek consumer ethnocentrism should be evaluated toward customer loyalty.

## REFERENCES

1. Anastasiadou, S. (2006). *Factorial validity evaluation of a measurement through principal components analysis and implicative statistical analysis*. In D.X.Xatzidimou, K. Mpikos, P.A. Stravakou, & K.D. Xatzidimou (eds), 5<sup>th</sup> Hellenic Conference of Pedagogy Company, Thessaloniki, pp. 341-348
2. Bagozzi, R. P., & Kimmel, S. K. (1995). A comparison of leading theories for the prediction of goal directed behaviors. *British Journal of Social Psychology*, 34, 437-461.
3. Baldinger, A.L. and Rubinson, J. (1996), Brand loyalty: the link between attitude and behavior, *Journal of Advertising Research*, Vol. 36 No. 6, pp. 22-34.
4. Bauer, R. A. (1960). Consumer behavior as risk taking. In R. S. Hancock (Ed.), *Dynamic marketing for a changing world* (pp. 389-398). Chicago: American Marketing Association.
5. Bentler, P. M. (1993). *EQS: Structural equations program manual*. Los Angeles: BMDP Statistical Software.
6. Brady, M.K. and Cronin, J.J. Jr (2001). Some new thoughts on conceptualizing perceived service quality: a hierarchical approach, *Journal of Marketing*, Vol. 65 No. 3, pp. 34-49.
7. Burns A. C., & Bush R. F. (1995). *Marketing Research*. Englewood Cliffs, NJ: Prentice-Hall.
8. Chung J-E., Pysarchik, D. T. (2000), "A model of behavioral intention to buy domestic versus imported products in a Confucian culture", *Marketing Intelligence & Planning*, Vol. 18 Iss: 5 pp. 281 - 291
9. Cohen, R. T., Monlaque, P., Nathanson, L. S., & Swerdlik, M. E. 1988. *Psychological testing: An introduction to tests of measurement*. Mountain View, CA: Mayfield Publishing Company.
10. Chin W. W. (1998). Issues and opinion on structural equation modeling. *Mis Quarterly*, 22(1), 7-16.
11. Churchill, G.A. (1979). A paradigm for developing better measures for marketing constructs. *Journal of Marketing Research*, 16, 64-73.
12. Cox, D.F. (1967). Synthesis-perceived risk and information handling, in Cox, D.F. (Ed.), *Risk Taking and Information Handling on Consumer Behavior*, Harvard University Press, Boston, pp. 603-39.
13. Croanbach, L. J. (1984). *Essentials of psychological testing* (4<sup>th</sup> ed.). New York: Harper & Row.
14. Gommans, M., Krishnan, S. K. & Scheffold, B. K. 2001. From Brand Loyalty to E-Loyalty: A Conceptual Framework *Journal of Economic and Social Research* 3(1) 43-58.
15. Hair, J., Anderson, R., Tatham, R. and Black, W. (1995). *Multivariate Data Analysis With Raedings*. USA: Prentice-Hall International, Inc.
16. Hair, F. J., Black C. W., Badin, N. J., Anderson, E. R., Tatham, R. L. (2005). *Multivariate Data Analysis*. New Jersey, Pearson Education Inc.



