The crisis of economics

"Fundamental research happens
when I do something I don't know how to do."
Werner von Braun

What could be fatal to Economics is the resilience of its basic principles in moments of crisis. The key to this fatalism lies in the expectance – instituted by classical Economics – that the "invisible hand" will have a harmonizing effect on individual interests. In other words – uttered by some theoreticians such as Myrdal – economics is built on the assumption of the unique interest which would regularize fluctuations in a natural manner. Simply put, the individual behaviors led by the desire for apropriation are being forced to have a sense which legitimizes the common interest. Having tailored the universe of Economics in this way, Adam Smith has forced the individuality of interests to subordinate itself to the scientific fiction of the unique interest, as observed by Arendt for instance.

Economics is in fact torn between two fictions: the morality of individual interests and the totalitarianism of the unique interest. The Smithian solution to the conservatorism of antiquity in matters of roles and rights specific to the private and public spheres is, therefore, a nebulous, somewhat mysterious one, akin to the Platonist behind-the-stage agent.

The invisible hand has the mission to offer the right to excellence not just in the Manichaean formula of the ancient Greeks, where only the right to perform in the Agora confers excellence, the economy being and exclusively non-public matter.

Labor becomes – according to Smith – a public issue, thus impregnated with excellence. But once labor is removed by Smith from the private sphere and is introduced in the public sphere, the empire of necessities has also entered into the sphere of the artificial, the unnatural. The action's motivation – along the lines of the economic – breaks with the fundamentals which insure its equilibrium, the natural correspondence between needs and resources, therefore ever faster and in disequilibrium multiplying the corresponding terms. Wealth is no longer a means but an end to individual interest, tending to become a supreme goal with the power to transform liberty into a transactional means.

The invisible hand provides the social engineering for "harmonizing" interests, this being in fact the unique interest baptized either as prosperity (in the manner of the Platonic egalitarianism of the ruling class) or as general welfare (the Marxist egalitarianism of all), both impregnating with sense that which has been called the communist fiction. It did not come by chance that, as revealed by many scholars, the invisible hand emerged from the Smithian mind together with the Hobbesian state but as an expression of the Common Wealth.

Modern thinking, in the Enlightenment form, has freed labor from its place of sufficiency as a private means of insuring existence in order to bring it into the public space, as a public action, and to transform it into the source of wealth. The original sense of the state, fixed by Plato as the absolute right of the aristocracy to rule, excluded wealth and enrichment both as a means as well as a scope of legitimization. The modern sense of the state lifts wealth to the rank of fundamental principle of social action and centers society around the action of creating wealth through the socialization of labor (both through the fact that labor is an essential public action as well as through the fact that mass labor is proven as a preferable formula for increasing wealth).

It is not random, likewise, that since the moderns the preference for the process has become established; a process having as a final goal wealth, meaning progress. Economics, obsessed by progress, is counting on pre-established finalities because of the functioning of the belief in the invisible hand and in its essence of leveling fluctuations in order for the final goal of wealth to be registered as inevitable.

For this though it sacrifices the facts and removes the events as diversified products of individual behavior, evading into the leveling abstraction of the process which must respect the belief in the common goal modeled by the invisible hand. Through this vision Economics is looking to be not a social science and for this is sacrifices man, pure and simple! Homo Oeconomicus was born with the function of being a wealth producing machine. The action of Homo Oeconomicus is predictable because he has no sentiments, sensation and passions.

Only that precisely what absolute scientific innovation was supposed to be – through which Economics should have gained the status of an exact prediction-making science, meaning Homo Oeconomicus – is constantly annihilated by the unpredictable behavior of real man. The assumption of the unique interest distilled by the invisible hand from the myriad of individual interests throws Economics in the humble field of a scientific activity of evaluating, post-factum, the productivity of combining resources. It becomes a procedure for diagnosis similar to what is happening in medicine, where the particular is treated – meaning the disease of an individual, and not the general – meaning disease as a common feature of all individuals, as the invisible hand would have it.

The epistemological tragedy of Economics lies in the fact that it insists on a propensity towards wealth which is considered general, even if it does not generate results but for a highly reduced number of people. The final cause of the invisible hand (as a communist fiction) responds deceivingly to people's expectations. Just as the apple of knowledge, wealth is not accessible to all nor is there any technology which to realize that which the invisible hand strives to achieve. The truth, it is suggested, must be concealed in order not to create disappointment and panic.

Somewhat incitingly said, Economics is not a fundamentally human science. A science built on the assumption of general wealth (either as prosperity, or as wellbeing) is rather condemned to be religion, a religion of social progress. It is a religion which by not being able to anticipate the falling into sin (the crisis) it does not prevent its consequences through ante-factum solutions.

Marin Dinu

Contents

The Transformation of Municipal Services: towards Quality in the Public Sector
- Pablo Gutiérrez Rodríguez, José Luis Vázquez Burguete, Roge Vaughan, Jonathan Edwards 3

Quantitative Evaluations of Foreign Direct Investments Impact on Productivity Development of Companies from Central and Eastern Europe
- Marilen Pirtea, Carmen Corduneanu, Bogdan Dima, Laura Miloș 17

Minority Shareholders' Protection: the Romanian Experience
- Victor Dragotă, Anamaria Ciobanu, Delia Cataramă, Andreea Semenescu, Carmen Maria Lăcătuș 35

Quantifying Update Effects in Citizen-Oriented Software
- Ion Ivan, Sorin Pavel 49

Is there Needed an Industry Approach on Corporate Default Risk? Case Study on Companies Listed on Romanian Stock Exchange
- Cristina Maria Triandafil, Petre Brezeanu, Marius Petrescu, Leonardo Badea 61

Controversies in the Debate Regarding Economic Convergence
- Marieta Stanciu, Carmen Puiu 73

Note: The authors are responsable for the content of their articles and for obtaining necessary permissions.

Text revision: Gabriela Ochiană
Computerized drawing up: Nicoleta Bobocea
Cover: Alexandru Ion
Subscriptions distribution: Viorela Petrici (021/312.22.48 – int. 24)

Data base indexation:
Research Papers in Economics (RePEc)
http://www.ideas.repec.org
Directory of Open Access Journals (DOAJ)
http: //www.doaj.org
CNCSIS categoria B+

www.economieteoreticasiaplicata.ro; www.ectap.ro
Reception of texts: economia.ta@edeconomica.com

The Transformation of Municipal Services: towards Quality in the Public Sector

Pablo Gutiérrez Rodríguez
José Luis Vázquez Burguete
Universidad de León, Spain
Roge Vaughan
Jonathan Edwards
Bournemouth University, United Kingdom

Abstract. *The development of the public service modernization seeks to facilitate services delivery to citizens, when and where they need them. For it, management and utilization of service quality have special relevancy. In this paper, we are trying to contribute for improving the relations between the small public local administrations and citizens across analysis of the link between quality and satisfaction, beside of analyzing how they relate to citizen's credibility on institutions. By means of opinions spilt by citizens, obtained results allow us to raise a series of public policies and offers for the improvement of administration service quality, which end up as directly satisfaction and credibility.*

Key words: quality; satisfaction; citizens; public policies.

JEL Codes: H72.
REL Codes: 13C, 13G.

Introduction

Over recent years, governments have struggled to determinate how much money should be spent on public services, what components of a public service program are most valuable and whether services delivery can be measurable and thereby allow the development of a performance plan. This paper examines the problems and possibilities of re-orienting local public sector services from a traditional administrative approach to delivering administrative services on a quality basis.

Local government plays an important role in creating public value for their citizens. Recognizing this, they have made improving local service quality a high priority. The quality of service today is a topical issue through-out the public sector. A wide variety of influences are effectively bringing about an awareness of quality issues, and of concepts such as quality management. There is a real debate about whether quality concepts can be successfully transposed from the private and service sector to public services. If so, it is important to establish how quality can be implemented most effectively and the conditions for doing so. For example, high quality local services, and attention to an area's physical appearance, can affect economic investment decisions (Sharpe, 1990, Glaser, 1991, Gottleib, 1997). Thus the value created in local settings is directly affected by the quality of local service delivery. A very important part of this value is citizen satisfaction and institutional credibility. One of the reasons for this situation is the strong relation between quality and satisfaction, and, as demonstrated in this paper, the relation with credibility, too. Recent research indicates that these three concepts are quite distinct. Customer satisfaction or dissatisfaction results from experiencing a service quality encounter and comparing that encounter with what was expected (Oliver, 1980). Perceived service quality can be defined as the customer's judgment about the superiority or excellence of a product while perceived value is the customer's overall assessment of the utility of a product based on perceptions of what is received and what is given (Zeithaml, 1988). The dimensions underlying quality are fairly specific while satisfaction judgments have a broader range of dimensions that also include quality aspects (Oliver, 1993). Moreover, satisfaction assessments require customer experience while quality does not (Bolton, Drew, 1991a, Boulding et al., 1993, Cronin, Taylor, 1994, Oliver, 1980, Parasuraman et al., 1988). Value is seen to be more individualistic and personal than quality and involves both a get and a give component (Zeithaml, 1988). Credibility is both the objective and subjective component of the believability of a source or message. Traditionally, credibility is composed of two primary dimensions, trustworthiness and expertise, which have both objective and subjective components. That is, trustworthiness is a receiver judgment based on subjective factors (De Wulf, Odekerken-Schröder, 2003). Expertise can be similarly subjectively perceived but includes the relatively objective characteristics of the source or message as well (e.g., source credentials or information quality). Some secondary dimensions include source

dynamism (charisma) and physical attractiveness, for example.

Citizen satisfaction surveys are an established method for public administration to assess the quality of local government services. There has been little modelling of satisfaction with local government services that links evaluations of administrative and common services with the overall satisfaction judgments that people form about the performance of their local governments (Van Ryzin, 2004). We are going inside of a very different field if we contrast that with the well-developed and tested models of customer satisfaction in the marketing research field.

Local service quality

Providing high quality and cost-effective public services is not easy. It involves creating organizations with the right approaches and ethos, establishing clear ways of delivering services and putting the right people in place to respond to the needs of customers. It also requires a combination of good policy development, successful implementation, a good understanding of citizen needs, technology, appropriate resources, a responsive organizational culture and well trained staff.

Definitions of service quality revolve around the idea that it is the result of the comparison that customers make between their expectations about a service and their perception of the way the service has been performed (Lewis, Booms, 1983, Lehtinen, Lehtinen, 1982, Grönroos, 1984, Parasuraman et al., 1985, 1988, 1991, 1994). Grönroos (2007) gives a two-dimensional view of service in his model. He calls the first "technical" quality or "what" is received by the customer and the other "functional" quality or "how" a service is provided. The latter is the most critical aspect and is concerned with the psychological interaction taking place during the exchange transaction. It is based on the customer's perception and is therefore extremely subjective and encompasses all the cues that the customer picks up during the transaction. These are by no means limited to cues emanating from the server but also from the entire service environment.

The interest in service quality has been influential in contributing significantly to the growth of the general services marketing field. The reviews in Berry and Parasuraman (1993) and Fisk et al. (1993) recognise the contributions made by various academics both in the service quality and in the general area of services marketing.

At the same time, Matei (2008) approaches the contribution of public services to local development, using the input-output method and Matei and Matei (2006) describe a systemic model for optimal adjustment of public services. The same can be said for Leonard Berry who was one of the earliest writers on services marketing. In operationalising the service quality construct Parasuraman et al. (1985, 1988, 1994) have made use of qualitative and quantitative research following generally accepted psychometric procedures (Churchill, 1979). This resulted in the development of the original 22-item SERVQUAL instrument that represents one of the most widely used operationalisations of service quality. Their measurement of service quality proposes a

gap-based comparison of the expectations and performance perceptions of consumers. This measurement paradigm is similar to the disconfirmation model traditionally used to assess consumer satisfaction (Cronin, Taylor, 1992, 1994, Parasuraman et al., 1994, Teas, 1993, 1994). Cronin and Taylor (1992) were the first to offer a theoretical justification for discarding the expectations portion of SERVQUAL in favor of just the performance measures included in the scale (SERVPERF).

SERVQUAL provided researchers with the possibility of measuring the performance-expectations gap (Gap 5) ostensibly composed of five determinants, namely:

(1) reliability;

(2) responsiveness;

(3) empathy;

(4) assurance; and

(5) tangibles.

In response to the empirical findings that have emerged, Parasuraman et al. (1994) have undertaken significant changes. These have included a re-conceptualisation and extension of the expectations side distinguishing between desired and minimum expectations and suggesting the use of a three-column format that eliminates the need to re-administer items. The authors also proposed a reduction in the number of items to 21, together with the use of nine-point instead of seven-point scales. They also recognised the possibility of the existence of three rather than five dimensions where "responsiveness, assurance and empathy meld into a single factor".

The number of precedents in the application of this methodology in the field of municipal services is very limited: Scott and Shieff, (1993); Dalrymple et al. (1995); Donnelly et al. (1995); Wisniewski, Donnelly (1996); Gaster (1996); Donnelly, Shiu, (1999); Wisniewski, (2001); Van Ryzin (2004) and Gutiérrez and Jorge (2008).

We have developed a new model for quality in local government and we have three new dimensions where citizens evaluate service quality:

(1) Objective or "technical" features. Objective items related to the quality.

(2) Subjective or "functional" features. Subjective items related to the quality.

(3) General features "latent image". General items related to different features in local government.

Although perceived quality and satisfaction are the two concepts used most often in the literature on services, differentiating them remains a challenge (Hurley, Estalami, 1998). All researchers agree that perceived quality and satisfaction are two distinct construct. In general, it is very easy to differentiate between these elements in the case of tangible products. In the case of services, the definition of quality is based on the difference between service perceived and service expected, so that a service is perceived as being one of quality when prior expectations are exceeded.

Satisfaction

Customer satisfaction or dissatisfaction is a well-known and established concept in several sciences. In marketing and consumer research, customer satisfaction has been used in order to describe the differences between specific alternatives and brands (Yi, 1990). Economists have used customer satisfaction

as a common denominator to describe differences between product groups and industries (Meeks, 1984). Customer satisfaction cannot be measured directly using an objective measure (Simon, 1974). If, however, customer satisfaction is treated as an abstract and theoretical phenomenon it can be measured as a weighted average of multiple indicators (Johnson, Fornell, 1991). Measurement errors in the index are taken care of through the quality and quantity of the measures being used (Fornell, Wernerfelt, 1987). Measured in this manner, customer satisfaction becomes the common denominator in making it possible to compare different industries, companies and individuals. Customer satisfaction is the accumulated experience of a customer's purchase and consumption experiences. Customer satisfaction is influenced by two factors: expectations and experienced service performance (Yi, 1989). Perceived performance is influenced by the consumers' perception of service quality, marketing mix, brand name and image of the company. Because satisfied customers tend to maintain their consumption pattern, or consume more of the same product or service, customer satisfaction has become an important indicator of the credibility and future behaviour. Fornell claims that customer satisfaction influences purchasing behaviour: satisfied customers tend to be loyal customers, but loyal customers are not necessarily satisfied. According to Yi (1989) customer satisfaction is a function of perceived (service) quality and expectations. We will propose that satisfaction and a new element (credibility) in relation to this is also influenced by quality.

Credibility

In marketing, much attention has been given to the concept of brand (Aaker, 1991, Aaker, Biel, 1992, Leutheser, 1991). The motivations for studying the importance of brands are centred around financial and strategy based motivations. In marketing, awareness and image of a brand, and the reputation of the product or supplier, influences the buyer's purchasing decision, i.e. a good brand or reputation stimulates purchase by simplifying decision rules. In this context, credibility becomes an issue of attitudes and beliefs with regard to brand awareness and image (Maltz, 1991) and to customer satisfaction and loyalty (Fornell, 1992). Keller (1993) claims that *brand awareness* "…relates to the likelihood that a brand name will come to mind, and the ease with which it does", whereas *brand image* is defined as "…perceptions about a brand as reflected by the brand associations held in consumer memory". Attitudes and beliefs are influenced by previous experience. People with previous experience will base their attitudes and beliefs on experience of the product or service quality. People with little or no experience may base their attitudes and beliefs on credibility. Nations, regions and governments enjoy different credibility.

Consequently, credibility may be aggregated to macro level through the concept of *country of origin.* Citizens in a region have experience with the business services offered by the government. Among other factors they base their satisfaction with the government on perceived service quality. Citizens located outside the region have no

experience of the policy offered by the government in that region. Their decision with regard to making use of the capability in the country is partly based on the country or region credibility and advice from people who may have the expertise.

Based on their own research, and previous research done on the subject of country of origin, Papadopoulos et al. (1987) conclude that there is enough evidence to claim that:

(1) The "country-of-origin" effect exists;

(2) Both consumers and industrial buyers are affected by "made-in" images.

(3) Made-in stereotypes can be changed.

Credibility becomes an important issue both from a marketing and strategy point of view. We will propose that credibility is an important factor influencing the satisfaction of citizens and companies with local government policy.

Model and hypotheses

The disconfirmation paradigm provides the theoretical basis for the link between quality and satisfaction (Churchill, Surprenant, 1982, Oliver, 1980, 1981, Oliver, DeSarbo, 1988, Tse, Wilton, 1988, Yi, 1990, Cronin et al., 2000, Brady, Cronin, & Brand, 2002). Quality can be considered as one component of satisfaction (Cronin, Taylor, 1992, Rust, Oliver, 1994). Empirical evidence for the link is available from a number of studies (cf. Bitner, Hubbert, 1994, Cronin, Taylor, 1992, 1994, Deruyter et al., 1997, Oliver, 1993, Spreng, Mackoy, 1996). Loyalty is a multidimensional construct that has been conceptualised and operationalised in many different ways in the marketing literature (Oliver, 1999). We can observe that the literature does not address the relationship between credibility and satisfaction but note that it is likely that satisfaction, like quality, is an encounter specific input to credibility. We have replaced loyalty with credibility in our model.

We can try to remember that low perceived service quality may result in high service satisfaction. That is convenience and availability (in public case) may enhance satisfaction without actually affecting customer perceptions of service quality.

Our literature review provides support for a strong direct link between service quality and satisfaction but makes no such claim of a direct causal link of satisfaction to credibility. We only propose to analyse the effect of the components of quality on the link between satisfaction and credibility. Therefore, this research seeks to explore the relationship between service quality, satisfaction and credibility. The research hypotheses supporting this proposal are as follows:

H_1: Public service quality is a direct antecedent of citizen satisfaction.

H_2: Satisfaction is positively related to credibility.

H_3: Quality is positively related to credibility.

H_4: Local Public Quality is determined for technical features, functional features and latent image.

The research model is presented in Figure 1.

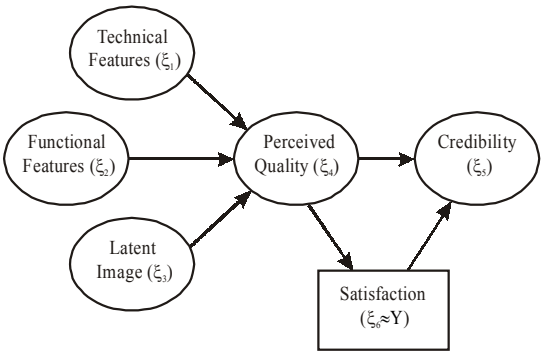

Figure 1. *Causality model describing causes and consequences*

Survey of citizens

A total of 400 personal interviews were conducted in 76 different local governments in Castilla y León, a region in Spain, over a period of four weeks. Respondents, equally male and female, reported having received a service delivery in last three months. Along with the SERVPERF (performance and expectation) items, the survey instrument contained questions related to the attribute importance and the demographic characteristics of the respondent.

The survey questionnaires were designed to measure five distinct latent constructs: Technical features (ξ_1), Functional features (ξ_2), Latent Image features (ξ_3), Perceived Quality (ξ_4) and Credibility (ξ_5). In our model we have another element – manifest variable – that is going to be related with these latent variables, Citizen Satisfaction (ξ_6).

Measurement instrument for the municipalities

Table 1

Latent variables	Manifest variables
Technical features (ξ_1) (7 items)	a) Office setting in council. b) The forms of the Town Hall are foolproof. c) Telephone (fax, internet) is a good communication with the Town Hall. d) Notifications are interesting for someone. e) Notifications use an easy language with citizen. f) Employees are always prepared for helping citizens. g) Locales are in good condition.
Functional features (ξ_2) (7 items)	a) If they promise something, they will carry out in time. b) I can understand how it is running my Town Hall. c) I know who received my plaint. d) Employees are prepared for working in their job perfectly. e) Employees are informing about services. f) Employees are kind and courteous. g) Employees take into account my personal situation.
Latent Image (ξ_3) (4 items)	a) Services have changed by our ideas. b) Our plaints are processed. c) We trust in employees. d) Employees have enough resources for developing services.
Perceived Quality (ξ_4) (2 items)	a) Global quality is good. b) Quality in this Town Hall is better than another one.
Credibility (ξ_5) (2 items)	a) Services must be developed for municipalities. b) Our Town Hall has reputation.

We are developing the Local Government Citizen Reputation Index (LGCRI) as an economic indicator that measures Customer Satisfaction and Credibility. In this model, six interrelated variables – five latent variables and one manifest variable – are introduced. It is based on well-established theories and approaches in customer behaviour and it is applicable for a number of different public governments.

The research instrument

The SERVQUAL versus SERVPERF debate is ongoing. According to Cronin and Taylor (1992), their un-weighted performance-based SERVPERF scale is a better method of measuring service quality. Arguing that the gap theory of service quality is supported by little empirical and theoretical evidence, Cronin and Taylor (1992) developed the "performance-based" service quality measurement scale called SERVPERF. Basing the scale on an earlier work by Bolton and Drew (1991a), they note that a customer's perception of service quality is based on his/her "preconceived" attitude about the service. These authors note that a consumer's current attitude (or citizen's attitude) is based on their residual attitude resulting from a previous experience of the service quality, and their satisfaction or dissatisfaction with, the service (Bolton, Drew, 1991). As consumers experience a service, their attitudes towards the service quality may be revised, thereby causing a change in future attitudes. Although it is possible to advance a relatively strong case for using the SERVQUAL scale, we have chosen to use the SERVPERF scale primarily because of the many criticisms of SERVQUAL (Cronin, Taylor, 1992, Teas, 1993; Churchill, Brown, Peter, 1993), and the failure of empirical studies to replicate SERVQUAL's initial success (Carman, 1990, Babakus, Boller, 1992). While using SERVPERF, we are mindful that while Cronin, Taylor (1992) have argued strongly in defense of SERVPERF, the scale has yet to be empirically tested in as wide a number of sectors as has SERVQUAL.

Each of the performance items were described by five-point Likert type scales anchored by 1 = "strongly disagree" to 5 = "strongly agree". Higher scores on this scale indicate higher levels of service quality. Evidence for the scale's reliability and validity has been provided (Parasuraman et al., 1991). Many of the instruments used to measure satisfaction often consist of single item measures (Cronin, Taylor, 1992, Spreng, Mackoy, 1996, Taylor, Baker, 1994). The measurement of constructs with single items has been criticized in the marketing literature, as it often cannot capture the richness of a concept (Churchill, 1979, Parasuraman et al., 1994). We used the single-item measure because researchers often report on unidimensional self-report measures to capture the concept assuming shared meanings among consumers (Zeithaml, 1988). To maintain overall consistency five-point scales were used throughout, described by 1 = "strongly disagree" to 5 = "strongly agree".

Analysis

The PLS (Partial Least Squares) procedure has been gaining interest and use in recent years (Compeau, Higgins 1995, Aubert, Rivard, Paltry 1994, Chin, Gopal 1995) because of its ability to model latent constructs under conditions of non normality and small to medium sample sizes. Being a components-based structural equations modeling technique, PLS is similar to regression, but simultaneously models the structural paths (i.e., theoretical relationships among latent variables) and measurement paths (i.e., relationships between a latent

variable and its indicators). Rather than assume equal weights for all indicators of a scale, the PLS algorithm allows each indicator to vary in how much it contributes to the composite score of the latent variable. Thus indicators with weaker relationships to related indicators and the latent construct are given lower weightings. In this sense, PLS is preferable to techniques such as regression which assume error free measurement (Lohmöller, 1989, Wold, 1982, 1985, 1989). In general, the power to detect an interaction effect at a given reduced sample size is better than other techniques.

Variables are now viewed as latent variables (constructs) which cannot be measured directly. Instead, multiple indicators (measures) for these latent variables need to be obtained. Each indicator is modeled as being influenced by the underlying latent variable and error. Product indicators reflecting the latent interaction variables are then created. Each set of indicators reflecting their underlying construct (latent variable) are then submitted to PLS for estimation resulting in a more accurate assessment of the underlying latent variables and their relationships (Chin et al., 1996).

