

Fundamental transfers

“The test of maturity for Economics is for it to achieve epistemological connections with the package of social sciences.”

The maturation of Economics is not attested – as claimed by modern belief – by the employment of Mathematics. The sense of the maturity should be given by the strengthening of Economics’ capacity to most adequately reflect the ineffable complexity and the inevitable volatility of the object of study.

Mathematics’ cognitive power is demonstrated by applying it to homogenous, time-neutral systems, with repetitive movement and linear causality. Mathematics itself continues to show immaturity when describing complex, dynamic and negative-feedback structures, such as economic systems. Moreover, Mathematics operates with quantitative reductions which distort the very essence of social processes.

The human phenomenon cannot be mathematicised. It may be possible for the anthropic part of the world to be quantified in some way, but we do not possess such an instrument yet. What can be mathematicised is the human labour, the artificial addition by which man complements the natural. But even this is achieved to a marginal degree, through indirect measurement. In distilling the essence of social phenomena Mathematics provides the relevant cognitive instruments for about a quarter of the way, with the whole truth being revealed by other means, forms and practices of human reasoning.

What Mathematics achieves in Economics is approximation, but without control over the error, without the power to predict, without measuring the uncertainty.

The error and the uncertainty found in the space of economicity defy the rational functions of Mathematics. The cognitive and operational utility of mathematical instruments is limited by the configuration of Economics between the fluid determinants of the motivations and the volatility of individual answers in the fundamental action. The intellectual model of rational knowledge is inefficient in a universe which is constrained by conjecturally multi-stratified causes and by randomly dissipated consequences.

The accuracy of information, the consistency of cognitive patterns and the coherence of explanations cannot be attained by the mathematical method to an acceptable degree of relevance in Economics. The mix of advantages and disadvantages in the combination of resources is dependent on the subjectual, further widening the gap between Economics and Mathematics.

The test of maturity for Economics is for it to achieve epistemological connections with the package of social sciences. This indicates, on one hand, Economics' escape from the cognitive cul-de-sac it has reached by following the path of Mechanical Physics after the adventure of breaking the corpus of Natural Philosophy in the Enlightenment, and on the other hand it signifies the return of the subjective dimension in the space of economicity by linking naturally with Anthropology, Psychology, Sociology etc.

Economics did not really take into consideration the basic theories of Biology without cautious adjustments. Evolutionism came into Economics through Sociology, via Spencer. The specifics of the problem-focus of Economics are mostly sociological. The notion of subsistence for example, which defines the space of economicity, has an indirect biological sense. When referring to needs we usually consider their cultural reflection, thus looking at them from a sociological perspective. In Economics needs are mostly interpreted from a distinctly human standpoint, which is not strictly biological. The guidelines for understanding the needs are in step with the alignments of the human condition: work, labour, action. The animal condition does not sit comfortably in Economics, as it only has sense when it is associated with survival, as a chronic state. Subsistence turns survival into a potential state.

Economics considers its fundamentals without looking at survival. Darwin deals with survival and when he talks about man in this context he does not go beyond instincts. Cultural resonance – the conscious, rational thought of the human condition – creates a cognitive turbulence when contemplated next to the human nature. However, things are hard to set apart. The human nature evolves on a cultural path, toward the fabrication of the artificial in its own nature, even by dislocating the *natura naturans*. The animal nature is *natura naturans*, it does not have its own culture (or artificial nature).

The place of conjunction between *natura naturans* and the artificial nature is simply the human nature. The fundamentals of Economics are linked to this ineffable conjunction. In Economics the structuring of the conjunction is essential, above all as actional arrangements around the relationship (brilliantly studied by Jung) between the conscious and the unconscious, between Reason and Instinct. As a consequence of this constitution, Economics also follows the patterns of

fundamental finality through the un-mathematizable contribution of emotions, of the options based on non-logical fundamentals.

Kahneman and Tversky have explained the conditional algorithms resulting from a complicated relationship, that between fast and slow thought. One is fast because it belongs to the natural reflexes of survival (belonging to the animal or to the hunter) from a time without cultural memory, whereas the other is slow because it builds arguments, it employs reasoning, it optimizes and it calculates and it has been doing this since the Axial Era, while doing it with consistency for the past three centuries.

Rapid thought occurs naturally, without calculation; it wants everything at once and it can lose anything in the order of things, even irredeemably. This thought creates the frenzy of the hunter, which stirs the casino economy. It is responsible for the majority of decisions and it sits every time at the origin of excesses. Irrational exuberance and its opposite, panic, stem from this thought. Statistically, the economic phenomenology is three quarters of the way the product of this unquantifiable thought. Slow thought must be challenged, it demands costs before profit. It is the entrepreneurial calculation in taking the step in order to confront the invisible forces which make up the market.

The double typology of thought covers the territory of economicity integrally. Economics functions with both states of the human nature. Mathematics chooses rational thought. Biology is at home in with the first form of thought. The entire dialectics, which counts as the 1:1 scale of reality for the human phenomenon, is dealt with by Psychology seconded by Anthropology.

Sociology spans the interstices of the whole, as it has too – just like Economics – attempted alliances with Logic, Mathematics a.s.o. Quantitative sociology replays the fate of Astrology and, just like quantitative Economics, becomes a footnote of Mathematics.

Marin Dinu

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www.econometeoreticasiaplicata.ro; www.ectap.ro

Reception of texts: economia.ta@edeconomica.com

ISSN 1841-8678 (Print)
ISSN 1844-0029 (Online)

The analysis of regional earnings inequalities in Romania

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Abstract. *The priorities of regional development policies aim at reducing interregional and intraregional disparities by supporting the creation of some more integrated regional labour markets and by a better use of regional synergies in order to increase the investment attractiveness.*

Considering these aspects, the purpose of the study was to do an analysis in the developing regions of Romania which tried to identify the factors that influence earnings and earnings inequalities. We considered a panel analysis in which the determinant factors were the gross domestic product, foreign direct investment, the share of graduates from post-secondary and tertiary education of the total population of the region and inflation. These macroeconomic indicators play an important role in achieving the cohesion policy objectives to reduce disparities between the most developed regions and those with a lower level of development.

Keywords: earnings inequalities, regional disparities, earnings, panel data.

JEL Classification: J31, R23, C23.

REL Classification: 16F, 12I.

1. Introduction and literature

In the last years, the European countries seem to convey a greater importance to the territorial dimension of the policies promoted. The territorial (regional) dimension of cohesion was introduced in the Lisbon Treaty, and added to the social and economic dimension, thus becoming a political objective in the European Union.

The regional policy promoted by the European Union regarding cohesion and the territorial development refers mainly to job creation, competitiveness, economic growth, a higher quality of life and sustainable development. Clearly, the achievement of all these aspects contributes to the implementation of the Europe 2020 Strategy. Thus, the European Union, by its policies, aims at reducing the economic, social and territorial significant disparities which still exist between regions.

The territorial cohesion complements and enhances the process of economic and social cohesion promoted by the EU to support the reduction of intra and inter regional disparities. The progress achieved within the process of economic and social convergence is measured by a series of specific indicators, such as GDP, the volume of FDIs, wage level etc., which are defining indicators in reducing income disparities between regions. The regional cohesion policy is therefore a tool to promote economic and social convergence.

Recognizing the important role held by the territorial dimension within the development policies and strategies is reflected in the European documents issued. Thus, the Territorial Agenda of the European Union 2020 “Towards an inclusive, smart and sustainable Europe of diverse regions”⁽¹⁾, aims to establish the principles and to draw the strategic directions for the territorial development of the European Union and promotes the integration of the territorial dimension in sectoral policies at all levels of government.

The picture of economic and social disparities in the EU is highly complex as it reveals major differences in development between countries and between regions within a country. Thus we can say that, although in most countries regional disparities are at similar levels relatively speaking, the situation is much more difficult in countries where the GDP/capita is substantially below the EU average; in these countries even the most developed regions have a low level of development compared with the EU average. This situation also applies in the case of Romania, and therefore an analysis on earnings and territorial earnings inequalities helps identify the factors that may help achieve the regional convergence objectives.

In the eight development regions of Romania there is still a risk of deepening economic and social disparities because of factors such as: the lack of basic conditions to attract investors, and especially foreign investors; the insufficiently qualified workforce; the strong dependence on a limited number of economic sectors with low added value etc. It is obvious that the current and the potential economic and social problems are different from one region to another, which requires a targeted approach, adapted to the needs in each region, especially targeting the sectors that have a higher potential of growth.

In the models that assume a free labour market and costless labour mobility, the equilibrium is reached when wages adjust to the level where labour supply equals labour demand. In such models, wages of workers with the same characteristics converge on the labour market, regardless of infrastructure or capital differences between regions. This convergence occurs after equalizing marginal productivity. In this case, differences in inter-regional earnings reflect differences in labour productivity.

When the restrictive assumptions of a perfect market are relaxed, other explanations can be mentioned for the earnings disparities between regions. First, labour mobility may be hampered by the relocation costs, search and information costs or disutility felt at leaving home and moving to a new environment. For low development levels, higher mobility costs were observed when the density of non-agricultural activity is low and the infrastructure is underdeveloped (Park, 2008).

The literature indicated several explanations for the international phenomenon of increasing wage inequality. At the macroeconomic level, the most important factors proposed and investigated in empirical studies are: international trade, globalization, the shift from production activities to services, technological progress and increasing female participation in the labour market. At the microeconomic level, the main factors considered are increasing demand for education and skills and increase the returns of these factors. In addition, some institutional factors related to labour market flexibility have been examined, like the decline in unionization, the minimum wage and the unemployment benefits (Monastiriotis, 2002).

Empirical studies designed mostly for China concluded that the main determinants of inter-regional earnings inequality are: GDP per capita, the share of industry, unequal accumulation of domestic or foreign capital and the degree of urbanization (Candelaria et al., 2013).

The theory states that inequality coexists with economic growth. From the utilitarian perspective, inequality should exist along with economic growth, in order to maximize social welfare. This opinion is in contradiction with the

egalitarian view which states that all members of the society should have equal access to economic resources. Most empirical research addressing the inequality – economic growth relationship either analyse the impact of inequality on economic growth or the impact of various socio-economic variables on inequality (Fallah and Partridge, 2007).

Economic growth may have a negative impact on wage inequality as growth is often positively associated with higher investment, higher employment generating processes and, therefore, with increased access to jobs and wages for a greater number of people. The magnitude of the impact may vary between regions for many reasons. For example, the regions with higher density of urban population are associated with greater competition and therefore less access to certain jobs. Also, these regions are more attractive for migrants/immigrants, which, especially the low-skilled ones are willing to accept lower paid jobs and reduce the access to jobs for locals. Those with a higher level of education will be drawn to the more developed regions, which offer more opportunities and more jobs requiring a high level of training which, of course, are better paid (Majumdar and Partridge, 2009).

Among the results of the empirical studies on the impact of economic growth on wage inequality we can mention those of Bartik (1994), which states that economic growth disproportionately benefits less skilled workers, which reduces wage inequality. Moreover, Pardo-Beltran (2002) argues that economic growth negatively affects the earnings inequality and this effect is nonlinear, results also sustained by García-Penalosa and Turnovsky (2006) in the context of an endogenous growth model.

Many researchers have examined foreign direct investment (FDI) as one of the causes of wage inequality. Although FDI seems to be good for development (positive correlations were found between FDI and GDP, productivity or wages), not all categories of workers gain from them in the same extent. The reasons for this include: FDI induces technological changes that require specific skills; it can be located only in certain sectors, mostly in those requiring higher qualifications; and it provides training to skilled workers more than to unskilled workers (Te Velde, 2003).

A review of the empirical studies at micro and macro level show that, at the minimum, the foreign direct investment perpetuate inequalities, although most studies conclude that FDI emphasizes them. Most evidence on the relationship between FDI and earnings inequality is for developed countries. Figini and Gorg (1999) concluded that FDI has led to increased employee skills and greater dispersion of wages in Ireland in the period 1979-1995; Taylor and Driffield (2000) found a significant impact of foreign direct investment on the dispersion of

wages in the UK; while Te Velde (2001) observed an increase in wages of workers in the sectors which require mainly skilled workers.

For the developing countries from Latin America, Feenstra and Hanson (1995) found that foreign direct investment increased the relative demand for skilled workers in manufacturing in the period 1975-1998. In some regions, FDI accounted for more than 50% of the increase in the labour wage share.

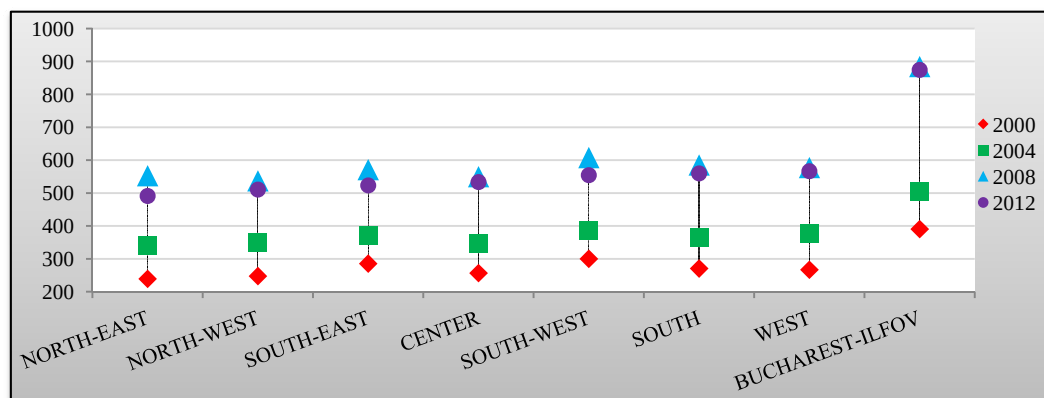
Te Velde and Morrissey (2002) studied the effects of foreign direct investment on wages and wage inequality in five East Asian countries (Korea, Singapore, Hong Kong, Thailand and the Philippines) and found that FDI increased wage inequality in Thailand. They also found that FDI leads to an increase of wages for both skilled and unskilled workers.

2. Descriptive analysis

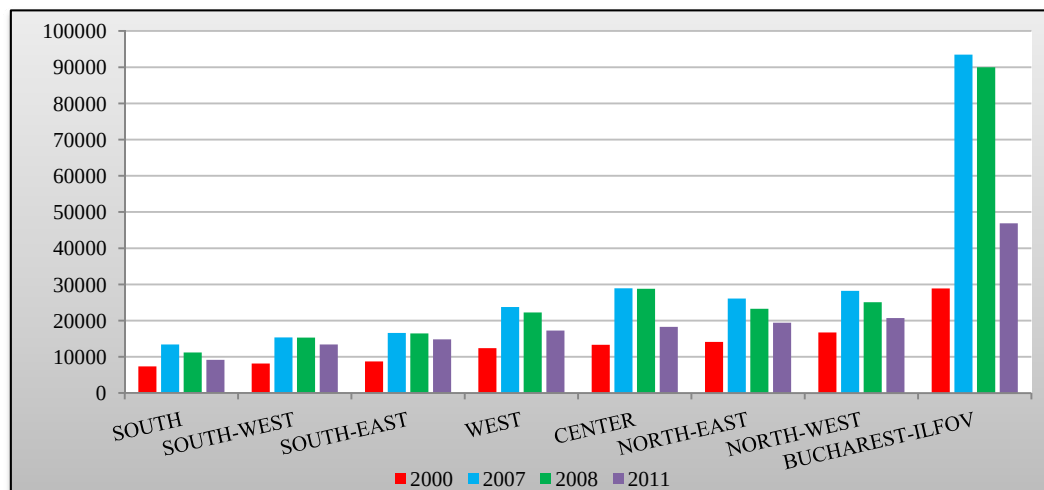
In this paper we used annual data for the period 2001-2011 on the 8 regions of Romania. The variables used were the foreign direct investment, the gross domestic product and the share of post-secondary and tertiary graduates of the total population of the region. The data on GDP, earnings and graduates were collected from the database of the National Institute of Statistics, while the FDI was obtained from the National Trade Register Office.

Both earnings⁽²⁾ and investments were deflated by the consumer price index (expressed in 2000 prices), while GDP was deflated by the GDP deflator (in prices of the previous year). The period investigated was imposed by the fact that foreign direct investment has not been found before 2001, while the data on graduates stopped in 2011.