17. Han, C. M. and Vem T. (1988), "Country-of Origin Effects for Uni-National and Bi-National Products," *Journal of International Business Studies*, 16 , 235-56.
18. Hunter M. L., Kasouf, J. C.\*, Kevin G. Celuch, G. K., Curryd, A. K (2004) A classification of business-to-business buying decisions: Risk importance and probability as a framework for e-business benefits. *Industrial Marketing Management*, 33, 145–154.
19. Fornell C., Larcker D. (1981). Evaluating Structural equation models with unobservable variables and measurement error. *Journal of Marketing Research*, 18, 39–50.
20. Jøsang, A. and Lo Presti, S. 2004 Analysing the Relationship between Risk and Trust. In T. Dimitrakos (eds), *Proceedings of the Second International Conference on Trust Management (iTrust'04)*, Oxford.
21. Joreskog, K. G., & Sordom, D. (1996). *Lisrel 8: User's reference guide*. Chicago: Scientific Software International.
22. Kaiser, H, F. (1960). The application of electronic computers to factors analysis. *Educational and Psychological Measurement*, 20, 141–151
23. Kaiser, H.F. (1974). An index of factorial simplicity. *Psychometrika*, 39, 310–39.
24. Kline, P. (1992). *The handbook of psychological testing*. London: Routledge.
25. Kline, P. (1994). *An easy guide to factor analysis*. London: Routledge.
26. Netemeyer, R. G, Durvasula, S., and Lichtenstein D. R. (1991). A Cross-National Assessment of the Reliability and Validity of the CETSCALE. *Journal of Marketing Research* Vol. XXVII, 320-7
27. Nunnally, C. Jum. (1978). *Psychometric Theory*. New York: McGraw Hill Book Co.
28. Schene, A., Wijngaarden, B., Koeter. M. (1998). Family Caregiving inSchizophrenia: Domains, Distress. *Schizophrenia Bulletin*, 24(4), 609–618.
29. Sharma, S. (1996). *Applied Multivariate Techniques*. USA: John Willey & Sons, Inc.
30. Spector P.E (1992). Summated Rating Scale Construction: An Introduction. *Sage University Paper Series on Quantitative Application in the Social Sciences*. Newbury Park, CA.

## SOLVENCY II – THE NEW EU SOLVENCY REGIME ON THE INSURANCE MARKET

Emilia CLIPICI

Faculty of Economic Sciences, University of Pitesti, Romania

[emilia\\_clipici@yahoo.com](mailto:emilia_clipici@yahoo.com)

***Abstract:** The main causes that lead to insurer's solvency issues such as the underwriting, investment or reinsurance deficiencies have remained the same over time. However, their incidence is increasing, as well as their complexity. Solvency II, the latest directive in this field is intended to be the legislative act that will settle the solvency issue on the European insurance market. The Solvency II Directive will lead to a new approach to the supervision process at the common European level, based on economic principles for assessing the assets and liabilities. It will use common principles when taking into account the multitude and variety of risks to which the company is exposed. These will form the basis for establishing the level of the capital and updating the calculation methods for the capital of the insurance companies under unusual circumstances.*

*The article summarizes the Directive and describes some difficulties arising in connection with its rendering and implementation at the Member State level.*

**Keywords:** solvency, insurance, insurer's risks

**JEL Classification Codes:** G15, G22

### 1. INTRODUCTION

The volatility of financial markets and the increasingly dynamic business environment have strongly marked the financial security of the insurance companies and one of the most stringent issues is the insurer's solvency. The main causes of the insurer's solvency issues have not changed over time (for example, deficiencies concerning the underwriting, investment or reinsurance activity), but the probability that they occur with a high frequency and intensity is getting higher. Solvency II, the new directive in this area is intended to be the legislative act that will settle solvency issues on the European insurance market.

On 25 November 2009, according to the Lamfalussy process, the review of the solvency calculation methods and of the risk management standards was completed for the insurance activity within the European Union. The result was the adoption of the directive known as Solvency II, whose exact name is *DIRECTIVE 2009/138/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the taking-up and pursuit of the business of Insurance and Reinsurance (Solvency II)*, as amended by the Omnibus II Directive. The legislation replaces 13 existing EU directives in the insurance field (Directives 64/225/EEC, 73/239/EEC, 73/240/EEC, 76/580/EEC, 78/473/EEC, 84/641/EEC, 87/344/EEC, 88/357/EEC, 92/49/EEC, 98/78/EC, 2001/17/EC, 2002/83/EC and 2005/68/EC).

The Omnibus II Directive will set the date when the Solvency II regime enters into force as well as the scope of the technical standards to be drafted by EIOPA. EIOPA strongly supports the entry into force of Solvency II from 1 January 2014 and will make every effort to secure this,

in accordance with the constraints of the final decisions of the Parliament and Council on the timeline and the scope of technical standards.

The directive will apply to all insurance and reinsurance companies with annual premiums of over 5 million euros or technical reserves of over 25 million euros. Although the Solvency II regime was approved in November 2009, this directive will be "transposed" into the national legislation of each member state; the initial implementation schedule was October 2012, but the deadline was extended to all EU countries due to the amendment of the initial directive.