The first step in assessing the measurement model normally involves testing the individual item' reliabilities to ensure that the hypothesized indicators load meaningfully to the related constructs. This is called "uni-dimensionality" (Bili et al., 1994), which is indicative of the fact that all the related indicators of the construct do in fact measure just the associated latent variable. We can use the standardized measurement loadings for examining this uni-dimensionality. These indicators are measures of simple correlations of the measured items with the respective construct (Barclay et al., 1993). Different threshold values have been suggested by authors (Bili et al., 1994, Raymond, Bergeron, 1997, Nummally, 1978) but loadings should be greater than 0.707 to ensure al least 50% of the variance. It can be observed that the loadings are over this number (less variables 4, 18 and 22, but are very close to the threshold value).

After assessing the reliability of the individual items, the researcher should next examine the composite reliabilities of latent constructs, to ensure that the measures have minimized the occurrence of random error. In our case, the coefficient rho for the 18 items dealing with service quality perception was calculated in place of coefficient alpha (Cronbach, 1951) because this takes into consideration the causality model and the number of items is not going to have an influence on the result. The result is 0.92 and this provided values greater than 0.70 and is therefore acceptable (Barclay et al., 1993). This then ensures that the estimates of the structural paths are closer to the true paths, allowing relaxation of the need for many indicators per construct, and eases the requirement of a large sample size (Chin et al., 1996).

Different measures

Table 2

	(1)	(2)	No. items	Mean	Std. Dev.	Relia-bility
Quality Dimensions			18	65.15	10.66	0.92
(1)Technical			7	26.76	4.28	0.81
(2)Functional	0.71***		7	25.34	4.98	0.84
(3)Latent Image	0.63***	0.68***	4	13.06	2.90	0.76

The last important measurement model is validity. Given a hypothesized structure, discriminant validity indicates the extent to

which latent constructs are different from each other, i.e. their ability to measure distinct concepts (Rivard et al., 1994). The construct should share more variance with its measures (indicators) and this can be tested with the AVE (Average Variance Extracted). The composite reliability of each scale and measurement model ranged between 0.63 and 0.74. This exceeds the 0.60 threshold for acceptable reliability as recommended by Fornell and Larcker (1981). This provides further evidence that the measures used are internally consistent and exhibit satisfactory reliability.

The correlations matrix of the latent constructs, with the squares roots of AVE as the diagonal elements, can be observed in Table 3. Since the diagonal values are higher, as compared with the correlation between latent variables, the posited model suggests good discrimination validity. We can remember that AVE is representative of the variance shared between a construct and its measures: its value is greater than the variance shared between the construct and other construct (or the squared correlation between constructs).

Correlations matrix and square roots of AVEs

Table 3

Construct	Technical features	Functional features	Latent image
Technical features	**0.730**		
Functional features	0.713	**0.744**	
Latent image	0.632	0.680	**0.704**

The main interest of a researcher in analyzing the structural model after ensuring a reliable and valid measurement model is two-fold: investigate the explanatory power of the independent construct and study the size and significance of the path coefficients. Analogous to regressions, the R^2 values are indicative of the amount of variance in the dependent (latent) variables that are being explained by the independent variables of model. An R^2 of less than 0.2 for instance would surely suggest model improvements (Figure 2).

The analysis of path coefficients covers not only the direct effects, but also the indirect effects (Table 5). The magnitude of both the effects of an exogenous construct, along with the statistical significance of the structural path, is indicative of the relative importance of various explanatory construct.

The results provide partial support for the hypothesis of the study confirming a direct link between service quality and satisfaction (0.789) and a partial effect of quality on credibility (0.232). This last relation is confirmed through the indirect effect. Satisfaction and credibility have a strong link (0.476). What is interesting is that the coefficients for the technical features, functional features and latent image are showing a good formative structure, 0.69, 0.73, and 0.346 respectively (Table 4).

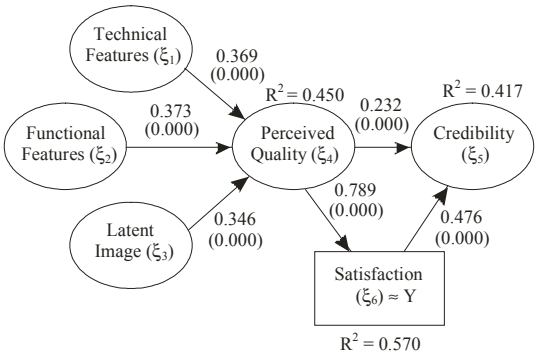

Figure 2. *Causality model*

Direct and indirect effects

Table 4

Relations	Direct effects	Indirect effects
Technical features → Quality	0.369	-
Functional features →Quality	0.373	-
Latent image → Quality	0.346	-
Quality → Satisfaction	0.789	-
Quality → Credibility	0.232	0.789*0.476
Satisfaction → Credibility	0.476	-

Though the understanding of PLS results pertaining to the measurement and the structural models suggest that a researcher could improve the model by removing the indicators that do not satisfy the reliability and validity criteria, one would need to have some measure of overall goodness of fit beyond R^2 values of the individual dependent variables. This can be done by the Stone-Geisser cross validation test. It is similar to an R-square test but has the additional merit of not losing degrees of freedom. The overall Q^2 is then calculated from these repeated "error sum of squares". The way the statistic is interpreted is if $Q^2>0$ a relationship exits (Table 5).

Model Values of R^2 y Q^2.

Table 5

Construct	R^2	Q^2
$\eta_1 = f(\xi_1, \xi_2, \xi_3)$	0.450	0.464
$\eta_2 = f(\xi_4, \xi_6)$	0.417	0.520
$\eta_3 = f(\xi_4)$	0.570	0.530

Conclusions and limitations

Although much has been written on the relationship between service quality and satisfaction the possible role of credibility as a very important variable in a public model appears to have received less attention. The results of the work on which this paper is based suggest that the effect of quality on satisfaction is just direct but the effect of quality on credibility is relevant in an indirect way. If this finding from this exploratory research is confirmed in further studies it would represent an important addition in our understanding of the interrelationships between these three constructs. These variables have increasingly played a key role in services management generally and are believed to have a significant effect on citizen perception and ultimately long-term benefit in creating public value. The implication for the management of local government concerns the important effect of technical features, functional features and latent image on quality, satisfaction and credibility. Quality does not appear to have a strong direct effect on credibility. However, the regression coefficient for the interaction between service quality and satisfaction indicates that service factor can have an impact on credibility and these are the instruments for getting better results in latent variables. The results indicate that although citizens may believe that local public services provide low levels of service quality, it does not necessarily follow that satisfaction will be high. Satisfaction does not depend on service quality alone. The political situation, taxes, or other personal situations can change citizens' perceptions. The results also provide a basis for understanding the role of quality as an instrument for transforming municipal services. It can be argued that we know what changes must be produced.

In the public sector, perceived quality of the offering may be somewhat lower, but the value received is high and good levels of satisfaction and credibility can still be achieved. The findings substantiate the salience of satisfaction in services confirming that ensuring citizens' satisfaction should be as much a concern in service management as obtaining positive service quality judgments.

The study has a number of limitations. First, the research has primarily been of a descriptive nature and has focused on the citizens of small local government. The findings need to be confirmed from other public organizations. Second, the number of respondents is concentrated in a region of

Spain. A larger sample would have strengthened the results obtained. Finally, it is necessary to develop more studies about local and public organizations.

Further research should first concentrate on developing a clearer articulation of the constructs used in this study, particularly that of credibility. This can in turn result in better measures, after which the interrelationship between the three constructs considered together with other variables such as corporate reputation, purchase intentions and ultimately customer retention can be better understood.

References

Aaker, D. (1991). *Brand Equit,* The Free Press, New York, NY

Aaker, D., Biel, A. (Eds.) (1992), *Building Strong Brands,* Lawrence Erlbaum Ass. Hillsdale, NJ

Aubert, B.A., Rivard, S., Patry, M., "Development of Measures to Assess Dimension of IS Operation Transactions." In J. I. DeGross, S. L. Huff, and M. C. Munro (Eds.), *Proceedings of the Fifteenth International Conference on Information Systems*, Vancouver, British Columbia, 1994, pp. 13-26

Babakus, E., Boller, G.W., "An empirical assessment of the SERVQUAL scale", *Journal of Business Research*, 24(3), 1992, pp. 253-268

Barclay, M., Holderness, C., Pontiff, J., "Private benefits from block ownership and discounts on closed-end funds", *Journal of Financial Economics,* 33(3), 1993, pp. 263-291

Billi, M., Ambrosino, G., Boero, M. (1994). *Artificial Intelligence Applications to Traffic Engineering,* VSP BV, AH Zeist

Bolton, Ruth N., Drew, James H., "A Longitudinal Analysis of the Impact of Service Changes on Customer Attitudes", *Journal of Marketing*, 55(1), 1991, pp. 1-9

Boulding, W., Kalra, A, Staelin, R., Zeithaml, V., "A dynamic process model of service quality: from expectations to behavioral intentions", *Journal of Marketing Research*, 30(1), 1993, pp. 7-27

Carman, J.H., "Consumer perceptions of service quality: an assessment of the SERVQUAL dimensions", *Journal of Retailing*, 66(1), 1990, pp. 33-55

Chin, W.W., Gopal, A., "Adoption Intention in GSS: Importance of Beliefs", *Data Base Advances*, 26(2/3), 1995, pp. 42-64

Chin, W.W., Marcolin, B.L., Newsted, P.R., "A partial least squares latent variable modeling approach for measuring interaction effects: results from a Monte Carlo simulation study and voice mail emotion/adoption study", *Proceedings of the 17th International Conference on Information Systems,* 1996, Cleveland, OH

Compeau, D., Higgins, C. A., Huff, S., "Social Cognitive Theory and Individual Reactions to Computing Technology: A Longitudinal Study", *MIS Quarterly,* 23(2), 1999, pp. 145-158

Cronbach, L. J. , "Coefficient alpha and the internal structure of tests", *Psy-chometrika,* 16(3), 1951, pp.297-334

Berry, L.L., Parasuraman, A., "Building a New Academic Field: The Case of Services Marketing", *Journal of Retailing,* 69(1), 1993, pp. 13-60

Bitner, M.J., Hubbert, A.R , "Encounter satisfaction versus overall satisfaction versus quality", in Rust, R.T, Oliver R.L (Eds.),*Service Quality: New Directions in Theory and Practice*, 1994, pp. 72-94, Sage, Thousand Oaks, CA

Brady, M.K., Cronin, J.J., Brand, R.R., "Performance-only measurement of service quality: a replication and extension", *Journal of Business Research*, 55(1), 2002, pp. 17-31

Churchill, G.A. Jr, "A paradigm for developing better measures of marketing constructs", *Journal of Marketing Research,* 16(1), 1979, pp.64-73

Churchill, G.A. Jr., Brown, T.J., Peter, J.P., "Improving the Measurement of Service Quality,", *Journal of Retailing*, 69(1), 1993, pp. 127-139

Churchill, G.A., Surprenant, C., "An investigation into the determinants of customer satisfaction", *Journal of Marketing Research*, 19(4), 1982, pp. 491-504

Cronin, J.J. Jr., Taylor, S.A., "Measuring Service Quality: A Reexamination and Extension", *Journal of Marketing*, 56(3), 1992, pp. 55-68

Cronin, J.J. Jr., Taylor, S.A., "SERVPERF versus SERVQUAL: reconciling performance-based and

perceptions-minus-expectations measurement of service quality", *Journal of Marketing*, 58(1), 2000, pp.125-31

Dalrymple, J.F., Donnelly, M., Wisniewski, M., Curry, A.C., "Measuring Service Quality in Local Government", in *Proceedings of the First World Congress on TQM,* 1995, pp. 263-266, Londres: Chapman and Hall

Cronin, J.J., Brady, M.K., Hult, G.T.M., "Assessing the effects of quality, value and customer satisfaction on consumer behavioural intentions in service environments", *Journal of Retailing*, 76(2), 2000, pp. 193-218

Deruyter, K., Bloemer, J., Peeters, P., "Merging service quality and service satisfaction: an empirical test of an integrative model", *Journal of Economic Psychology*, 18(4), 1997, pp.387-406

De Wulf, K., Odekerken-Schröder, G., "Assessing the impact of a retailer's relationship efforts on consumer' attitudes and behavior". *Journal of Retailing and Consumer Services*, 10(2), 2003, pp. 95-108

Donnelly, M., Shiu, E., "Assessing Service Quality and its Link with Vaule for Money in a UK Local Authority's Housing Repairs Service Using the SERVQUAL Approach", *Total Quality Management*, 10 (4/5), 1999, pp. 498-506

Donnelly, M., Wisniewski, M., Dalrymple, J.F., Curry, A.C., "Measuring Service Quality in Local Government: the SERVQUAL Approach", *International Journal of Public Sector Management*, 8(7), 1995, pp. 15-20

Fisk, R.P., Brown, S.W., Bitner, M.J., "Tracking the evolution of the services marketing literature", *Journal of Retailing*, 69(1), 1993, pp. 61-103

Fornell, C., "A National Customer Satisfaction Barometer: The Swedish Experience", *Journal of Marketing,* 56(1), 1992, pp. 6-21

Fornell, C., Larcker, D.E., "Evaluating structural equation models with unobservable variables and measurement error", *Journal of Marketing Research*, 18(1), 1981, pp. 39-50

Fornell, C., Wernerfelt, B., "Defensive Marketing Strategy by Customer Complaint Management: A Theoretical Analysis", *Journal of Marketing Research,* 24(4), 1987, pp. 337-346

Gaster, L., "Quality Services in Local Government: a Bottom-Up Approach", *Journal of Management Development*, 15(2), 1996, pp. 80-96

Glaser, M.A., "The Business Psyque: Exploring Relationships Between Local Quality of Life and City Image", *Public Administration Quarterly*, 14(4), 1991, pp. 287-303

Gottlieb, P.D., "Neighborhood Development in the Metropolitan Economy: A Policy Review", *Journal of Urban Affairs*, 19(2), 1997, pp. 163-182

Grönroos, C. , "A Service Quality Model and its Marketing Implications", *European Journal of Marketing*, 18(4), 1984, pp. 36-44

Grönroos, C. (2007). *Service Management and Marketing. Customer Management in Service Competition*, Chichester: John Wiley & Sons

Gutiérrez, P., Jorge, M. (2008). *El Desarrollo de Políticas Públicas Locales como Garantes de la Satisfacción de los Ciudadanos*, Madrid: Fundación Alternativas

Hurley, R.F., Estalami, F., "Alternative indexes for monitoring customer perceptions of service quality: a comparative evaluation in retail context", *Journal of the Academy of Marketing Science*, 26(3), 1998, pp. 209-21

Johnson, M.D., Fornell, C., "A Framework for Comparing Customer Satisfaction across Individuals and Product Categories", *Journal of Economic Psychology,* 12(2), 1991, pp. 267-286

Keller, K.L., "Conceptualizing, Measuring and Managing Customer-based Equity", *Journal of Marketing,* 57(1), 1993, pp. 1-22

Lehtinen, J.R and Lehtinen, U., "Service quality: a study of quality dimensions", *Unpublished working paper,* 1982, Service Management Institute, Helsinki

Leutheser, L. (Ed.), "Defining, Measuring and Managing Brand Equity: A Conference Summary", *Report No. 88 -104,* 1991, Marketing Science Institute, Cambridge, MA

Lewis, R.C., Booms, B.H., "The marketing aspects of service quality", in Berry, L., Shostack, G., Upah, G. (Eds.), *Emerging Perspectives on Services Marketing*, 1983, pp. 99-107, American Marketing Association, Chicago, IL

Lohmöller, J.B. (1989). *Latent Variable Path Modeling with Partial Least Squares*, Heidelberg: Physica-Verlag

Maltz, E., "Managing Brand Equity: A Conference Summary", *Report No. 99-110,* 1991, Marketing Science Institute, Cambridge, MA

Matei, A, "Empirical Approaches About the Input-Output Model for the Local Economic Development: Case Study in Braila Municipality", *International Journal of Public Administration in Central and Eastern Europe*, No. 1, 2008. Available at SSRN: http://ssrn.com/abstract=1317609

Matei, A., Matei, L., "Systemic Model for Optimal Regulation in Public Service", *Theoretical and Applied Economics,* vol. 3 (3(498)), pp. 45-50, May, 2006, Bucharest, Romania

Meeks, J.G., "Utility in Economics: A Survey of the Literature", in Turner, C.F. and Martin, E. (Eds.), *Surveying Subjective Phenomena,* Vol. 2, 1984, pp. 41-91, Russel Sage Foundation, New York, NY

Nummally, J.C. (1978). *Psychometric theory*, McGraw-Hill, New York, NY

Oliver, R.L., "A Cognitive Model of the Antecedents and Consequences of Satisfaction decisions", *Journal of Marketing Research*, 17(4), 1980, pp. 460-469

Oliver, R.L., "A Conceptual Model of Service Quality and Service Satisfaction: Compatible Goals, Different Concepts", in *Advances in Services Marketing and Management: Research and Practice,* Vol. 2, 1993, pp. 65-85, Connecticut: JAI Press Inc. Greenwich

Oliver, R.L., "Whence consumer loyalty?", *Journal of Marketing,* 63(Special issue), 1999, pp. 33-44

Oliver, R.L., DeSarbo, W.S., "Response determinants in satisfaction judgements", *Journal of Consumer Research*, 14(4), 1988, pp. 495-507

Papadopoulos, N.G., Heslop, L.A., Graby, F., Avlontis, G., "Does 'Country-of-Origin' Matter? Some Findings from a Cross-cultural Study of Consumer Views about Foreign Products", *Report No. 87-104*, 1987, Marketing Science Institute, Cambridge, MA

Parasuraman, A., Berry, L.L., Zeithaml, V.A., "Refinement and reassessment of the SERVQUAL scale", *Journal of Retailing*, 67(4), 1991, pp. 420-450

Parasuraman, A., Zeithaml, V.A., Berry, L.L., "A conceptual model of service quality and its implications for future research", *Journal of Marketing*, 49(4), 1985, pp. 41-50

Parasuraman, A., Zeithaml, V.A., Berry, L.L., "SERVQUAL: a multiple-item scale for measuring consumer perceptions of service quality", *Journal of Retailing*, 64(1), 1988, pp. 12-40

Parasuraman, A., Zeithaml, V.A., Berry, L.L., "Reassessment of expectations as a comparison standard in measuring service quality: implications for future research", *Journal of Marketing*, 58(1), 1994, pp. 111-124

Rust, R.T., Oliver, R.L., "Service quality: insights and managerial implications from the frontier. Services quality: new directions", in *Theory and Practice*, 1994, pp. 1-19, Thousand Oaks, CA: Sage Publications

Scott, D., Shieff, D., "Service Quality Components and Group Criteria in Local Government", *International Journal of Service Industry Management*, 4(4), 1993, pp. 42-53

Sharpe, E.B. (1990). *Urban Politics and Administration: From Service Delivery to Economic Development*. New York: Longman

Simon, J.L., "Interpersonal Welfare Comparison Can Be Made and Used for Redistribution Decisions", *Kyklos*, 27(1), 1974, pp. 68-98

Raymond, L., Bergeron, F., "Global distribution systems: A field study of their use and advantages in travel agencies", *Journal of Global Information Management*, 5(4), 1997, pp. 23-32

Spreng, A.R., Mackoy, D.R., "An empirical examination of a model of perceived service quality and satisfaction", *Journal of Retailing,* 72(2), 1996, pp. 201-214

Taylor, S.A., Baker, T.L., "An assessment of the relationship between service quality and customer satisfaction in the formation of consumers' purchase intentions'', *Journal of Retailing*, 70(2), 1994, pp. 163-78

Teas, R.K., "Expectations, performance evaluation, and consumers' perceptions of quality", *Journal of Marketing*, 57(4), 1993, pp. 18-34

Teas, R.K., "Expectations as a comparison standard in measuring service quality: an assessment of a reassessment", *Journal of Marketing,* 58(1), 1994, pp. 132-139

Tse, D.K., Wilton, P.C., "Models of consumer satisfaction formation: an extension", *Journal of Marketing Research*, 25(2), 1988, pp. 460-69

Van Ryzin, G.G., "The measurement of overall citizen satisfaction", *Public Performance and Management Review,* 27(3), 2004, pp. 9-28

Wisniewski, M., "Using SERVQUAL to Assess Customer Satisfaction with Public Sector Services", *Managing Service Quality*, 11(6), 2001, pp. 995-1001

Wisniewski, M., Donnelly, M., "Measuring service Quality in the Public Sector: the Potential for SERVQUAL", *Total Quality Management*, 7(4), 1996, pp. 357-66

Wold, H., "Soft Modeling. The Basic Design and Some Extensions", in *Systems Under Indirect Observation*, 1982, pp. 1-54, Amsterdam: North Holland

Wold, H., "Partial Least Squares" in S. Kotz and N. L. Johnson, (Eds), *Encyclopedia of Statistical Sciences*, Vol. 6, 1985, pp. 581-591, New York: Wiley

Wold, H., "Introduction to the Second Generation of Multivariate Analysis" in H. Wold, Editor, *Theoretical Empiricism*, 1989, pp. 7-11, New York: Paragon House

Yi, "A critical review of customer satisfaction", in Zeithaml, V.A. (Eds.), *Review in Marketing*, 1990, pp. 68-123, American Marketing Association, Chicago, IL

Zeithaml, V.A. (1988). *Consumer perceptions of price, quality and value: a means-end model and synthesis of evidence*

Quantitative Evaluations of Foreign Direct Investments Impact on Productivity Development of Companies from Central and Eastern Europe

Marilen Pirtea
Carmen Corduneanu
Bogdan Dima
Laura Miloș
West University of Timișoara

Abstract. *The approach of the foreign direct investments impact belonging to multinational companies on host country companies and on national economy is an extremely complex and present-day interest issue in the context of globalization phenomena, which at this time puts a mark on the human society evolution. During this period of rapid changes, the economies of those countries, which find them crossing a development process, can benefit a significant increase of productivity and an enhanced access to new resources and commodity markets, but at the same time they are subject to considerable risks. The purpose of this paper is to bring an empirical support at the current level of research, taking into consideration a set of Central and Eastern European countries, including Romania.*

Key words: foreign direct investment; productivity; Central and Eastern European countries.

JEL Codes: F21.
REL Codes: 10F, 20F.

1. Introduction

Among other well-known authors that have discussed the problem of *the interactions of foreign direct investments impact on the economy of host countries* is Sanjaya Lall, who through his studies approached the primordial role of technological capacities in the process of economic competitiveness development of one country, focusing on the impact of foreign direct investments on the existing technological potential.

The international competitiveness is considered a vital issue for generating economic development in the industrialized countries. Because of globalization, this issue has become an important one for those countries that find them crossing a development process, too, including Romania. The achievement of competitiveness is a difficult process and needs more than a simple passive opening towards the international markets. It is a process that needs to be well thought, mostly framed, and laid out; it is a complex, expensive and exigent process (UNIDO, 2002). According to a recent report[1], there have been ascertained 12 pillars of competitiveness classified in three categories, each with a different level of significance; in accordance with this, there has been put into effect a classification of all countries, having the global competitiveness as comparative criterion. As there can be easily noticed in the chart below, Romania, at the end of 2007, was on place 74 out of 131 countries, with a score of 3.97 out of the highest score equivalent to 7; this aspect indicates that in this section it has to be made visible efforts in order to place Romania at least on the same level as the developed countries in Central and Eastern Europe, recently accepted into the European Union, if not at the level of first member countries of the EU.

Classification of countries as function of global competitiveness

Table 1

Competitiveness indicators	The first 2 countries in the global ranking		The first 3 EU-27 countries in in the global ranking			The last 3 EU-27 countries in the global ranking		
	USA	*Switzerland*	*Denmark*	*Sweden*	*Germany*	*Greece*	*Romania*	*Bulgaria*
Main category	23	4	1	6	9	48	88	76
• Existence of state institutions	33	4	2	6	7	49	94	109
• Infrastructure	6	4	7	12	1	35	100	84
• Macroeocnomic stability	75	22	10	17	60	106	84	47
• Health& Primary education	34	14	3	5	40	42	52	56
Determinant factors of efficiency	1	7	4	8	11	57	62	72
• High education and trainings	5	7	3	2	20	39	54	66
• Efficiency of the goods market	12	6	3	7	14	60	74	90
• Efficiency on the labor market	1	3	5	37	47	120	85	73
• Degree of spophistication of financial markets	11	21	6	9	14	60	78	74
• Technological development	9	3	5	1	21	58	59	65
• Market size	1	37	45	34	5	39	43	61
• Factors related to innovation and sophistication	4	1	8	5	3	59	73	91
• Degree of sophistication of business	7	2	6	4	1	62	73	92
• Innovation	1	2	10	6	7	63	76	88
Place in the ranking (from 131 countries)	1	2	3	4	5	65	74	79
Dynamics over the previous year	⟺	↷	⟺	↷	↷	⟺	↷	↷

Source: World Economic Forum, The Global Competitiveness Index, 2007-2008.