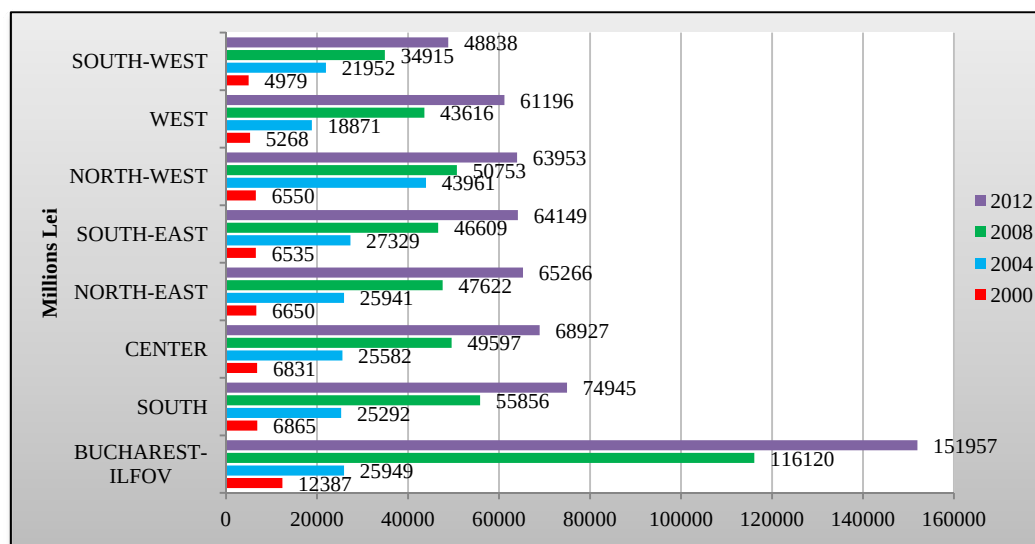
The earnings (expressed in 2000 prices) in the 8 regions of Romania are represented in Figure 1. We chose to represent only four years: 2000, 2004, 2008 and 2012 in order to be easier to follow the trend. Thus one can easily notice that in all regions earnings increased until 2008, so that later recording decreases in the real value (albeit nominal earnings have continued to grow). In most regions the earnings in 2012 was more than 100% higher than in 2000 (in the Bucharest-Ilfov, the increase was of 124%), the only exceptions being the South-East and South-West regions where the increases were of about 84%. However, earnings were lower in 2012 than in 2008, when Romania not yet started experiencing the effects of the economic and financial crisis. The smallest reductions (in 2012 as compared to 2008) occurred in the West and Bucharest-Ilfov regions (below 2%) and the highest was recorded in the North-East region (11%). However, for most regions the minimum was recorded in 2011.

Figure 1. *The real gross average monthly earnings*

In terms of the graduates of post-secondary and tertiary education, their number increased in all regions until 2007 and then declined. In regions where the increases were not substantial, nor the reductions were not pronounced.

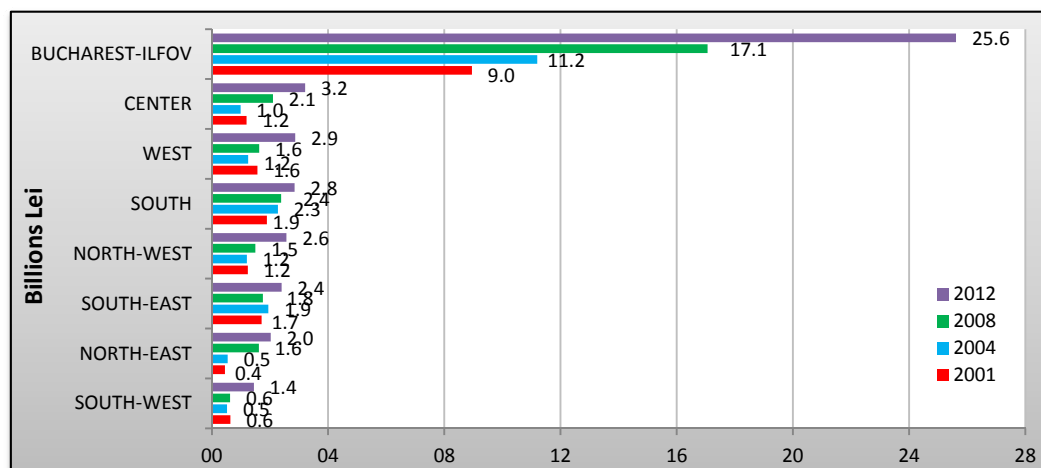
Figure 2. *Graduates of post-secondary and tertiary education*

However, in regions such as Centre or Bucharest-Ilfov, where in 2007 there were over 100% more graduates than in 2000, the decrease of their number was higher (over 36%). Yet, most graduates in 2012 are still registered in the capital region (both in number and as a share of total population).

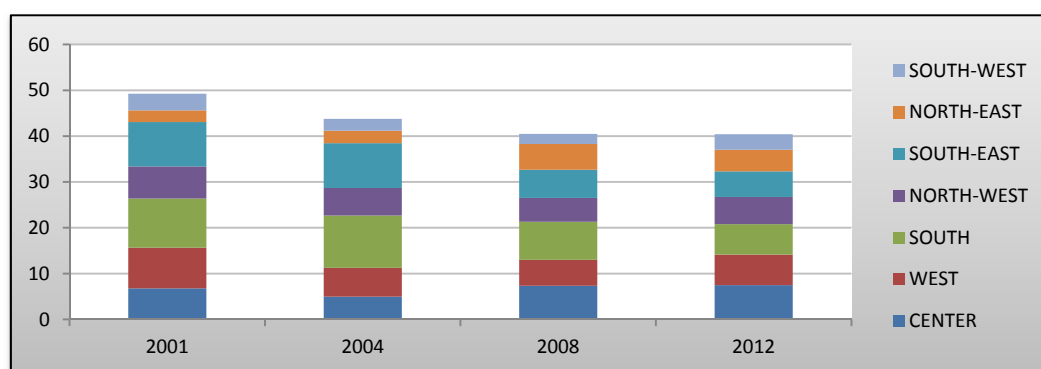
Figure 3. *The real gross domestic product*

The region that contributes most to the gross domestic product is Bucharest-Ilfov, followed by the South region. If we look at the GDP per capita, the second is the West region and not the South. Regarding the evolution in the analysed period, in nominal terms, regional GDP grew at least 6 times (the highest increase occurred for the Bucharest-Ilfov region and the lowest for North-West region).

The largest increases (year to year) were recorded in the period 2001-2004, with increases even higher than 50%. For example, in 2001 the largest increase in GDP was of 60.2% in the Northeast region and the lowest of 43.6% for the Bucharest-Ilfov region. After 2004, the GDP growth was not as pronounced, falling below 25% by 2008 (the only exception is the increase from 2005 in the capital region - 32.3%). The period 2008-2012 was a time of crisis, especially felt in 2010, when in the South region the GDP growth was negative (0.2%). In 2012, the GDP of the regions began to grow at rates similar to those before 2009, indicating an improvement in the economic environment.

Figure 4. Foreign direct investments

a. Foreign direct investments, regional level (2000=100)



b. Foreign direct investments, share of regions in total (Bucharest-Ilfov region was excluded)

The foreign direct investment in Romania increased from year to year, in the analysed period. Moreover, in five of the regions these increases were more than 100% (in the Northeast region the increase was of 353%). The smallest increases occurred in South-East (40%), South (51%) and West (83%). In the year 2012, most investment went into Bucharest-Ilfov region, followed by the Central region.

Regarding the share of each region in the total FDI brought into Romania, as expected, the Bucharest-Ilfov region represents over 50% (reaching almost 60% in 2012). The following rank is held by the central region (7.5%), while the smallest share is represented by the South-West region. It is worth noting the fact that while the growth in the period under review for the West region was among the lowest, the amount of FDI entered in 2012 in this region represents 6.7% of total investment in 2012 (immediately after the central region).

3. Methodology and econometric analysis

We considered the estimation of two econometric models in order to analyse the impact of different variables on earnings inequality, considering as dependent variable the monthly gross earnings and the Gini index at regional level. Although initially we considered a large number of factors, after several estimations we obtained that for the earnings inequality (*ineq*) only the foreign direct investment (*fdi*) and gross domestic product (*gdp*) have a significant statistical influence, while the earnings (*earn*) are influenced by FDI, GDP, the share of post-secondary and tertiary graduates of the total population in the region (*grad*) and inflation rate (*ir*).

Regarding the Gini index, for each of the Romanian regions we calculated an index by considering the earnings at county level, corresponding to each region. The main purpose was to determine the wage inequality within regions and subsequently use these Gini indices as independent variable in an econometric model built to assess inter-regional earnings disparities in Romania. The Gini index measures the deviation of an individual's income distribution from a perfect egalitarian one. This index ranges between zero and one, where 0 indicates a perfect equitable income distribution across the individuals and 1 means that only one individual receives all the income. The Gini index calculated from a sample is a statistic, therefore it is recommended to report its standard error or confidence intervals, in order to provide some information regarding the measure of bias. These can be calculated using bootstrap techniques (Karagiannis and Kovacevic, 2000).

We decided to estimate a panel data based on the 8 regions of Romania and a period of 11 years. All the estimations were made in Stata. For this particular case we considered the individual effects as fixed, allowing them to be correlated with the explanatory variables and providing the opportunity to control the unobservable effects specific to each region. After this decision, which has also been tested through the Hausman test and indicating the use of a fixed effects panel data model, we tested the hypothesis of the model errors. Thus, we applied tests for autocorrelation and homoscedasticity (Drucker, 2003, Baum, 2001), obtaining that errors are indeed heteroscedastic and autocorrelated. Considering this result it was necessary to obtain consistent estimators by applying robust estimates.

$$\ln_earn_{it} = -15.1784 + 0.0742*\ln_fdi_{it} + 0.0850*\ln_grad_{it} + 0.842*\ln_gdp_{it} + 0.0643*ir_{it}$$

(0.86)* (0.02)* (0.03)** (0.05)* (0.02)**

where between brackets are the robust standard errors and the *, **, *** stands for 1%, 5% and 10% significance.

The variable that has the greatest influence on the dynamics of earnings is the GDP (associated coefficient 0.842), consistent with the economic literature.

Thus, it is natural that the level of earnings is correlated with the macroeconomic outcomes in a country, as the GDP growth provides conditions for the growth of all incomes of the population (including earnings).

Regarding the influence of the tertiary education, the result is normal as a sign (positive), even if it has a low associated coefficient (0.0850). Nevertheless, it is significant that this coefficient is higher than that associated with FDI (0.0742) in a period of analysis in which Romania experienced an investment boom. This means that the contribution of human capital exceeds the contribution of foreign technology in support of earnings increases. The positive influence of the FDI on earnings dynamics is natural since the jobs created by these investments are better paid than the national average (the contribution of superior technology and the management quality support higher levels of labour productivity).

Even though inflation has the least influence (associated coefficient 0.0643), the direction of the correlation indicates that inflationary pressures (higher in the first part of the analysed period) supported earnings increases. The main reason is that most of the time interval for the estimated model includes the boom period (inflationary output gap). It is possible that in the analysed interval there could have occurred small salary adjustments to compensate for eroding the purchasing power of earnings due to the high level of inflation in the first part of the interval.

$$\ln_ineq_{it} = -1.8383 - 0.1729 \ln_gdp_{it} + 0.1327 \ln_fdi_{it}$$

(0.57)** (0.05)** (0.04)**

where between brackets are the robust standard errors and the *, **, *** stands for 1%, 5% and 10% significance.

Analysing the model describing the dynamics of earnings inequalities, we note that once again, the GDP has the greatest influence (associated coefficient - 0.1729). But the most important result is given by the sign of the coefficient associated with GDP which shows that earnings inequalities are on the right side of a Kuznets curve, which is a situation specific to developed countries. This shows that the performance improvements in economic growth create conditions for reducing earnings inequality. The intensity of the FDI influence is close to that of the GDP (associated coefficient 0.1327), which is a normal result given that jobs in foreign-owned enterprises are better paid.

The result is also confirmed by the higher value of the coefficient associated with FDI in this model compared to that in the earnings dynamics equation. This means that the FDI flow first supports earnings differences (supported in return by the positive differences of technology and management), but in time, it also supports the increases in the general level of earnings.

4. Conclusions

Following the panel estimates made on the development regions in Romania we noticed that the greatest influence, positively speaking, on the level of earnings is exercised by the GDP, which is a normal economic influence since it shows a correlation between macroeconomic outcomes and earnings. All other variables included in the model have also a positive influence on earnings – FDI and people with a higher level of education indicate that high-skilled labour force is better paid, especially by foreign investors who need specialists in various fields of activity. The influence of the inflation rate shows that inflationary pressures sustained earnings increases.

The GDP has a negative impact on earnings inequalities, showing that these inequalities are on the right side of a Kuznets curve, which to some extent indicates that the performance improvements in the economic growth create conditions for reducing earnings inequalities. FDI has a positive influence showing once again that jobs in foreign-owned companies are better paid.

In order to reduce income inequalities and promote social inclusion it is important to promote policies aimed at increasing and improving the employment structure, especially the employment of those who have difficulties in finding a job, to boost labour productivity and the employment of young people on the labour market. For Romania an important element in reducing poverty and inequalities is the development of agriculture, and rural economy in general but also the development of the regions where the income is low, the stimulation of investment, especially FDI. The improvement of education and professional training and the chance to equal opportunities to participate in education and reduce the rates of school dropout are elements that can contribute to reducing inequalities in the long term.

Acknowledgements

This work was supported from the European Social Fund through Sectorial Operational Programme Human Resources Development 2007-2013, project number POSDRU/159/1.5/S/134197, project title “Performance and Excellence in Postdoctoral Research in Romanian Economics Science Domain”.

Notes

- (1) The Territorial Agenda 2020 was adopted at the Informal Meeting of Ministers responsible for Spatial Planning and Territorial Development held in Hungary on May 19, 2011
http://www.minind.ro/cctc_2014_2020/dse/Agenda_teritoriala_a_UE_2020.pdf
- (2) For the econometric analysis the earnings are expressed in nominal terms, because we were also interested in the impact of inflation on them.

References

- Bartik, T.J. (1994). "The Effects of Metropolitan Job Growth on the Size Distribution of Family Income", *Journal of Regional Science*, Vol. 34, pp. 483-502
- Baum, C.F. (2001). "Residual diagnostics for cross-section time series regression models", *The Stata Journal*, Vol. 1, pp. 101-104
- Candelaria, C., Daly, M., Hale, G. (2013). "Persistence of Regional Inequality in China", *Working Paper* 2013-06, Federal Reserve Bank of San Francisco
- Drukker, D.M. (2003). "Testing for serial correlation in linear panel-data models", *The Stata Journal*, Vol. 3, pp. 168-177
- Fallah, B., Partridge, M. (2007). "The elusive inequality-economic growth relationship: are there differences between cities and the countryside?", *The Annals of Regional Science*, Springer, vol. 41(2), pp 375-400
- Feenstra, R.C, Hanson, G.H. (1995). "Foreign Direct Investment and Relative Wages: Evidence from Mexico's Maquiladoras", *NBER working paper* 5122
- Figini, P., Gorg, H. (1999). "Multinational Companies and Wage inequality in the Host Country: The Case of Ireland", *Review of World Economics*, 135, pp. 594-612
- García-Peñalosa, C., Turnovsky, S.J. (2006). "Growth and income inequality: a canonical model", *Economic Theory*, Vol. 28, No. 1, pp. 25-49
- Karagiannis, E., Kovacevic, M. (2000). "A Method to Calculate the Jackknife Variance Estimator for the Gini Coefficient", *Oxford Bulletin of Economics & Statistics*, Vol. 62, pp. 119-122
- Majumdar, S. Partridge, M.D. (2009). "Impact of Economic Growth on Income Inequality: A Regional Perspective, Agricultural and Applied Economics Association Annual Meeting", Milwaukee, Wisconsin
- Monastiriotes V. (2002). "Inter- and intra-regional wage inequalities in the UK: sources and evolution", *Research Papers in Environmental and Spatial Analysis*, No.70, LSE
- Pardo-Beltran, E. (2002). "Effects of Income Distribution on Growth, CEPA Working Paper 2002-16, Center for Economic Policy Analysis
- Park, A. (2008). "Rural-urban inequality in China", in Yusuf, S. and Nabeshima, S. (eds.), *China Urbanizes World Bank: Washington DC*
- Taylor, K., Driffield, N. (2000). "Wage dispersion and the role of multinationals: Evidence from UK panel data", The International Economic Association Conference on Globalisation and Labour Markets, University of Nottingham
- Te Velde, D.W. (2001). "Foreign Direct Investment and Factor Prices in US Manufacturing", *Review of World Economics*, 137(4), pp. 622-643
- Te Velde, D.W. (2003). *Foreign Direct Investment and Income Inequality in Latin America*, Overseas Development Institute, UK
- Te Velde, D.W., Morrissey O. (2002). "Foreign Direct Investment, Skills and Wage Inequality in East Asia, DESG Nottingham", <http://www.odi.org.uk/iedg/meetconf.html>

Wavelet based sample entropy analysis: A new method to test weak form market efficiency

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Abstract. *In this article, we analyze informational efficiency in daily returns of NASDAQ, DJIA and S&P 500 indices ranging from 04-01-1980 to 12-09-2013. We replace the traditional coarse graining method used in multi-scale entropy analysis by a Maximal Overlap Discrete Wavelet Transform decomposition and extract Sample entropy measure across different timescales. To compare against efficient market behavior, we simulate an i.i.d. normal series with the same mean and variance of the underlying series and repeat the procedure. Next, we plot both of these estimates to see how the values differ from each other across the scales. It is found that the three markets under study are not weak form efficient at high to medium frequencies (up to semi-annual period). They are informationally efficient in the long run (annual-biannual period). Here, efficiency of a financial market is closely related with the time horizons under which the agents operate. As time horizon increases, the markets move towards an informationally efficient state. It could be due to the fact that agents with a long investment horizon make use of the information set available in a comparatively efficient manner due to their comparatively high tolerance for price fluctuations as opposed to their high-frequency counterparts.*

Keywords: EMH, efficiency, transfer entropy, wavelets, equity markets.