The Solvency II Directive is a solution tailored to market conditions, but also a challenge for the European insurance industry regarding the achievement of a unitary framework for action, based on uniform supervision standards. Many insurers have already started implementing coherent risk management systems developing internal models to determine capital requirements, which provide them with a source of competitive advantage due to the role of pro-active players. Solvency II regulations attach great importance to groups, who have the opportunity to access efficiency reserves in the use of capital and to develop unitary solvency management platforms, trying to align the supervision system to the realities of the insurance market dominated by global players.

## **2. THE PRESENTATION OF THE SOLVANCY II DIRECTIVE**

The Solvency II Directive will lead to a new approach to the monitoring process at common European level based on economic principles for measuring the assets and liabilities. Using common principles, it will take into account the multitude and variety of risks to which the company is exposed. These principles will help establish the level of the capital and update the calculation methods for the capital of the insurance companies under unusual circumstances.

The main objectives of Solvency II are as follows:

- a) Protecting consumers by increasing confidence in the products offered by the EU insurance market.
- b) Modern Supervision: EU insurers and reinsurers will estimate capital requirements based on the exposure to risks; the solvency requirements of the companies must be supplemented by monitoring governance and organizational structure.
- c) Thorough integration of the European insurance market through the harmonization of the monitoring regimes.
- d) Increasing the international competitiveness of EU insurers.

The Solvency II project can be regarded both as a vertical representation and as a horizontal one. The vertical representation is given by the very construction of the system, on a three-pillar structure (the central elements of the Solvency II regime, which are quantitative and qualitative elements):

- Pillar 1 (quantitative) - refers to the size of the required capital for an insurance company to deal with the guaranteed obligations in an extreme situation;
- Pillar 2 (qualitative) - includes quality surveillance regulations;
- Pillar 3 (qualitative) - includes obligations concerning transparency, supervisory reporting and public disclosure.

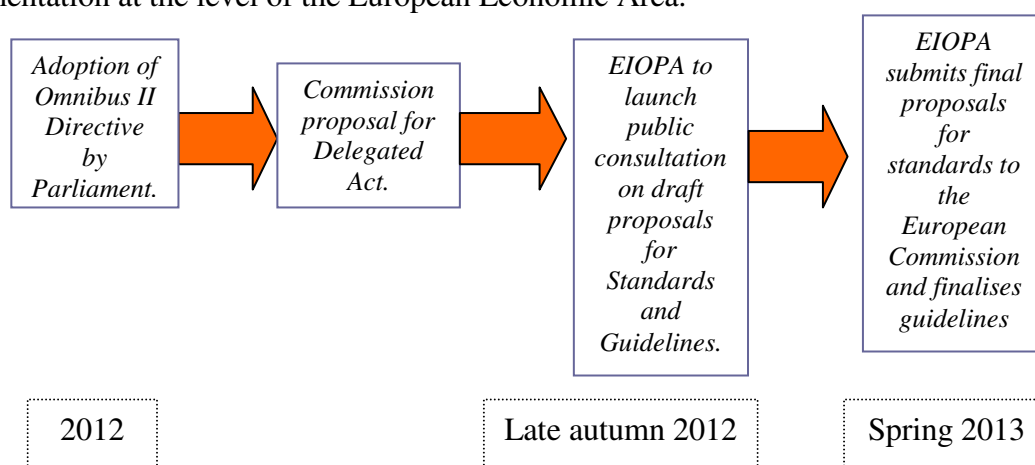
The horizontal representation is the result of adapting the Lamfalussy process to the insurance industry. After adopting this work process, the Solvency II project was to be performed on four horizontal levels<sup>1</sup>.