One of the main reasons for which international competitiveness has become a very important problem is the level of technological development. The innovation speed – and its promising results – makes it almost impossible for the economies to isolate themselves from the international commerce and for the international investments to be extremely expensive. One of the important consequences of liberalization and technological changes occurring everywhere is the fact that technology and capital have become extremely mobile, the foreign direct investments playing a key-role in the resources mobility. In addition to the productive resources transfer, the role played by the investments of foreign companies is developed by organizing the activities in a manner different from the traditional one, as well as correlating the production and services with other places from which there can be obtained specific costs, capacities and advantageous logistics.

2. The foreign direct investments influence on the technology transfer and on the company productivity

2.1. Theoretical considerations

The most important contribution of foreign direct investments, in those countries they have their destination in, is represented by the technology transfer, as we stated in the above paragraph. We refer to any tangible or intangible resource that generates a plus of productivity for the resident companies[1]. In specialized studies, the foreign direct investments are associated to the "hard" technologies transfer (devices, equipments, sketches and projects), as well as with the "soft" technologies transfer (organizational and managerial competences and practices, information). Therefore, the technology transfer has two dimensions: on one hand, there is the generic know-how, as the organizational and managerial competences and practices and quality systems and, on the other hand, the specific know-how, which cannot be obtained by means of "arms-length" direct[2] because of existing weaknesses and vulnerabilities inside the promoted policies and valid regulations (such as the protection of the rights for intellectual property) or because of existing stimuli and motivations for the operation internalization performed by the trans-national corporations.

The technology is created inside the research and development departments and it is supervised from the part of industrialized countries, as the source of foreign direct investments. This aspect facilitates the development of autochthonous research and development departments. The technology transfer can be performed in a direct manner corresponding to the subsidiary branch in which the multinational companies have already invested, or in an indirect manner following a *spillover*[3] benefit on the local companies. There are four channels for transmitting spillovers: vertical connections between the subsidiary branches of multinational companies and the suppliers, subcontractors or clients from the host-country; horizontal connections between the subsidiary branches and autochthonous companies from the same industry field, as well as the internationalization of the activity performed inside the research and development departments.

In the economic theoretic system, it is a diversity of opinions regarding the technology transfer performed by means of foreign direct investments. Thus, Markusen and Maskus (1999) state that these multinational companies choose to perform the technology transfer inside the host countries by means of foreign direct investments to the prejudice of other market

alternatives such as licensing, due to the fact that this one is associated with two risks: the one corresponding to the deterioration of the host-company quality standards, as well as sharing its technological classified information. According to this theory, the multinational companies are able to initiate or to enter competitions with the local competitors that own elaborate knowledge with reference to the local market and its characteristics, because of superior technologies, management and know-how of marketing strategy. If the companies obtaining the licenses for this specific technology or if the local partners of multinational companies have access to the knowledge of the multinational companies, the value of this particular knowledge may dissipate. This process can take place due to a tight competition (Ethier, Markusen, 1991, Saggi, 1999, Blomström, 1999) or because of the fact that the local partner does not have sufficient resources to protect the knowledge of the multinational company (Horstman, Markusen, 1987). The dissipation effect can determine the company to invest or bring inside the firm old or less advanced technologies (Blomström, Sjoholm, 1999). The multinational company can also spend important resources in order to avoid the transfer of technology, even resorting to hire foreign managers or to pay additional salaries to the native managers in order to keep the professional classified information (Blomström, 1999).

The multinational company will allow the local companies to take possession of personal technology, in case they will guarantee the access to the autochthonous technology or the procurement of commercial advantages. Another important reason for which a multinational company may perform the technology transfer is the possibility of avoiding the costs needed for preventing the transfer of technology, as well as increased efficiency inside the global network of multinational companies referring to the elaboration of manuals that allows a rapid technology transfer among the subsidiary branches of multinational companies (Blomström, 1999). Therefore, the foreign technology made available to the native companies is mainly owed to the foreign investors. The local companies spend resources for adopting new technologies, including the necessary resources for accomplishing a complementarity between the new technology with the existing productivity capacity, as well as for hiring the personnel from the multinational company, licenses and other incomes corresponding to the multinational company for the copyright (Blomström, 1999). Therefore, the effect of adopting the new technology and the quality of spillover is influenced negatively by the cost of implementing the new technology. Other factors that influence the demand and offer for the technology transfer would be: the particular conditions valid in the host country (the market structure, the existing mean gross incomes on the local market, the existing competition, the technological capacity of the local market, the presence or absence of some particular cheap factors of production), the governmental policies of the host country and, of course, the technological discrepancy between the autochthonous and foreign companies (Blomström, 1999, Findlay, 1978). An economy with a highly competitive market stimulates the local companies to search for adequate technology in order to survive on the market, but the technology transfer may be accomplished only if there is also the availability of foreign companies to perform this specific transfer. The centers of excellence

in the field of research and development of foreign direct investments inside the host countries create a development potential for the multinational companies, too, because they can have access to the existing technology.

The access to the existing technology inside the highly industrialized countries is restricted by:

- The absence of fundamental productive capacities, such as research institutions which need to suggest to the companies the necessity of using new technologies, such as museums and factories with practical demonstrations or different stimuli in order to encourage the companies to adopt and use the new technologies.
- The restriction of migration of the qualified work force, the restrictions inside the raw material exports, a certain rigid regime of rights for intellectual property, a high cost of licenses.
- Cultural impediments in cases of migration and export of the qualified work force in order to ensure the transfer of technology.

2.2. The current state of empirical research with reference to the foreign direct investments impact on the performance of companies

Along the years, in the specialized economic literature there were initiatives to demonstrate empirically the connection between the foreign direct investments and the technology transfer.

2.2.1. The impact on productivity

The earliest empirical attempts to detect the impact of foreign direct investments belong to case studies (Mansfield, Romeo, 1980). Caves (1974) formulates probably the first empirical model that estimates the effects of foreign direct investments on labor productivity inside the country receiving the foreign direct investments. Using sectoriale data from Canada and Australia, the author demonstrates the existence of some positive spillovers generated by the manufacture sector in which foreign direct investments were present. More recently, evidence of the existence of positive intra-sectoriale spillovers owed to foreign direct investments was found also in highly industrialized countries, such as Great Britain (Haskel et al., 2002). As for the countries passing through the development process, the empirical studies generally measure the effects of foreign direct investments on the productivity of autochthonous companies inside one activity field, by means of a regression with a productivity index as a resulting variable, and an index of foreign presence inside that particular activity field as a factorial variable, as well as a series of other variables supposed to have an influence on the productivity of that branch. It is important to keep in mind that this specific approach does not emphasize the way spillovers are transmitted or disseminated, but it refers only to their presence or absence. The estimation of spillover effects on the intra-industrial productivity are thus obtained by estimating a regression such as follows:

$$\text{Index of productivity} = \\ = \delta_0 + \sum_{j=1}^{k-1} \delta_j \times X_j + \delta_k \text{ Index of ISD} + \varepsilon$$

The dependent variable is an index of the output corresponding to that particular branch (Aitken, Harrison, 1999), or an index of labor productivity (Blomström, Sjöholm, 1999), or an index of the total factor productivity (TFP) (Chuang, Lin, 1999). Some studies have also used an index of efficiency as a measure for productivity, whereas the most advanced company from a technological point of view

represents a technological desideratum for other companies and their convergence on the level of the leader company represents a method of development of the technological performance in that specific branch (Aslanoglu, 2000, Blomström, 1986).

A parameter with a special emphasis is the coefficient used to estimate the foreign direct investments indicator, δ_k, which indicates the impact of foreign direct investments on the productivity of companies from that particular activity field. Even though along the years the authors have chosen different indexes in order to designate the foreign presence inside the autochthonous companies, the most used indexes of foreign direct investments were: statistical weight of employees inside the companies which benefit of foreign capital in that particular activity field, statistical weight of the company capital which benefit of foreign capital in that particular activity field, as well as statistical weight of the output performed by the companies which benefit of foreign capital in that particular activity field. In some of the above-mentioned cases, these variables were taken into consideration due to their availability as compared to other relevant data and not in accordance with the existing theoretical researches at that specific moment in time. Some of the studies, which used the above stated variables for the defined regressions, were set forth in Table 2.

The variables used in empirical regression studies of economic researches

Table 2

Paper	Analysed country	Indicator of productivity	Indicator of FDI
Aitken and Harrison (1999)	Venezuela	O	LS
Aslanoglu (2000)	Turkey	IE, PM	OS
Blomström (1986)	Mexico	IE	LS
Blomström and Persson (1983)	Mexico	PM	LS
Blomström and Sjojolm (1999)	Indonesia	PM	OS
Bosco (2001)	Hungary	O	OS
Buckley et al. (2002)	China	PM	KS,LS
Chuang and Lin (1999)	Taiwan	TFP	KS
Damijan et al. (2003)	Transition economies (a)	O	OS
Djankov and Hoekman (2000)	Czech Republic	O	KS
Feinberg and Majumdar (2001)	India	O,IE	KS
Haddad and Harrison (1993)	Marocco	IE	KS
Kathuria (2002)	India	TFP	OS
Khawar (2003)	Mexico	PM	KS
Kinoshita (2000)	Czech Republic	O	LS
Kokko (1994)	Mexico	PM	LS
Kokko et al. (1996)	Uruguay	PM	OS
Konings (1999)	Bulgaria, Poland, Romania	O	OS
Liu and Wang (2003)	China	TFP	KS
Liu et al. (2001)	China	PM	KS
Lutz and Talavera (2004)	Ukraine	PM	OS
Rattsø et al. (2003)	Thailand	TFP	KS
Sadik and Bolbol (2001)	Arab countries (b)	O	OS
Sgard (2001)	Hungary	O	KS
Sinani and Meyer (2004)	Estonia	O	OS,LS,KS
Sjöholm (1999)	Indonesia	PM	OS
Thuy (2005)	Vietnam	PM	LS
Tian (2004)	China	O	OS
Vahter (2004)	Estonia, Slovenia	PM	KS
Yudaeva et al. (2003)	Russia	O	OS
Zhu and Tan (2000)	China	PM	KS

Note:

O= Output

IE= Indicator of efficiency

W= Labor productivity

TFP= Total factor productivity

LS= % employees from foreign capital entreprises/total sector

KS= % capital of the foreign capital entreprises/total sector

OS= % created output of the foreign capital entreprises/total sector

a) Here are included Bulgaria, Czech Republic, Estonia, Hungary, Poland, Romania, Slovakia and Slovenia.

b) Here are included Oman, Morocco, Saudi Arabia, Jordan, Tunisia and Egipt.

Even though they took into consideration the same variables, the studies concerning regression (1) had two differences regarding the delimitation of the companies which benefit from "foreign capital" and the type of data used for estimating the spillover effects (cross section or panel).

As for the first distinction, the studies have delimitated the companies by means of national classifications, as well as of personal delimitations. For example, regarding the case studies which referred to China, the delimitation was made by taking into consideration the governmental definition of an company in which a foreign capital has been invested, which allowed the uniformity of the data considered by the authors (Sadih, Bolbol, 2001, Buckley et al., 2002, Wang, 2003). In other case studies, all companies that benefited of foreign direct investments were taken into account, no matter what their level was (Konings, 1999, Damijan et al., 2003). These studies use the capital or output weight, as well as the weight of employees of those particular companies as a measure of the presence of foreign investments. Other studies take the companies that benefit of foreign direct investments into consideration only if they have a weight of the foreign capital between 5 and 50% (Khawar, 2003). Therefore, this type of variables taken into account may lead to different results that point out to a different impact of foreign direct investments on the productivity of companies from the recipient country economy.

As for the second differentiation, there are recent studies (Damijan et al., 2003, Sinani, Meyer, 2004) which use aggregated data on the company level, whereas older studies (Blomström, Persson, 1983, Kokko, 1994) tend to use aggregated data on the industry level. Recent economy analysis also uses panel data more often than cross-section data. The selection of existing data on the level of the industry is used when there is no access to the company data. For example, China does not publish any data on the level of the company on a regular basis, which is why the panel analysis needs to be founded on aggregated data on the level of the industry (Tian et al., 2004).

Since the productivity of recipient companies of foreign direct investments may register an improvement not only because of the impact of foreign direct investments, but also as an effect of conjugated action of foreign direct investments with other specific factors of each country and each economy. This is a question of the education level of work force, the investments in the research – development field, the quality of infrastructure and other characteristics of the sector taken into consideration, such as the level of concentration corresponding to the respective industry.

Following these empirical studies, different results were reached. Kumar (1996), intending to emphasize in his empirical study the impact of foreign direct investments on the companies productivity, reaches the conclusion that introducing new technologies had an effect on the companies productivity made visible only after a longer period of time, which leads to another conclusion regarding the fact that time series used in order to emphasize this correlation may not always reflect the truth. Moreover, before any benefic effect on the productivity is made visible, there is likely for the autochthonous companies to suffer due to an increase of market competition because of which some companies with a lower efficiency may need to refer to specific resources in order to perform investments that

are more efficient (Blomström, 1999). Local companies previously without any competitors will need to become more efficient in order to keep their market quota, leading to the development of the entire sector efficiency.

In general, the studies made on a microeconomic level, find the investment of foreign capital in the autochthonous companies with mixed capital, as well as their productivity under a positive correlation. Spillover effects for local companies which are not involved in a joint-venture partnership with foreign companies are very weak ones, especially in those countries which are passing through the development process (Blomström, 1999), Saggi and Kumar (1996). As for the developed countries, there are studies which identify positive spillover effects, such as Mexic, Uruguay or Indonesia (Kokko, 1994, Blomström,1994, Sjöholm, 1999), whilst Haddad and Harrison (1993), as well as Aitken and Harrison (1991), find limited or even inexistent spillover effects for Morocco or Venezuela.

The empirical studies emphasizing the horizontal spillover effects, especially for autochthonous companies that are in a direct competition with the subsidiary branches of multinational companies, reach the conclusion that these are very rare cases, except the ones already existing between the companies operating in different sectors of activity (Saggi, OECD, 2002).

Foreign direct investments generate spillover effects, leading to an economic development only in certain contexts, here including the existence of *an efficient learning system* (Borensztein, 1998, Engelbrecht, 1997, OECD, 2002), *an efficient income system* (Blomström, 1994), existence of *developed financial markets* (Alfaro, 2000), *the degree of commerce opening* (Balasubramanyam, 1996). Other factors that have a positive influence on the dimension of spillover effects are the following:

- The autochthonous competitive frame;
- The characteristics of the labor market from the host country;
- The technological capacities or the absorbing capacity of autochthonous companies;
- The technological gap between the multinational companies and the autochthonous ones, the complementarity between the foreign technologies and the local ones;
- The nature of foreign direct investments;
- The characteristics and motivations of foreign investors.

On the level of Romanian companies, up until now there were not many empirical studies made in order to prove the positive correlation between foreign direct investments and the productivity. On the other hand, the only existing studies were concentrated on the companies from the processing industries with the corresponding data from 1998 (Boşcaiu et al., 2000).

2.2.2. The impact on innovation, exports of industry and of human capital inside the host-country economy

The foreign direct investments may seem to substitute the local activities of research and development, and consequently of innovation, as the company receiving the technology becomes a connection point between the global subsidiary branches network of the multinational company, subject to decision on a central basis. Multinational companies centralize the activities of research and development on the level of the host-company and the local

activity of research and development corresponding to the countries in which subsidiary branches are located is taken over only if it corresponds to the global strategy corresponding to the level of the multinational company (Kumar, 1996). This situation slows down the process of technology transfer inside the host countries.

Bernstein and Mohnen (1998) state that autochthonous companies may benefit of an increase of the innovation process precisely because of the fact that the presence of subsidiary branches of multinational companies leads to a tighter competitive frame and consequently to stimulating the local companies to innovate in order to remain competitive on the market.

The impact on the exports of industry inside the host-country economy is also highly debated and empirically studied by economists. The most distinguishable effects of stimulating the exports generated by the foreign direct investments and the operations of multinational companies inside the states of implantation, consequently inside the countries passing through the development process or with a transition economy, are found in the sector of processing industry. This is the field in which, along the 1970's and the 1980's, the competition based on costs corresponding to some goods more and more standardized, the convergence of consumption models along with decrease of transport expenses called upon the widening of the sphere of internationalizing strategies of the firms. The important oligopoly companies from the car-manufacturing industry and the electronic industry made the first move towards combining the generated advantages of scale economies with the ones resulting from the organization on regional or even global basis of some networks of suppliers with lower costs and belonging to countries passing through the development process.

The key role of multinational companies regarding the stimulation of product exports corresponding to the receiving states of foreign direct investments is put in a concrete form by establishing from the very beginning some type of production operations having commerce as a goal. A second method by which foreign direct investments stimulate the exports of the host country is an indirect one, by means of the impact generated on the level of local companies, as suppliers of production inputs for the subsidiary branches of the foreign company. The respective companies thus become indirect export agents or even direct export agents in the situation in which different multinational companies facilitate contact with other subsidiary branches in their activity field, situated in host-countries or in third party markets. There is also the possibility that this kind of productive facilities oriented towards the export may not lead to the network development with the local firms, creating enclaves inside the host-economy.

The impact of foreign direct investments and of foreign companies operations on the exports of the host country sometimes is very significant. The other types of effects resulted from production internationalization may be best evaluated through an individual approach, each country representing different characteristics and a different position as a recipient of foreign direct investments.

The impact on the human capital is also obvious and leads to the increase of general production of companies. The operations effects corresponding to the subsidiary branches of foreign companies on the work

force inside the host-countries depend on numerous factors, such as the motivation and type of investment that is closely connected to the strategy of internationalization of the investing company. The local companies may benefit from the existence on the market of a work force that is trained highly and proficiently by the already existing multinational companies. On their turn, the foreign companies may benefit of employees that have useful information about the market.

The most important effects generated by the presence of subsidiary branches of multinational companies can be grouped in three categories, such as *generating new jobs, increasing the quality of work force and ameliorating the quality of* work force.

It is very difficult to draw up a balance of increases and reduction of the number of jobs generated by foreign direct investments of the multinational companies. Moreover, the situation varies along the periods. A short-term reduction of the available jobs may be counteracted by long-term effects regarding the economic development stimulated by the foreign direct investments that is equivalent to an increase of available jobs on the market. A very important specification is that *the net impact as to creating or cutting up the number of jobs by means of the activity performed by the transnational firms in an economy is not that important so that it exerts constraints on the macroeconomic management in those host-*countries. Statistics showing a clear image regarding the role of foreign companies in generating new jobs are generally missing.

Information offered by UNCTAD[4] (*United Nations Conference on Trade and Development*) indicate on a global level a reduced dimension of manpower taken over by the foreign companies, an increasing, but slow evolution of this one, as well as an increase rhythm lower to the one registered by other indexes of international production. This is why, from approximately 19 millions of available jobs in 1982, the subsidiary branches of foreign companies hired little over 24 millions of persons in 1990, reaching a value of over 57 millions in 2004. Between 1990 and 2004, the increase of available jobs inside the subsidiary branches of foreign companies was around 134.8%, the increase of global entries generated by the foreign direct investments was of 211 %, and the evolution of foreign total assets corresponding to the subsidiary branches of foreign companies was of 506%. The number of indirect jobs created by the transnational companies was higher than the number of direct jobs corresponding to the situations in which the development of a relationship with the local suppliers of goods and services was initiated.

With reference to the second type of effects, *the foreign companies finance the qualification increase of work force from the recipient economy in a greater extent than the local ones* in order to ensure that the transferred technologies are efficiently used. The decision to invest in more complex training models depends on the companies' expectations regarding future incomes, on the period in accordance with which they establish a functioning pattern, as well as on the level of the market competition. A very important aspect is the level of training itself that is made available through the internal education system.

At last, *work force directly designated by the subsidiary branches of the foreign companies is paid better and benefits of better conditions of work than the one hired by local companies*. If we refer to other factors than remuneration, the conditions of work and

employment standards are generally no less favorable than the local ones compared to the subsidiary branches of the foreign companies.

The interests of one particular country regarding the foreign direct investments involves the enhancement of certain types of investments, respectively of the ones corresponding to the activities with a high value added tax, the ones that generate exports and the greenfield ones which imply a complex and more thorough transfer of economic resources. All these categories of investments first imply the involvement of foreign investors in providing a superior qualification of work force, as well as a net positive contribution regarding the number of available jobs. Therefore, drawing these categories of investments will contribute to the provision of benefic effects regarding the work force. On the other hand, there needs to be specified the fact that state institutions need to ensure an adequate educational level, on all the three levels, a process found in a critical phase at the present moment, having the deterioration of training qualification of manpower as a complex consequence.

2.3. The impact of foreign direct investments on labor productivity. Empirical study on countries from Central and Eastern Europe

Foreign direct investments have a series of complex effects on the recipient economic systems, both on the real sector and the nominal sector, as well as on the level of *institutional quality,* of „organizational culture", of quality of the market mechanisms and of the functioning method of the public authority system, etc.

Systematically, on the level of impact exerted on the internal labor productivity we mention the following effects:

- Foreign direct investments contribute to the provision of technological and financial resources in favor of the recipient economy;
- Foreign direct investments ensure *a conceptual transfer,* organizing systems and optimization of the productive processes;
- Foreign direct investments also recast, at least on the microeconomic level, the „organizational culture" of the autochthonous entities to which it contributes/of newly created entities with diffusion effects on the rest of the economic subjects;
- Foreign direct investments can contribute to the reduction of discrepancies between the sectoriale labor productivity to the extent it is performed in an uniform manner (otherwise, the recipient economy can be described through the productivity dynamics as a bi-sectoriale economy with a superior productivity sector in which foreign direct investments have reached a critical threshold and an autochthonous sector of low productivity made of autochthonous economic subjects).

As a formula:

$$\sum_{i=1}^{N} \lambda_{ti} = \sum_{i=1}^{N} \lambda_{ti} (isd_{ti}; I_{ti}; S_{ti}; \varepsilon_{ti})$$

where for a recipient economy of foreign direct investments made of *N* sectors, the productivity of labour is a function of sectorial foreign direct investments flows *isd,* an index of internal hard factors (the degree of material and financial resources and associated costs, human capital, production structures, etc. -*I*), an index of soft factors

(cultural paradigm and institutional quality and market mechanism -*S*) as well as of exogenous shocks – sole periods or multi-periods - ε .

In order to estimate the empirical connections between the dynamics of foreign direct investments and their exerted impact on the variations occurred on the productivity level of labour we suggest an empirical analysis based upon the regressions applied on a set of pool data. Following the data availability, the period of analysis taken into account was 2000-2006. There were 10 states taken into consideration, all from the Central and Eastern Europe, five of them also members of the European Union (UE-27).

The economic systems included in the sample are:

Economic	Symbol
Albania	alb
Bosnia	bsn
Croatia	cro
Czech Republic	cze
Hungary	hun
Macedonia	mac
Poland	pol
Romania	rom
Slovenia	ser
Slovakia	slo
Turkey	tky

The data was processed based on the information offered by the Central Banks of the countries which were taken into account, on the statistical data offered by Eurostat, UNCTAD and database of IndexMundi.

The general formula of a regression based upon the pool data is:

$$Y_{it=}\alpha + X'_{it} \times \beta_{it} + \delta_i + \gamma_t + \varepsilon_{it} \qquad (1)$$

where *Y* is the vector of endogenous variables (they estimate the dynamics of foreign direct investments), *X* is the vector of exogenous variables (*index of opacity*), ε_{it} represents the errors of the estimation i = 1, 2, …, *M* transversal data observed for t = 1, 2, …, *T* periods of observation. α represents the global constant of the mode whereas the parameters δ_i, γ_t represent the specific transversal or periodic effects (*fixed or random effects*). The estimation of the model implies an application of corresponding restrictions on parameters β . The data is balanced in the way that unavailable observations are eliminated, obtaining a more concrete representation of the results.