JEL Classification: G01, G14, G15.

REL Classification: 11B.

1. Introduction

Efficient market hypothesis in its weak form (EMH henceforth), proposed by (Fama, 1965) makes the assumption that all past information related to an asset is reflected in its price. It talks about of investors who are rational in behavior, taking decisions alone and able to process all the information available to them instantly. Here, an implicit assumption is that all investors operate under same time horizon and use the same information set. In such a scenario, it is not possible to have supernormal returns in the long run. In other words, returns follow a normal distribution. If this hypothesis is to hold, there are no chances of extreme fluctuations in a market such as an asset bubble or a financial crisis. The notion of efficient markets has been refuted by many empirical evidences over the years as well as the major financial crises occurred during the past years, the global financial crisis of 2007 being the most recent one. Still, EMH considered as one of the bedrocks of main stream finance theory.

In a market, there are different type of investors with different time horizons and risk preferences. A good example will be an intra-day trader (chartist) and a mutual fund manager. While a chartist is mostly concerned with the trends in the data, the mutual fund manger would be looking into the information s/he has about the performance of the economy. In other words, even though both may have access to the complete information set, they consider only parts of it that they feel relevant to them.

It could be assumed that their risk preference will be also difference. An investor with a long investment time horizon would treat the variance in an asset price differently from a chartist. If we take standard deviation as a measure of risk, the σ_m of the mutual fund manager calculated based on his/her transactions will be higher than the same of a chartist (σ_c) for the same asset under normal circumstances as the former trades keeping a longer time-frame in mind and therefore accept larger variations in asset prices compared to the chartist. Each of them would have a threshold level beyond which they will not hold the asset.

Consider the following scenario: a chartist decides to sell of an asset where the σ_m crosses the 'acceptable threshold'. At the same time, the mutual fund manager could purchase this asset if s/he is interested because of the longer investment horizon and thereby the corresponding larger value of σ . Here, the selling signal made by the chartist is considered to be a buying signal by the mutual fund manager. A volume of such transactions keep the market stable. However, we cannot be sure if the market is efficient under such circumstances.

There are many econometric/statistical tests such as variance ratio tests by (Lo and McKinlay, 1988), (Chow and Denning, 1993), (Chen and Deo, 2005) as well as unit root tests formulated by (Phillips and Perron, 1998), (Kwiatkowski et al., 1992) etc.

to test weak form market efficiency. However, it is to be noted that these tests deals with the level data and thereby implicitly accepting the assumption that all traders operate under the same time horizon and with the same information set.

Here we propose a new method to test weak form market efficiency with the help of information theory. Information theory could be traced back to the seminal work of (Shannon, 1948) where he introduced the concept of Shannon entropy to extract the information content of a time series. (Pincus et al., 1991) bought the concept of Approximate Entropy. (Richman and Moorman, 2000) introduced the concept of sample entropy, an improvement over Approximate Entropy. Sample entropy in its initial form also dealt with information content of a time series at its level. (Costa et al., 2002) introduced the idea of multiscale entropy analysis where he implemented a coarse graining procedure to create different realizations of the same time series over a number of scales and extract the sample entropy for all the realizations. Here, we propose an alternative to the coarse graining method to suit our purposes. The details are given in the following section.

2. Data and Methodology

We have use log returns calculated from the daily closing data for 3 major US equity indices namely NASDAQ, S&P 500 and DJIA from 04-Jan-1980 to 12-Sep-2013 for the analytical purpose.

Multiscale entropy (MSE) analysis is a relatively new method of measuring the complexity of finite length time series. This method was developed by (Costa et al., 2002). Here entropy was estimated using the sample entropy (SampEn) measure, developed by (Richman and Moorman, 2002). SampEn is a refinement of the approximate entropy (ApEn) family of statistics. SampEn is preferred because it avoids self counting and it is suitable for a short-lengthed sample.

Traditional entropy measures quantify only the regularity (predictability) of time series on a single scale. However, a single value cannot explain the underlying dynamics of the given data. The MSE method tries to address this problem. The estimation incorporates two steps:

1. A “coarse-graining” process is applied to the time series. For a given time series, multiple coarse-grained time series are constructed by averaging the data points within non-overlapping windows of increasing length, τ . Each element of the coarse-grained time series y_j^τ , is calculated according to the equation $y_j^\tau = \frac{1}{\tau} \sum_{i=(j-1)\tau+1}^{j\tau} x_i$.

Where τ represents the scale factor and $1 \leq j \leq N/\tau$. The length of each coarse-grained time series is N/τ . For scale 1, the coarse-grained time series is simply the original time series.

2. SampEn is calculated for each coarse-grained time series, and then plotted as a function of the scale factor. SampEn is a regularity statistic. It looks for patterns in a time series and quantifies its degree of predictability or regularity.

For a time series with enough data points, application of the coarse graining procedure will be of no issue. However if we are a shorter time series like IIP, the estimation of SampEn after a particular scale will not be possible. Our method is implemented keeping this issue in mind.

Here, we propose to use a MODWT decomposition instead of coarse graining.

The MODWT (Percival and Walden, 2000) is similar to the discrete wavelet transform (DWT) in that the high-pass and low-pass filters are applied to the input signal at each level. However, in the MODWT, the output signal is never sub-sampled (not decimated). Instead, the filters are up sampled at each level. Suppose we are given a signal $s[n]$ of length N where $N = 2^J$ for some integer J . Let $h_1[n]$ and $g_1[n]$ be the low-pass filter and the high-pass filter defined by an orthogonal wavelet. At the first level of MODWT, the input signal $s[n]$ is convolved with $h_1[n]$ to obtain the approximation coefficients $a_1[n]$, and with $g_1[n]$ to obtain the detail coefficients $d_1[n]$:

$$a_1[n] = h_1[n] \times s[n] = \sum_k h_1[n-k]s[k] \quad (1)$$

$$d_1[n] = g_1[n] \times s[n] = \sum_k g_1[n-k]s[k] \quad (2)$$

Without sub-sampling, $a_1[n]$ and $d_1[n]$ are of length N instead of $N/2$ as in the DWT. At the next level of the MODWT, $a_1[n]$ is filtered using the same scheme, but with modified filters $h_2[n]$ and $g_2[n]$ obtained by dyadic up-sampling $h_1[n]$ and $g_1[n]$. This process is continued recursively. For $J=1, 2, \dots, J_0-1$, where $J_0 \leq J$, define

$$a_{j+1}[n] = h_{j+1}[n] \times a_j[n] = \sum_k h_{j+1}[n-k]a_j[k] \quad (3)$$

$$d_{j+1}[n] = g_{j+1}[n] \times a_j[n] = \sum_k g_{j+1}[n-k]a_j[k] \quad (4)$$

Where $h_{j+1}[n] = U(h_j[n])$ and $g_{j+1}[n] = U(g_j[n])$. Here U is the up-sampling operator that inserts a zero between every adjacent pair of elements of the time series. The output of the MODWT is the sum of the detailed coefficients $d_1[n], d_2[n], d_3[n], \dots, d_{J_0}[n]$ and the approximate coefficients $a_{J_0}[n]$.

The wavelet decomposition makes sense because here we can decompose the data into different timescales and thereby effectively isolates the information associated with all timescales. Also, here all the decomposed time series have

same length where in the original procedure; hence we could be sure about get robust estimates of SampEn.

Here in the first step as explained before, we decompose the given time series into J levels using a MODWT. Next we compute transfer entropy for all the decomposed wavelet coefficients.

The next step involves simulating an efficient behavior against which we can test the measures obtained in the first step. If a market is efficient, the prices are said to follow a geometrical Brownian motion, or random walk. In other words, there is no temporal dependence structure among the time series under analysis. Moreover, the returns follow normal distribution.

Therefore in order to verify EMH, we simulate an i.i.d. normal series with same mean and standard deviation of the analyzed dataset and apply the two steps explained above. Then we plot the values of entropy at different scales for both series. If the market is efficient, the entropy curve of the original should coincide with the entropy curve of the simulated series. We have used an LA (least asymmetric) wavelet filter with a length of 8 for the wavelet decomposition.

3. Analysis

Figures 1 to 3 represent entropy curves for DJIA, NASDAQ and S&P 500. The X axis depicts the wavelet scales while Y axis shows the SampEn values.

Figure 1. Entropy curve for DJIA

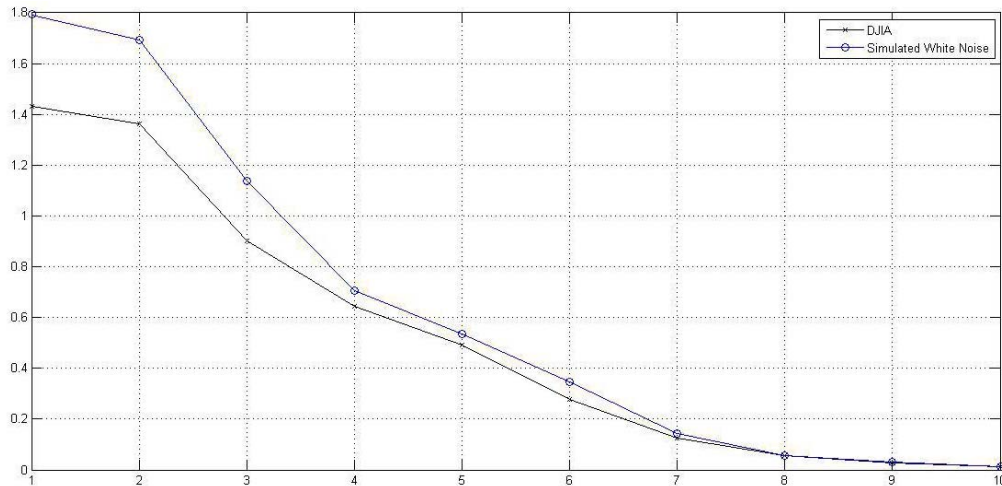
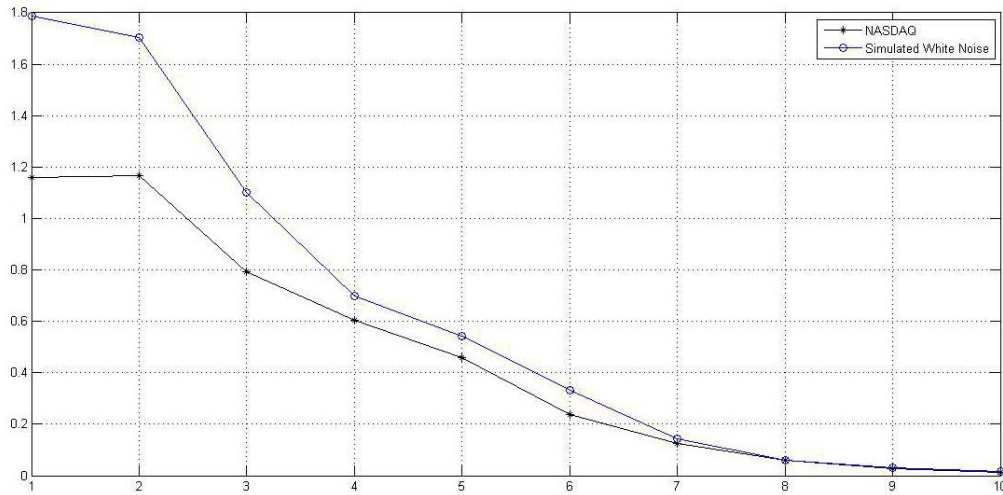
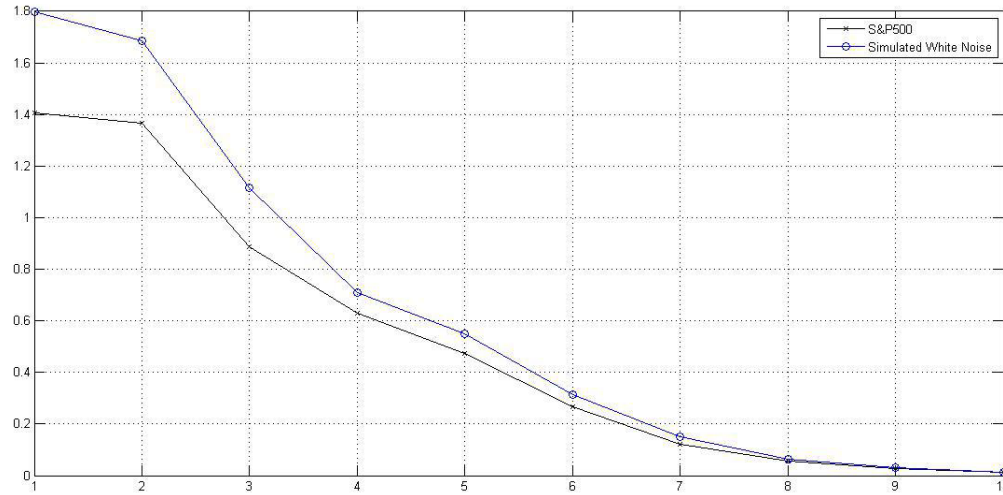


Figure 2. Entropy curve for NASDAQ**Figure 3.** Entropy curve for S & P 500

From the graphs, certain common features are visible. First, the corresponding i.i.d. normal series have a greater value of sample entropy compared to its counterpart at short frequencies. As we move towards coarser scales, (low frequency), this divergence becomes small, and the curves coincide around scale 8 for all the series. Scale 8 means the timescale of 256-512 trading days, or annual-biannual period.

Here, the market does not reflect the informationally efficient behavior in the finer scales i.e. high to medium frequency areas. The actual market behavior converges

towards the efficient behavior as the timescale increases. From scale 8 onwards, the curves converge; indicating informational efficiency in the long run.

As bulk of the transactions in an equity market happen within the high to medium frequency timescales; it could be safely assumed that the market behavior will be influenced by activities taking place across those timescales. Hence, the informational efficiency at the long run might not have any effect on turbulences that can happen in an equity market. If it had any effect at all, the markets should be free from the extreme events such as financial crash of 1987, the dot-com bubble and 2008 meltdown that occurred during the period of analysis.

Conclusion

In this article, we tried to analyze weak form market efficiency using a new method, namely wavelet based sample entropy analysis. We worked under the assumption that a market consists of different types of traders with different risk preferences and investment time horizon. Due to these factors, while it is possible that the market may remain stable, it need not be true that it is informationally efficient. We have used daily log returns of three major US equity indices namely DJIA, NASDAQ and S&P 500 from the period 03-01-1980 to 13-09-2013 for the analysis. In the first stage, we decomposed the give data series into different timescales using a MODWT procedure. MODWT was preferred over the traditionally used coarse graining method in order to avoid down-sampling. To see the degree of efficiency, an i.i.d. normal series with the same mean and standard deviation of the underlying indice were simulated and entropy measures were calculated after decomposing it using the wavelet procedure. From the entropy curves, it was visible that the actual market behavior diverges from the expected efficient market behavior at high to medium frequencies. At low frequencies (annual-biannual timescales), the market becomes informationally efficient. However, this efficiency does not prevent the markets from undergoing extreme events like financial crises.