**Table no.1: Pillars of the Solvency II Programme**

Pillar 1	Pillar 2	Pillar 3
<b>Capital Requirements</b>	<b>Governance &amp; Supervision</b>	<b>Reporting/ Disclosure</b>
<ul style="list-style-type: none"> <li>Two thresholds:</li> <li>- Solvency Capital Requirement (SCR)</li> <li>- Minimum Capital Requirement (MCR)               <ul style="list-style-type: none"> <li>SCR is calculated using either a standard formula or, with regulatory approval, an internal model.</li> <li>MCR is calculated as a linear function having specified variables: it cannot fall below 25%, or exceed 45% of an insurer's SCR.</li> <li>There are also harmonised standards for the valuation of assets and liabilities.</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>Effective risk management system.</li> <li>Own Risk &amp; Solvency Assessment (ORSA)</li> <li>Supervisory review &amp; intervention.</li> </ul>	<ul style="list-style-type: none"> <li>Insurers required to publish details of the risks they encounter, capital adequacy and risk management.</li> <li>Transparency and open information are intended to assist market forces in imposing greater discipline on the industry.</li> </ul>

Source: Lloyds, *Solvency II 2012 guidance notes*, February 2012, available at <http://www.lloyds.com/The-Market/Operating-at-Lloyds/Solvency-II>, <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2009:335:FULL:EN:PDF>

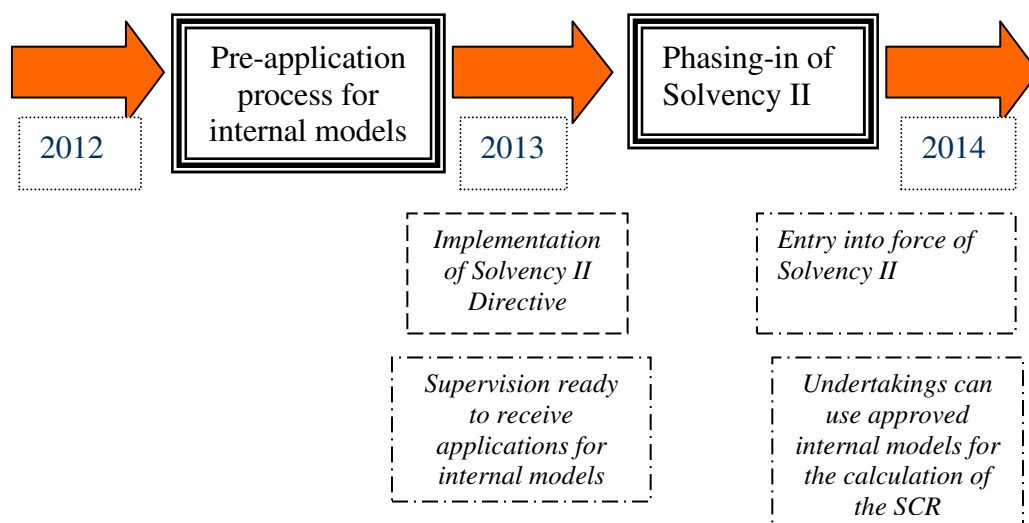
The first level dealt with the preparation of the EU framework directive on the solvency system, the second level is related to the preparation of implementation methodologies, the third level prepares monitoring guidelines, and the last level is designed to assess the compliance and implementation at the level of the European Economic Area.

**Scheme no.1 - Timeline Solvency II – Regulation**

The standards and guidelines are expected to cover the following areas:

- Internal models, Solvency capital requirements, Own funds, Technical provisions, Valuation of assets and liabilities
- Group supervision
- Supervisory transparency and accountability, Reporting and disclosure
- Governance, ORSA

- Supervisory review process, Capital add-ons, Extension of recovery period ("Pillar 2 dampener"), Finite reinsurance, Special purpose vehicles, Repackaged loan investments



**Scheme no.2 - Solvency II Timeline – Supervision**

For the implementation of the Solvency II requirements it is recommended:

1. To designate a team within the company to bear the responsibility of preparing a viable implementation plan of Solvency II, mastering statistical and actuarial techniques. Given the consequences, it is better to obtain the approval of the general meeting of shareholders concerning the appointment of the team.
2. The existence of a risk management system which largely complies with the requirements set forth in Art. 44 of the Solvency II Directive, without being limited to them, the improvement of the risk management system also being “stimulated” by the global financial crisis. In addition, its quality will be studied in detail and it is possible to request justifications for each decision made.
3. Based on the short and medium term strategy, you can start calculating the capital requirements. Its importance is given by the degree to which these can influence the strategy.

a. The calculation of the MCR (Minimum Capital Requirement) is presented in Section 5, Article 128 and 129. MCR must be calculated quarterly. The formula was tested on the occasion of the QIS 5 exercise and did not create problems to insurers. However, the difference lies in creating separate MCR calculation formulas for life and non-life. Moreover, the separation of the calculations continues by highlighting four components of the linear formula, i.e.<sup>1</sup>:

- a.1) non-life insurance on non-life technical bases;
- a.2) non-life insurance on technical bases similar to life insurance;
- a.3) life insurance on a technical life bases;
- a.4) life insurance – additional duties charged on non-life technical bases.