For the chosen models, a simplified alternative of the general form was taken into account, but it does not include the fixed or random effects, or any global constant:

$$Y_{it=}X'_{it} \times \beta + \varepsilon_{it} \qquad (2)$$

A special observation needs to be made regarding the residual variables. For their estimation, a heteroscedasticity was taken into account specific to each period which allows a non-uniform variance for the observation periods corresponding to each residual variable (it is supposed that there are no transversal connections between the residual variables or the inter-period ones):

$$E\left(\varepsilon_{it}\varepsilon_{jt} \mid X^*_t\right) = \sigma^2_t \qquad (3)$$

$$E\left(\varepsilon_{is}\varepsilon_{jt} \mid X^*_t\right) = 0 \qquad (4)$$

for all values *i, j, s, t* cu $s \neq t$. X^*_t contains all values of X_t and, if the estimation is made taking into account the fixed effects, as the parameters which describe the adequate transversal or periodic effects (δ, γ_t).

Using the vectors of transversal residual variables can be added:

$$E\left(\varepsilon_{it}\varepsilon_{jt} \mid X^*_t\right) = \sigma^2_t \times I_M \qquad (5)$$

where I_M is an identity matrix of *M* elements.

A proxy of the labour productivity increase defined as it follows represents the endogenous variable:

$$\lambda_t = gdp_t\% - \left[\frac{100-u_t\%}{100-u_{t-1}\%}\times 100 - 100\right] \quad (6)$$

where $gdp_t\%$ represents the output increase rate (variance of GDP) and $u_t\%$ is the unemployment rate.

The obtained results for a period of analysis equivalent to 2000-2006 for the economic systems series taken into account are the following:

Dependent variable: Real productivity of labor (%;-*proxy*)
Method: Pooled EGLS (Period SUR)
Period of observation: 2000 2006
Included observations: 6
Cross-sections included: 11
Total pool (balanced) observations included: 66
Standard errors and covariances:Period SUR (PCSE)

Variable	Coefficient	Standard error	t-Statistic	Probability
ALB	0.972886	0.005370	181.1758	0.0000
BSN	1.152356	0.007771	148.2963	0.0000
CRO	0.436095	0.009064	48.11310	0.0000
CZE	0.545788	0.007566	72.13569	0.0000
HUN	0.467347	0.005044	92.65363	0.0000
MAC	0.564406	0.017050	33.10213	0.0000
POL	0.280968	0.003550	79.15202	0.0000
ROM	0.499401	0.007393	67.55442	0.0000
SLV	0.506444	0.010733	47.18759	0.0000
SLO	0.436902	0.007318	59.70329	0.0000
TKY	0.747937	0.009956	75.12709	0.0000
	Ponderated statistics			
R^2	0.443558	Mean dependent variable		4.966130
Adjusted R^2	0.342386	S.D. dependent variable		3.139781
S.E of regression	2.546155	Sum squared residual errors		356.5597
F-statistic	4.384225	Durbin-Watson stat		2.439024
Prob.(F-statistic)	0.000156			
	Unponderated statistics			
R^2	0.252804	Mean dependent variable		4.309066
Sum squared residual errors	414.4934	Durbin-Watson stat		2.534335

For testing the model quality, it is highly recommended to use the stationarity tests for ordinary residual variables as it follows:

Exogenuos variables: Individual effects

Newey-West bandwidth selection using Quadratic Spectral kernel

Method	Statistics	Prob.**	Observations Cross-section	Obs
***Nule hypotesis*: Unit roots (assuming common *unit root* processes)**				
Levin, Lin & Chu t*	-7.43065	0.0000	11	55
Breitung t-stat	-2.54197	0.0055	11	44
***Nule hypotesis*: Unit roots (assuming common *unit root* processes)**				
Im, Pesaran and Shin W-stat	-2.50695	0.0061	11	55
ADF - Fisher Chi-square	45.9164	0.0020	11	55
PP - Fisher Chi-square	59.8328	0.0000	11	55
***Nule hypotesis*: There are no unit roots (assuming common *unit root* processes)**				
Hadri Z-stat	9.98683	0.0000	11	66

** Probabilities for Fisher tests are computed assuming a *Chi-square* asymptotic distribution. All the other tests have a normal asymptotic distribution.

These results suggest that on the unitary roots level one can be identified certain individual unit root processes and, consequently, there exist certain systematic deviations corresponding to the stipulations made based on this empirical model. This result is not surprising due to the reduced dimension of the analysis series and of the sole criterion character of the model. Durbin - Watson test indicates the presence of certain auto-correlations to the right of the residual values. In general, the quality of the model can be described as satisfactory and allows the elaboration of preliminary conclusions.

These are the following:

- For all economic systems taken into account there is a possible positive effect of labour productivity development which can be identified under the impact of net foreign direct investments (resulted from the significant statistical association between these variables).
- The above-mentioned association is non-uniform for the observations set. There can be identified the fact that its maximal levels are registered in countries such as Albania or Bosnia, whereas for Macedonia or Slovakia and Slovenia the intensity of connection between the dependent and exogenous variable is reduced.
- The connections set between the proxy variable for the global productivity of labour and the foreign direct investments vary along the period of analysis under the effect of modifications both on the level of other determining variables and inside the recipient structure of them.

The advanced analysis has a series of limits out of which we state:

- The insufficient volume of data and the sensitivity of connections taken into account for the exogenous shocks.
- The absence of control variables which can explain the difference between the economies taken into consideration both under the report of supply with factors of production, and

the degree of exogenous technology compared to the foreign direct investments.

- The absence of structural analysis that can point to the existing distinctions between various components of the recipient economic system, with reference to the absorption capacity.

In spite of these limits, we believe that advanced analysis allows the provision of some empirical evidences in favor of sustaining a positive impact on the global productivity exerted by financial and technological resources transfer, as well as the associated models of the organizational culture specific to the foreign direct investments.

4. Conclusions

The fast technological progress gives rise on a global level to some important changes with reference to the industrial activity, and the countries passing through a development process must acknowledge these changes and must take measures in order to reach the development of technological capacities. The isolation of economies from the international commerce and from the international investments is extremely expensive. An important consequence of liberalization and technological modifications is the fact that technology and capital have become extremely mobile and the foreign direct investments have a key role in the mobility of resources. In addition to the productive resources transfer, the role that the investments of foreign companies play is shown through the activity organization in a different manner of the traditional one, as well as the correlation of production and services with other sources of advantageous technological capacities.

There is no doubt that foreign direct investments are extremely important in generating spillovers which improve the performance of the autochthonous companies by the technology transfers, a high productivity of labour, intensity of investments and exports, the qualification of manpower. In addition to the efforts of the autochthonous companies to assimilate the new technologies in order to improve their productivity, it is necessary to be a national strategy or policy for stimulating the technological development in addition to the foreign direct investments and the technologies and managerial capacities of them.

Global empirical studies, which quantify the impact of foreign direct investments on the productivity, had some positive, significant or limited, but also negative results, depending on the industry or economy taken into account. Even though they are numerous on an international level, the studies in Romania are just a few, because of the fact that the data are not available on a national level.

In this study, we have tried to quantify the impact of foreign direct investments in Romania, as well as in other 10 countries from the Central and Eastern Europe with reference to the impact of labour productivity. Such a study is very necessary because it takes into consideration a wider series of countries, the defined region never being taken into account previously in other empirical studies.

The main conclusions have demonstrated in an empirical manner the positive correlation between the foreign direct investments and the labour productivity in all countries taken into account, with some discrepancies concerning the intensity of this correlation. Therefore, we can state that in countries such as Albania or Bosnia the level of correlation is the maximum one; in countries such as Turkey, Macedonia, the Czech Republic and Romania the level is medium and low in countries such as Slovenia or Poland. Among the possible differentiation factors, we mention the following: the unequal degree of structural, institutional and functional development between the economies taken into account; unequal structures of production; unequal degree and mobility with different level of imperfections and corresponding training of manpower; the specific characteristics and the degree of cultural divergence between the origin countries and the host-countries with reference to the foreign direct investments.

Notes

(1) See Blomström, 1999.

(2) The dictionaries have the following definition for "arms-length" transactions: those transactions that are performed and accomplished as if there is no other kind of connection between the involved bodies, besides the business relationship, thus avoiding any kind of interest conflict (see "Dictionary of Finance and Investment Terms, Third Edition, New York, Barron's Educational Series, Inc., 1991).

(3) From English – transfer of technology.

(4) See UNCTAD, World Investment Report 2005.

References

Aitken, B.J., Harrison, A., „Are There Spillovers From Foreign Direct Investment? Evidence from Panel Data for Venezuela", Mimeo, *MIT and the World Bank*, 1999

Aitken, B.J., Harrison, A. „Do Domestic Firms Benefit from Direct Foreign Investment? Evidence from Venezuela", *The American Economic Review,* 89 (3), 1999, pp. 605-618

Alfaro, L., Chanda, A., Kalemli-Ozcan, S., Sayek, S. „FDI and Economic Growth: The Role of Local Financial Markets", Harvard Business School, *Working Paper,* 01-083, 2000

Aslanoglu, E., „Spillover Effects of Foreign Direct Investments on Turkish Manufacturing Industry", *Journal of International Development,* 12(8), 2000, pp. 1111-1130

Balasubramanyam, V.N., Salisu, M., Sapsford, D. „Foreign Direct Investment and Growth in EP and IS Countries", *Economic Journal*, 106, pp. 92-105

Bell, M. *Learning and accumulation of industrial and technological capability in developing countries*, în: Fransman, M., King, K. (Eds.) (1984). *Technological capacity in the Third Word*, Londra, Macmillan, pp. 187-209

Bell, M., Albu, M. „Knowledge systems and technological dynamism in industrial clusters in developing countries", *World Development*, v. 27, n. 9, pp.1715-1734

Bell, M., Pavitt, K. „Accumulating technological capability in developing countries", *Proceedings of the World Bank Annual Conference on Development Economics*, 1992, pp. 257-281

Bernstein, J.I., Mohnen, P. „International R&D Spillovers and Japanese R&D Intensive Sectors", *Journal of International Economics,* 44, 1998, pp. 315-338

Blomström, M. „Foreign Investment and Productive Efficiency: The Case of Mexico, *The Journal of Industrial Economics,* 35(1), 1986, pp. 97-110

Blomström, M., Kokko, A., Zejan, M., „Host Country Competition and Technology Transfer by Multinationals", *Weltwirtschaftliches Archiv,* 1994, pp. 521-33

Blomström, M., Zejan, M. „Why Do Multinational Firms Seek Out Joint Ventures?", *Journal of International Development,* 1991, pp. 53-63

Blomström, M., Globerman, S., Kokko, A., „The Determinants of Host Country Spillovers from Foreign Direct Investment: Review and Synthesis of the Literature", The European Institute of Japanese Studies (EIJS), *Working Paper No. 76*, 1999, Stockholm

Blomström, M., Sjöholm, A., „*Te*chnology Transfer and Spillovers: Does Local Participation with Multinationals Matter?", *European Economic Review*, 1999, pp. 915-923

Blomström, M., Konan, D., Lipsey, R., „FDI in the Restructuring of the Japanese Economy", The European Institute of Japanese Studies (EIJS), *Working Paper No. 91*, 2000, Stockholm

Blomström, M., Persson, H., „Foreign Investment and Spillover Efficiency in an Underdeveloped Economy: Evidence from the Mexican Manufacturing Industry", *World Development,* 11(6), 1983, pp. 493-503

Borensztein, E., DeGregorio, J., Lee, J. „How does foreign investment affect growth?", *Journal of International Economics* 45, 1998

Bosco, M., „Does FDI Contribute to Technological Spillovers and Growth? A Panel Data of Hungarian Firms", *Transnational Corporations,* 10(1), 2001, pp. 43-68

Boșcaiu V., Liușnea, D., Munteanu, C., Pușcoi, L., „Impactul comerțului exterior și investițiilor străine directe asupra productivității în industria prelucrătoare. Cazul României", *Romanian Center for Economic Policies,* 2000

Buckley, P., Clegg, J., Wang, C., „The Impact of Inward FDI on the Performance of Chinese Manufacturing Firms", *Journal of International Business Studies,* 33(4), 2002, pp. 637-655

Cohen, W., Levinthal, D., „Absorptive capacity: a new perspective on learning and innovation", *Administrative Science Quartely*, v.35, n.1, March, 1990, pp. 128-152

Chuang, Y., Lin, C., „Foreign Direct Investment, R&D and Spillover Efficiency: Evidence from Taiwan's Manufacturing Firms", *The Journal of Development Studies*, 35(4), 1999, pp. 117-137

Dahlman, C., Westphal, L. (1982). *Technological effort in industrial development – an interpretative survey of recent research*, în Stewart, F., James, J. (Eds.). The economics of new technology in developing countries, Londra: Frances Pinter, pp. 105-137

Damijan, J., Knell, M., Majcen, B., Rojec, M., „The Role of FDI, R&D Accumulation and Trade in Transferring Technology to Transition Countries: Evidence from Firm Panel Data for Eight Transition Countries", *Economics of Planning,* 27(2), 2003, pp.189-204

Djankov, S., Hoekman, B., „Foreign Investment and Productivity Growth in Czech Enterprises", *The World Bank Economic Review,* 14(1), 2000, pp. 49-64

Engelbrecht, H.J., „International R&D Spillovers, Human Capital and Productivity in OECD Economies: An Empirical Investigation", *European Economic Review,* 41, 1997, pp. 1479-1488

Feinberg, S., Majumdar, S., „Technology Spillovers from Foreign Direct Investment in the Indian Manufacturing Industry", *Journal of International Business Studies,* 32(3), 2001, pp. 423-437

Findlay, R., „Relative Backwardness, Direct Foreign Investment, and the Transfer of Technology: A Simple Dynamic Model", *Quarterly Journal of Economics*, 1978, pp. 1-16

Fransman, M., „Promoting technological capability in the capital goods sector: the case of Singapore", *Research Policy*, Elsevier, vol. 13(1), 1984, pp. 33-54

Haddad, M., Harrison, A., „Are there Positive Spillovers from Direct Foreign Investment?", *Journal of Development Economics*, 1993, pp. 51-74

Haskel, J.E., Pereira, S., Slaughter, M., „Does Inward Foreign Direct Investment Boost the Productivity of Domestic Firms?", *NBER Working Paper No. 8724*, 2002

Kathuria, V., „Liberalization, FDI, and Productivity Spillovers – An Analysis of Indian Manufacturing Firms", *Oxford Economic Papers,* 54(4), 2002, pp. 688-718

Katz, J.M., „Importación de tecnología, aprendizaje e industrialización dependiente", *Mexico: Fundo de Cultura Económica*, 1976, pp. 52-75

Katz, J.M. (1985). *Domestic technological innovations and dynamic comparative advantages: further reflections on a comparative care-study program*, în: Rosenberg, N., Frishtak, C. (Ed.). International Technology Transfer: concepts, measures and comparisons, Londra: Praeger, pp. 127-166

Katz, J.M. (1987). *Domestic technological generation in LDCs: a review of research finding*, în Technology generation in Latin American manufacturing industries, Londra, Macmillan, pp. 13-55

Katz, J.M., Bercovich, N.A. (1993). *National systems of innovation supporting technical advance in industry: the case of Argentina*, în: Nelson, R. (Ed.). National

Innovation Systems: a comparative analysis. New York : Oxford University Press, pp. 451-475

Khawar, M., „Productivity and Foreign Direct Investment – Evidence from Mexico", *Journal of Economic Studies,* 30(1), 2003, pp. 66-76

Kinoshita, Y., „R&D and Technology Spillovers through Foreign Direct Investment: Innovation and Absorptive Capacity", *CEPR Discussion Paper No. 2775*, 2000

Kokko, A., „Technology, Market Characteristics, and Spillovers", *Journal of Development Economics*, 1994, pp. 279-93

Kokko, A., Tansini, R., Zejan, M., „Local Technological Capability and Productivity Spillovers from FDI in the Uruguayan Manufacturing Sector", *The Journal of Development Studies,* 32(4), 1996, pp. 602-611

Konings, K., „The Effects of Direct Foreign Investment on Domestic Firms: Evidence from Firm Level Panel Date in Emerging Economies", *CEPR Discussion Paper No. 2586*, 1999

Kumar, N., „Foreign Direct Investments and Technology Transfers in Development: A Perspective on Recent Literature", Institute for New Technologies (INTECH), *Discussion Paper No. 9606*, The United Nations University, Maastricht, The Netherlands, 1996

Lall, S., „Policies for Industrial Competitiveness in Developing Countries: Learning from Asia", *Report prepared for the Commonwealth Secretariat*, Oxford,1997

Lall, S. (2003). *Foreign Direct Investment, Technology Development and Competitiveness: Issues and Evidence*, in S. Lall and S. Urata (eds.), Competitiveness, FDI and Technological Activity in East Asia, Cheltenham: Edward Elgar, pp. 12-56

Lall, S., Narula, R., „FDI and its role in economic development: Do we need a new agenda?", *Research Memoranda No. 019*, Maastricht: MERIT, Maastricht Economic Research Institute on Innovation and Technology, 2004

Liu, X., Wang, C., „Does Foreign Direct Investment Facilitate Technological Progress? Evidence from Chinese Industries", *Research Policy,* 32(6), 2003, pp. 945-953

Lutz, S., Talavera, O., „Do Ukrainian Firms Benefit from FDI?", *Economics of Planning,* 37(2), 2004, pp. 77-98

Mansfield, E., Romeo, A., „Technology Transfer to Overseas Subsidiaries by US-based Firms", *Quarterly Journal of Economics,* 95(4), 1980, pp.737-50

Markusen, J.R., „The Boundaries of Multinational Enterprises and the Theory of International Trade", *Journal of Economic Perspectives*, 1995, pp.169-189

Markusen, J.R., Maskus, K., „Discriminating Among Alternative Theories of the Multinational Enterprise", *NBER Working Paper No. 7164*, 1999

Najmabadi F., Lall, S., „Developing industrial technology: lessons for policy and practice", *A World Bank Operations Evaluation Study*, 1995

Rattsø, J., Stokke, H., „Learning and Foreign Technology Spillovers in Thailand: Empirical Evidence on Productivity Dynamics", *Nordic Journal of Political Economy,* 29(1), 2003, pp. 47-66

Sadik, A., Bolbol, A., „Capital Flows, FDI, and Technology Spillovers: Evidence from Arab Countries", *World Development,* 29(12), 2001, pp. 2111-2125

Saggi, K., „Trade, Foreign Direct Investment, and International Technology Transfer: A Survey", *Unpublished Paper*, Department of Economics, Southern Methodist University, USA

Saggi, K., „Foreign Direct Investment, Licensing, and Incentives for Innovation", *Review of International Economics,* 3(2), 1999, pp. 73-87

Sgard, J., „Direct Foreign Investment and Productivity Growth in Hungarian Firms, 1992-1999", *CEPII Working Paper No. 2001-19*, 2001

Sinani, E., Meyer, K., „Spillovers of Technology Transfer from FDI: The Case of Estonia", *Journal of Comparative Economics*, 32(3), 2004, pp. 445-466

Sjöholm, F., „Technology Gap, Competition and Spillovers from Direct Foreign Investment: Evidence from Establishment Data", *Journal of Development Studies,* 36(1), 1999, pp. 53-73

Sjöholm, F., „Productivity Growth in Indonesia: The Role of Regional Characteristics and Direct Foreign Investment", *Economic Development and Cultural Change,* 47(3), 1999, pp. 559- 584

Thuy, L., „Technological Spillovers from Foreign Direct Investment: The Case of Vietnam", *Working Paper*, University of Tokyo, 2005

Tian, X., Lin, S., Lo, V., „Foreign Direct Investment and Economic Performance in Transition Economies: Evidence from China", *Post-Communist Economies,* 16(4), 2004, pp. 497-510

Vahter, P., „The Effect of Foreign Direct Investment on Labor Productivity: Evidence from Estonia and Slovenia", University of Tartu Faculty of Economics and Business Administration, *Working Paper No. 32*, 2004

Yudaeva, K., Kozlov, K., Melentieva, N., Ponomareva, N., „Does Foreign Ownership Matter? The Russian Experience", *Economics of Transition,* 11(3), 2003, pp. 383-409

Zhu, G., Tan, K., „Foreign Direct Investment and Labor Productivity: New Evidence from China as the Host", *Thunderbird International Business Review* 2wAA,42(5), 2000, pp. 507-528

Minority Shareholders' Protection: the Romanian Experience

Victor Dragotă
Anamaria Ciobanu
Delia Cataramă
Andreea Semenescu
Carmen Maria Lăcătuș
Academy of Economic Studies, Bucharest

Abstract. *This paper performs an analysis of the regulation regarding minority shareholders protection in Romania. The paper estimates the level for minority shareholders protection based on the Pistor, Raiser and Gelfer (2000) index during the period 1996-2008. This index improved from 13 (January 1996) to 17.25 (March 2008) having a maximum value of 17.75 during May 2002- November 2006.*

Key words: corporate governance; minority shareholders protection; Romania.

JEL Codes: G34.
REL Codes: 11B.

1. Introduction

Since the Anti-Communist Revolutions, from the end of twentieth century, the Eastern Europe emergent markets are in a continuous transition process to functional market economies. Although most of these countries became members of the European Union, the capital markets regulation still remains a main issue for the capital markets development.

The Romanian experience can be interesting for at least two reasons: i) no knowledge of the market economy for a very long period of time (after 1938) and ii) no economic freedom or even relationships with the market based economies for this period. The result of this study can be useful for investors, as they will be able to find out whether their rights as minority shareholders are protected by Romanian regulators. This result might prove to be very important in the context of Romania's accession within the European Union, with constantly growing opportunities and no barriers for capital flows within EU.

Most of the countries in transition adopted organizational structures inspired by the ones in the developed countries. Anecdotally, the Romanian over the counter market is called RASDAQ, from NASDAQ. Yet, the implementation mechanism was not always brought into practice. As a result, a heterogeneous system has been created, which gathered structures and institutions some of them typical to the market economy, others of the state-owned economy.

Historically, in December 1989, the time of the Romanian anti-communist revolution, individuals were not familiar with market economy mechanisms. This state was due to more than fifty years of a non-market economy. In fact, before the Second World War, Romania was under a royal (1938-1940) and, after that, a fascist (1940-1941) dictatorship. Between 1941 and 1945, Romania fought in the Second World War, and beginning with 1945 was under the influence of the Union of Soviet Socialist Republics. During this period information related to anything that was associated with the market economy doctrine was practically unavailable to the majority of the Romanian population. Moreover, maybe in connection with this state, even after 1989, the mechanisms of the market economy were not enforced soon. Hence, there is an opportunity for studying the evolution of regulations related to corporate governance, especially to minority shareholders protection in a country that had no recent history of a market economy. The results can be analysed comparatively to Gillies et al. (2002) for Estonia. However, the situation in Romania is very different relative to Estonia. For instance, if Estonia benefited from the Finnish television network from 40 miles away, Romania's neighbours were only communist countries – USSR, Hungary, Yugoslavia, and Bulgaria so these television networks were under the Communist doctrine, too.

Historically, the Romanian stock market exchange activity began in 1839, when trade markets were open. On January

1st 1882 Bucharest Stock Exchange Market (BSE) was officially opened, and after one week the stock market quotations were published in the Romanian Official Journal. During its existence the stock market's activity was influenced by the socio-political events of the time (the 1907 revolt, the Balkan war in 1912-1913), but it was closed only during the First World War. The activity of the stock market is interrupted in 1948 following nationalization. At the moment of its closure, there were listed shares of 93 companies and 77 fixed income assets (bonds) (www.kmarket.ro, section "Documentaries").

After a break of almost 50 years, the BSE was reopened in 1995, the first day of trading being November 20th 1995. BSE is a share-owned company and was set up by the decision of the National Securities Commission (NSC). Presently, it offers the possibility to invest in equity securities (shares and allocation rights), debt securities (municipal bonds and corporate bonds), securities issued by mutual funds (shares and fund units), and futures contracts. Shares, rights and corporate bonds are divided in three tiers, depending on how they fulfil the NSC requirements (www.kmarket.ro, section "Presentation. History"). Currently, at the first tier there are 21 securities listed, at the second 38 securities and at the third one security (www.kmarket.ro, section "Listed shares").

Several indices are computed by the BSE. The most important are BET, which includes the most liquid 10 shares from the first tier, and BET-COMPOZIT, which include all the shares from the first and the second tier. Some descriptive statistics for the BET Index evolution are presented in Figure 1.