References

- Chen, W., Deo, R. (2005). "The Variance Ratio Statistic at large Horizons", *Econometrics*, 0501003 EconWPA
- Chow, K.V., Denning, K.C. (1993). "A simple multiple variance ratio test", *Journal of Econometrics*, 58(3), pp. 385-401
- Costa, M., Goldberger, A.L., Peng, C.K. (2002). "Multiscale Entropy Analysis of Complex Physiologic Time Series", *Physical Review Letters*, 89(6): 068102-1-4
- Fama, E. (1965). "The Behavior of Stock Market Prices", *Journal of Business*, 38, pp. 34-105

- Kwiatkowski, D., Phillips, P.C.B., Schmidt, P., Shin, Y. (1992). "Testing the null hypothesis of stationarity against the alternative of a unit root: How sure are we that economic time series have a unit root?", *Journal of Econometrics*, 54(3), pp. 159-178
- Lo, A.W., McKinlay, A.C. (1988). "Stock Market Prices do not Follow Random Walks: Evidence from a Simple Specification Test", *Review of Financial Studies*, 1, pp. 41-66
- Percival, D., Walden, A. (2000), *Wavelet Methods for Time Series Analysis*, Cambridge University Press
- Pincus, S., Gladstone, I., Ehrenkranz, R. (1991). "A regularity statistic for medical data analysis", *Journal of Clinical Monitoring*, 7 (4), pp. 335-345
- Richman, J.S., Moorman, J.R. (2000). "Physiological time-series analysis using approximate entropy and sample entropy", *American Journal of Physiology, Heart and Circulatory Physiology*, 278: H2039-H2049, 2000
- Shannon, C.E. (1948). "A Mathematical Theory of Communication", *Bell System Technical Journal*, 27, pp. 379-423, 623-656

Assessing integration of EU banking sectors using lending margins

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Abstract. *Banking integration is generally linked to price convergence. In addition to interest rates, we argue that lending margins provide important information regarding price setting convergence in banking sectors. House purchase and non-financial corporations (NFC) lending margins confirm that EU banking integration was affected by financial crises. There is a relatively higher convergence for NFC lending margins, while integration is deeper in the euro-area. The country specific analysis differentiates between integrated and dissimilar EU banking sectors. Besides their financial information content and direct economic impact, lending margins are useful measures of banking integration for policy decisions.*

Keywords: banking integration, financial convergence, lending margins, interest rates, contagion risk.

JEL Classification: F15, F36, G21, G28.

REL Classification: 11C, 11Z, 20B.

Introduction

The political and economic construction which is now the European Union led to significant changes on many different areas of activity. Starting from the need perceived by six countries, which were close trading partners, to improve economic cooperation, the construction moved from a purely economic union to a union which was also political. Under the rule of increasingly integrated laws, the single market enhanced the free movement of goods, services, people, and capital.

With a view on financial integration, efficiency, stability and competitiveness, the European Commission has consistently monitored developments in the EU financial sector. The “European Financial Stability and Integration Report 2012” showed that stress in the EU financial markets was reduced, in the fifth year of the financial crisis, following the steps towards building a Banking Union and the strong commitment of the European Central Bank to do whatever necessary to avoid the breakup of the euro. The subsequent developments with regard to the Banking Union, establishing the Single Supervisory Mechanism and the Single Resolution Mechanism, as well as the work done for setting up an effective network of deposit guarantee schemes emphasize the importance of financial integration for the EU, also acknowledging it as a potential source of financial contagion.

The European Central Bank (ECB) “Financial Integration in Europe (April 2014)” report showed that EU financial integration has continued to improve since mid-2012, but market fragmentations persist. The report called for effective implementation of the Banking Union and for fiscal consolidation and structural reforms. With regard to banking integration, the ECB discussed implications to monetary and macro-prudential policy of the dispersion of borrowing costs for non-financial corporations, taking into account the low level of cross-border lending to these entities.

Financial sectors have been traditionally dominated by the central role of credit institutions. Countries with developed economies tend to also have larger stock markets, insurance and private pensions sectors, as well as investment funds and other non-bank financial institutions. In other countries, where other components of the financial sectors are relatively small, the role of the banking sector is even more important in supporting the economy.

Within the EU, the presence of a large number of cross-border financial groups, mainly centered on credit institutions, strongly contributes to financial integration. These groups promote strong financial ties between home and host countries; they provide funds to non-financial corporations and households and freely move

capital from one country to another, while also providing liquidity to local financial markets. On the other hand, cross-border financial groups generate interdependencies between national financial sectors which may be an important source of contagion.

The European integration of national banking sectors is a process which is taking place in the larger context of the EU political, economic and monetary integration. As a consequence, the topic is highly important from a policy perspective, while also providing useful information with regard to the functioning of the national banking sectors.

The level of integration reached by each national banking sector may be perceived differently due to the national characteristics as well as the different measures of integration taken into account. The European Central Bank developed and updates biannually several indicators of financial integration in the main financial market segments of the euro area, such as money market, bond markets, equity markets and banking markets. National competent authorities from both euro-area and non-euro-area Member States also consider European integration when assessing the financial stability and the soundness of the banking sectors in their jurisdictions. As an example for non-euro-area Member States, the National Bank of Romania presents in its annual Financial Stability Report assessments of the Romanian banking sector which include comparisons with developments in other EU banking sectors. Indicators which are used for international comparisons in these assessments include the number of credit institutions and branches per 100,000 inhabitants, degree of financial intermediation, asset concentration, leverage ratio, non-performing loans ratio, coverage ratio and foreign liabilities. Other assessments refer to the interdependencies with other EU banking sectors, such as the market share of credit institutions of (EU) foreign capital and the on-going process of disintermediation.

The level of integration of the EU banking sectors cannot be evaluated through a single measure. The common regulatory framework, such as the CRD IV package, the activity of cross-border financial groups and the European project of the Banking Union are three important factors which make the process of banking European integration more pronounced than the interdependencies between other banking sectors outside the EU. Measuring European banking integration might prove to be challenging, due to the complex nature of the relationships between EU banking sectors and the different effects they suffered in the context of the international financial crisis.

This paper aims to support a new measure for the integration of EU banking sectors and to discuss its specific results, in the context of the current literature perspectives presented in the next section. While interest rates and profitability convergence were previously considered as measures for banking integration, this paper focuses on the use of lending margins for new loans. The next section covers a literature review on the relevant issues for banking integration and the measures used to quantify it. The following sections focus on the methodology used for measuring banking integration through lending margins for new loans, the results and the conclusions derived from this quantitative approach.

Literature review

Integration of banking sectors has been discussed in the relevant literature from several different points of views. As presented by Gropp and Kashyap (2009), these views can be classified under three directions: the extent of cross-border direct retail operations of banks, cross-border mergers of banks and the study of retail interest rates.

Regarding the extent of cross-border direct retail operations of banks, Gual (2004) and Perez et al. (2005) indicate that retail flows are relatively low compared to money market flows within the euro area. However, banking integration do not necessarily imply the existence of large retail flows, therefore this indicator is useful for describing important relationships between different banking sectors, but may not be seen as an effective measure of banking integration.

Cross-border mergers of banks have also been discussed in connection to banking integration. Köhler (2010) elaborates on this approach and provides a review of the relevant literature. The number of cross-border mergers of banks has been compared to the number of domestic bank mergers, but the former has not proved to be a necessary or sufficient condition for financial integration.

The study of retail interest rates in connection with financial integration is generally focused on convergence. Adam et al. (2002) showed slow convergence on both corporate and mortgage rates, after 1999, concluding that banking sectors are not integrated and they are not likely to be on a path towards integration. Affinito and Farabulini (2006) showed that dispersion of interest rates can be reduced by taking into account national specificities of borrowers such as risk exposure, disposable income and firm size.

In addition to the three directions presented above, Gropp and Kashyap (2009) proposed a new test of integration based on convergence in bank profitability and

found that banking integration in Europe is not achieved, whereas US banks converge with regard to profitability targets. They also argued that dispersion of interest rates is an ineffective tool in analyzing bank integration, due to differentiation by national factors.

Other lines of research focused on the so-called convergence clubs. Affinito (2011) analyzed banking convergence using the ratios of deposits and loans to GDP and found that convergence is higher within clubs than in the entire sample and that euro-area convergence is supported by all methodologies. Another important result is that real convergence significantly benefits from banking convergence.

As indicated by the literature referenced above, different methodologies have been used for analyzing integration of banking sectors. Within these methodologies, the study of interest rates might prove to be well-fitted to indicate banking convergence, as they are timely visible due to data availability and have immediate consequences to the real economy. On the other hand, there are national specificities such as financial characteristics of borrowers, sovereign risk, speculative bubbles, phases of the economic cycle and the monetary policy, which affect the level of lending interest rates. As a consequence, the law of one price seems to be neither necessary nor sufficient to express integration of EU banking sectors. However, as the use of lending margins instead of simple lending interest rates may limit the impact of national specificities by capturing them in both active and passive interest rates, this paper contributes to the relevant literature by studying EU banking integration with the use of lending margins for new business for both loans to house purchases and loans to non-financial corporations.

Methodology

Considering the various methodologies used in the relevant literature to account for banking integration, as well as the difficulties in directly applying the law of one price to banking products in a cross-border sample, we explore the topic of banking integration with the use of lending margins for new business. Banking groups operating in the EU are facing the developing level playing field envisaged by EU regulators. While having comparable business practices, EU banks also compete with each other and have business relationships which are significantly related to funding. Therefore, although the law of one price may be ineffective to account for banking integration in the EU, a level of convergence in the practice of price setting can be expected and such convergence can be assessed by analyzing lending margins for new business.

In this paper, lending margins for new business are examined with respect to their convergence to a common average at EU level (m_t^*), while also accounting for autocorrelation (m_{it-1}). The equations estimated for lending to both households and non-financial corporations (NFC) have the following general specification:

$$\Delta m_{it} = \alpha + \beta \times \Delta m_t^* + \gamma \times \Delta m_{it-1} + \varepsilon_{it} \quad (1)$$

In order to test for a potentially different degree of banking integration within and outside the euro-area, equation (1) has been estimated for an EU overall sample of and for two samples containing data for member states within and outside of the euro area. For both house purchase and NFC loans, the analysis is focused on the statistical significance of the relationship between lending margins and the average lending margins in the sample taken into account. In the cases in which this relationship is shown to be weak, this is considered to be signaling an insufficient banking integration.

With regard to the EU integration of national banking sectors, equation (1) has also been estimated for individual member states. As a consequence, member states have been divided in three categories of banking integration as shown by the analysis of lending margins. First category contains member states for which the relationship between national and average EU lending margins holds at 95% confidence level for both households and NFC lending. Reaching this category is likely to show a high degree of banking integration. The second category contains member states for which the relationship holds at 95% confidence level for only one of the two lending margins. This category will show signs of banking integration for households or NFC lending. The third category contains member states for which the relationship does not hold at 95% confidence level for neither households nor NFC lending, which may be considered a sign of low banking integration.

The data used for this analysis is taken from the ECB Statistical Data Warehouse and contains two monthly datasets: monetary financial institutions (MFIs) lending margins on loans for house purchase and MFIs lending margins on loans to non-financial corporations (NFC). Lending margins are measured as the difference between MFIs' interest rates for new business loans to households for house purchase (or to non-financial corporations) and a weighted average rate of new deposits from households and non-financial corporations. For non-euro area member states, loans and deposits taken into account are denominated in both euro and national currency. In order to have comparable records for national banking sectors, the selected data covers monthly percentage variations from January 2007 to January 2014 for EU 27.

Results

Monthly variations of lending margins for both house purchase and non-financial corporations loans had similar developments during the analyzed 7 year period (Table 1), while the correlation coefficient between the two data series equals 21.8%.

Table 1. Descriptive statistics of the dependent variables

	House	NFC
Mean	0.0028	0.0129
Median	0.0000	0.0000
Maximum	1.1768	0.8242
Minimum	-0.9973	-0.5411
Std. Dev.	0.1684	0.1696
Skewness	0.2113	0.7503
Kurtosis	11.5668	5.8535
Observations	2295	2295

During the onset of the international financial crisis, lending margins for house purchase loans had large variations across the EU banking sectors (Chart 1). The subsequent variations were more stable until the beginning of 2012 when a relatively higher dispersion occurred. For NFC loans, lending margins had also varied significantly during the financial crisis (Chart 2). After that, the inter-quartile interval shows that the distribution of lending margins needed a longer period to return to its pre-crisis levels.

Chart 1. Distribution quartiles for House lending margins

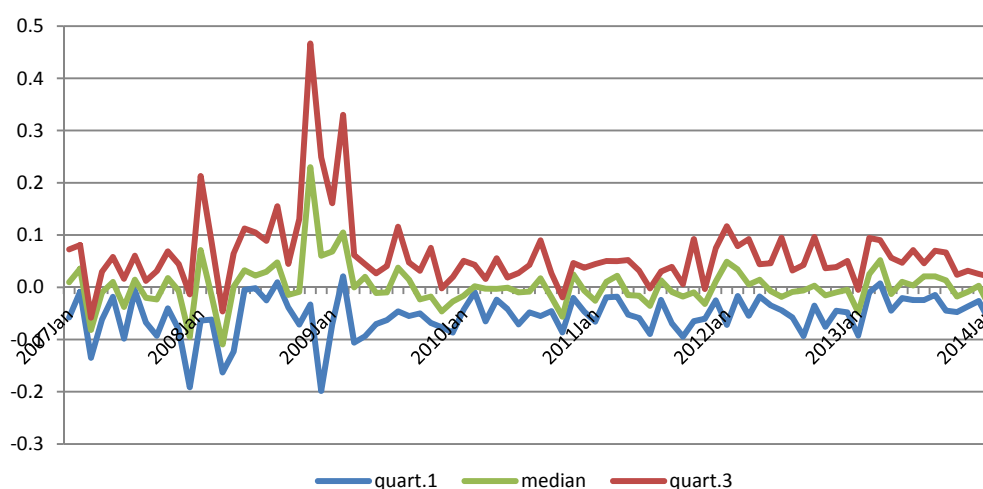
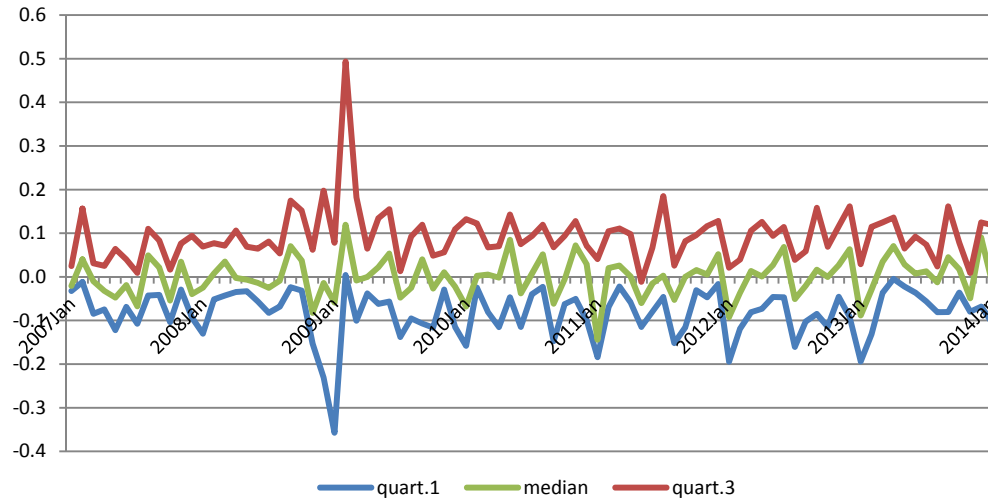


Chart 2. *Distribution quartiles for NFC lending margins*

Models built for house purchase (Table 2) and non-financial corporations (Table 3) lending margins at EU level include the explanatory variables accounting for both the EU average variations and the autocorrelation of the dependent variable. The relationships with the EU average variations are shown to be statistically significant at 99% confidence level, thus indicating a tendency of bank integration with respect to margins to new loans. However, as the level of the coefficient of determination is considerably lower for the model built for house purchases lending margins, the banking integration at EU level seems to be more visible with regard to NFC lending margins.

Table 2. *Model for House lending margins (EU sample)*

Variable	Coefficient
C	-0.0002 (0.0035)
House_m	0.6148*** (0.0850)
House(-1)	0.0616*** (0.0208)
Adjusted R-squared	0.0263

Note: Markings *, ** and *** represent the statistical significance of the coefficients at the level of 90%, 95% and 99% respectively. Unmarked coefficients are not statistically significant at the 90% level.

Table 3. *Model for NFC lending margins (EU sample)*

Variable	Coefficient
C	0.0149*** (0.0034)
NFC_m	0.4505*** (0.0569)
NFC(-1)	-0.2950*** (0.0200)
Adjusted R-squared	0.1126

Note: Markings *, ** and *** represent the statistical significance of the coefficients at the level of 90%, 95% and 99% respectively. Unmarked coefficients are not statistically significant at the 90% level.

As also shown by the relevant literature, banking integration is likely to be deeper within the so-called convergence clubs. In this case, the euro-area delimits itself within the EU due mainly to the effects of the single currency on funding costs, intra- and inter-group funding and cross-border banking relationships. As a consequence, it is important to assess how lending margins in the EU are affected by the existence of the euro area. The models built for a specific euro-area sample also include (euro-area) average variations and the lagged lending margins. Also similar to the EU level analysis, the coefficients of the explanatory variables are statistically significant at 99% confidence level for both house purchase (Table 4) and NFC (Table 5) lending margins. However, a notable result is that house purchases lending margins for the euro-area are considerably better explained by the model than for the EU sample. Therefore, the analysis of lending margins indicates a generally higher level of banking integration in the euro-area.