Example:

For a.1):  $MCR_{a1} = \sum \max(\alpha_j * RT_n ; \beta_j * PS_n)$ , where  $RT_n$  = net technical reserves for reinsurance without risk margin for each class of insurance (segmented into 15 classes);  $PS_n$  = premiums for each class in the last 12 months, net of reinsurance. The calibration of factors  $\alpha_j$  and  $\beta_j$  is based on the standard deviations of the premium and reserve risks using a lognormal

<sup>1</sup> The calculation is not applied to composite insurance companies, for which there is another calculation method.

function, determining the statistic estimate VaR for a confidence interval of 85% instead of 99.5% applied to the SCR calculation.

b. The calculation of the SCR (Solvency Capital Requirement) can be done in two ways: by standard formulas, based on more detailed risk modules in Section 4, Sub-section 2 and Annex IV or based on an internal model. If you choose to create an internal model to determine the SCR (Section 4, Subsection 3), you must explain why the company's risk profile is better described by an internal model, may it be only partial, compared to the standard formula. The company management must prove that they understand the internal model that fits the business model and that this is currently used in the decision making process, approaching sufficient risks to be useful, facilitating the analysis of the decisions and being integrated with the risk management system, which it improves. The SCR calculation using an internal model can be done annually or whenever a significant change in the risk profile, work assumptions or business plan of the insurer occurs.

Furthermore, insurance companies that participated in the quantitative impact study generically called QIS 5 have an additional advantage in understanding the Solvency II approach (at least covering the tables and associated technical specifications - a document containing detailed explanations in its 286 pages).

An insurer must be able to calculate what Solvency II requires as a minimum condition, i.e. the SCR using the standard formula. The Basic Solvency Capital Requirement set forth in Article 104(1) shall be equal to the following:

$$\text{Basic SCR} = \sqrt{\sum_{i,j} \text{Corr}_{i,j} \times \text{SCR}_i \times \text{SCR}_j}$$

, where SCR<sub>i</sub> denotes the risk module i and SCR<sub>j</sub> denotes the risk module j, and where 'i,j' means that the sum of the different terms should cover all possible combinations of i and j. In the calculation, SCR<sub>i</sub> and SCR<sub>j</sub> are replaced by the following:

- SCR non-life denotes the non-life underwriting risk module;
- SCR life denotes the life underwriting risk module;
- SCR health denotes the health underwriting risk module;
- SCR market denotes the market risk module;
- SCR default denotes the counterparty default risk module.

The factor Corr<sub>i,j</sub> denotes the item set out in row i and in column j of the following correlation matrix:

**Table no.2: Correlation matrix for the Corr<sub>i,j</sub> factor**

i \ j	Market	Default	Life	Health	Non-life
Market	1	0,25	0,25	0,25	0,25
Default	0,25	1	0,25	0,25	0,5
Life	0,25	0,25	1	0,25	0
Health	0,25	0,25	0,25	1	0
Non-life	0,25	0,5	0	0	1

Source: DIRECTIVE 2009/138/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the taking-up and pursuit of the business of Insurance and Reinsurance (Solvency II) available at <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2009:335:0001:0155:en:PDF>

The calculation method was used for the QIS 4 exercise. It is advisable for those companies that did not take part in QIS 5 to perform the exercise, which can take on average around 3 months.

On the other hand, it will be critical for many insurers to calculate the capital regulation requirements using their business model, and that is because the standard formula is somewhat strict and cannot provide sufficient recognition of certain characteristics of the activity (for example, non-proportional reinsurance), and it is difficult to accept even for niche insurers. In this case, it is preferable to use an internal model that offers the possibility to motivate a capital level they can afford. However, it must be approved by the supervisory authority in order to be used, and the research work must begin now, in order to be able to use the appropriate resources and to be able to apply such a model in 2012.