In this figure descriptive statistics are provided for the series of nominal and real return on BET. The data regarding the BET index was provided by the Bucharest Stock Exchange site (*www.bvb.ro*). Monthly data for the period 1997 - 2007 was used, taking into account that the BET index was computed starting with July 1997. In this study the index value has been considered as the last working day of the month. The index monthly return was computed according to the relationship:

$$\text{Return on Index} = \frac{\text{Index at the end of the month - Index at the beginning of the month}}{\text{Index at the beginning of the month}}$$

As the studied period was characterized by high inflation, an analysis of the real monthly return was also performed. Data on the monthly inflation rate was provided by the Romanian National Institute of Statistics.

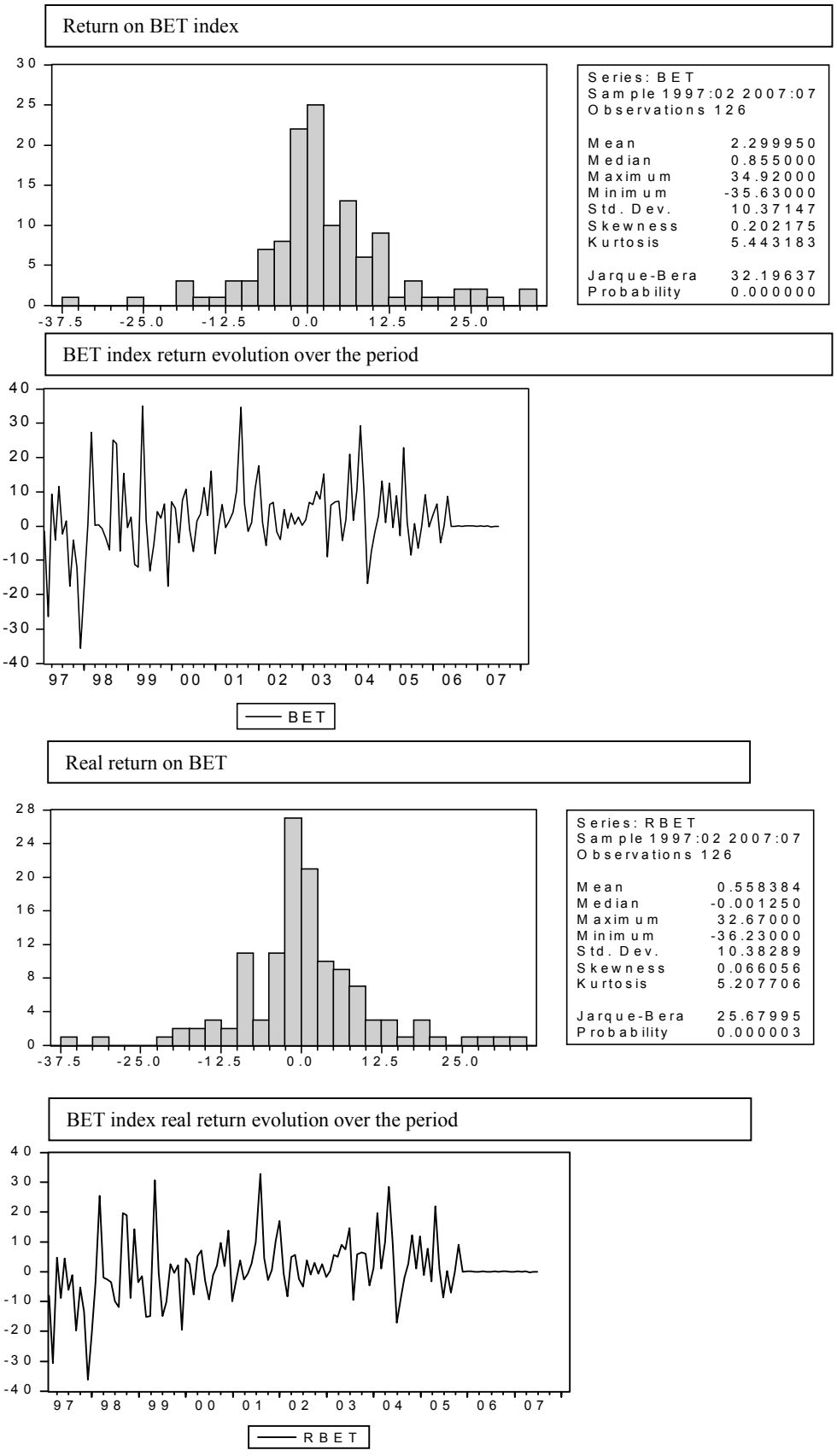

Figure 1. *Descriptive statistics for BET Romanian market index (1997-2007)*

In the development period of the Romanian capital market (before 2002), the most important events were: (i) setting up the market for unlisted securities traded through the system of the stock market (1999); (ii) the listing of the five financial investment companies - SIF (1999); (iii) the trade of the first deposit certificates issued by a bank and the first issue of corporate bonds (listed on RASDAQ in 2000); (iv) the first transaction with derivatives at the Sibiu Monetary – Financial and Commodities Exchange (2000); (v) the first listing of municipal bonds at the Bucharest Stock Market Exchange (2001) (www.kmarket.ro, section "Documentaries and analysis").

The year 2002 brought changes for the capital market regulations that created the framework for introducing a lot of innovations: rights' transactions, options on shares, futures on stock market indices, short sales etc. Among the effects of the new regulations that can be mentioned are: raising the standards of transparency, investors' protection, improving the activity of the market's intermediaries and the growth of the market's activity. The change of investors' perception made the capital market a viable alternative to invest, 2002 being a year of growth in shares' quotations and as a result in indices.

During 2003-2007 BSE had an encouraging evolution, which could be explained by the increase of foreign investors' funds flow as an effect of Romania's accession to the European Union, and by the development of large companies and also by several mass privatizations. However, some studies related to Romanian capital market questioned the market efficiency (see, for instance, Dragotă, Mitrică, 2004).

The development of capital markets seems to depend, in a great measure, on ensuring the conditions for information disclosure and also on setting up the framework which would encourage the minority shareholders to invest. Therefore, studying minority shareholders' protection became a frequent subject of analysis. In the existing literature, some issues can be mentioned: (i) the analysis of minority shareholders' protection in different countries (La Porta, Lopez-de-Silanes, Shleifer, and Vishny, 1998, 2000; Pajuste, 2002; Klapper, Laeven, Love, 2006); (ii) the impact of minority shareholders' protection on capital market development (Modigliani, Perotti, 1997, Pagano, Volpin, 2006); (iii) the estimation of the optimum control level and its impact on company value (Butz, 1994, Pagano, Roell, 1998, Claessens, Djankov, Fan, Lang, 2002, Edwards, Weichenrieder, 2004)[1]; (iv) the protection of the investors and the effects on company value (Yarrow, 1985, Zingales, 1994, La Porta, Lopez-de-Silanes, Shleifer, Vishny, 2002, Buysschaert, Deloof, Jegers, 2003) etc.

Modigliani and Perotti (1997) consider that the essential conditions for capital market development are: (i) the existence of proper legislation; (ii) the appropriate enforcement of the law and (iii) the guarantee of free trade. The absence of adequate legislation or of an efficient implementation mechanism generates a low

confidence in capital markets and weak efficiency, as a result of restricted transactions. Inadequate legislation or inefficient enforcement mechanisms lead to a low protection of minority shareholders, thus making possible the existence of higher control premiums. The conclusions of Modigliani and Perotti (1997) are similar to Nenova (2003), revealing that lower control premiums are connected to economies with developed capital markets, while higher levels are specific to the bank-oriented countries. Hence, Romania, having a small capital market[(2)], may be included in the class of countries with low protection. In this context, Dragotă et al. (2007) estimated a control premium for Romanian listed shares in the period 2002-2004, with a median of 44.62% and an average of 82.44%.

It has to be emphasized that it is not only the institutional factors that have a dominant influence on the capital market, but the company financial policies and the corporate governance, too. Thus, in some countries, even if the legislation is more relaxed, the shareholders benefit from an adequate treatment because of the custom of the company to acquire financial resources through the capital market (Albuquerque, Wang, 2005).

Analyzing the influence of minority shareholders' protection on the development of the capital market, Pagano and Volpin (2006) build a model used to prove the existence of a bidirectional relationship between the variable reflecting minority shareholders protection, namely La Porta et al. (1998) index, and variables reflecting capital market development. The conclusion is that the improvement of minority shareholders' protection leads to capital market development and that a developed capital market determines the efficiency of the mechanisms ensuring the minority shareholders' protection.

The issue of corporate governance for Romania became a field of interest in the past few years (Mallin, 2000, Pajuste, 2002, Hashi, 2004, Claessens, Tzioumis, 2006, Dragotă, Semenescu, Pele, Lipară, 2008 etc.). The seminal literature dealing with the protection of the minority shareholders in ex Communist countries is represented by Pistor et al. (2000) and Pajuste (2002). We can mention that in Romania, companies with major shareholders owning a large percentage of the capital set dividend ratios lower than the others (Dragotă, 2006). The average stake owned by the major shareholder is very large (the average first shareholder control percentage is 53%, and for the second is 16.6%). Also, the control premium for the companies listed on the Romanian capital market is higher than the world average (Dragotă et al., 2007).

This study analyzes the evolution of minority shareholders' protection regulations measured through the Pistor, Reiser and Gelfer (2000) index applied to the Romanian capital market. The rest of this paper is organized as follows. The evolution of regulation in the field of capital markets over the period 1996-2008 and the way it was reflected in the index quantifying the minority shareholders protection in Romania is described in Section 2. Section 3 concludes the study.

2. Minority shareholders protection in Romania

The measurement of the minority shareholders protection may be completed by construction of some indices like the one of La Porta et al. (1998), Pistor et al. (2000), Lele and Siems (2007), etc. A specific index for the East European countries, the ex-communist ones, is the one recommended by Pistor et al. (2000).

The present Romanian capital market is relatively young and the legislation has had a dynamic evolution. The main legislative events that influenced the protection of minority shareholders' rights are presented in Appendix 1. In order to reveal the evolution of Romanian legislation related to minority shareholders' protection, Pistor et al. index (2000) was estimated. This index was also used by Pajuste (2002) in order to analyse corporate governance issues behind stock market performance in nine Central and Eastern European (CEE) countries, over the period June 1994-June 2001.

Comparatively to the La Porta et al. (1998) index, the Pistor et al. index (2000) was considered because of the more detailed analysis of legislation concerning minority shareholders' protection[3]. As a result, small changes of the regulations in force are reflected in the index level.

The legal index introduced by Pistor et al. (2000) is based on the sum of three indices, in their turn explained by some market characteristics as follows: (1) *Voice*, which shows the minority shareholders power to be informed and to exercise their right to vote. This index quantifies the voting power of minority shareholders, the easiness of exercising their right to vote and of subscribing to the new shares issues; (2) *Exit*, which is a variable showing how easy the minority shareholders may liquidate their positions at the right price if they consider their rights are not fulfilled; (3) *Stock Market Integrity index*, which is a variable defining the capital market regulation and the legislative protection of the minority shareholders.

Based on the Pistor et al. (2000) index, a similar analysis for the Romanian legislation for the period 1996-2008 has been performed. The 24 characteristics taken into account in the Pistor et al. (2000) index have been analysed in accordance with the Romanian legal settlements concerning the minority shareholders protection. The index has been computed monthly. The impact of the legislative changes on this index was considered starting the month after they appeared. After analysing the regulations on corporations and capital market (see Appendix 1), the result was 13 points for the legislative index registered in 1996, reaching a maximum of 17.75 points in May 2002, a level which remained the same until the end of 2006 (see Table 1)[4]. The updates of Company Law (Law no. 441/2006) that allow decisions of the Shareholders' Assembly be taken with a quorum of only 1/4 of the shareholders have decreased the index level to 17.25. The issues for which the legislation has registered deficiencies during the entire period of the study are as follows: (i) the right for voting by mail; (ii) the lack of an

obligation to register the shares by a specific date in order to have the right to participate in the Shareholders General Meeting; (iii) the requirement of the qualified majority (at least 3/4) for fundamental decisions, including charter changes, liquidation of companies, sales of major assets; (iv) the existence of the right to transfer the shares without legal, statutory or constitutive documents' restrictions; (v) the obligation that corporate statutes must specify a certain amount of dividends to be paid to shareholders. The cumulative vote; the existence of a minimum limit above which takeover offers are compulsory, the shareholders' register to be kept by an independent company, the right of the shareholders owning less then 10% to invoke the censors' committee , the prohibition of insiders' transactions, the disclosure obligation on transactions which result in the acquisition of a significant percentage of shares. These represent criteria which have been fulfilled over time, the effect being the growth of the index from 13 to 17.75 (until December 2006).

The monthly level of Pistor, Raiser and Gelfer legislative index, estimated for Romanian case in the period Jan. 1996 –March. 2008

Table 1

No.	Year	Quarter	Month	Pistor, Raiser and Gelfer Index	No.	Year	Quarter	Month	Pistor, Raiser and Gelfer Index	No.	Year	Quarter	Month	Pistor, Raiser and Gelfer Index
1	1996	I	Jan.	13	50	2000	I	Feb.	16	99	2004	I	March	17.75
2	1996	I	Feb.	13	51	2000	I	March	16	100	2004	II	Apr.	17.75
3	1996	I	March	13	52	2000	II	Apr.	16	101	2004	II	May	17.75
4	1996	II	Apr.	13	53	2000	II	May	16	102	2004	II	June	17.75
5	1996	II	May	13	54	2000	II	June	16	103	2004	III	July	17.75
6	1996	II	June	14	55	2000	III	July	16	104	2004	III	Aug.	17.75
7	1996	III	July	14	56	2000	III	Aug.	16	105	2004	III	Sept.	17.75
8	1996	III	Aug.	14	57	2000	III	Sept.	16	106	2004	IV	Oct.	17.75
9	1996	III	Sept.	14	58	2000	IV	Oct.	16	107	2004	IV	Nov.	17.75
10	1996	IV	Oct.	14	59	2000	IV	Nov.	16	108	2004	IV	Dec.	17.75
11	1996	IV	Nov.	15	60	2000	IV	Dec.	17	109	2005	I	Jan.	17.75
12	1996	IV	Dec.	15	61	2001	I	Jan.	17	110	2005	I	Feb.	17.75
13	1997	I	Jan.	15	62	2001	I	Feb.	17	111	2005	I	March	17.75
14	1997	I	Feb.	16	63	2001	I	March	16	112	2005	II	Apr.	17.75
15	1997	I	March	16	64	2001	II	Apr.	16	113	2005	II	May	17.75
16	1997	II	Apr.	16	65	2001	II	May	16	114	2005	II	June	17.75
17	1997	II	May	16	66	2001	II	June	16	115	2005	III	July	17.75
18	1997	II	June	16	67	2001	III	July	16	116	2005	III	Aug.	17.75
19	1997	III	July	16	68	2001	III	Aug.	16	117	2005	III	Sept.	17.75
20	1997	III	Aug.	16	69	2001	III	Sept.	16	118	2005	IV	Oct.	17.75
21	1997	III	Sept.	16	70	2001	IV	Oct.	16	119	2005	IV	Nov.	17.75
22	1997	IV	Oct.	16	71	2001	IV	Nov.	16	120	2005	IV	Dec.	17.75
23	1997	IV	Nov.	16	72	2001	IV	Dec.	16	121	2006	I	Jan.	17.75
24	1997	IV	Dec.	16	73	2002	I	Jan.	16	122	2006	I	Feb.	17.75
25	1998	I	Jan.	16	74	2002	I	Feb.	16	123	2006	I	March	17.75
26	1998	I	Feb.	16	75	2002	I	March	16	124	2006	II	Apr.	17.75

No.	Year	Quarter	Month	Pistor, Raiser and Gelfer Index	No.	Year	Quarter	Month	Pistor, Raiser and Gelfer Index	No.	Year	Quarter	Month	Pistor, Raiser and Gelfer Index
27	1998	I	March	16	76	2002	II	Apr.	16	125	2006	II	May	17.75
28	1998	II	Apr.	16	77	2002	II	May	17.75	126	2006	II	June	17.75
29	1998	II	May	16	78	2002	II	June	17.75	127	2006	III	July	17.75
30	1998	II	June	16	79	2002	III	July	17.75	128	2006	III	Aug.	17.75
31	1998	III	July	16	80	2002	III	Aug.	17.75	129	2006	III	Sept.	17.75
32	1998	III	Aug.	16	81	2002	III	Sept.	17.75	130	2006	IV	Oct.	17.75
33	1998	III	Sept.	16	82	2002	IV	Oct.	17.75	131	2006	IV	Nov.	17.75
34	1998	IV	Oct.	16	83	2002	IV	Nov.	17.75	132	2006	IV	Dec.	17.25
35	1998	IV	Nov.	16	84	2002	IV	Dec.	17.75	133	2007	I	Jan	17.25
36	1998	IV	Dec.	16	85	2003	I	Jan.	17.75	134	2007	I	Feb.	17.25
37	1999	I	Jan.	16	86	2003	I	Feb.	17.75	135	2007	I	March	17.25
38	1999	I	Feb.	16	87	2003	I	March	17.75	136	2007	II	Apr.	17.25
39	1999	I	March	16	88	2003	II	Apr.	17.75	137	2007	II	May	17.25
40	1999	II	Apr.	16	89	2003	II	May	17.75	138	2007	II	June	17.25
41	1999	II	May	16	90	2003	II	June	17.75	139	2007	III	July	17.25
42	1999	II	June	16	91	2003	III	July	17.75	140	2007	III	Aug.	17.25
43	1999	III	July	16	92	2003	III	Aug.	17.75	141	2007	III	Sept.	17.25
44	1999	III	Aug.	16	93	2003	III	Sept.	17.75	142	2007	IV	Oct.	17.25
45	1999	III	Sept.	16	94	2003	IV	Oct.	17.75	143	2007	IV	Nov.	17.25
46	1999	IV	Oct.	16	95	2003	IV	Nov.	17.75	144	2007	IV	Dec.	17.25
47	1999	IV	Nov.	16	96	2003	IV	Dec.	17.75	145	2008	I	Jan.	17.25
48	1999	IV	Dec.	16	97	2004	I	Jan.	17.75	146	2008	I	Feb.	17.25
49	2000	I	Jan.	16	98	2004	I	Feb.	17.75	147	2008	I	March	17.25

Although the changes in regulations seem to improve the minority shareholders protection, the enforcement of the law is the problem that remains. An exhaustive presentation for enforcement of the law indices is made in Kaufman et al. (2005). However, in their paper there is no clear evidence regarding a change in enforcement of the law in Romania over the analyzed period. The evolution of the Romania enforcement of the law index is presented in the International Country Risk Guide. The figures revealed by this publication show a decrease of "law and order" index, that had a level of 5 (from a maximal value of 6) in the period 1996 – January 1999, to 4 points since February 1999. From this perspective, the improvement of legislative protection of the minority shareholders can be partly offset by the regress manifested in the enforcement of the law field.

3. Conclusions

This study offers a presentation of the stages in the evolution of the developments related to the minority shareholders protection in Romania for the period 1996-2008, measured by the Pistor, Raiser and Gelfer (2000) index. It can be noticed that this index improves from 13 (January 1996) to 17. 25 (March 2008). The result shows to investors interested in the Romanian capital market that the minority shareholders' protection has increased over the years.

Acknowledgements

This research was supported by the Romanian Ministry of Education and Research – National University Research Council (NURC) through a Grant type At, Grant No. 130/2006. The authors would like to thank NURC for its support. The authors wish to thank to XLII Euro Working Group on Financial Modelling (15-17 May, 2008, Stockholm University School of Business) participants and, especially, to Christine Mallin and Nico van der Wijst for very useful comments. Also, the authors wish to thank Daniel Traian Pele for his useful observations. The usual disclaimer applies.

Notes

(1) Given the characteristics of each economy, the optimal control level is not the same. The deviations from this optimal level generate a decrease in company market value, with effects on investors' behaviour on the specific share market.

(2) In 2007, the market capitalization represented 35,326.04 millions USD, respectively around 21.24% from the gross domestic product, but the annual transaction volume represented almost 15.72% of the market capitalization.

(3) The Antidirector Rights Index, proposed by La Porta, Lopez-de-Silanes, Shleifer and Vishny (1998), quantifies the existence of adequate regulations, scaling from 0 to 6, where 0 represents the lowest minority shareholders protection. In Romania this index reached 2.75 points in 2005 (Dragotă, 2006). This level is very close to the world average. For comparison, the median values for this index in English-origin countries, based on „common law", equals 4, as for the countries based on French law and German law the average level is 2.33, while Scandinavian law countries reach 3 points.

(4) The maximum level for this index is 23.

References

Albuquerque, R. Wang, N., „Agency Conflicts, Investment and Asset Pricing", *Social Science Research Network*, Centre for Economic Policy Research Discussion Paper, 2005, 4955

Buysschaert, A., Deloof, M., Jegers, M., „Equity sales in Belgian corporate groups: expropriation of minority shareholders? A clinical study", *Journal of Corporate Finance*, 10, 2004, pp. 81-103

Claessens, S., Djankov, S., Fan, J., Lang, L., „Disentangling the Incentive and Entrenchment Effects of Large Shareholdings", *The Journal of Finance*, 57, 2002, pp. 2741-2771

Claessens, S., Tzioumis, K., Ownership and Financing Structures of Listed and Large Non-listed Corporations, *Corporate Governance: An International Review*, 14, 2006, pp. 266-276

Dragotă, I.M., Semenescu, A., Pele, D.T., Lipară, C., „Capital Structure and Financial Performance - Related or Independent Variables? Empirical Study on Romanian Companies Listed on Capital Market", *Theoretical and Applied Economics*, vol. 4(04(521) (s), 2008, pp. 143-150, April

Dragotă, V., Mitrică, E., „Emergent capital markets' efficiency: The case of Romania", *European Journal of Operational Research*, vol. 155(2), June, 2004, pp. 353-360

Dragotă, V., „Minority shareholders' protection in Romanian capital markets: evidence on dividends", *Euro Mediterranean Economics and Finance Review*, 1, 2006, pp. 76-89

Dragotă, V., Dumitrescu, D., Ruxanda, G., Ciobanu, A., Brașoveanu, I., Stoian, A., Lipară, C., „Estimation of Control Premium: The Case of Romanian Listed

Companies", *Economic Computation and Economic Cybernetics Studies and Research*, Vol. 41, No. 3-4, 2007, pp. 55-72

Edwards, J., Weichenrieder, A., „Ownership Concentration and Share Valuation", *German Economic Review*, 5, 2004, pp. 143-171

Gillies, J., Leimann, J., Peterson, R., „Making a Successful Transition from a Command to a Market Economy: the lessons from Estonia", *Corporate Governance: an International Review*, 10, 2002, 175-186

Hashi, I., „The Legal Framework for Effective Corporate Governance: Comparative Analysis of Provisions in Selected Transition Economies", *Center for Social and Economic Research*, 268, 2004

Kaufmann, D., Kraay, A., Mastruzzi, M., „Governance Matters: Governance Indicators for 1996-2004", *World Bank Policy Research Working Paper 3630*, June, 2005

Klapper, L., Laeven, L., Love, I., „Corporate Governance Provision and Firm Ownership: Firm-Level Evidence for Central Europe", *Journal of International Money and Finance*, 25, 2006, pp. 429-444

La Porta, R. Lopez-de-Silanes, F., Shleifer, A., „What Works in Securities Laws?", *Journal of Finance*, 61, 2006, pp. 1-32

La Porta, R., Lopez de Silanes, F., Shleifer, A., Vishny, R., „Investor protection and corporate valuation", *Journal of Finance*, 57, 2002, pp. 1147-1170

La Porta, R., Lopez-de-Silanes, F., Shleifer, A., Vishny, R., „Agency Problems and Dividend Policies Around the World", *Journal of Finance*, 55, 2000, pp. 1-33

La Porta, R., Lopez-de-Silanes, F., Shleifer, A., „Corporate Ownership around the World", *The Journal of Finance*, 54, 1999, pp. 471-517

La Porta, R., Lopez-de-Silanes, F., Shleifer, A., Vishny, R., „Law and Finance", *The Journal of Political Economy*, 106, 1998, pp. 1113-1155

Lele, P., Siems, M., „Shareholder Protection: a Leximetric Approach", *Journal of Corporate Law Studies*, 17, 2007, pp. 17-50

Levine, R., Zervos, S., „Stock Markets, Banks, and Economic Growth", *American Economic Review*, 88, 1998, pp. 537-558

Lopez-de-Silanes, F., „A Survey of Securities Laws and Enforcement", *World Bank Policy Research Working Paper*, 3405, 2004

Mallin, C., Jelic, R., „Developments in Corporate Governance in Central and Eastern Europe", *Corporate Governance: An International Review*, 8, 2000, pp. 43-51

Menzie, D.C., Ito, H., „What Matters for Financial Development? Capital Controls, Institutions, and Interactions", *National Bureau of Economic Research Working Paper Series Working Paper*, 2005, 11370

Milgrom, P., Roberts, J., „Relying on the information of interested parties", *Rand Journal of Economics*, 17, 1986, pp. 18-32

Modigliani, F., Perotti, E., „Protection of Minority Interest and the Development of Security Markets", *Managerial and Decision Economics*, 18, 1997, pp. 519-528

Nenova, T., „The Value of Corporate Votes and Control Benefits: A Cross-country Analysis", *Journal of Financial Economics*, 68, 2003, pp. 325-351

Pagano, M., Roell, A., „The Choice of Stock Ownership Structure: Agency Costs, Monitoring, and Decision to go Public", *The Quarterly Journal of Economics*, 113, 1998, pp. 187-225

Pagano, M., Volpin, P., „Shareholder Protection, Stock Market Development, and Politics", *Finance working paper 105/* 2005, 2006, European Corporate Governance Institute

Pajuste, A., „Corporate Governance and Stock Market Performance in Central and Eastern Europe: A Study of Nine Countries", 1994-2001, SITE, 2002, Stockholm School of Economics

Pistor, K., Raiser, M., Gelfer, S., „Law and finance in transition economies", *Economics of transition*, 8, 2000, pp. 325-368

Pistor, K., Xu, C., „Governing Emerging Stock Markets: legal vs. Administrative Governance", *Corporate Governance: An International Review*, 13, 2005, pp. 5-10

Shleifer, A., Vishny, R.W., „A Survey of Corporate Governance", *Journal of Finance*, 52, 1997, pp. 737-783

Stigler, G., „Public regulation of the securities market", *Journal of Business,* 37, 1964, pp. 117-142

Trojanowski, G., „Equity Block Transfers in Transition Economies: Evidence from Poland", *EFA Annual Conference*, 467, 2003

Wei, S. J., Shleifer, A., „Local Corruption and Global Capital Flows in Reports", *Brookings Papers on Economic Activity*, 2, 2000, pp. 303-354

Yarrow, G.K., „Shareholder Protection, Compulsory Acquisition and Efficiency of the Takeover Process", *The Journal of Industrial Economics*, 34, 1985, pp. 3-16

Zingales, L., „The Value of the Voting Right: A Study of the Milan Stock Exchange Experience", *The Review of Financial Studies*, 7, 1994, pp. 125-148

www.bvb.ro

www. kmarket.ro

Appendix 1

The evolution of minority shareholders' protection legislation in Romania. A chronological presentation

The Romanian legislation may be divided into two categories: (a) Primary legislation: laws, ordinances, governmental resolutions; (b) Secondary legislation: regulations and decisions of the National Securities Commission. The following dates represent points in time when the respective documents came into force.