Table 4. *Model for House lending margins (euro-area sample)*

Variable	Coefficient
C	-0.0022 (0.0042)
House_m	0.8260*** (0.0740)
House(-1)	0.0708*** (0.0247)
Adjusted R-squared	0.0812

Note: Markings *, ** and *** represent the statistical significance of the coefficients at the level of 90%, 95% and 99% respectively. Unmarked coefficients are not statistically significant at the 90% level.

Table 5. *Model for NFC lending margins (euro-area sample)*

Variable	Coefficient
C	0.0147*** (0.0040)
NFC_m	0.5305*** (0.0619)
NFC(-1)	-0.2631*** (0.0246)
Adjusted R-squared	0.1169

Note: Markings *, ** and *** represent the statistical significance of the coefficients at the level of 90%, 95% and 99% respectively. Unmarked coefficients are not statistically significant at the 90% level.

Continuing the analysis within the segments of the EU sample, models built for non-euro-area show different results for house purchase (Table 6) and NFC (Table 7) lending margins. Firstly, house purchase lending margins cannot be easily explained by the average variations in non-euro member states and the coefficient of the lagged variable is not statistical significant at 90% confidence level. Secondly, the NFC lending margins seem to converge even more for these countries than for the EU or the euro-area sample, as the model performs better in this case.

Table 6. *Model for House lending margins (non-euro-area sample)*

Variable	Coefficient
C	0.0016 (0.0060)
House_m	0.2377*** (0.0867)
House(-1)	0.0343 (0.0365)

Note: Markings *, ** and *** represent the statistical significance of the coefficients at the level of 90%, 95% and 99% respectively. Unmarked coefficients are not statistically significant at the 90% level.

Table 7. *Model for NFC lending margins (non-euro-area sample)*

Adjusted R-squared	0.0090
Variable	Coefficient
C	0.0132** (0.0061)
NFC_m	0.4073*** (0.0698)
NFC(-1)	-0.3322*** (0.0336)
Adjusted R-squared	0.1492

Note: Markings *, ** and *** represent the statistical significance of the coefficients at the level of 90%, 95% and 99% respectively. Unmarked coefficients are not statistically significant at the 90% level.

For the time period under review, models built for individual member states (Table 8) indicate different degrees of banking integration, with regard to the convergence of house purchase and NFC lending margins. Member states are classified into three categories of banking integration, as provided in the methodological section.

The first category covers member states with lending margins models which have statistically significant coefficients (at 95% confidence level) for the explanatory variables of EU average variations. This category is designed to signal convergence on both house purchase and NFC lending margins. It is also notable that models built for these countries are generally well-performing.

The second category contains countries with signals of convergence on only one of the two lending margins. The third category highlights countries for which convergence is not observed for the time period under review either for house purchase or NFC lending margins. It is notable that the member states in this category contain some of the countries which were most deeply affected by the financial crisis or the sovereign debt crisis (e.g. Greece, Lithuania and Spain) and also countries that have national specificities that can explain a different behavior of their banking sectors (e.g. Poland and Sweden).

Table 8. Main results of individual models (country level)

Category	Country	House model			NFC model		
		House_m	Prob.	R2	NFC_m	Prob.	R2
I	Bulgaria	0.5598	***	0.1411	1.5356	***	0.3249
	Czech Rep.	0.5161	***	0.1875	0.5649	**	0.0884
	Denmark	1.0386	***	0.1603	1.4280	***	0.1653
	Estonia	2.5173	***	0.3125	0.8809	***	0.2482
	Germany	0.8559	***	0.3475	0.3583	***	0.1301
	Ireland	1.2400	***	0.2063	0.6565	***	0.1720
	Italy	0.9677	***	0.1287	0.5759	**	0.0723
	Netherlands	1.7220	***	0.2767	2.4536	***	0.2494
II	Austria	0.7165	**	0.0704	-0.2185		0.1627
	Belgium	0.5315	**	0.2383	0.0136		0.0387
	Cyprus	3.2968	***	0.2363	0.7937		0.0391
	Finland	0.7800	**	0.1251	0.2751		0.0636
	France	1.5094	***	0.1279	0.3107		0.2853
	Hungary	2.9615	***	0.2383	1.2870		0.0730
	Latvia	-1.2115		0.0049	2.8083	***	0.2327
	Luxembourg	0.8652	***	0.0972	0.3910		0.1553
	Malta	0.2081		0.1155	1.6837	***	0.2943
	Romania	1.9698		0.0418	0.9315	**	0.1805
	Slovenia	0.1877		0.0143	0.8647	***	0.2250
	UK	1.4269	**	0.0785	0.0585		0.0512

Category	Country	House model			NFC model		
		House_m	Prob.	R2	NFC_m	Prob.	R2
III	Greece	4.2054		0.0467	0.7120	*	0.0787
	Lithuania	-0.9500		0.0066	0.6868		0.0228
	Poland	0.0880		0.0300	0.1929		0.1235
	Portugal	2.6488		0.0427	0.3362		0.1262
	Slovakia	0.2118		0.1414	0.3808		0.1177
	Spain	-0.4444		0.0881	0.2080		0.1307
	Sweden	0.0199		0.0436	-0.2185		0.1572

Note: Markings *, ** and *** represent the statistical significance of the coefficients at the level of 90%, 95% and 99% respectively. Unmarked coefficients are not statistically significant at the 90% level.

The analysis of lending margins shows that there are different degrees of banking integration in the EU, in the euro-area and in non-euro member states. Banking sectors also behaved differently with regard to loans for house purchases as opposed to lending to non-financial corporations. The results presented in this section are dependent on the quality of the aggregated data reported for each national banking sector. Moreover, analyzing lending margins at a more detailed level, including the distribution of lending margins values within national banking sectors, may provide further information with regard to banking integration in the EU. The average values which are reported for each member state have the potential to indicate existing EU banking integration, but their respective underlying distributions would complement this overview by highlighting the banking convergence which takes place at national level.

Conclusions

The integration of the EU banking sectors is an on-going process which leads to benefits for credit institutions and customers, while also responding to requirements derived from the design of the EU single market. However, in times of crisis, banking integration can be a contributing factor to financial contagion. In this context, national and European institutions, such as central banks, supervisory and macro-prudential authorities, perform their duties taking into consideration the EU banking integration. The lack of a single framework for assessing banking integration has led to a continued search for appropriate measures and instruments. In this paper we argue that such a measure may result from the analysis of lending margins, as these indicators have similar benefits with the more commonly used lending interest rates, while also overcoming some of their inconveniences.

Lending margins for new loans recorded a higher dispersion during the onset of the international financial crisis and, at times, during the EU sovereign debt crisis.

Models built for house purchase and NFC lending margins showed that these indicators can be explained by the peer average variations and by the lagged values of the indicators. Therefore, house purchase and NFC lending margins provide useful information with regard to the banking integration in the EU.

For house purchase loans, lending margins variations are more easily explained for euro-area member states, while at the EU level and outside the euro-area banking integration seems to be less apparent. For NFC loans, the higher performance of the statistical models indicates a higher degree of convergence with regard to the price setting of new loans to the real economy.

The results of the country specific analysis show that lending margins in banking sectors of more stable and developed economies tend to converge to the developments at EU level. On the other hand, lending margins follow a separate path in banking sectors of countries more deeply affected by financial crises or countries with specificities that may limit financial contagion.

While the EU economy is becoming increasingly integrated, financial convergence can be assessed by a multitude of measures. Both house purchase and NFC lending margins are useful in describing the reactions of credit institutions to changes in their operating environment. These indicators have thus a threefold importance. Firstly, they help in measuring profitability of main banking activities, which benefits micro-prudential supervisors, credit institutions and other financial stakeholders. Secondly, they are price-setting factors which significantly impact customers and, implicitly, real national economies. And thirdly, as argued in this paper, lending margins have the potential to highlight existing banking integration and, as a consequence, to be used as measures of financial convergence by national or European authorities while taking the policy decisions needed to fulfill their monetary or supervisory responsibilities.

References

- Adam, K., Jappelli, T., Menchini, A., Padula, M., Pagano, M. (2002). *Analyse, compare and apply alternative indicators and monitoring methodologies to measure the evolution of capital market integration in the EU*. Centre for Studies in Economics and Finance (CSEF), Department of Economics and Statistics, University of Salerno. Available through: http://ec.europa.eu/internal_market/economic-reports/docs/020128_cap_mark_int_en.pdf
- Affinito, M. (2011). *Convergence clubs, the Euro-area rank and the relationship between banking and real convergence*. Bank of Italy Temi di Discussione (Working Paper) No. 809. Available through: http://www.bancaditalia.it/pubblicazioni/econo/temidi/td11/td809_11/en_td_809_11/en_tema_809.pdf

- Affinito, M., Farabullini, F. (2006). *An empirical analysis of national differences in the retail bank interest rates of the euro area*. Bank of Italy Temi di discussione (Economic working papers) No. 589. Available through: http://www.bancaditalia.it/pubblicazioni/econo/temidi/td06/td589_06/td589/tema_589.pdf
- Gropp, R., Kashyap, A. (2009). *A new metric for banking integration in Europe*. NBER Working Paper Nr. 14735. Available through: <http://www.nber.org/papers/w14735>
- Gual, J. (2004). *The integration of EU banking markets*. CEPR Working paper No. 4212. Available through: <http://www.cepr.org/pubs/dps/DP4212.asp>
- Köhler, M. (2010). *Transparency of regulation and cross-border bank mergers*. Center for European Economic Research - ZEW Discussion Papers 08-009 [rev.]. Available through: <http://econstor.eu/bitstream/10419/29646/1/617052476.pdf>
- Perez, D., Salas-Fumas, V., Saurina, J. (2005). *Banking integration in Europe*, Bank of Spain Working Papers No. 0519. Available through: <http://www.bde.es/f/webbde/SES/Secciones/Publicaciones/PublicacionesSeriadas/DocumentosTrabajo/05/Fic/dt0519e.pdf>
- European Central Bank (2014). *Financial Integration in Europe*, ECB Publications. Available through: <http://www.ecb.europa.eu/pub/pdf/other/financialintegrationineurope201404en.pdf>.
- European Commission (2013). *European Financial Stability and Integration Report 2012*. Available through: http://ec.europa.eu/internal_market/economic_analysis/docs/efsir/130425_efsir-2012_en.pdf
- National Bank of Romania (2013). *Financial Stability Report*. Available through: <http://www.bnr.ro/DocumentInformation.aspx?idDocument=15974&idInfoClass=6877>

Measuring the governance in Pakistan: An introduction to KU Index

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Abstract. *The governance at the national level has commonly been measured as poor or good governance by researchers in the area of public sector reforms. They have rarely attempted the numeric estimation of the concept but used different socioeconomic indicators as proxies. Governance is a multidimensional concept that cannot be accurately elaborated by a single indicator. In the literature there exists a gap for gauging the governance in the form of an index. The current study has attempted to ameliorate different dimensions of governance by including forty two social, political, economic, demographic and environmental indicators. These indicators are firstly merged into thirteen sub-dimensions and then into five dimensions. The dimensions have been transformed in to governance index. The trend of the index shows that governance has not only progressed very slowly but it remained desperate in the study period. The contribution of this study is to provide governance index named KU index for Pakistan in annual time series for the years 1980-81 to 2010-2011. The index explained the level of governance in different eras and is ultimately connected with public sector reforms. It can be used by researchers as an explanatory factor for various political, socioeconomic and regional strategic phenomenon. Furthermore, the criterion of estimation of governance may be adopted for other economies and comparative analysis may be done.*

Keywords: safety and security, social development, economic governance, rule of law.

JEL Classification: F52, H11, H55, O15.

REL Classification: 13C, 13J.

1. Introduction

The concept of governance is enjoying high status after 1980s. It is an emerging issue in national and international public policies. The targets and achievements of Millennium Development Goals (MDG's) are concerned with national governance. These goals serve as the internationally shared agenda for development at global, regional, and national levels. This agenda encompasses inter-linked issues that cover all aspects of social and economic indicators ranging from absolute poverty, gender equality, social incorporation, health, population, employment and education to human rights, environmental sustainability and sustainable development. The issues at the national level are directly linked with national governance.

There are two schools of thought about measuring the governance. One argues that governance is a qualitative concept that cannot be measured. Other argues that governance is clearly measureable by suitable proxy indicators. World Bank and other international institutions argued that governance is an abstract concept that cannot be measured directly. By supplying the tools to monitor and measure governance, they have reshaped the framework of governance. This framework produces a better and deeper understanding of a nation's strength and weakness. By using this framework the nations can improve the quality of governance at national and sectoral level.

World Bank has also ranked countries with good governance to poor governance on the basis of KK index (Kaufmann, et al. 2005) that is based on cross-sectional variables. Drawback of such type of indices is that they neglect social, cultural, political, geopolitical and economic constraints that developing nations face. These constraints completely differ for the nations.

In the literature a variety of proxies has been used to measure the governance in Pakistan. They include voice and accountability, political stability, rule of law, regulatory quality, control of corruption and institutions (Staphen and Kafeer, 1999; Haq and Zia, 2009). However, some of the studies have constructed the indices. For instance, Qureshi (1999) and Roy (2005) constructed the Human Governance Index for Pakistan and Governance Index in time series for Bangladesh respectively.

We attempt to construct a time series index named KU (Khan and Ullah) index by covering five dimensions, 13 sub-dimensions and 42 indicators⁽¹⁾. It is based on time series data of the dimensions of governance like political, economic, social, environmental and human development. The practical significance of the KU index would be to see the quality of governance in Pakistan in time series. It may be used to estimate its impact on socioeconomic indicators of the economy.

The major contribution of the study would be provision of a new index for researchers for further analysis in relevant areas.

2. Literature review

Governance and its relation with socioeconomic indicators have been analyzed by a number of studies. We are concerned with the literature relating methodologies for construction of governance index. Stephen and Kafeer (1999) discussed the theoretical justification of development in the perspective of good governance. The study concluded that institutions are mobilizing the economic governance and good governance is a crucial determinant of living standards. Hijazi (1999) identified different aspects of motivation for good governance in Pakistan. The study concluded that there is no use of motivational theories in the system as the work by public sector employees is administrative not managerial. Shafqat (1999) emphasized the crisis of governance in the perspective of bureaucracy of Pakistan. Qureshi (1999) also emphasized on governance in the perspective of bureaucracy. Institutional reforms were found basic mode by which bureaucracy can convert the governance into good governance (see also Shafqat, 1999). Roy (2005) estimated the impact of various governance dimensions in Bangladesh's development process using time series data. The study used an index of governance. Haq and Zia (2009) analyzed the link between governance and pro-poor growth in Pakistan. They divided the concept of governance into dimensions like political governance, economic governance and institutional governance. To see the effect of governance on income equality the voice and accountability, political stability, regularity quality, rule of law and control of corruption were used as proxies of governance. Zhuang et al. (2010) used institutional quality as a proxy of governance. The study concluded that institutional quality of Pakistan is lower than a number of developing economies. Akram et al. (2011) concluded that one of the factors of the poverty in Pakistan is poor governance and inequity in income distribution. The study used the International Country Risk Guide as indicator of quality of government. Islam (2012) represented the urban governance by municipality system.

The literature lacks the comprehensive estimation of governance in Pakistan, including all the dimensions of the governance in time series.

3. Conceptual framework and methodology

The annual time series data for the years 1980-2010 taken from World Development Indicators (World Bank), Pakistan Economic Survey by Government of Pakistan (GOP various issues), Statistical Year Book by Federal Bureau of

Statistics (FBS various issues), Annual Reports by State Bank of Pakistan (SBP various issues) and Asian Development Bank (ADB various issues) has been used. The missed observations are filled by using interpolation through the compound average rate formula, also called as mean substitutions (see also, Jalil and Iqbal, 2009; Rotberg and Gisselquist, 2009 for using the same technique).

The objective of the study is to create an index covering a variety of socio-economic indicators. The conceptual framework for the contribution of the indicators in sub-dimensions and ultimately the dimensions has been shown in Table 1.