4. After the calculations of the MCR and SCR, the next step could be to find ways to optimize the calculated values. For example, one of the basic exposures of an insurer results from the underwriting risk. By analysing the profile of the underwritten portfolio, in terms of the balance of the volume of underwritten premiums and of a possible concentration of exposures associated with natural risks (for example), and the level of costs and methods associated with the protection by reinsurance, we can identify the area with the highest exposure for the capital. This results in protection measures (portfolio diversification, geographic, target market etc.) oriented towards those areas and designed to optimize the risks. It has to be established to what extent they lead to the optimization of capital.

All these things can be done as long as:

- policyholders remain the current top priority, as the existence of the company is strictly related to them,
- and the company applies the one-third rule, which proposes to dedicate one third of the approximately 940 days to the implementation of the planning and design of the strategy and the other two thirds of this period to execution.

### **3. THE IMPACT OF THE SOLVENCY II DIRECTIVE ON THE ROMANIAN INSURANCE MARKET**

The new European solvency regime, applicable from 1 January 2013, will have little impact on the Romanian insurance market, affecting to some extent the technical reserves, and consequently, the own funds of the company. The Romanian insurance market is mostly composed of general insurances. According to the Solvency II EU Directive implementation timetable, from 2014, following the entry into force of the Directive, insurance companies within the European Union with a gross premium income of more than 5 million euro will be required to establish their capital requirements in accordance with this Directive.

For the assessment of the impact the new solvency regime might have on the European insurance industry, the European Commission requested CEIOPS (now EIOPA) to perform, from 2005, a number of quantitative impact studies, called QIS. In the second half of the last year, the fifth study was performed. This was the second study that included Romania, after QIS 4.

The purpose of the fifth impact study undertaken by EIOPA was to evaluate the practicability, implications and impact of specific approaches on the value of the assets and liabilities as well as the calibration of the capitals of the (re)insurers as required by Solvency II, the new directive that will become effective from January 2013. In general, the quantitative impact study QIS5 showed that the financial position of the European insurance and reinsurance sector, compared to the capital requirements for solvency stipulated in the Solvency II Directive, remained strong.

#### 4. CONCLUSIONS

According to the data of the European Insurance and Reinsurance Federation - CEA, from the approximately 5,000 insurance companies in Europe, around 3,600 will fall under the incidence of the Solvency II Directive from 1 January 2013, but only 65% of them took part in the quantitative impact studies QIS5.

Romanian insurers meet the solvency capital requirements under Solvency II. QIS 5 included 18 insurers from Romania, accounting for 93.9% of the gross premiums written for life insurances, or 79.8% of the gross premiums written for general insurances recorded in 2009.

Several parameters were analysed in order to evaluate the results of the QIS5 exercise, among which mention should be made of the impact on the balance sheet, the financial impact generated by the new solvency requirements. The analysis was performed by comparing the results obtained according to the technical specifications of QIS5 with the results obtained according to the actual solvency regime, with the reference date 31 December 2009. Given the representativeness of the companies taken into account and the results of the study, we can conclude that the impact of Solvency II on the assets of most insurance companies in Romania will not be a major one. At the same time a reduction in the value of the technical reserves will be made, especially in the life insurance activity. Consequently, an increase in the own funds will be recorded.

Furthermore, the solvency capital requirements have increased, especially in the general insurance business for which the underwriting risk is predominant.

Another conclusion that can be drawn from the study is that the number of companies which would be forced to adjust their risk profile to comply with the solvency capital requirements is not significant. All the participants meet the minimum capital requirements in accordance with CSA. At the aggregate level, there is a capital surplus of approximately 398 million euros, although it decreased by 17.5% compared to the level determined by the current solvency regime.

The same tendencies can be noticed if we compare QIS4 and QIS 5: reducing reserves, increasing own funds and the increase in the solvency capital requirements. Romania's report for QIS5 was included in the EU Report made by EIOPA and was made public on Monday, 14 March 2011.

Solvency II is not just about capital. It is a comprehensive programme of regulatory requirements for insurers, which covers important aspects such as the authorisation, corporate governance, supervisory reports, public disclosure, risk assessment and management, solvency and reserves. This Directive establishes a new and modern solvency regime for insurers and reinsurers in the European Union. It provides for an economic risk-based approach which provides incentives for insurance and reinsurance undertakings to properly measure and manage their risks.