- December, 17th, 1990: The Law no. 31 – The Company Act established the fundamental characteristics for corporations. It is the first act that established the shareholder's rights equality. As there were no specific rules, the transactions with shares were made respecting the simple trading rules. The ones who wanted to sell using publicity had to make a prospectus. It was established that the shareholders will be represented in the general shareholders meeting proportionally with equity holdings. Each share gave the right to one vote, but it was possible to diminish the number of votes for the shareholders who owned more than one share.

- October, 15th, 1992: The *„Agenția Națională pentru Titluri de Valoare*" (The National Agency for Securities) was set up as regulator for trading shares and trading agents. It was a part of the Economics and Finance Ministry. The content of a public offer was also established and the rules for giving information to the shareholders on a company's result.

- August, 26th, 1993: "Agenția Națională pentru Titluri de Valoare" (The National Agency for Securities) transformed into "*Agenția de Valori Mobiliare" (The Agency for Securities)*, which represented a general office of the Ministry of Finance. The transactions with securities had to be made only by an authorized agent. For the first time some rules were established in the shareholders' protection field.

- September, 1[0th], 1994: The Law No. 52, on securities and stock exchanges. It settled *"Comisia Națională de Valori Mobiliare"* (The National Securities Commission) - an autonomous administrative authority and a legal person. It undertook the tasks from the Agency for Securities which stopped functioning. It settled the public offer and the securities trading. It also established that stock exchanges be created as public institutions, by the decision of the National Securities Commission. It regulated the operations allowed on a stock exchange. It also established some rules about investors' protection, portfolio consultants and the share register.

- April, 24th, 1995: The Decision No. 20 of the National Securities Commission, which created the Bucharest Stock Exchange. Its first transaction session was on November, 20th.

- May, 7th, 1996: The National Securities Commission regulates the periodical and continuous information reports made by the issuers of securities. It established the reports which had to be made by the issuers to the National Securities Commission and published, for example: current reports, semester reports and annual reports. It also established the treatment for confidential information and the list of persons considered to have such information.

- October, 25th, 1996: RASDAQ was founded, the Romanian over-the-counter market.

- June, 27th, 1997: the Company Act was modified: preferential shares were introduced and the regulation of shares transactions was left to the special law on securities and stock exchanges. It was also decided that the shares not fully paid will not have voting rights, unless the company by-laws permitted this.

■ August, 6th, 2001: Bucharest Stock Exchange adopted the Running and Management Code of Corporate Governance, which undertook the corporate governance principles of OECD. This established the shareholders' rights as follows: the right to participate in the General Meetings, the right to ask questions at the General Meetings gathering, the right to debate the issues on the General Meeting's agenda, the right to receive information, the right to receive dividends, the right to participate in the major decisions of the company's management, the right to be represented in the Administration Board, the preference shareholders' rights. There were also established the duties of administrators in the shareholders' protection area. The Company Act in 1990 had fixed all these rights and the capital market specific legislation supported the shareholders' right to be informed.

■ April, 4th, 2002: There were established the roles and objectives of the National Securities Commission on the market. These are as follows: "a) to establish and maintain the necessary background for the development of the regulated market; b) the promotion of trust in regulated markets and in financial instruments investments; c) to ensure the protection of investors and operators against the illegal, abusive and fraudulent practices; d) the promotion of the correct and transparent functioning of the regulated markets; e) the prevention of market manipulation, of fraud and the insurance of the integrity of the regulated markets; f) to fix the standards for the financial solidarity and honest practice of the regulated markets; g) to adopt the necessary measures to avoid systemic risk in markets; h) to prevent the lack of equality in investors' information, treatment or in the respect of their interests".

■ April, the 9th, 2002: A new Governmental Ordinance on securities, financial investment services and the regulated markets. It established the stock exchanges as public institutions but also the possibility to organize other regulated markets as joint-stock companies. It regulated the types of market operations and introduced margin transactions, transactions of preferential rights and also transactions with derivatives. It detailed the significance of investors' protection emphasizing the importance of the Company Act in this area and the special rules for listed companies. It established rules for market-disclosure and equality between investors. For the first time in Romania, it prohibited the handling of the market and transactions based on inside information. The Fund for Investors' Compensation started its activity. Also, this Act regulated the activity of the financial investments companies, the investment consultants, the compensation, deduction, deposit and registering systems, etc.

■ August, 5th, 2002: The Governmental Ordinance was approved by law with some amendments. In the initial version, the shareholders may ask for intermediary reports about the financial situation of the company only if they own individually 5% or in common 10%. The law modified the threshold to 5% of the capital for both individually or in common.

■ July, 1st, 2004: A new settlement of The National Securities Commission on the issuers and the securities operations. It established the reports which had to be presented by the listed shares issuers and the treatment of preferential information.

■ July, 29th, 2004: The Law No. 597 on the capital market. It transposed the European orders in the capital market field, as follows: a) Directive No. 93/22/CEE, on investment services in the securities field; b) Directive No. 97/9/CEE, on investor-compensation schemes; c) Directive No. 85/611/CEE, on the coordination of laws, regulations and administrative provisions relating to undertakings for collective investment in transferable securities (UCITS); d) Directive No. 98/26/CEE on settlement finality in payment and securities settlement systems; e) Directive No. 2003/71/CEE, on the pro-

spectus to be published when securities are offered to the public or admitted to trading and amending Directive No. 2001/34/EC; f) Directive No. 2001/34/CEE, on the admission of securities to official stock exchange listing and on information to be published on those securities; g) Directive No. 2003/6/CEE, on insider dealing and market manipulation (market abuse); h) Directive No. 2002/65/CEE, concerning the distance marketing of consumer financial services; i) Directive No. 1993/6/CEE, on the capital adequacy of investment firms and credit institutions.

- January, 13th, 2006: The Regulation No.1 in 2006, on the issuers and the securities operations. It assumes the following European orders: a) Directive No.2001/34/EC, on the admission of securities to official stock exchange listing and on information to be published on those securities; b) Directive No.2003/71/CEE, on the prospectus to be published when securities are offered to the public or admitted to trading and amending Directive No. 2001/34/EC; c) Directive No. 2003/6/CEE, on insider dealing and market manipulation (market abuse); d) Directive No. 2004/39/EC, on markets in financial instruments; e) Directive No. 2004/25/EC, on takeover bids; f) Directive No. 2004/109/EC, on the harmonisation of transparency requirements in relation to information about issuers whose securities are admitted to trading on a regulated market and amending Directive No. 2001/34/EC; g) Directive No. 2003/124/EC, implementing Directive No. 2003/6/EC of the European Parliament and of the Council as regards the definition and public disclosure of inside information and the definition of market manipulation; h) Directive No. 2004/72/EC, implementing Directive 2003/6/EC of the European Parliament and of the Council as regards accepted market practices, the definition of inside information in relation to derivatives on commodities, the drawing up of lists of insiders, the notification of managers' transactions and the notification of suspicious transactions; i) Regulation No. 2273/2003/EC implementing Directive No. 2003/6/EC of the European Parliament and of the Council as regards exemptions for buy-back programmes and stabilisation of financial instruments; j) Regulation No. 809/2004 implementing Directive No. 2003/71/EC of the European Parliament and of the Council as regards information contained in prospectuses as well as the format, incorporation by reference and publication of such prospectuses and dissemination of advertisements.

- December 1st 2006, The Law no. 441 modified the Company Act bringing fundamental changes as regards the companies' administration. Thus two systems of administration were introduced: a unitary system, based on an administration council, and a dualist system, based on a managerial board and a supervisory council. A fundamental change was that the decisions of the Shareholders' Assembly may be taken with a quorum of only 1/4 of the shareholders.

Quantifying Update Effects in Citizen-Oriented Software

Ion Ivan
Sorin Pavel
Academy of Economic Studies, Bucharest

Abstract. *Defining citizen-oriented software. Detailing technical issues regarding update process in this kind of software. Presenting different effects triggered by types of update. Building model for update costs estimation, including producer-side and consumer-side effects. Analyzing model applicability on INVMAT – large scale matrix inversion software. Proposing a model for update effects estimation. Specifying ways for softening effects of inaccurate updates.*

Key words: update; costs; model; online software.

JEL Codes: M15.
REL Codes: 10A.

1. Citizen-oriented software

Knowledge-based society is described by:

- generalizing participation in finding solutions to citizen own problems within human-computer interaction;
- increasing number of software applications available to citizens for assigning and managing resources, together with decreasing number of software applications destined to general information;
- building favorable context for database integration in order to reduce informational system redundancy;
- developing new applications by recycling glossaries and interfaces, in order to reduce the time spent on software adapting and to maximize interoperability;
- saving and activating data without refilling forms;
- creating software which maximizes client satisfaction and leads the producer interest towards commissions taken depending on the customer actions.

Types of citizen-oriented software applications include:

- e-commerce applications, which cover large variety of transactions: buying a book, booking a hotel room, ordering a computer component, bidding an instrument or cash withdrawing from an ATM; because of the important information exchanged through this type of transactions, e-commerce is regulated by applicable laws and is constrained to fulfill security standards; the best-known e-commerce applications are specialized in buying/selling goods or services: www.amazon.com rated as the best e-commerce site, www.bestbuy.com, www.circuitcity.com or www.quelle.com;
- software for utilities payments which offers ways to pay the bills for mobile phones, internet, electricity and so on; the strengths of these systems are given by:
  - little time for payment transaction;
  - bills archives;
  - quick visualization of the payments history or current payment state;
  - quick confirmation of payment completion;
  - real time support.

These applications are part of local government – http://plati.primarie6.ro, software companies – www.e-facturi.ro, or banks – www.citibank.ro, www.chase.com, www.pacifictrustbank.com, and implement secure methods of dealing with transactions.

- e-banking applications that integrates the two above-mentioned services, plus other types of transactions which operate directly on the personal bank account of the customer – deposits, reports, statements, currency exchanges; the user has:
  - access to his account 24/7, regardless of the bank opening hours;
  - reduced commissions than the ones available at bank counters;
  - total control upon personal account information.

Depending on the situations they are used in, e-banking services – www.ingonline.ro, www.raiffeisenonline.ro,

www.bancpost.ro – cover internet-banking, home-banking and mobile-banking;

- e-learning software for virtual education and professional distance-training that offers scheduled methods of teaching/ learning through usage of information technologies and suspension of physical presence of the students; e-learning facilities include:

- availability because teaching topics are always achievable;

- flexibility through ways of approaching topic structure depending on the students interests;

- effectiveness by granting access for all students to the same learning resources, thus reducing shipping costs;

- consistency by permanently updating and normalizing the process.

E-learning solutions are increasingly sough-after as they adapt to regulations and customer requirements: www.siveco.ro, www.academiaonline.ro, www.timsoft.ro;

- information and utility software:

- news feed (newspapers, TV, shows) which use different communication systems to broadcast news and useful information; these kind of on-line applications:

- are constantly updated for the latest news;

- keep track of news for future visualization;

- use multimedia communication – real-time photo/audio/video;

- are flexible and easy to integrate in websites and e-mail.

The most news feed software – www.stirionline.net, www.hotnews.ro, www.realitateatvonline.ro, www.evz.ro – is available for free which attracts more users than the classic ways of information;

- on-line dictionaries which provide:

- the same definitions as the printed dictionaries;

- increased searching facilities;

- minimum storage space;

- free access to information.

Depending on the nature, dictionaries are:

- explanatory – www.dexonline.ro, www.dictionary.com, www.merriam-webster.com

- multimedia – http://visual.merriam-webster.com, www.music.vt.edu/ musicdictionary/

- reference – www.reference.com

- real-time automatic translators which combine word dictionaries with grammar rules of the selected languages; although the final output is not 100% correct, automatic translators are preferred for quick and simple translations: www.translation2.paralink.com, www.etranslator.ro, www.google.translate.com.

The numerous advantages of the online applications determine the citizen to use them instead of other classic ways. The quality of these applications is given by:

- availability because the user is no more bound to the opening hours of institution counters and his needs are met any time they occur;

- viability because of their trustworthiness;
- generality because the services are for all citizens, regardless of their level of knowledge or friendliness with the online methods;
- continuity by using familiar interfaces, by emulating real life documents – which makes handling applications intuitive – and by providing non-stop support;
- portability by using communication technologies – radio waves, mobile devices – and services which detach the user from a certain place;
- correctness by managing data-flows to assure complete fulfillment of the user's objectives, without jeopardizing his informational integrity;

The high level of quality found in this kind of applications is due to the detailed process of software testing. Citizen-oriented applications follow certain steps described in the software development process:

- requirements analysis interacts with the client/citizen to record his needs and to elaborate solutions; depending on the accuracy of the use cases description, the problem is well-defined – description matches the exact functionality expected in specified situations along with details of behavior; sub-defined – certain use cases are skipped; over-defined – description contains redundant data;
- the type and destination of input data is settled, the application's vocabulary is build and the output data types are designed;
- project design elaboration starts from requirements analysis and chooses the building resources concerning application architecture, programming language and technologies used;
- implementation of the product by generating or recycling code and building application modules;
- modules assembly and software crystallization;
- global testing in order to assure correct functioning with different testing methods which cover all use cases;
- documentation and system requirements papers;
- software installation and means of support/update creation.

When finished, the application is presented for customer trial. If any deficiency is detected, the software is modified.

2. Updating operations

Use cases of citizen-oriented software generate payments, allocate resources or information for decision taking and reflect laws, regulations, formulae, needed data, market or policies modification.

The life cycle of this kind of software includes:

- creation, which supposes following the software development process with its specific phases and procedures and has the software product as output;

- update, which means software personalization in order to maximize effective use of specific customers;
- maintenance or resolving conflict situations met while using the software, caused by both internal or external sources;
- reengineering, which means changing the architecture structure, the information technologies or the algorithms used within the application;
- disabling or dropping the software because of its incapacity of fulfilling customer's needs;
- incorporation by including some modules or entire application within another software directly or with some modifications.

Updating a citizen-oriented application means:

- introducing new modules for new functionalities;
- introducing new fields within interfaces;
- deleting modules that are no longer being used;
- deleting fields from interfaces;
- introducing new data in database;
- modifying data;
- modifying authentication methods;
- introducing filters for more accurate validations in order to obtain complete data and citizen guidance within application.

The update process is completed by software producers, by authorized operators or by citizen himself and needs to be accomplished in real-time, correct, complete and verifiable because of the severe consequences in case of inaccurate update.

Types of errors that occur while updating are:

- modifying different data than expected;
- performing incomplete modification of the data;
- executing undesirable data transfers;
- hiding vital information for decision-taking.

The effects of inaccurate updates vary considering the type of application and their tracing depends on their importance within the company.

3. Update effects

The update process progress and its output have a notable impact on any company activity. In case of a correct, complete and synchronized update:

- sales grow;
- stocks decrease – especially hard-selling products;
- customer satisfaction rise;
- all resources are assigned;
- savings are kept unaltered.

Effects of incorrect updates vary on the type of application where they occur:

- in a product price management application:

- unwanted products are being sold cheaper because discounts are applied to product P_i instead of product P_j;

- differences are recorded between the price at the store shelf and the price at the check-out;
- profit is decreasing.

▪ in a railway ticketing software:

- tickets are bought for inexistent trains;
- tickets are bought for already taken seats;
- tickets are bought for wrong level of comfort (class ½);
- the customer is specified a wrong time of train departure/arrival.

▪ in an admission exam listing application:

- names are not listed;
- names are listed within wrong faculty;
- names are misspelled;
- grades are incorrect.

Corrections required by inaccurate updates are:

▪ reversible – the customer benefits from software actions even though delayed;

▪ irreversible

- the customer is paid back the money;
- the customer has lost all resources invested.

For update effects quantification, the following notations are used:

Q – total amount of products – by products meaning whatever data, record or object that can be updated;

N – amount of products that have to be updated;

M – amount of products updated;

$\Delta = N - M$

$\Delta > 0$ – there are Δ products out of N, which, although they had to be updated, they have not.

$\Delta < 0$ – there are Δ products besides N that have been updated additionally;

$P_1, P_2, ..., P_M$ – old values of updated products;

$X_1, X_2, ..., X_N$ – new values needed to be introduced;

$R_1, R_2, ..., R_M$ – new values updated;

K – amount of products which have the updated value higher than the intended value;

L – amount of products which have the updated value lower than the intended value;

C – amount of products correctly updated.

Considering the case where update objects are products and their value is their price, the effects are studied for higher updating – new values are higher than old ones – and lower updating – new values are lower than old ones.

The $X_i < P_i$ case describes price dropping because of the stock liquidation or special offers. If $R_i < X_i < P_i$, then the new value updated is lower than the one desired. Loss quantification is given by following formula:

$$PP = \sum_{i=1}^{L} V_i (X_i - R_i)$$

where:

V_i – amount of product i sold;

Although small prices attract buyers, the profit of the company is decreasing below the expected level with every product sold.

If $X_i < R_i < P_i$, the updated value is higher than expected but lower than the old value. The loss is measured by:

$$PP = \sum_{i=1}^{K} V_i(R_i - X_i)$$

The loss is smaller than the first case, but:

- buyers don't fully appreciate the discounts/the offer;
- the price policy objectives (buyer attraction, stock liquidation) are not fulfilled.

From the customer's point of view, he pays more than is needed and has to be

- returned the money;
- save the difference for future shopping.

If $X_i < P_i < R_i$, the actual updated value is higher than the old value, although it should have been lower – a price cut was intended. The loss formula is the same:

$$PP = \sum_{i=1}^{K} V_i(R_i - X_i)$$

The effects are emphasized:

- demand for goods is dropping, the buyers are aiming other goods;
- stocks are growing;
- profit decreases as the products are not sold, because a price-cut was expected.

The buyers are paying more, losing money while the seller has to compensate them.

In the $X_i = R_i < P_i$ case, the actual updated value is the same with the intended one. No losses are recorded and chances that the company's price policy is fulfilled are growing. Sales expand and stocks decrease while the long-term profit level appreciates.

The price growth is described by $X_i > P_i$ – the new updated value is higher than the old one. If $R_i > X_i > P_i$, then the new value is higher than the intended one. The prices are growing more than expected. Each product sold generates a surplus given by:

$$S = \sum_{i=1}^{K} V_i(R_i - X_i)$$

This artificial price growth leads to an increased profit only in the case of un-substitute goods. Generally speaking, any rootless price growth generates loss for both sides: sellers and buyers.

$X_i > R_i > P_i$ means that the updated value is higher than the old value but still lower than the intended value. This situation creates also a difference of:

$$S = \sum_{i=1}^{L} V_i(X_i - R_i)$$

The company price policy is not finding its target.

If $X_i > P_i > R_i$, the new value, instead of being higher, is lower than the old one. The surplus increases:

$$S = \sum_{i=1}^{L} V_i(X_i - R_i)$$

The effects are opposite than the ones expected:

- demand grows;

- stocks drop;
- sales increase;
- profit decrease compared with the foreseen value.

For $X_i = R_i > P_i$, the updated value is similar with the one expected. No loss or surplus is recorded. The company's price policy is reached and the company's profit increase on the long term.

Table 1 records a database containing the products that have to be updated, their old price, the new one and the one intended:

Updated values

Table 1

Product	Old price	New updated price	New intended price
P_1	100	50	150
P_2	200	250	100
P_3	100	100	150
P_4	100	100	90
P_5	100	100	100

For P_5 the update is correct and complete. The new updated value is the one intended and the one needed. This is the ideal situation because it maximizes the profit, it sustains the company's price policy and minimizes customer dissatisfaction.

There are products that have differences between recorded and intended values. If the modification consists of a price growth – P_1, P_3 – the company is losing money for each sold product. If the price is cut – P_2, P_4 – it leads to surplus. Both cases generate deficiencies for the customer and the company.

If the update is not completed – P_3, P_4 – all intended effects are canceled.

For N updatable products, the following cases are possible:

- C products are correctly updated; if N = C, the update is complete and correct with the above-mentioned effects;
- K products are updated with a higher value than in the documents, but the rest N – K = C are correct;
- L products are updated with a lower value than in the documents, but the rest N – L = C are correct;
- K products are updated with a higher value, L products with a lower value and C products are correct:

N= K + L + C;

In this case, the effects need to be treated separately. If the difference between surplus and loss is positive, meaning:

$$S = \sum_{i=1}^{K} V_i(R_i - X_i) > PP = \sum_{i=1}^{L} V_i(X_i - R_i)$$

then the effects are monetary surplus accumulation, unsold stocks existence, profit outrun and price policy miss.

If the loss is greater than surplus:

$$PP = \sum_{i=1}^{L} V_i(X_i - R_i) > S = \sum_{i=1}^{K} V_i(R_i - X_i)$$

Then the demand grows, the stocks decrease, the profit shrinks and the objectives of price policy are missed.

The update cost includes:

- writing source-codes expenses;
- database updating expenses;
- correction expenses;
- cheap products generated losses;
- transportation, waiting expenses;

- customer letdown losses;
- expenses for software errors
- wrong formulae;
- wrong dataflow;

Computing expenses model requires the exact number of customers N, the number of correctly updated products P and the real costs C:

$$CC = \sum_{\substack{i=1 \\ j=1}}^{N,P} n_i \times v_j + v_{P+1}$$

where:

n_i – number of products bought by client i, i = 1...N;

v_i – difference between intended value and real price of product i, i=1…P;

v_{P+1} – fixed expense for repairing mistake.