Table 1. *Conceptual Framework of KU Index for Governance in Pakistan*

KU Index	Dimensions	Sub-dimensions	Indicators	Hypothesized Effects
G O V E R N A N C E	Safety and Security	National security	Armed forces	+
			Tourists arrivals	+
			Military expenditures	+
			Refugee population	-
		Public security	Battle deaths	-
			Crimes	-
	Rule of law and Institutional Quality	Ratification of legal norms	Newspaper and periodicals	+
			Trademark applications	+
			Foreign direct investment	+
		Judicial efficiency	Supreme court petitions	-
	Social and Environmental Governance	Participation in general elections	Opposition boycotts	-
		Human rights	Political stability	+
			Labor unions	+
			Films released	+
		Environmental governance	Women participation in National Assembly	+
			CO ₂ emission	-
	Economic Governance	Wealth formation	GDP per capita, PPP	+
			GDP per capita growth	+
		Macroeconomic stability and financial integrity	Inflation	-
			Foreign reserves	+
			Budget deficit	-
			Trade balance	+
		Facilities for commerce and trade	Roads	+
			Electricity	+
			Mobile phones	+
			External debt	-
	Social Development	Poverty and inequality	Poverty	-
			Inequity	-
		Health and sanitation	Life expectancy	+
			Infant mortality	-
			Fertility	-
			Immunization of DPT	+
			Immunization of measles	+
			Medical physicians	+
			Sanitation	+
			Nurses	+

KU Index	Dimensions	Sub-dimensions	Indicators	Hypothesized Effects
		Education	Primary education	+
			vocational education	+
			Gender disparity in tertiary enrollment	-
			Gender disparity in primary enrollment	-
			Public spending on education	+
			Pupil teacher ratio	-

The measurement of the indicators has been shown in Table 2.

Table 2. *Measurement of Indicators*

Dimensions	Sub-dimensions	Indicators	Measurement
Safety and Security	National security	Armed forces	Total armed forces personnel in a year ⁱ
		Tourist arrivals	Tourist arrival in Pakistan in a year (thousands) ⁱⁱ
		Military expenditures	Military expenditure as percentage of GDP ⁱ
		Refugee population	Refugee population as percentage of total population of Pakistan ⁱ
	Public security	Battle deaths	Battle-related deaths in a year ⁱ
		Crimes	Total FIRs registered in a year in police stations ⁱⁱ
Rule of law and Institutional Quality	Ratification of legal norms	Newspaper and periodicals	Newspapers and periodicals circulation in a year ⁱⁱ
		Trademark applications	Total trademark applications in a year ⁱⁱ
		Foreign direct investment	Net annual foreign direct investment in \$US ⁱ
	Judicial efficiency	Supreme court petitions	Total petitions in supreme court in a year ⁱⁱ
Social and Environmental Governance	Participation in general elections	Opposition boycotts	Dummy variable: 1 if even a single party has boycotted the elections; otherwise 0
		Political stability	Dummy variable: 1 if elected government; otherwise 0
	Human rights	Labor unions	Number of labor unions registered in a year ⁱⁱⁱ
		Films released	Number of featured films released in a year ⁱⁱ
		Women participation in National Assembly	Percentage of women seats (both elected and special) in National Assembly ⁱⁱ
	Environmental governance	CO ₂ emission	CO ₂ emission in metric tons per-capita ⁱⁱ
Economic Governance	Wealth formation	GDP per-capita, PPP	GDP per-capita in current US\$ ⁱ
		GDP per-capita growth	GDP per-capita annual growth rate ⁱ
	Macroeconomic stability and financial integrity	Inflation	Consumer Price Index ⁱ
		Foreign reserves	Total reserves in current US\$ including gold ⁱ
		Budget deficit	Budget deficit in local currency ^{i,iv}
		Trade balance	Trade balance in local currency ⁱⁱ
	Facilities for commerce and trade	Roads	The length of total paved roads ⁱⁱ
		Electricity	Electricity production per-capita in Kwh ⁱ
		Mobile phones	Number of cellular phone subscriptions per 10,000 people ⁱ
		External debt	External debt stock in US\$

Dimensions	Sub-dimensions	Indicators	Measurement
Social Development	Poverty and inequality	Poverty	Head count ratio ^{iv}
		Inequity	Gini Index ^v
	Health and sanitation	Life expectancy	Average life expectancy ⁱ
		Infant mortality	Infant mortality rate per 10,000 live births ⁱ
		Fertility	Fertility rate
		Immunization of DPT	Immunization (DPT) of children in percentage ⁱ
		Immunization of measles	Immunization (Measles) of children in percentage ⁱ
		Medical physicians	Medical physicians per 10,000 people ⁱⁱ
		Sanitation	Percentage of population with access to improved sanitation facilities ⁱ
		Nurses	Number of nurses per 1,000 people ⁱⁱ
	Education	Primary education	Gross primary school enrolment rate ^{i,ii}
		Vocational education	Secondary and vocational students ^{i,ii}
		Gender disparity in tertiary enrollment	Ratio of male to female tertiary enrolment in percentage ^{i,ii}
		Gender disparity in primary enrollment	Ratio of male to female primary enrolment in percentage ^{i,ii}
		Public spending on education	Public spending on education as percentage of GDP ⁱ
		Pupil-teacher ratio	Pupil-teacher ratio at tertiary level

Source of data: ⁱ World Development Indicators, ⁱⁱ State Bank of Pakistan, ⁱⁱⁱ Federal Bureau of Statistics, ^{iv} Planning Commission and MCHD/UNDP, ^v Zaidi (2002) and Anwar and Qureshi (2002).

4. Normalization of data and dimensional indices

The data has been normalized through the formula as:

$$SNV = (X_t - \text{Minimum } X_{it}) / (\text{Maximum } X_{it} - \text{Minimum } X_{it})$$

Where SNV is same scaled and normalized variable. X_t is raw value of each indicator what so ever its scale and measure. Minimum X_{it} is smallest value of raw data from each indicator and maximum X_{it} is largest value of raw data. The high values of SNV indicate good performance for some indicators (for instance GDP growth rate) but sometimes low values explain good performance (for instance crime reported). After normalizing each indicator, the simple average of indicators of sub-dimensions is taken. Then the simple average of sub-dimensions provides the value of dimensions (exception is the dimension of safety and security where weight for sub-dimension differs). Ultimately the average value of dimension is the value of KU index. Applying the above mentioned formula for all indicators we have obtained values ranging from zero to 100 (by multiplying the ratio by 100). For the indicators having negative effect, these values are subtracted from 100, so that the best performers receive the highest and positive

values. On the other hand, the worst performance receives the lowest values (see also Rotberg and Gisselquist, 2009; Ibrahim, 2013).

To check the internal consistency, the weight distribution has been done from indicators to sub-dimensions, sub-dimension to dimensions and finally from dimensions to index. The correlation between KU index and dimensions has been estimated through Pearson correlation. The results of the correlation are shown in Table 3.

Table 3. *Weight Distribution and Results of Correlation between KU Index and Dimensions*

KU Index	Dimensions	Sub-dimensions	Indicators	Correlation between KU Index and Dimensions
G O V E R N A N C E	1/5 Safety and Security	National security	Armed forces	-0.856681
			Tourist arrivals	
			Military expenditures	
			Refugee population	
		Public security	Battle deaths	
			Crimes	
	1/5 Rule of law and Institutional Quality	Ratification of legal norms	Newspaper and periodicals	0.430571
			Trademark applications	
			Foreign direct investment	
		Judicial efficiency	Supreme court petition	
	1/5 Social and Environmental Governance	Participation in general election	Opposition boycott	0.782463
			political stability	
		Human rights	Labor union	
			Films released	
			Women participation in National ssemble	
		Environmental governance	CO ₂ emission	
	1/5 Economic Governance	Wealth formation	GDP per capita, PPP	0.793118
			GDP per capita growth	
		Macroeconomic stability and financial integrity	Inflation	
			Foreign reserves	
			Budget deficit	
			Trade balance	
		Facilities for commerce and trade	Roads	
			Electricity	
			Mobile phones	
	1/5 Social Development	Poverty and inequality	Poverty	0.958710
			Inequity	
		Health and sanitation	Life expectancy	
			Infant mortality	
			Fertility rate	
			Immunization of DPT	
			Immunization of measles	
			Medical physicians	
			Sanitation	
			Nurses	

KU Index	Dimensions	Sub-dimensions	Indicators	Correlation between KU Index and Dimensions
		Education	Primary education Vocational education Gender disparity in tertiary enrollment Gender disparity in primary enrollment Public spending on education Pupil-teacher ratio	

The statistics in Table-3 show that all the dimensions have positive association with index except safety and security. The explanation may be that during the last three decades there has been heavy inflow of refugees in Pakistan. The afghan migration increased this inflow to Pakistan. On the other hand the tourists' arrival has been drastically decreased due to same type of factors. The results explain positive association between index and rule of law and institutional quality, social and environmental governance, economic governance and social development.

We have estimated the correlation between sub-dimensions and dimension. The results are shown in Table 4.

Table 4. Weight distributions and correlation results between dimensions and sub-dimensions

Dimensions	Sub-dimensions	Indicators	Correlation between Dimension and Sub-dimension
Safety and Security	1/3 National security	Armed forces	0.953541
		Tourist arrivals	
		Military expenditure	
		Refugee population	
	2/3 Public security	Battle deaths Crime	0.958699
Rule of Law and Institutional Quality	1/2 Ratification of legal norms	Newspaper and periodicals	0.848050
		Trademark applications	
		Foreign direct investment	
	1/3 Judicial Efficiency	Supreme Court Petition	0.476864
Social and Environmental Governance	1/3 Participation in elections	Opposition Boycott	0.088370
		Political stability	
	1/3 Human rights	Labor union	0.994487
		Films released	
		Women participation in National Assembly	
	1/3 Environmental governance	CO ₂ emissions	-0.584880
Economic Governance	1/3 Wealth formation	GDP per capita, PPP	0.298542
		GDP per capita growth	

Dimensions	Sub-dimensions	Indicators	Correlation between Dimension and Sub-dimension
	1/3 Macroeconomic stability and financial integrity	Inflation	-0.158379
		Foreign reserves	
		Budget deficit	
		Trade Balance	
	1/3 Facilities for commerce and trade	Roads	0.935377
		Electricity	
		Mobile phones	
		External debt	
Social Development	1/3 Poverty and inequality	Poverty	-0.407229
		Inequality	
	1/3 Health and sanitation	Life expectancy	0.993625
		Infant mortality	
		Fertility	
		Immunization of DPT	
		Immunization of measles	
		Medical physicians	
		Sanitation	
		Nurses	
	1/3 Education	Primary education	0.879224
		Secondary education	
		Gender disparity in tertiary enrollment	
		Gender disparity in primary enrollment	
		Public spending on education	
		Pupil-teacher ratio	

Table 5. Results of correlation between sub-dimensions and indicators

Dimensions	Sub-dimensions	Indicators	Correlation between indicators and Index
Safety and Security	National security	1/4 Armed forces	0.182248
		1/4 Tourist arrivals	0.285915
		1/4 Military expenditures	-0.18717
		1/4 Refugee population	-0.12673
	Public security	1/2 Battle deaths	0.464728
		1/2 Crime	0.055766
Rule of law and Institutional Quality	Ratification of legal norms	1/3 Newspaper and periodicals	0.575377
		1/3 Trademark applications	0.004146
		1/3 Foreign direct investment	0.331302
	Judicial efficiency	Supreme Court Petitions	0.538379
Social and Environmental Governance	Participation in general elections	1/2 Opposition Boycott	0.421104
	Human rights	1/2 political stability	0.25667
		1/3 Labor union	-0.13184
		1/3 Films released	0.237028
		1/3 Women participation in National Assembly	0.03191
	Environmental governance	CO ₂ emission	-0.16935

Dimensions	Sub-dimensions	Indicators	Correlation between indicators and Index
Economic Governance	Wealth formation	1/2 GDP per capita, PPP	0.22287
		1/2 GDP per capita growth	0.006824
	Macroeconomic stability and financial integrity	1/4 Inflation	-0.06385
		1/4 Foreign reserves	-0.13184
		1/4 Budget deficit	0.045565
		1/4 Trade balance	0.018507
	Facilities for commerce and trade	1/4 Roads	0.301023
		1/4 Electricity	0.336795
		1/4 Mobile phones	-0.29503
		1/4 External debt	-0.03335
Social Development	Poverty and inequality	1/2 Poverty	0.457286
		1/2 Inequality	-0.26688
	Health and sanitation	1/8 Life expectancy	0.200076
		1/8 Infant mortality	0.164934
		1/8 Fertility rate	0.102396
		1/8 Immunization of DPT	0.218357
		1/8 Immunization of measles	0.102396
		1/8 Medical physicians	-0.18514
		1/8 Sanitation	0.294717
		1/8 Nurses	0.144399
	Education	1/6 Primary education	0.364173
		1/6 Vocational education	-0.18669
		1/6 Gender disparity in tertiary enrollment	0.006824
		1/6 Gender disparity in primary enrollment	0.05789
		1/6 Public spending on education	-0.14045
		1/6 Pupil-teacher ratio	-0.23989

5. Discussion

The range of the index is 0 to 100. We will discuss here the dimensions and KU index.

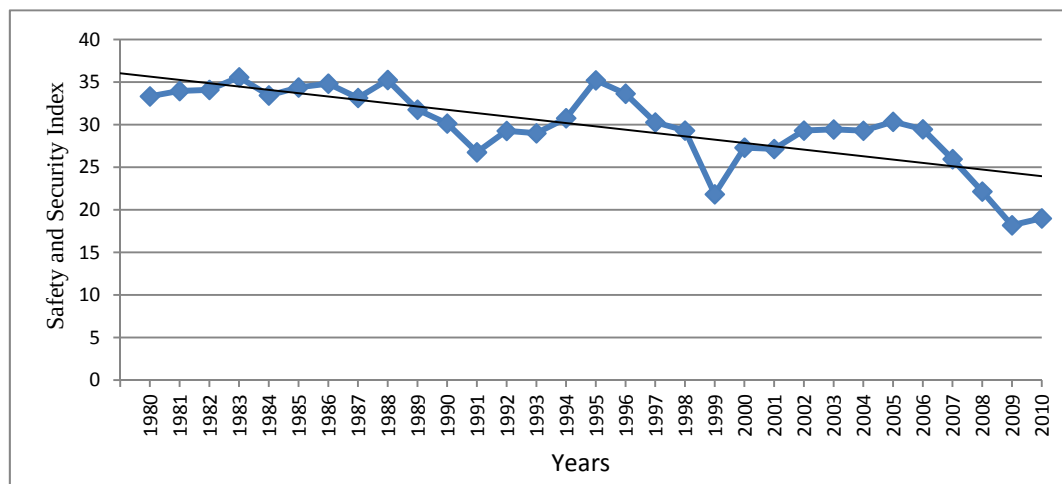
5.1. Safety and security

The dimension of safety and security has two sub-dimensions, i.e. national security and public security having weights of 2/3 and 1/3 for national security and public security respectively (see also Rotberg and Gisselquist, 2009; Ibrahim, 2013). National security is measured by four variables, i.e. armed forces personnel, tourist arrivals, military expenditures and refugees' population. Military expenditures, tourists' arrival and armed force personnel represent increased safety and security. Refugees' population represents aggravated safety and security and ultimately governance. The quantitative relationship in the form

of correlation between dimensions and sub-dimensions shows a high association between national security and dimensions of safety and security ($r = 0.953541$).

Public security that is second sub-dimension of safety and security is proxied by two variables, i.e. battle related deaths and crimes reported. Battle related deaths has also negative impact on safety and security. The increase in crimes decreases the public security and ultimately the dimension of safety and security. Public security (sub-dimension) has shown high association with dimension of safety and security ($r = 0.958699$). The trend of safety and security dimension is expressed in Figure1.

Figure 1. *Trend of safety and security dimension*



The trend line of safety and security is negatively sloped. It explains the phenomenon of terrorism resulting into refugees arrivals along with battle deaths. Due to the same phenomenon the tourist arrivals has also been drastically decreased. In the last decade of the analysis, the safety and security has remained lowest and has shown negative trend. The crimes rate also explained the trend. It is again related with terrorism and sectarian violence which has remained highest in these years. The era also represents the effect of the 9/11 incidence.

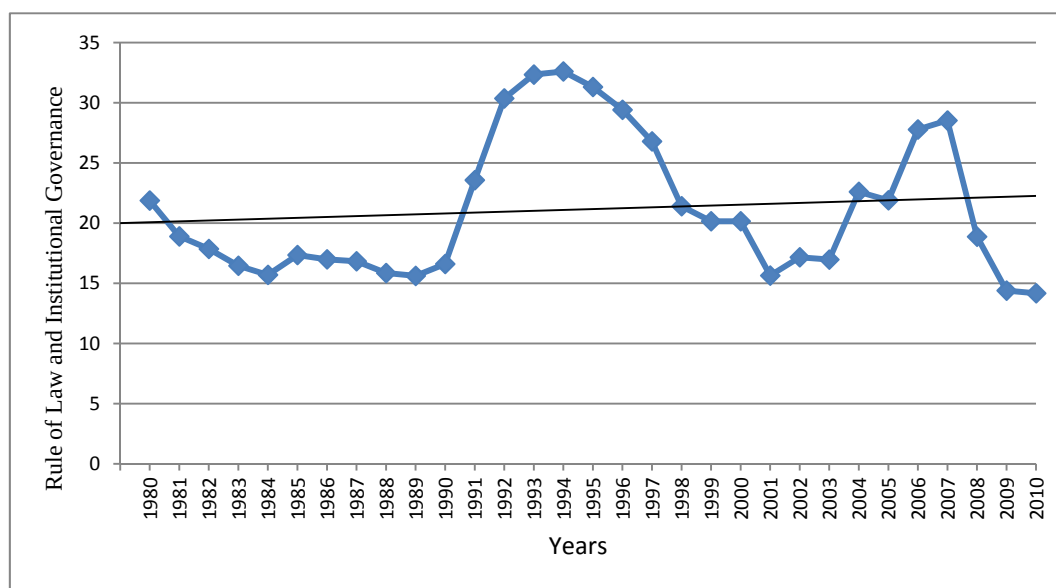
5.2. Rule of law and institutional quality

Rule of law and institutional quality is the second dimension of KU Index. It is composed of two sub-dimensions, i.e. ratification of legal norms and judicial efficiency and four indicators. Equal weights have been given to each indicator in a sub-dimension and equal weight to each sub-dimension. The association

between the dimension of rule of law and institutional quality and its sub-dimensions, i.e. ratification of legal norms and judicial efficiency are $r = 0.848050$ and $r = 0.476864$ respectively. The values show high positive association between dimension and sub-dimensions.