#### REFERENCES

1. Christoph Kaserer, *Solvency II and Basel III. The reform of Europe's system of insurance and banking regulation and its effects upon corporate financing*, Technische Universität München, June 2011, available at [http://www.fpmi.de/tl\\_files/fpmi/downloads/en/Solvency\\_II\\_Basel\\_III\\_en\\_v8.pdf](http://www.fpmi.de/tl_files/fpmi/downloads/en/Solvency_II_Basel_III_en_v8.pdf)
2. CEIOPS Level 3 Guidance on Solvency II: Pre-application Process for Internal Models, CEIOPS-DOC-76/10, March 2010, available at [https://eiopa.europa.eu/fileadmin/tx\\_dam/files/consultations/consultationpapers/CP80/CEIOPS-DOC-76-10-Guidance-pre-application-internal-models.pdf](https://eiopa.europa.eu/fileadmin/tx_dam/files/consultations/consultationpapers/CP80/CEIOPS-DOC-76-10-Guidance-pre-application-internal-models.pdf)



3. Directive 2009/138/EC of the European Parliament and of the Council of 25 November 2009 on the taking-up and pursuit of the business of Insurance and Reinsurance (Solvency II), available at <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:32009L0138:EN:NOT>
4. Ernst & Young EMEA Asset Management, How asset managers are preparing for Solvency II, available at [http://www.ey.com/Publication/vwLUAssets/How-asset-managers-are-preparing-for-Solvency-II/\\$FILE/How-asset-managers-are-preparing-for-Solvency-II.pdf](http://www.ey.com/Publication/vwLUAssets/How-asset-managers-are-preparing-for-Solvency-II/$FILE/How-asset-managers-are-preparing-for-Solvency-II.pdf)
5. Lloyds, Solvency II 2012 guidance notes, February 2012, available at <http://www.lloyds.com/The-Market/Operating-at-Lloyds/Solvency-II/~media/Files/The%20Market/Operating%20at%20Lloyds/Solvency%20II/2012%20Guidance/SII%202012%20Guidance%20Notes%20Feb%202012.pdf>
6. Mihai Aristotel Ungureanu, Mihaela Gruiescu, Corina Ioanăș, Dragoș Dan Morega, *The Evaluation of Risk Regarding Insurance. Statistical Methods of Risk Dissipation*, Annals of the University of Petrosani, Economics, Volume 10, Issue 2, 2010
7. Munich Re, *Reinsurance in the Era of Solvency II*, Solvency Consulting Knowledge Series, available to [http://www.munichre.com/publications/302-06011\\_en.pdf](http://www.munichre.com/publications/302-06011_en.pdf)
8. <http://ec.europa.eu>
9. [www.solvency-ii-association.com](http://www.solvency-ii-association.com)
10. [www.ceiops.org](http://www.ceiops.org)
11. [www.easy2comply.com](http://www.easy2comply.com)

---

<sup>(i)</sup> The objective of the Lamfalussy process is to simplify and accelerate the EU legislative process in the financial service field within a four-level plan.

- Level 1 – Framework principles. Level 1 is represented by the traditional decision-making process at the level of the European Union, for example the adoption of directives or regulations proposed by the European Commission on which the European Parliament and the European Council decide.
- Level 2 – Technical implementation measures. This level refers to the technical implementation measures that support the operational principles of Level 1, also adopted under the EU legislation by expert committees composed of representatives of national finance ministries, under the aegis of the Commission, and performing a purely advisory function concerning the technical implementing rules – the European Insurance and Occupational Pensions Committee, EIOPC)
- Level 3 – Guidelines and standards. In order to facilitate the consistent implementation and smooth application of the legislation of the European Union by the Member States, the Committee of European Insurance and Occupational Pensions Supervisors (CEIOPS) may adopt guidelines and standards on aspects that are not covered by the Community legislation. Such standards must be compatible with the legislation enacted at Level 1 and Level 2.
- Level 4 – Monitoring the degree of implementation of the legislation. This stage refers to monitoring the implementation of the legislation of the European Union into the national legislation by the European Commission, and in case of non-compliance, launching infringement procedures.)