If the expected company profit is Pr and the expenses caused by the inaccurate update are bigger, the following relation is true:

$$\sum_{\substack{i=1 \\ j=1}}^{N,P} n_i v_j + v_{P+1} > \sum_{\substack{i=1 \\ j=1}}^{N} n_i d_j$$

where:

d_j – difference between old value and intended new value.

It results that if every update satisfies the relation – update expenses outrun the profit – the update is ineffective.

4. Update effects estimation for INVMAT application

Citizen-oriented software is first and fore mostly preoccupied about the specific needs of the customer. INVMAT is an application designed to automate matrix calculations where user declares, initializes and manipulates matrices.

When declaring the matrices, the user chooses the type of account he is using: FREE account or PLUS account. The FREE account lets the user declare only two matrices – named A and B – and their maxim dimensions are 10x10. The PLUS account lets the user declare how many matrices he needs and name them appropriately. The declaration is made considering the form of the matrix: unit matrix, rare matrix, diagonal matrix, symmetric matrix. The upgrade from FREE to PLUS account is done by registering the user (with a username and password).

The INVMAT software functionalities include:

- defining matrix dimensions;
- specifying every element's value;
- loading matrix values from file;
- visualization of matrices;
- updating the matrices;
- unimatrix calculi: opposite matrix, inverse matrix, pseudoinverse matrix;
- multimatrix calculi: addition, subtraction, multiplication;
- visualization of results.

The meaning of matrix values is defined by the users: prices, consumption values, rates, budgets etc.

The matrix below contains the utilities consumption values by month for a small company within the first half of the year:

Monthly utility consumptions in monetary units

Table 2

	January	February	Mars	April	May	June
Rent	300	300	300	300	300	300
Water	120	123	117	121	119	122
Electricity	79	82	77	78	81	80
Gas	12	15	11	13	15	12
Parking	50	50	50	50	50	50
Other utilities	8	9	12	9	2	10

For the second half of the year, the rent and the parking fees are increasing. The update is faulty done. The real new values are: 370 mu for rent and 70 mu for parking. The new updated values are: 340 mu for rent and 80 mu for parking.

By applying the above-mentioned formula:

$$S = \sum_{i=1}^{L} V_i(X_i - R_i)$$

It results an annual difference of 80 mu for rent and 60 mu for parking.

The differences are projected in the company's budget and leads to differences in the assets and liabilities balance. The cover expenses will affect the planned budget level and the expenses policy of the company.

5. Ways of softening the inaccurate updates effects

In order to define accurate/inaccurate updates, let T be a text that implies actions A_1, A_2, A_3, ..., A_k. If a person operates on the database actions A_1, A_2, A_3, ..., A_k, then the update is accurate. If the actions performed are A_1, A_2, ..., A_{i-1}, A_{i+1}, ..., A_k then the update is partially accurate. If for every A_i where i = 1,k the following relation is true: $A_i \cap B = \emptyset$, where B is the performed operation vector – B_1, B_2, ..., B_j – the update is inaccurate.

The inaccurate updates are caused by both the subjective elements of the operator:

- incomplete receiving of the input documents containing updatable values;
- incomplete cover of the list with the updatable values;
- negligence in introducing new values;
- unknowing the update procedure;
- lack of saving the new value;
- updating the wrong database;

and the objective elements of the computer or surroundings:

- absence of database/internet connection;
- using default settings;
- absence of automated saving;
- interrupting the update process due to time expiration/ electricity fluctuation;

- existence of an input device failure.

In order to avoid and reduce inaccurate updates, these causes must be treated and diminished by:

- thoroughly documentation of the update process: defining update's objectives, methods and implied parts;
- clear specification of updatable objects, of the old values and the new ones;
- authorizing update documentation – management validation of the process and values;
- assigning the proper person for implementing the update process;
- localizing updatable objects and assuring connection;
- marking updated objects on the update documentation;
- verifying values after update;
- completing update process – saving, form filling, disconnection;
- Assuring quality computers, UPS devices, external memory;

There are even more ways to verify and control the update process, ways that connects with the software structure/ functionalities:

- authorizing the person that updates, to avoid modifications from an unqualified person and to record the author of the update;
- validating the new input values by comparing them with a certain type, range, minimum/maximum value, standard deviation etc.;
- implementing automatic saving;
- error signaling with proper messages;
- interrupting updates when connection with database is lost;
- creating back-up copies of the old values;
- keeping update logs.

Following the above-mentioned methods does not exclude the human error element, but it diminishes the chances of generating large-scale effects in the update process.

6. Conclusion

Citizen-oriented software is becoming more and more used and developed, which draws even more attention to its core elements. Update is part of the important processes in software lifecycle. Its consequences lead to either improved performance or to severe errors for both company and customer.

To prevent undesired situations, it is recommended to stress the software testing processes, despite costs increasing. The diversity of the test datasets should be aimed along with the software structure coverage. The software audit role increases while the software quality is improved.

The present article is part of research on techniques of large, inhomogeneous datasets oriented software development, within Phd. school, contract no. 50/oct. 1, 2008.

References

Ivan, I., Milodin, D., Popa, M., „Operation on Text Entities", *Informatică Economică*, vol. 11, nr. 1, 2007, pp. 14-20, ISSN 1453-1305

Ivan, I., Boja, C., „Practica optimizării aplicațiilor informatice", ASE, București, 2007, ISBN 978-973-594-932-7

Ivan, I., Boja, C., „Optimizarea bicriterială a software, *Informatică Economică*, vol. 10, nr. 1, 2006, pp. 17-24, ISSN 1453-1305

Ivan, I., Amancei, C. (2006). *Stabilitatea coeficienților modelului global de calitate software*, ASE, București

Ivan, I, Rădulescu, I. (2006). *Analiza comparată a complexității entităților text Generate prin tehnici de programare*, ASE, București 2006, p. 164, ISBN 973-594-754-4

Ivan, I., Noșca, Gh., Popa, M. (2006). *Managementul calității aplicațiilor informatice*, ASE, București

Ivan, I., Cristescu, M., Popa, M., „Modele pentru estimarea costului fiabilității software", *Revista Română de Informatică și Automatică*, vol. 15, nr. 1, 2005, pp. 41-46

Ivan, I., Popa, M., „Uniformitatea, caracteristica de calitate a entităților text", *Informatică Economică*, vol. 9, nr. 1, 2005

Ivan, I., Popa, M., „Entități text, dezvoltare, evaluare, analiză", ASE, București, 2005, ISBN 973-594-663-7, p. 587

Ivan, I., Boja, C. (2004). *Statistical Methods in Software Analysis*, ASE, București

Ivan, I., Pocatilu, P., Amitroaie, M., „Metrici ale societății informaționale", *Informatică Economică*, vol. 5, nr. 4, 2001, pp. 33-40

Ivan, I., Teodorescu, L. (1999). *Software Quality Management*, INFOREC, București

Maydanchik, A., „Data Quality Assesment*", Tehnics Publications LLC*, 2007

Goodchild, M.F., Clarke, K.C. (2002). *Data Quality in Massive Data Sets*, Kluwer Academic Publishers

Beall, J., „Metadata and Data Quality Problems in the Digital Library", *Journal of Digital Information*, Vol. 6, Nr. 3, iunie 2005

Herzog, T.N., Scheuren, F.J., Winkler, W.E. (2008). *Data Quality and Record Linkage Tehniques*, Springer New York

Is there Needed an Industry Approach on Corporate Default Risk? Case Study on Companies Listed on Romanian Stock Exchange

Cristina Maria Triandafil
Petre Brezeanu
Academy of Economic Studies, Bucharest
Marius Petrescu
Leonardo Badea
„Valahia" University of Târgoviște

Abstract. *This paper focuses on applying Black and Scholes structural approach on credit risk in the case of the companies listed on Romanian Stock Exchange. We conduct a case-study on 35 companies belonging to five industries (energetic, materials, chemistry, pharmaceuticals, equipments) during a period of 10 years in order to highlight out default point/threshold and its essential factors evolution across industries. Research approach is concentrated also on the specific characteristics of the Romanian capital market (especially in terms of illiquidity and lack of transparency additional costs), macroeconomic environment and corporate finance decision process.*

We compute default point from the perspective of the arbitrage between assets and leverage; in accordance with the most recent theories on specific features corporate default within emerging countries (Galytskyy, 2006), a key element will be represented by the assets volatility which will be correlated with the country risk premium in order to highlight out a potential macroeconomic impact on corporate failure.

Key words: distance to default; default point; industry impact.

JEL Codes: G32, L16.
REL Codes: 11B, 17C.

Introduction

Credit risk literature has highly expanded under the impact of the financial globalization and Basel 2 regulatory framework. Corporate default has become a challenge for analysts in terms of prediction and assessment. Classical perspective developed by Altman credit scoring model has been followed up by the structural (Merton, 1974, Black, Scholes, 1973) and reduced form approach (Duffie, Singleton, 1999). From the perspective of the structural approach, credit is conceived as a contingent claim on the value of company' assets and is assessed according to the option pricing theory (Elizalde, 2005). Default will intervene whenever the value of the firm will reach a pre-set threshold (Davydenko, 2005). Hsu, Saa and Santa-Clara (2004) have pointed out that this "threshold corporate default" is represented by the leverage multiplier ratio. The Reduced Form or Intensity models conceive time of default as being determined exogenously, modelling the market value of the firm in accordance with its capital structure having no importance; default time will be represented by the time of the first jump of a Poisson process with random intensity (Cohen, 2007). Recently, there have been developed non-paraemtric models (Chen 2006) where default is valued based on the historical information on the ratios reflecting the market value of the firm. Alternative approaches using non-parametric methods include also classification trees, neural networks and fuzzy algorithms (Kraft, Muller, 2004).

Nevertheless, the aforementioned theories can not be generally applied to the corporations based in emerging countries. Underdeveloped financial systems, lack of liquidity and of financial history, unstable macroeconomic environment, differences in financial reporting are usually the difficulties encountered when it comes about implementing and calibrating a corporate default model especially created for corporations located into emerging countries. Zulkarnain Sori (2006) made a research on Malaysian listed firms during the Asian financial crisis and pointed out that distress signs have been shown out long before the Asian Financial Crisis in 1997 and concluded that if those symptoms have been detected earlier, the impact of the crisis might have not been so tough.

Since emerging markets imply a high degree of peculiarity, there will be needed an individual approach developed also at the level of the industry. Fernandes (2005) elaborated a study on the listed Portuguese firms across industries and implemented scoring models in accordance with the business profile of the company. Significant differences have been identified between the general approach (which has not made any differenciation according to the industry) and the industry level adapted one.

Lateley, there have been pointed out that emerging countries tend to become more and more correlated with the developed ones in terms of macroecomic volatility. The

recent subprime mortgage crisis has affected all the financial systems, inclusvely the emerging ones. A sudden drop of the corporate yields has been remarked inclusively at the level of the emerging countries. Therefore, a particular attention must be paid to the corporate default valuation as for the emerging countries. This study has been conducted in order to have a more thorought overview on the corporate default across industries in the case of the companies listed on the Bucharest Stock Exchange. The structural approach has been valorized. The research is performed both at the level of the corporate default indicators, but also at the level of the capital structure specifications across industries. Distance to Default and Default Point are the main indicators that have been valorized. The focus has been directed towards potential higher correlations between certain industries and macroeconomic environment from the perspective of the theories that concentrate on the impact of the macroeconomic stability on the corporate default within the emerging countries (Hochrainer, 2006).

There has been approached also a differenciation in terms of corporate default determinants according to the business profile.

Conclusions subscribe to the idea that corporate default valuation varies across industries and it is necessary to perform an industry level approach in order to increase corporate default models accuracy.

This study is structured as follows: section 2 is dedicated to the case-study which includes a research on the Distance to Default and Default Point descriptive statistics in accordance with the industry, section 3 contains a research on the corporate default determinants and section 4 concludes.

2. Case study

2.1. Database and methodology description

The most recent theories regarding the corporate default assume a certain differentiation across industries. It has been pointed out that there are several industries which are more exposed to corporate default and therefore corporate default assessment and prediction must be adapted to. This study focuses on revealing if this impact can be validated at the level of a sample of 34 companies listed on the Romanian Stock Exchange. The innovative element consists of highlighting out a potential industry impact/differentiation in terms of corporate default prediction/ assessment in the case of the corporations located into an emerging East European country such as Romania which implies an assemble of characteristics in terms of corporate finance decision making process: high degree of macroeconomic volatility and illiquid underdeveloped capital market. The sample includes companies activating in 5 fields (energy, pharmaceutics, chemicals, equipments, materials).

The study follows up the research pathway initiated by Fernandes (2005), Ericsson, Reneby (2005), Elizalde (2005b) and Chen(2006).

Companies activating in the financial services field have been eliminated from the database because of the specific features implied by their activity in terms of capital structure.

The deep analysis will be performed in terms of descriptive statistics corresponding to the default point and distance to default (DD) indicators determined both globally and at the level of every business profile in order to highlight out a potential industry impact on the corporate default valuation.

Variables will be integrated into default point and distance to default valuation in accordance with Merton's structural perspective on corporate default:

DD = (Market Value of Assets – DP) / (Market Value of Assets × Assets Volatility)
where:

DD= distance to default;

DP = default point.

The default point will conceived under the term of the arbitrage between liabilities and assets. Literature agreed on the fact that default point quantification can be made by the liabilities perspective:

DP = STD +0,5 × LTD
where:

DP = Default Point;

STD = Short term debt;

LTD = Long term debt.

A firm is more and more exposed to default as long as assets will tend to equalize the value of the total liabilities. In other words, negative net worth triggers default.

Other variables which have been integrated into the Distance to Default valuation (DD) are represented by the market value of assets (reflected into the market capitalization of the company) and assets volatility (measured by the variance of the return on assets (ROA).

The analysis performed at the level of the Descriptive Statistics corresponding to the Distance to Default (DD) and Default Point indicators will be exerted also at the level of the industry impact on financial ratios. There have been selected three financial ratios (leverage, return on assets and earnings per share (EPS)) reflecting both book and market company value whose dynamic has been followed up at the level of the 5 business segments.

The last part of the case study will concentrate on the Distance to Default determinant factors. There will be valorized a differentiated Distance to Default factorial perspective in accordance with the 5 different business profiles.

The sources the information was obtained from were the following:

- www.ktd.ro site in order to get information on the financial indicators characteristic to the 34 companies;
- www.bvb.ro site in order to get an insight on the companies listed on the Romanian Stock exchange.

As for the methodology, analysis of the descriptive statistics and regression are the most frequently used tools in order to highlight out the industry impact on corporate default.

Financial ratios will be analyzed during a period of 10 years (1997-2007).

2.2. Descriptive statistics analysis of the business profile default point

In order to highlight out the industry impact on the corporate default valuation, default point has been computed at the level of every business profile; consolidation of the financial input corresponding to the companies listed on the Bucharest Stock Exchange has been the method by which default point has been assessed.

Corresponding descriptive statistics underline a certain differentiation of the default point in accordance with the business profile. Default point valuation reflects also financing policy of the company; a high default point underlines an aggressive leverage policy while a low default point is the mark of the self-financing (pecking behaviour).

Descriptive statistics corresponding to energy sector default point

Table 1

MEAN	CONFID. - 95%	CONFID. +95%	MEDIAN
2,012,074.90	1,764,345.18	2,259,804.63	1,960,000.00
Variance	**Std,Dev,**	**Maximum**	**Minimum**
103,867,240,754.55	322,284.41	1,645,808.47	2,491,687.83
Lower Quartile	**Upper Quartile**	**Range**	**Quartile range**
1,710,089.32	2,232,414.85	845,879.36	522,325.54
Kurtosis	**Std,Err, Kurtosis**	**Skewness**	**Std,Err, Skewness**
-1.44	1.40	0.29	0.72

Source: own processing.

An analysis at the level of the descriptive statistics corresponding to the default point reveals the fact that the highest default point is recorded by the companies activating in the energy field while the lowest one is recorded by the companies activating in the pharmaceutical sector.

Energy field implies a high degree of technical endowment and an aggressive investing policy frequently supported by leverage which triggers a high default point.

The high energy business profile Default Point can be explained also from the perspective of the tough pricing policy implied by the continuous oil price increase.

Pharmaceuticals imply a high working capital level and the short-term financing policy which triggers a low default point.

Chemicals and equipments are quite similar in terms of default point level while materials are closer to chemicals.

The Default Point Skewness indicator is identical in the case of the chemical, equipment and material business profile (0.66) and it is quite close to the energy Default Point Skewness indicator (0.72).

Descriptive statistics corresponding to pharmaceutics sector default point

Table 2

MEAN	CONFID. - 95%	CONFID. +95%	MEDIAN
39,362.59	26,445.17	52,280.01	46,910.09
Variance	**Std.Dev.**	**Maximum**	**Minimum**
369,708,709.15	19,227.81	64,639.73	13,599.30
Lower Quartile	**Upper Quartile**	**Range**	**Quartile range**
18,703.47	53,301.27	51,040.43	34,597.80
Kurtosis	**Std.Err. Kurtosis**	**Skewness**	**Std.Err. Skewness**
-1.78	1.28	-0.19	0.66

Source: own processing.

Chemicals, equipments and materials practice a financing policy based on a mixture between long term and short term debt. Default point volatility may represent an adequate indicator of the business risk. The highest volatility associated to the

default point is recorded by the energy sector which reflects the fact that business risk is one of the most significant in the case of the oil processing companies determined by the oil price dynamic and by the limited worldwide oil resources.

Descriptive statistics corresponding to the chemicals sector default point

Table 3

MEAN	CONFID. - 95%	CONFID. +95%	MEDIAN
173,431.19	126,133.65	220,728.73	165,932.31
Variance	**Std.Dev.**	**Maximum**	**Minimum**
4,956,615,985.85	70,403.24	343,707.85	93,671.32
Lower Quartile	**Upper Quartile**	**Range**	**Quartile range**
123,747.25	196,951.35	250,036.52	73,204.10
Kurtosis	**Std.Err. Kurtosis**	**Skewness**	**Std.Err. Skewness**
2.86	1.28	1.42	0.66

Source: own processing.

The lowest Default Point volatility is recorded by the pharmaceutical field which reflects the fact that business profiles deeply rooted into vital products such as medicines imply a low business risk because of a steady demand.

Descriptive statistics corresponding to the materials sector default point

Table 4

MEAN	CONFID. - 95%	CONFID. +95%	MEDIAN
115,419.43	72,566.73	158,272.13	93,592.25
Variance	**Std.Dev.**	**Maximum**	**Minimum**
4,068,784,111.47	63,787.02	266,935.80	52,773.57
Lower Quartile	**Upper Quartile**	**Range**	**Quartile range**
77,007.37	148,668.29	214,162.23	71,660.92
Kurtosis	**Std.Err. Kurtosis**	**Skewness**	**Std.Err. Skewness**
2.33	1.28	1.58	0.66

Source: own processing.

Chemicals and materials have similar default point volatility which reflects the fact that both industries imply raw materials processing.

Descriptive statistics corresponding to the equipment sector default point

Table 5

MEAN	CONFID. - 95%	CONFID. +95%	MEDIAN
91,963.10	61,654.11	122,272.08	85,275.83
Variance	**Std.Dev.**	**Maximum**	**Minimum**
2,035,405,874.40	45,115.47	176,324.45	10,767.86
Lower Quartile	**Upper Quartile**	**Range**	**Quartile range**
66,774.99	121,516.35	165,556.59	54,741.36
Kurtosis	**Std.Err. Kurtosis**	**Skewness**	**Std.Err. Skewness**
0.57	1.28	0.25	0.66

Source: own processing.

2.3. Descriptive statistics analysis of the business profile distance to default (DD)

Distance to Default descriptive statistics analysis reveal some interesting aspects regarding the business risk profile. The lowest Distance to Default value is recorded by the chemical sector while the highest one is recorded by pharmaceuticals which had the lowest default point volatility.

This is in line with the assumption that Default Point and Distance to Default volatility can be correlated. A low Default Point volatility keeps a business sector out of the corporate default danger area.

Energy sector ranks secondly in terms of descending Distance to Default, but reported to the pharmaceutical sector, the gap is a high one.

While energy has the highest Default Point and the most aggressive leverage policy, when it comes about Distance to Default ranking, it is very closely positioned to materials and equipments.

Descriptive statistics corresponding to the energy sector DD

Table 6

MEAN	CONFID. - 95%	CONFID. +95%	MEDIAN
227.5826	178.419	276.7461	254.8547
Variance	**Std.Dev.**	**Maximum**	**Minimum**
10,404.47	102.00	353.00	0.00
Lower Quartile	**Upper Quartile**	**Range**	**Quartile range**
175.07	298.79	353.00	123.72
Kurtosis	**Std.Err. Kurtosis**	**Skewness**	**Std.Err. Skewness**
0.80	1.01	-1.07	0.52

Source: own processing.

This can be explained by the logistic and production process similarities. Since all the three business profiles imply raw materials acquisition and processing, they are obeyed to their pricing policy fluctuations.

Descriptive statistics corresponding to the chemicals sector DD

Table 7

MEAN	CONFID. - 95%	CONFID. +95%	MEDIAN
56.53	-211.08	324.13	216.57
Variance	**Std.Dev.**	**Maximum**	**Minimum**
158,671.37	398.34	286.08	-1,098.80
Lower Quartile	**Upper Quartile**	**Range**	**Quartile range**
65.04	249.78	1,384.88	184.74
Kurtosis	**Std.Err. Kurtosis**	**Skewness**	**Std.Err. Skewness**
8.88	1.28	-2.90	0.66

Source: own processing.

The highest Distance to Default volatility is recorded by the pharmaceutical sector. Although this sector is placed at the highest Distance to Default, it seems that the implied volatility is the highest one too.

Materials and energy sectors have similar Distance to Default volatility.

Descriptive statistics corresponding to the pharmaceuticals sector DD

Table 8

MEAN	CONFID. - 95%	CONFID. +95%	MEDIAN
3,365.67	-1,493.04	8,224.39	109.46
Variance	**Std.Dev.**	**Maximum**	**Minimum**
52,305,959.38	7,232.29	286.08	-1,098.80
Lower Quartile	**Upper Quartile**	**Range**	**Quartile range**
65.04	249.78	1,384.88	184.74
Kurtosis	**Std.Err. Kurtosis**	**Skewness**	**Std.Err. Skewness**
-8.88	1.28	-2.90	0.66

Source: own processing.

The lowest Distance to Default is recorded by the equipment sector. As for the Skewness indicator, all the business profiles have recorded the same value (0.66).

Descriptive statistics corresponding to the materials sector DD

Table 9

MEAN	CONFID. - 95%	CONFID. +95%	MEDIAN
197.26	126.21	268.32	203.55
Variance	**Std.Dev.**	**Maximum**	**Minimum**
11,186.42	105.77	314.14	-4.23
Lower Quartile	**Upper Quartile**	**Range**	**Quartile range**
104.98	301.67	318.37	196.69
Kurtosis	**Std.Err. Kurtosis**	**Skewness**	**Std.Err. Skewness**
-0.48	1.28	-0.70	0.66

Source: own processing.

Materials and energy sectors have similar Distance to Default volatility.

Descriptive statistics corresponding to the equipment sector DD

Table 10

MEAN	CONFID. - 95%	CONFID. +95%	MEDIAN
205.46	194.63	216.3	205.88
Variance	**Std.Dev.**	**Maximum**	**Minimum**
260.21	16.13	239.39	181.29
Lower Quartile	**Upper Quartile**	**Range**	**Quartile range**
197.07	214.71	58.1	17.64
Kurtosis	**Std.Err. Kurtosis**	**Skewness**	**Std.Err. Skewness**
1.03	1.28	0.56	0.66

Source: own processing.

In order to get a deeper insight on the industry impact on the corporate default valuation, there have been selected three ratios reflecting both book and market company value (leverage, return on assets and EPS).

Financial ratios in accordance with the business profile

Table 11

	Leverage	ROA	EPS
energy	0.507078	0.016556	0.016737778
pharmaceutics	0.469732	0.105764	0.051951667
chemicals	1,67	5,55	0,40
materials	5, 78	-2,01	-0,23
equipments	31, 47	0,84	207,76

Source: own processing.

Equipments sector has the highest leverage while pharmaceutics has the lowest one. It is very interesting that although energy has the highest Default Point, when it comes about leverage level, it is outperformed by the equipment section which highlights out the fact that energy sector is strongerly capitalized than equipment. In fact, default point is obtained by the global perspective on the mixture between long term debt and short term debt while leverage derives from the weight of the total debts into the assets.

The lowest value is recorded by the pharmaceutics which is in line with the initial assumption of the lowest default point.