Figure 2 expresses the situation of rule of law and institutional quality in Pakistan from 1980 to 2010.

Figure 2. *Trend of rule of law and institutional quality*



The rule of law and institutional quality in Pakistan remained too much fluctuated during the study period, however the trend is positive.

5.3. Social and environmental governance

Social and environmental governance is the third dimension of KU Index with three sub-dimensions and six variables. The three sub-dimensions are participation in general elections, human rights and environmental governance. The participation in general elections is measured by dummy variables. If opposition boycotts in election even by a single party the variable has the value one, otherwise zero. The second variable included in same sub-dimension is political stability. Political stability is measured by dummy variable, i.e. one for democratic government, otherwise zero.

Human rights is the second sub-dimension that is measured by three variables. They are labor unions registered, films released per year and women seats in national assembly.

Environmental governance is third sub-dimension of social and environmental governance. It is measured by a single indicator that is carbon dioxide (CO₂) emission. Each sub-dimension is allotted same weightage that is 1/3. In all the sub-dimensions equal weights have been given to the indicators.

The association between dimension of social and environmental governance and sub-dimensions of participation in general elections, human rights and environmental governance is represented by $r = 0.088370$, $r = 0.994487$ and $r = -0.584880$ respectively. The trend of the social and environmental governance is expressed in Figure 3.

Figure 3. Trend of social and environmental governance

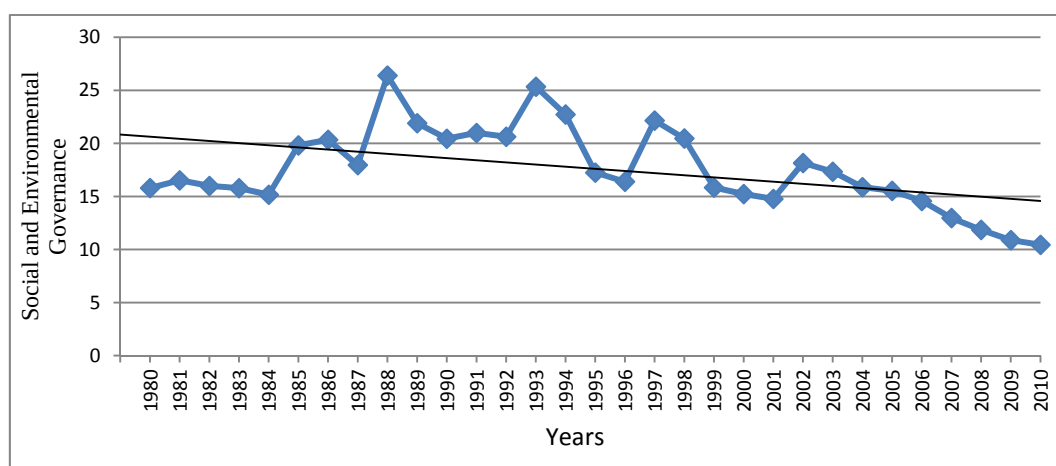


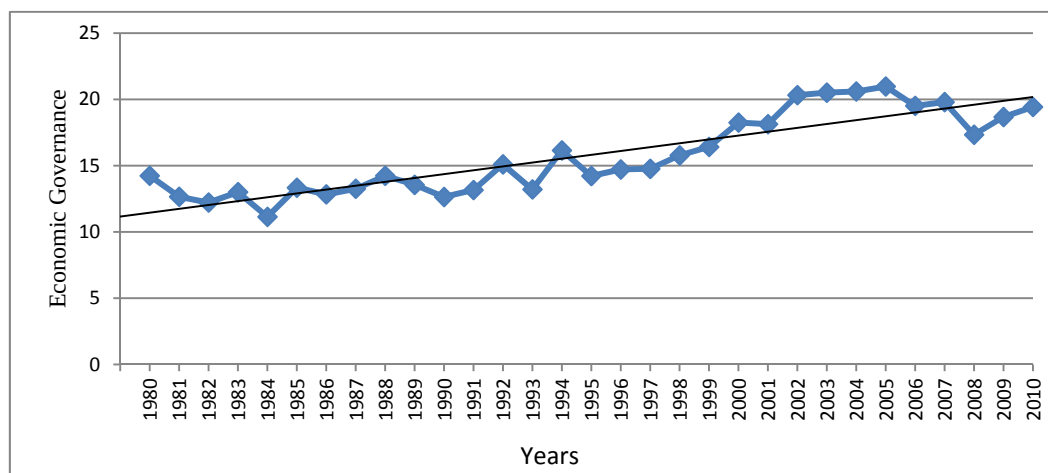
Figure 3 shows the situation of social and environmental governance in Pakistan from 1980-2010. In the early period of study, i.e. 1980-1984 and the last twelve years, i.e. 1998-2010 the situation remained very poor.

5.4. Economic governance

Economic governance is an important part of overall governance. Economic governance is fourth dimension of KU Index. It contains three sub-dimensions and ten indicators. Three sub-dimensions are wealth creation, macroeconomic stability and financial integrity, and facilities for commerce and trade. Each sub-dimension has equal weight and all the indicators have also equal weights.

The association between dimension and sub-dimensions is represented by $r = 0.298542$, $r = -0.158379$ and $r = 0.935377$ respectively for wealth creation, macroeconomic stability and financial integrity, and facilities for commerce and trade. The trend of the economic governance in Pakistan is shown in Figure 4.

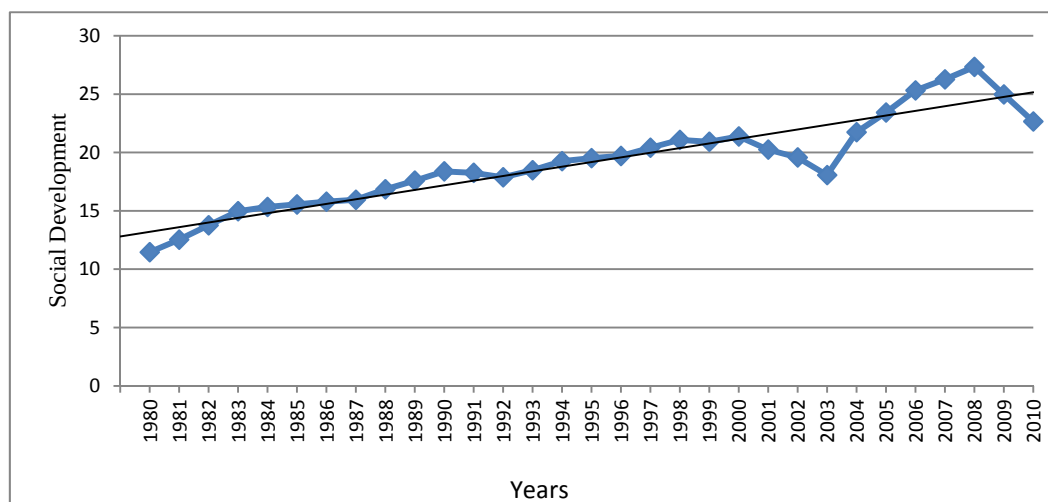
Figure 4. *Trend of economic governance*



The trend of the economic governance is positive. The phenomenon is based on the fact that Pakistan has a good record of GDP growth rate along with expansion of roads and particularly mobile phones. The capital inflow has also remained good in most of the years under study.

5.5. Social development

The social development is the last dimension of KU Index. It has three sub-dimensions and sixteen indicators. Three sub-dimensions are poverty and inequality, health and sanitation, and education. Poverty and inequality has two indicators, i.e. income inequality and poverty. In education sub-dimension the indicators are primary education, vocational education, gender disparity in tertiary enrolment, gender disparity in primary enrolment, public spending on education and pupil-teacher ratio. In the health and sanitation, the indicators included are life expectancy, infant mortality, fertility, immunization of DPT, immunization of measles, medical physicians, sanitation and nurses. Results have shown highly positive association between health and sanitation, and education ($r = 0.993625$, $r = 0.879224$ respectively). Social development has shown negative association with poverty and inequality sub-dimension ($r = -.407229$). The trend of social development has been shown in Figure 5.

Figure 5. *Trend of social development dimension*

The trend line of social development has positive slope. It is the dimension which has shown good progress in the study period. The progress is related with the trend of dimension of economic governance.

5.6. KU Index of Governance in Pakistan

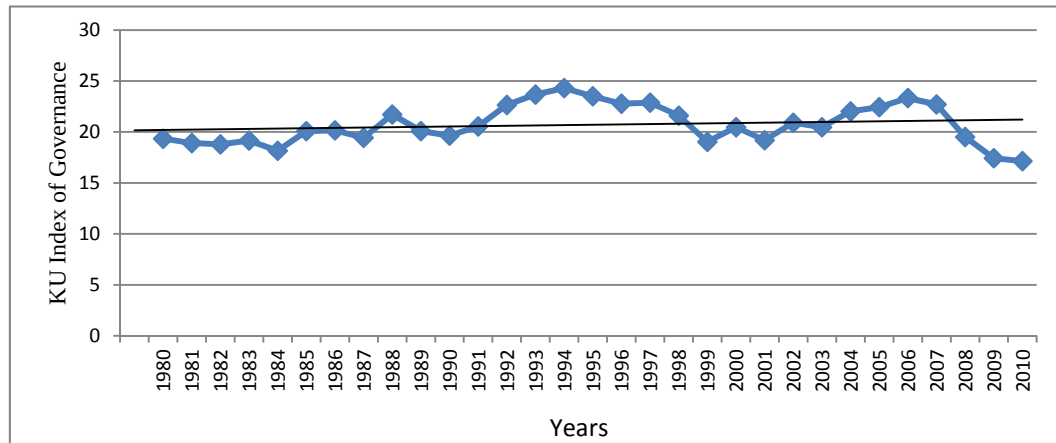
The averages of the dimensions results into KU Index of governance in Pakistan for the period 1980-2010.

Table 5. *KU Index of governance in Pakistan*

Years	KU index for governance Pakistan	Years	KU index for governance Pakistan
1980	18.97001	1996	22.54059
1981	18.53746	1997	22.73136
1982	18.36113	1998	21.56042
1983	18.72229	1999	19.05628
1984	17.68457	2000	20.59284
1985	19.58081	2001	19.36876
1986	19.62893	2002	21.1621
1987	18.88256	2003	20.77199
1988	21.18956	2004	22.06966
1989	19.58047	2005	22.38866
1990	19.16846	2006	23.2269
1991	20.08016	2007	22.60605
1992	22.18379	2008	19.43731
1993	23.25907	2009	17.62593
1994	23.95388	2010	17.37079
1995	23.2098		

The trend of the governance has been shown in Figure 6.

Figure 6. *Trend of KU Index of governance in Pakistan*



The index explains the comparatively good level in 1988, 1992-98 and then 2002-07. There is a declining trend from 2008 onwards and lowest level of governance remained in 2010. The overall trend of KU index is not encouraging as it has very low positive slope and low value ranging from 17 to 23. It explains that the situation of governance is not only poor but has not been improved significantly in the last thirty years.

6. Conclusions

Governance cannot be measured directly as it is a multidimensional concept. The aim of this paper was to construct a comprehensive index that would be comprised of all the dimensions and more reliable.

The index is open for the further research to see its contribution in different macroeconomic and socioeconomic variables like urbanization, employment, food security, nutrition, child labor and regional disparity. Applying the same technique, the governance may be estimated for other developing economies particularly for those economies which are at the same level of development. In this way a comparison may be done among the economies.

It is concluded that governance in Pakistan is not in a good shape and it has not even improved in a good way. The three dimensions of governance, i.e. safety and security, rule of law and institutional quality, and social and environmental governance has contributed negatively to the overall governance. These areas need the focus of public sector reforms. Although the dimension of safety and

security has higher index values as compared to the other dimensions but it has declining trend. Furthermore the trend is very sharp. On the other hand economic governance and social development have contributed positively, but the values of the indices of these dimensions are comparatively lower to the other dimensions.

It may further be concluded that proxies of the governance used by various studies represents the partial picture of the governance at the national level. It is based on the fact that dimensions included in this study have different levels and trends in the study period.

Note

- ⁽¹⁾ We used the term dimension, sub-dimension and indicators instead of category, sub-category and sub-sub-category used by Rotberg and Gisselquist (2009). The terms of pillar and sub-pillar of governance have been used by Ibrahim (2013) for Africa.

References

- Akram, Z., Wajid, S., Mahmood, T., Sarwar, S. (2011). "Impact of Poor Governance and Income Inequality of Poverty in Pakistan", *Far East Journal of Psychology and Business*, Vol. 4(3), pp. 43-55
- Anwar, T., Qureshi, S.K. (2002) "Trends in Absolute Poverty in Pakistan: 1990-1991 and 2001", *The Pakistan Development Review*, Vol. 41(4), pp.859-878
- FBS (various years) *Statistical Year Book*, Federal Bureau of Statistics (FBS), Government of Pakistan
- GOP (various years) *Pakistan Economic Survey*, Finance Division, Economic Advisor's Wing, Government of Pakistan (GOP)
- Haq, R., Zia, R. (2009). "Does Governance Contribute to Pro-poor Growth? Evidence from Pakistan", *PIDE Working Papers* 2009/52, Pakistan Institute of Development Economics, Islamabad
- Hijazi, S.T. (1999). "Motivational Aspect of Good Governance", *The Pakistan Development Review*, Vol. 38(4), pp.905-912
- Ibrahim, M. (2013). *Ibrahim Index of African Governance*, The Mo Ibrahim Foundation
- Islam, N. (2012). "Urbanization and Urban Governance in Bangladesh", Background paper for the 13th Annual Global Development Conference on Urbanization & Development: Delving Deeper into the Nexus. Budapest, June 16-18
- Jalil, H.H., Iqbal, M.M. (2010). "Urbanization and Crime: A Case Study of Pakistan", *Pakistan Development Review*, Vol. 49(4), pp.741-755.
- Kaufmann, D., Kraay, A., Mastruzzi, M. (2005). *Governance Matters IV: Governance Indicators for 1996-2004*, World Bank Policy Research Working Paper Series No. 3630, World Bank, Washington, DC

- Qureshi, S.K. (1999). "A Governance Perspective on Development Issues", *The Pakistan Development Review*, Vol. 38(4), pp. 327-332.
- Rotberg, R.I., Gisselquist, R.M. (2009). *Strengthening African Governance: Index of African Governance Results and Rankings*, Harvard Kennedy School 79 John F. Kennedy Street, Box 121 Cambridge, MA. 02138 October
- Roy, K. Dilip (2005). "Governance and Development: The Challenges for Bangladesh", *The Bangladesh Development Studies*, Vol. 31(3 & 4), pp. 99-136
- SBP (various years) *Annual Reports*. State Bank of Pakistan (SBP), Pakistan
- Shafqat, S. (1999). "Pakistani Bureaucracy: Crisis of Governance and Prospects of Reform", *The Pakistan Development Review*, Vol. 38(4), pp. 995-1017
- Stephen, K., Kafeer, P. (1999). "Institutions and Economic Performance: Cross-Country Tests Using Alternative Institutional Measures", *Economics and Politics*, Vol. 7(3), pp. 207-227
- World Bank (2010). *World Development Indicators*, World Bank, Washington, DC
- Zaidi, S.A. (2005). *Issues in Pakistan Economy*, Oxford University Press, Karachi
- Zhuang, J., de Dios, E., Lagman-Martin, A. (2010). "Governance and Institutional Quality and the Links with Economic Growth and Income Inequality: With Special Reference to Developing Asia", *ADB Economics Working Paper Series No. 193*

Importance of financial perspective indicators in Balanced Scorecard in a leasing company

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Abstract. *Balanced scorecard is a strategic management tool for communicating performance and aims to help managers express priorities. Its philosophy is to learn from their actions, to work in a team and to supervise the activity of the company focusing on a clear communication of objectives and priorities.*

The study is limited to the financial perspective recognized for the importance of short-term financial results of the competitive environment institutions. The aim is to determine the importance of perspective indicators in order to know the critical areas with impact on the company performance. The analysis is addressed to the management of leasing companies and interpreted by a multiple regression model.