Descriptive statistics of the financial ratios according to the business profile

Table 12

	Mean	Minimum	Maximum	Std.Dev.
Leverage	7.981652	0.469732	31.47463	13.31185
ROA	0.199658	-0.0201	0.840618	0.361339
EPS	41.60136	-0.23793	207.7677	92.89007

Source: own processing.

Chemicals are the most profitable sector both from the perspective of the EPS and ROA while material is the lowest one; this situation is quite contradictory since both segments imply raw material processing and acquisition.

The highest volatility is recorded by the EPS; this can be explained by the fact that market value profitability is impacted to a high extent by the macroeconomic environment volatility (inflation, national currency depreciation).

3. What triggers distance to default?

This section is dedicated to the Distance to Default structural approach from the perspective of the industry impact.

There have been performed regressions at the level of the 5 business segments in order to determine which are the most significant variables impacting Distance to Default.

Energy regression

Table 13

Regression Summary for Dependent Variable: VAR1
R= .41814724 R^2= .17484712 Adjusted R^2= -----
F(3,6)=.42379 p<.74306 Std.Error of estimate: 18.573

	BETA	St. Err. of BETA	B	St. Err. of B	t(6)	p-level
Intercpt			202.3085269	19.76738602	10.23446	5.07E-05
VAR2	0.032445	0.44528	0.655369543	8.994419071	0.072864	0.944283
VAR3	0.323045	0.390637	147.1500223	177.9389799	0.826969	0.439896
VAR4	-0.25558	0.425944	-14.05843836	23.42972267	-0.60003	0.57044

Source: own processing.

Regressions conceived Distance to Default as independent variable and the set of 3 financial ratios as dependent variables. The choice for the 3 ratios has been impacted mostly by previous research activity based on the identification of the most important financial ratios. Applying Multiliniar Discriminant Analysis on a panel of 30 financial ratios for 150 companies, statistic output allowed us in the previous research papers to conceive the three indicators as being the most significant ones within financial analysis process[1].

Synthetically, Distance to Default can be modelled by linear regression according to the business profile as follows:

Distance to default model according to the business profile

Table 14

BUSINESS PROFILE	DISTANCE TO DEFAULT MODEL
EQUIPMENT	DD = -0.68871* LEV -0.77414* ROA + 0.261542* EPS
MATERIALS	DD = -0.12356 * LEV -0.36919*ROA + 0.522267*EPS
CHEMICALS	DD= 0.032445* LEV+ 0.323045*ROA - 0.25558*EPS
PHARMACEUTICALS	DD= -0.55875* LEV + 0.719256*ROA - 0.57248*EPS
ENERGY	DD= 0.032445* LEV +0.323045 ROA -0.25558 EPS

Source: own processing.

Pharmaceuticals regression

Table 15

Regression Summary for Dependent Variable: VAR1
R= .95395600 R^2= .91003206 Adjusted R^2= .85605129
F(3,5)=16.858 p<.00478 Std.Error of estimate: 2994.2

	BETA	St. Err. of BETA	B	St. Err. of B	t(5)	p-level
Intercpt			7849.292337	5648.151969	1.38971	0.223318
VAR2	-0.55875	0.134969	-28186.72455	6808.626299	-4.13985	0.008998
VAR3	0.719256	0.142326	209469.6653	41449.86494	5.053567	0.003921
VAR4	-0.57248	0.142191	-199560.4927	49565.92762	-4.02616	0.010059

Source: own processing.

The most significant regression output is delivered in the case of the pharmaceutics and equipment section.

EPS is delivered as the most significant DD determinant factor for both business segments.

The profitability can be considered the most important measure of a company's performance. In the long run, a company must remain profitable in order to keep good liquidity and solvency ratios. A high profitability will keep company away from corporate default area. EPS will act also as a good signal for investors which will strengthen company image on the market.

Chemicals regression

Table 16

Regression Summary for Dependent Variable: VAR1 R= .41814724 R²= .17484712 Adjusted R²= ----- F(3,6)=.42379 p<.74306 Std.Error of estimate: 18.573						
	BETA	St. Err. of BETA	B	St. Err. of B	t(6)	p-level
Intercpt			202.3085	19.76738602	10.23446027	5.07E-05
VAR2	0.032445	0.44528	0.65537	8.994419071	0.072864021	0.944283
VAR3	0.323045	0.390637	147.15	177.9389799	0.826969011	0.439896
VAR4	-0.25558	0.425944	-14.0584	23.42972267	-0.600025812	0.57044

Source: own processing.

As for the other business segments, regression output is closer to the 0.5 significance level of the R-squared coefficient.

We could conclude that equipments and pharmaceuticals Distance to Default sectors are more impacted by the idiosyncratic risk while for the other sectors – energy, chemicals, materials- the strongest impact derives from the macroeconomic context.

Energy is directly impacted by the worldwide oil quotations and also by the competition exerted on the Romanian market between Petrom and Rompetrol.

Chemicals are also impacted by the contradictions regarding potential privatizations (e.g. Oltchim).

Materials regression

Table 17

Regression Summary for Dependent Variable: VAR1 R= .42602089 R²= .18149379 Adjusted R²= ----- F(3,6)=.44348 p<.73062 Std.Error of estimate: 465.10						
	BETA	St. Err. of BETA	B	St. Err. of B	t(6)	p-level
Intercpt			61.26862	163.6258665	0.374443359	0.720951
VAR2	-0.12356	0.552518	-3.41056	15.25074881	-0.223632457	0.830463
VAR3	-0.36919	0.624927	-3457.45	5852.452561	-0.590768624	0.576236
VAR4	0.522267	0.478582	185.3109	169.8109221	1.091278123	0.317022

Source: own processing.

The least significant statistic results were obtained in the case of the materials, equipments and energy field.

The associated p-values to the financial ratios as dependent variables reflect the fact that in the case of these business profiles Distance to Default is not impacted to a high extent by profitability and leverage ratios.

Equipments regression

Table 18

Regression Summary for Dependent Variable: VAR1 R= .81045909 R²= .65684394 Adjusted R²= .48526591 F(3,6)=3.8283 p<.07610 Std.Error of estimate: 78.968						
	BETA	St. Err. of BETA	B	St. Err. of B	t(6)	p-level
Intercpt			439.7938	82.98812681	5.299478229	0.001831
VAR2	-0.68871	0.355997	-4.69873	2.428784865	-1.93459947	0.101197
VAR3	-0.77414	0.269366	-143.836	50.0486502	-2.873933605	0.028281
VAR4	0.261542	0.362079	1.039768	1.439455443	0.722333962	0.497265

Source: own processing.

Conclusions

Research concentrated on the industry impact on the Distance to Default structural approach valuation. Analysis performed at the level of the Distance to Default and Default Point determinants highlight out the fact that indeed there is a business profile differentiation in terms of default assessment at the level of the companies listed on the Bucharest Stock Exchange and financial analysis must be adapted to the characteristics implied by every industry sector. It has been pointed out that energy and chemicals are more exposed to the macroeconomic impact while pharmaceuticals and equipments are more exposed to the idiosyncratic risk reflected into the classic financial ratios.

Although energy had the highest Default Point, equipment had the utmost leverage and the lowest Distance to Default. The actual research validated the hypothesis of a deep correlation between aggressive leverage and high default probability. Equipment has also the lowest profitability reflected by the ROA in comparison with the other sectors while profitability reflected by the EPS is the highest one.

This is in line with the assumption that aggressive leverage is supported by the good investors perception of the companies.

As for the default valuation, it is necessary to build up especially created models, perfectly adapted to the characteristics of the business profile. This will impact to a high extent the accurate prediction of the corporate default and will allow corporate default models granularity.

Note

(1) Credit-scoring scoring models and their multidimensional practical approach: case study on the Romanian listed companies on the Bucharest Stock Exchange – research published within the volume „Business Excellence"/ Review of Management and Economical Engineering, Special issue, 2007. ISSN-1583-624X Authors: Petre Brezeanu, Cristina-Maria Triandafil

References

Chen, R., Hu,S., Pan, G. (2006). *Default Prediction of Various Structural Models*, Michigan University Press

Cohen, D., „Incorporating default risk into Hamada's equation for application to capital structure", MPRA Press, 2007, *http://mpra.ub.uni-muenchen.de*

Dangl T., Zechner J., „Credit risk and Dynamic Capital Structure Choice", Vienna Univesity Press, 2006, *www.creditrisk.com*

Davydenko, S., „When do firms default? A study on the default boundary", London Business School Press, 2005, *www.creditrisk.com*

Duffie, D., Singleton, K.J., „Modeling term structures of defaultable bonds", *Review of Financial Studies*, Vol. 12, Issue 4, 1999

Dwyer, D., „Examples of overfitting encountered when building private firm default prediction models", New York: Moody's KMV, 2005, *www.moody's.com/ whitepapers*

Dwyer,D., „*Expected Default Frequency Enhancements"*, New York: Moody's KMV, 2007, *www.moody's.com/ whitepapers*

Elizalde A., „Credit Risk Models I: Default Correlation in Intensity Models", 2005a, *www.abelelizalde.com*

Elizalde A., „Credit Risk Models II: Structural Models", 2005b, *www.abelelizalde.com*

Elizalde A., „Credit Risk Models III: Reconciliation Reduced-Structural Models", 2006, *www.abelelizalde.com*

Ericsson, J., Reneby, J. (2005). *Can Structural Models Price Default Risk: Evidence from Bond and Credit Derivative Market*, McGill University Press

Fernandes, J., „Corporate credit risk modeling: quantitative rating system and probability of default estimation", 2005, *http://papers.ssrn.com*

Hackbarth, D., Miao, J., Morellec, E., „Capital Structure, Credit-Risk and Macroeconomic Conditions", HEC University Press, 2004, *http://papers.ssrn.com*

Hochrainer, S., „Financial natural disaster risk management for developing countries, International Institute for Applied Systems Analysis Press", 2006, *http://papers.ssrn.com*

Hsu, Santa Clara, „Bond Pricing with Default Risk", 2002, *http://personal.anderson.ucla.edu/pedro.santa-clara/ Default.pdf*

Kraft, H., Muller, M., „Redesigning Ratings: Assessing the Discriminatory Power of Credit Scores under Censoring", *Working Paper*, *Fraunhofer Institut fur Technology und irtschaftsmathematik,* 2004

Merton, R., „On the Pricing of Corporate Debt: The Risk Structure of Interest Rates", *Journal of Finance*, Vol. 29, 1974, pp. 449-470

Peter, M., Grandes, M., „How important is sovereign risk in determing corporate default premia?", *International Monetary Fund Press*, 2005, *www.imf.org.com/research*

Rocha, K., Garcia, A., „Term Structure of Sovereign Spreads in Emerging Markets – A Calibration Approach for Structural Model", IPEA Press, Brazil, 2004, *http://papers.ssrn.com*

Saretto, A., „Predicting and Pricing the Probability of Default", UCLA Press, 2004, *http://papers.ssrn.com*

Schaffer, R., Sjolin, M., Sundin, A., „Credit-risk – a structural model with jumps and correlations", Lund University Press, 2007, *http://papers.ssrn.com*

Stein, R., „*Evidence* on the incompleteness of Merton-Type Structural Models for Deafult Prediction", New York: Moody's KMV, 2005, *www.moody's.com/ whitepapers*

Stein, R., „The relationship between default prediction and lending profits: Integrating ROC analysis and loan pricing", *Journal of Banking and Finance*, 29, 2005, pp. 1213-1236

Controversies in the Debate Regarding Economic Convergence

Marieta Stanciu
Carmen Puiu
University of Craiova

Abstract. *Countries from Central and Eastern Europe face some specific challenges for poor countries: still fragile institutions, a social cohesion under a lot of pressures, inequalities in rapid growth(1), endemic corruption etc. That is why these countries must prepare public policies that should try to solve a range of specific problemes that these countries faceses with on their way of development.*

A strategy of economic development means a construction of conscious public (economical) policy, therefore intellectual resources, a capacity to formulate and carry out policy.

Key words: convergence; catching-up; big push; social and economic cohesion.

JEL Codes: R11.
REL Codes: 19H, 20F.

The fact that countries from Central and East Europe – including Romania, joined EU meant accomplishing some political and economical pre-conditions. If, for the majority of candidate countries, political criteria were considered less problematic, economic criteria raised more questions, which, however, were outrun, candidate-countries made indisputable progresses in the domain of economic reforms.

Romanian relationship with EU is frequently judged through reforms, the process of transformation from an ex – command (communist) economy as well as through the so-called process of "catching-up", of reducing great development discrepancy compared with Western Europe (Easterly, 2001a, 2001b).

Big discrepancies in incomes per inhabitant (compared with those from the EU countries), high inflation rate, the fragility of financial systems, worsening of some social indicators, the impoverishment of a big part of the population and the capacity of some countries to achieve a convergence of "deep"[2], to face competitive pressures that are normal for the function of these countries inside the EU.

A country like Romania has to combine institutional reforms, especially those regarding markets formation, modernizing, that means it has to achieve the so-called process of catching-up which is a specific objective for a country, with a low income per inhabitant, and this will determine a sustained economic growth (Deepak, 1991) and a considerable reduction of discrepancies compared to developed countries from Europe.

There are many aspects that should be considered in expressing development policy and Romanian modernization:

- catching – up is a long-term process[3];
- financial discipline must be imposed in economy to allow the development of viable enterprises;
- a macroeconomic policy which will promote stability and economic growth;
- an intelligent politic policy that will take into account available resources and that it could rely on the entrepreneurial spirit of private entities from the society;
- the state must offer public assets like educational and sanitary system, public utilities, road networks, national defense and security system, protecting the environment, social assistance system etc.;
- an "extensive jump" convergence to another group (in Romania's case it would be the movement through the EU average from the present status of peripheral south-eastern country with a low income/inhabitant) is encouraged by the possibility of workforce export and massive foreign capital entrances, which have a strong training effect, of technology transfer and rapid productivity growth.

EU can offer to Romania that "big push" that Paul Rosenstein-Rodan (1961) referred to, when he talked about the secular difference between the rest of Europe and South-East Europe[4], this extern impulse should combine with a propellant intern force, with a well structured and pragmatic policy. It refers to institutional modernization and also about the supplement of resources that EU union can offer through cohesion funds[5] to a country which has many things to accomplish in infrastructure construction and achieving European standards in different domains.

The policy of social and economic cohesion (PCES) of the European union has three major objectives that refer to:

- convergence, which is an objective financed with 80% from the budget destined to structural and cohesion funds and which regards the regions from the member states of the EU that have PIB/inhabitant less than 75% from the communitarian average;
- regional competition and work forces occupation is an objective financed with 15% from the budget destined to structural and cohesion founds that regard regions that are not eligible inside the objective of convergence;
- European territorial cooperation is the objective financed with only 5% from the budget destined to the cohesion and structural founds and refers to transnational, trans-border and inter-regional cooperation.

Convergence priority (Guillen, 2001) regards sustaining economic growth and the process of creating new workplaces in the less developed states and communitarian regions, being the one that reflects the continuity element inside the PCES43. The regions in which a PIB/inhabitant is under 75% from the communitarian average are endorsed, and the interventions have as objective creating favorable conditions to ensure the economic growth, permitting the realization of a real convergence.

For the regions that will be affected by the so-called "statistic effect" 44, the Commission proposes to give a temporary sustentation. To maintain the equity of interventions, the level of given support should be bigger than that decided in 1999, in Berlin, for the regions that were at that time in transition. This help should end in 2013 without being followed by another period of transition.

The static effect was registered in 18 regions that have a PIB/inhabitant less than 75% from the EU-15 average, regions that sum about 19 million inhabitants (including Malta, the new member state). For the 18 regions, the EU expansion to 25 member states will mean the growth of PIB/inhabitant to over 75% from the communitarian average (average that is strictly statistic). According to estimation, 4 regions are placed in Eastern Germany, 4 in Great Britain, 4 in Spain, 1 in Greece and 1 in Portugal, these regions face with the same structural weaknesses that they had before the extension and the obligation to maintain the support for these appears to be evident,

There is a striking reality in the world that should make us more cautious when we judge the chances of a process of "catching-up". Angus Maddison (1995) in his fascinating work refers to the long dynamics from the worldwide economy that makes a revelation, mainly, of a divergent evolution between rich and poor countries. "Catching-up" rich countries, the so-called beta-convergence is very rare but less rare are convergences that are produced inside one country (clusters) and which are named in literature regarding economic growth as being sigma-convergence. European countries that are in the process of transition are interested in a convergence of beta type, which can permit the reduction of discrepancies when facing rich European countries and which will reduce the tensions that could appear along with the Union's extension.

Still, beta-convergence claims:

- high saving and investments rates;
- permanently amelioration of competition, a reasonable level of social straitening (a considerable social cohesion)
- rapid constant growth of total productivity in the production factors[6].

EU offers some examples regarding the possibility of economic convergence. So, Ireland, a relatively poor country, joined EU in 1973, when its income per inhabitant was 59% from the Union's average, but in 1998 it achieved the "catching-up" having an income per inhabitant a little over the EU average. Still, Greece's experience is not so positive, so the income per inhabitant compared with the EU average fell from 77% at the moment when it joined EU (in 1981) to 66% in 1998.

A study elaborated by Carmela Martin et al. (Carmela Martin, Francisco y Velazquez and Bernard Funck, European Integration and Income Convergence) indicates the fact that countries which benefited of cohesion funds had convergence evolutions through the average of income/inhabitant in the EU before joining the Union.

Massive entrances of capital (of direct investments) in Ireland seem to explain the rapid economic growth in this country, capital entrances that seem to have compensated the inferior intern effort regarding research and development (Rodrik, 2000).

Carmela Martin and her colleagues emphasizes that the convergence process on the incomes/person level is tight connected to the convergence on work productivity level and its growth id determined by a country's capacity to benefit from the international transfer of technology, of "the ability in valorizing technology gains".

The authors of the study speak about some observations regarding convergence in Western Europe:

- big differences can be noticed between past centuries and the present international environment;
- generally, past centuries were characterized by a high increase in Europe;
- countries that joined the Union in the past had not so much to restructure and apply such deep institutional reforms as ex-communist countries must do;
- there are still areas inside the Union that continue to be seriously behind the general progress.

In present and configured conditions, we should ask ourselves some questions:

Which are the basis premises that would allow Romania to have rapid and sustained economic growths?

Which are the ways to encourage convergence?

Convergence problem is available as for the countries that joined first, as for the other ones. Another aspect should be considered, and that is: it is for the first time in the Union's history when it admits such a big number of members, even if their cumulated PIB is not so impressive, incomes/inhabitant are low and economic performances are clearly inferior. It is not out of the question, in the presence of the actual EU functioning rules, that a "big-bang" extension creates major difficulties to the Union, both financial as well as functional.

Comparative analysis of Romanian economy state of health and that of EU countries, at the joining moment, shows Romanian advantages (strong points) and opportunities offered by integration, the

priorities that should be permanently reorganized through development strategies and policies of post-integration.

Romania joining the EU (on 1st of January 2007) allowed national development policy to connect to policies, main objectives and communitarian reorganizations in order to obtain an "European" development, which accelerates the process of social and economic convergence.

The global objective of the strategy for the period 2007-2013 is represented by a rapid reduction of socio-economic development disparities between Romania and EU member states, using as target a level of PIB/inhabitant of 41% from the EU average in the year 2013[7].

Accomplishing the global objective of the Romanian development strategy is represented by national development priorities[8], which are compatible with the EU cohesion policy as well as with the fundamental objectives of this organization, established by the Lisboan Agenda. Development priorities have major importance domains as:

1. The increase of economic competition and economy development based on knowledge that has as general objective the increase of enterprises productivity in order to reduce discrepancies compared to the average productivity at the Union's level. Annual average increase of production must be of about 5,5% in order to permit Romania to reach a level of almost 55% from EU average;

2. Developing human resources, promoting occupation and social inclusion and straightening administrative capacity. The general objective of this priority has in mind the development of human capital and its increase in competition on work market, by insuring equal learning opportunities during life and developing a modern and flexible work market which can lead, until 2015 at the durable integration on the work market of 900.000 people.

3. Diminishing development disparities between country's regions represent a priority of great responsibility for those that elaborate policies and social-economic development strategies. The objective of this priority is a more accelerated economic growth of low developed regions in order to reduce inter-regional and intra-regional development disparities;

4. Developing and modernizing transport infrastructure which has as main objective insuring an extensive, modern and durable transport infrastructure, as well as all the other conditions that regard sustainable development of economy and improving life quality. The volume of transport activity in PIB should increase from 3, 6 million Euros in 2004 to 7 million Euros until 2015.

5. Protecting and improving environment according to social and economic needs of Romania fact which will lead to a significant improvement of life quality by encouraging durable development.

6. Developing rural economy and increasing productivity in the agriculture sector – priority that results from the necessity to diminish social and economic disparities from rural areas and urban ones – which has as general objective complex development on long-term period of rural space, which will ensure a decent life standard and achieving social and economic cohesion on national, regional and local level.

National priorities of development for the period 2007-2013, approved by the European Union, insure the continuity of established objectives in the National Development Plan 2004-2006 and are meant to ensure

concentration and orientation of available resources to those objectives and measures that have maximum impact on the reduction of discrepancies regarding European Union and intern ones of the Romanian economy.

The unity and solidarity of member states represents one of the current themes of the Union based on which these do not benefit only from integration advantages but also assume the responsibility of member state, actively contributing to intern cohesion of the Union. Solidarity represents the principle which not only leads the integration process, but differentiates in a real way EU from other international organizations. In the context of an extended Union, solidarity and intern cohesion gain major valences in going thoroughly in the European political project.

Notes

(1) See Bartlomiej Kaminski, Francis Ng, Trade and Production Fragmentation: Central European Economies in Networks of Production and Marketing, World Bank Study, 2001.

(2) "Deep" convergence refers to the base institutional formation of a society that generates constant and rapid technologic and economic progress without negative social effects.

(3) Admitting that EU would grow on an average by 2% per year and Romanian economic growth would be on an average of 5% per year, then it will need 21 years to reach 50% from the EU average and 35 years to reach 75% from the same average. In Romania the income/inhabitant is of 26-27% from the EU average.

(4) Rosenstein-Rodan elaborated this concept, the hole of his analysis starting from the low economic development in South-East Europe countries (Rosenstein-Rodan, P., „Problems of Industrialisation of Eastern and South-Eastern Europe", *Economic Journal*, 1943, 53, June-Sept., pp. 202-211)

(5) Cohesion founds are meant to help poorer countries of EU to reduce discrepancies compared to the ones that are more advanced economically

(6) Total productivity of production factors denotes the rate of technique progress, or what Robert Solow called 'the residual' – what it remains in the neo-classic equation of growth after the quantity contribution of increasing capital and work is being extinguished.

(7) Romanian Government, National Plan of Development 2007-2013, Bucharest, December, 2005, p. 226.

(8) Romanian Government, National Plan of Development 2007-2013, Bucharest, December, 2005, p. 133.

References

Dăianu, D., „Economic Transition in Romania", CEROPE and the World Bank, *Arta Geografică*, Bucharest, 2000

Dăianu, D., Vrânceanu, R., „Public Finance and Low Equilibria in Transition Economies: the Role of Institutions", *Working Paper*, nr. 319, William Davidson Institute

Deepak, L. (1991). *Unintended Consciences: The Impact of Factor Endowments, Cultural, and Politics on Long-Run Performance*, Cambridge, Mit Press

Easterly, W. (2001b). *The Elusive Quest for Growth*, Cambridge, Mit Press

Easterly, W. (2001a). *The Cost Decades: Developing Countries in Spite of Policy Reform: 1980-1998*

Guillen, M.F. (2001). *The Limits of Convergence, Globalization and Organization Change*, Princeton University Press, 2001

Kaminski, B., Ng, Fr., „Trade and Production Fragmentation: Central European Economies in Networks of Production and Marketing", *World Bank Study*, 2001

Maddison, A. (1995). *Monitoring the World Economy, 1820-1992*, Development Centre Studies, OECD, Paris

Martin, Carmela, Velazquez, Fr.J., Fuuck, B., „European Integration and Income Convergence. Lesson for Central and Eastern European Countries", mai 2001, manuscris

Rodrik, D. (2000). *Can integration into the world economy substitute for a development strategy*, Paris

Rosenstein-Rodan, P., „Notes on the Theory of the Big Push", *Economic Development for Latin America*, New York, St. Martin Press, 1961

Solow, R.M., „A contribution to the Theory of Economic Growth", *Quarterly Journal of Economics*, 1956