Keywords: balanced scorecard, profitability, decision, objectives, indicators.

JEL Classification: G23, C31.

REL Classification: 14K.

Introductions

Since 1988, researchers (Berliner and Brinson, 1988: pp. 25-33; Bromwich and Bhiman, 1989: pp.137-162; Johnson, 1988: pp. 15-28; McNair, Lynch and Cross, 1990: pp. 28-36) have shown the disadvantages of short-term financial analysis of the company. Managers were limited in taking long term decisions. Researchers urged them to use financial and non - financial results (Hoque, 2013: pp. 33-59) to determine long-term performance.

Balanced scorecard (BSC) pursues goals aligned with the mission, vision and core values to achieve performance (Banker et al., 2004: pp. 1-23) and requires the use of different sets of measures: financial and operational, qualitative and quantitative. When BSC uses only financial indicators, it gives managers a picture of past performance (Banker et al., 2004: pp. 1-23). By adding the analysis the learning and development indicators relating to clients or internal processes, management will be able to analyze the company's future. Management is able to make better decisions when using the four perspectives of BSC (Sainaghi and Corti, 2013: pp. 150-159).

Financial measures appear as a traditional method of analyzing success (Kaplan and Norton, 2000: pp. 9-15). To achieve these objectives, the research is divided into three parts. The first part includes the literature review on the use of BSC in managerial decision making and control of the company by adapting the financial perspective and the non-financial performance analysis. The second part introduces the concept of financial perspective, advantages and limitations arising in a company. The last part determines the importance of financial ratios using a multiple regression model and interprets the results. In conclusion we draw references for management and future research.

1. The use of BSC for decision and control

BSC is a necessary tool in the design and the achievement of objectives - the key to sustainable management and decision control. Researches on performance management systems have shown that excessive financial success may hinder organizational development (Kaplan and Norton, 1996: pp. 5-9). BSC has been widely applied to evaluate the performance of different industries (Wu and Chang, 2012: pp. 474-485).

BSC components are the following perspectives: financial – it pursues growth strategy and risk analyzed in terms of the shareholder; client – it provides strategy

for value creation; internal processes – it analyzes the strategic priorities in different business processes in order to create customer and shareholder satisfaction; learning and development – it creates a climate that supports organizational change, innovation and growth (Kaplan and Norton, 2000: pp. 9-15).

There are three characteristics that lead to mixed results: key performance indicators (KPIs), setting objectives and reward systems. Link reward system is sometimes referred to as a user attribute performance (Malmi, 2001: pp. 207-220; Speckbacher et al., 2003: pp. 361-387), but the design is a decision on the structure of BSC (Agostino and Arnaboldi, 2013: pp. 327-339). BSC seeks to measure both productivity and development of learning in the organization (Antonsen, 2013: pp.17-38). The measurements included customer satisfaction, process and output quality, productivity, efficiency and satisfied employees (Banker et al., 2004: pp. 1-23). Studies have found that BSC provides a structure for analyzing performance management (Voelpel et al., 2006: pp. 43-60), namely financial results (Antonsen, 2013: pp.17-38). Norreklit (2000, 2003 and 2012) was very critical regarding the causal relationships between the four perspectives of BSC and the validity of the system to serve as a strategic management tool (Hoque, 2013: pp. 33-59).

The critical point occurs when the four BSC perspectives are connected in a causal chain (Papalexandris et al., 2004: pp. 292-293). Prospects are part of a major impact on any company, whether analyzed by shareholders, customers or employees. The aim is to provide an overview of the organization that can be used for strategic thinking and implementation (Fernande et al., 2006: pp. 623-634).

2. Financial Perspective – concept, advantages and limitations

Balanced scorecard helps managers to establish strategic objectives and to monitor processes to achieve them. The information at the end of the study alerts managers about what they need to improve to ensure success. The financial perspective is recognized for the importance of short-term financial results obtained from the analysis of financial targets for institutions in the competitive environment (Kaplan and Norton, 2000: pp. 9-15). They can be different at each stage of development of the company's activity. The three main levels are: revenues growth, cost reduction or productivity improvement and assets use or investment strategy. The revenues growth is achieved by increasing sales volumes and refinancing. Perspective can be linked to the concept of “waste disposal” synonymous with cost reductions, considered the most important level of the also mentioned (Baroma et al., 2013: pp. 239-251). Cost reduction focuses on

decreasing the variables. This leads to further increase financial returns. After implementation it is necessary to increase the business volume, which would lead to a return to profitability in sales turnover and a high return on investment (Baroma et al., 2013: pp. 239-251).

The company's strategy presents value-based businesses. Unlike ordinary entities, maximizing cost efficiency in non - profit or government is achieved by maximizing the benefits of stakeholders, submitted to resource constraints. The financial target is considered a major goal. Financial indicators are presented together with the vision, mission and core values related to stakeholders. Successful financial measures may be considered massive cost reductions, small deviations from the budget, performance changes in a short period of time and increased return on investment. Critical success factors can increase the company's efficiency (Farooq and Hussain, 2011: pp. 754-768).

Improving the financial perspective and the internal process performance, objectives are achieved through the development of innovation and learning. For the financial perspective the following indicators are considered to be important: shareholder value, customer market share and customer satisfaction, basic skills of internal processes and learning and growth perspective, the attitude of employees (Kaplan and Norton, 2004: pp. 10-17). Shareholder value is an indicator of performance, not the performance, although it measures financial results. Presented in a hierarchical pyramid, the financial outlook appears at the top, and the prospect of learning and development at the bottom.

Achieving financial success cannot be the main objective of many organizations such as non -profit organizations, as modified hierarchical structure appears to peak customer perspective and financial perspective to the next level (Wu and Chang, 2012: pp. 474-485) .

3. Research methodology

The current research is based on an implementation model of Kaplan and Norton BSC used in the 2003 Federal Energy Personal Property Management program. We go through the following stages: defining the mission, vision and strategy, presenting the company organization chart, realizing customer analysis, establishing the deadline for completion of the implementation, but also listing the main objectives and measures of targets present in each BSC perspective.

Research study proposes to limit the financial perspective review of management vision through a multiple regression model. The study is applied on a leasing

company in Romania, located in Bucharest, a member of a well-known international group. Its market features over 20 active competitors and has over 5,000 employees. In the company there are 60 managers and 300 non-management employees, all with high economic education.

Of these, 27 are top managers, the rest being auxiliary managers. BSC implementation is achieved after the company has determined the problem areas. To determine the importance of the objectives of the BSC there were developed interviews with Likert response scale. The interview is addressed to the management and contains 20 questions that assess the impact of each objective on the company performance. In the interview, stage responses were obtained from a sample of 53 managers on the basis of which was established research practice.

The indicators listed in the financial perspective are: sales volumes (β_6), costs (β_7) margins over refinancing lines (β_8), old portfolio income (β_9) and net profit after tax (β_{10}). The multiple regression models appear as endogenous variables. The profitability was considered the exogenous variable, as measured by performance in 2013. Y can take values {1, 2}.

4. Results

To perform the research an AGA meeting was necessary; 53 top managers, general management and company associations took part. During the interview, respondents were asked their opinions on current performance of company's management, emphasizing aspects that are found in the Balance Scorecard. The main critical issues mentioned in the purview of this meeting are: to maintain its leading position in the market of leasing, the company – customer relationships, the company – supplier relationships and the company – employees' relationships (AGA X lease, 2013).

Following the debates conducted, the management wants to meet financial goals such as: increasing service facility determined as the ratio between facilities and developments, changing the company's profile as the ratio of market failure and sales loss, service costs reduction, calculated as a ratio between the high costs and facilities (Kartalis et al., 2013: pp. 413-422). The managers' responses on new targets are processed according to ANOVA equation and shows, according to the multiple regressions equation, the following results:

Table 1. Final performance indicators, financial perspective

SUMMARY OUTPUT	
Regression Statistics	
Multiple R	0,970075241
R Square	0,941045973
Adjusted R Square	0,9270093
Standard Error	0,120650527
Observations	53

ANOVA					
	df	SS	MS	F	Significance F
Regression	5	4,87949764	0,975899528	67,04195311	3,43183E-12
Residual	21	0,305687545	0,01455655		
Total	26	5,185185185			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	0,243046164	0,068405799	3,553005246	0,001881517	0,100788517	0,385303811	0,100788517	0,385303811
6	0,11620592	0,032549894	3,570085955	0,001807048	0,04851471	0,183897131	0,04851471	0,183897131
7	0,111488805	0,042872489	2,600474283	0,016698662	0,022330584	0,200647027	0,022330584	0,200647027
8	0,091277093	0,035119121	2,599071128	0,016750053	0,018242883	0,164311303	0,018242883	0,164311303
9	0,065054766	0,028683403	2,26802816	0,033998356	0,005404364	0,124705167	0,005404364	0,124705167
10	0,07332647	0,034533057	2,123370336	0,045772419	0,001511046	0,145141894	0,001511046	0,145141894

The regression model is:

$$Y = \beta_0 + \beta_6 x_6 + \beta_7 x_7 + \beta_8 x_8 + \beta_9 x_9 + \beta_{10} x_{10} + e_i$$

where:

Y represents profitability employee;

β_6 represent sales volumes;

β_7 represents the costs;

β_8 is refinancing margins over lines;

β_9 is old portfolio income;

β_{10} is the net profit after tax.

Each evaluation criterion has attached an appropriate performance indicator. All endogenous variables in the model (sales volumes, costs, refinancing margins over lines, old portfolio income, net profit after tax) have a positive influence on Y – profitability. There is no endogenous variable that adversely affects exogenous variable Y.

A significant influence is underlined by the values of the coefficients of determination ($R^2 = 0.9700752410$ and R^2 adjusted = 0.941046), meaning that both quantitatively and qualitatively, the variables included in the model are well

chosen, and the model is correctly specified (Radu 2013: pp. 26-47). A strong bond between them appears near R^2 and adjusted R^2 . The value of 0.941046 Adjusted R^2 shows that 94% of the variation is caused by the influence profitability targets financial perspective. Ideally, the standard deviation of the errors is 0 which means that all points are on the same regression axis.

The tests used to confirm the hypothesis that applied correlogram heteroscedasticity square error and settled in the absence of autocorrelation determined quadratic residues (Radu, 2013: pp. 26-47). The tests to verify the validity of the econometric model are t-test and F test. T test defines the econometric model and is valid because there is at least one parameter significantly different from 0. Assumptions in the model are defined by the null hypothesis H_0 where $\beta_i = 0$ and the alternative hypothesis H_A where $\beta_i \neq 0$, and $i = 1, 2$.

The model depends on the importance of the variables: volume of sales, costs, margins across lines refinancing old portfolio income. If variable sales volume increases or decreases by 1, then profitability changes by 0.11620592; if variable costs increase or decrease by 1, then profitability changes by 0.111488; if the variable margin over refinancing lines increases or decreases by 1, then profitability changes to 0.0912770934; if the variable income portfolio increases or decreases by 1, then profitability changes by 0.06505476; if net profit after tax increases or decreases by 1, then profitability changes in the same direction 0.073326469.

All parameters of the model ($\beta_0, \beta_6, \beta_7, \beta_8, \beta_9, \beta_{10}$) are significant because the test value $T > 0$ and P -value threshold of significance is less than 0.05.

F test shows that the regression model used is a valid model. The assumptions used in the model are: the null hypothesis H_0 where $\beta_0 + \beta_6 + \beta_7 + \beta_8 + \beta_9 + \beta_{10} = 0$ and the alternative hypothesis H_A where $\beta_0 + \beta_6 + \beta_7 + \beta_8 + \beta_9 + \beta_{10} \neq 0$. The value of $F = 67.0419531$ and the significance F is 3.43182993409634E -12 value of less than 0.05, in these conditions the regression model generated is valid and thus can be used to assess the dependence of the variables initially set.

The profitability growth strategy aims to develop existing sales volumes. A leasing company in the market is based on the life of the assets held in the lease. The weakness of this strategy is that less attention is being paid to long-term financial performance. To be successful, managers and employees must take appropriate measures that can be monitored by BSC. One advantage of using the BSC is that initiatives can be presented and verified at every level of the company (Radu, 2013: pp. 26-47).

Conclusions

BSC is a necessary tool in the design of objectives - the key to sustainable management and decision control. At the same time the record of the information is required to observe financial and non-financial performance (Lansiluoto and Jarvenpa, 2010: pp. 184-206).

The literature presents financial KPIs, less non-financial ones. Only by taking into account financial and non-financial KPIs, it is possible for a company to obtain information about the problems of businesses (Meier et al., 2013: pp. 28-39).

According to the multiple regression model performance, the indicator with the highest influence is the volume of sales activity, it is considered as a first priority to change the company's image to the general public in terms of management. Following strategic objective requests service cost adjustments. Another important point to be addressed is the refinancing margins over lines. The limitations of the current study are generated by human consciousness. The group of experts involved in the analysis may lead to a bias in the selection of indicators.

Acknowledgements

This work was financed by the Institute for Doctoral Studies, The Bucharest University of Economic Studies (IOSUD-ASE).

References

- Agostino, D., Arnaboldi, M. (2013). "Design issues in Balanced Scorecards: The "what" and "how" of control", *European Management Journal*, No. 30(32), pp. 327-339
- Antonsen, Y. (2013). "The downside of the Balanced Scorecard: A case study from Norway", *Scandinavian Journal of Management*, No. 2(4), pp. 17-38
- Banker, R.D., Chang, H., Pizzini, M.J. (2004). "The balanced scorecard: judgmental effects of performance measures linked to strategy", *The Accounting Review*, No. 79(1), pp. 1-23
- Baroma, B., Bellisario, A., Chirico, A., Appolloni (2013). "A Breakthroughs in the Management Accounting Science: Imaging a Balanced Scorecard Thought by Lean Philosophy Rationales Transit Stud Rev 20", pp. 239-251

- Berliner, A., Brimson, J.A. (1988). "Cost Management for Today's Advanced Manufacturing-The CAM-I Conceptual Design", *Harvard Business School Press*, No. 1(1), pp. 25-33
- Bromwich, M. (2009). "Economics in management accounting. In C.S. Chapman, A.G. Hopwood, M.D. Shields (Eds.)", *Handbook of Management Accounting Research*, No. 1(1), pp.137-162
- Farooq, A., Hussain, Z. (2011). "Balanced scorecard perspective on change and performance: a study of selected Indian companies", *Procedia Social and Behavioral Sciences*, No. 24(1), pp. 754-768
- Fernandes K.J., Raja V., Whalley A. (2006). "Lessons from implementing the balanced scorecard in a small and medium size manufacturing organization", *Technovation*, No. 26(2), pp. 623-634
- Hoque, Z. (2013). "20 years of studies on the Balanced Scorecard: Trends, accomplishments, gaps and opportunities for future research", *The British Accounting Review*, No. 26(1), pp. 33-59
- Johnson, H.T., Kaplan, R.S. (1988). "Relevance Lost, The Rise and Fall of Management Accounting. Boston", *Harvard Business School Press*, No. 4(1), pp. 15-28
- Kaplan, R.S., Norton, D. (2004). "The strategy map: Guide to aligning intangible assets", *Strategy and Leadership*, No. 32(5), pp. 10-17
- Kaplan, R.S., Norton, D.P. (1996). "The Balanced Scorecard: Translating strategy into action", *Harvard Business School Press*, No. 2(1), pp. 5-9
- Kaplan, R.S., Norton, D.P. (2000). "Strategy Maps: Converting Intangible Assets into Tangible Outcomes", *Harvard Business School Press*, No. 1(1), pp. 9-15
- Kartalis, N., Velentzas, J., Broni, G. (2013). "Balanced Scorecard and Performance measurement in a Greek Industry", *Procedia Economics and finance*, No. 5(1), pp. 413-422
- Lansiluoto, A., Jarvenpaa, M. (2008). "Environmental and performance management forces: integrating "greenness" into balanced scorecards", *Qual. Res. Acc. Manage*, No. 5(3), 184-206
- Malmi, T. (2001). "Balanced Scorecards in Finnish companies: A research note", *Management Accounting Research*, No. 12(1), pp. 207-220
- McNair, C.J., Lynch, R.L., Cross, K.F. (1990). "Do financial and nonfinancial performance measures have to agree?", *Management Accounting*, No. 1(2), pp. 28-36
- Meier, H., Lagemann, H., Morlock, F., Rathmann, C. (2013). "Key performance indicators for assessing the planning and delivery of industrial services", *Procedia CIRP*, No. 11(9), pp. 28-39
- Nørreklit, H. (2000). "The balance on the Balanced Scorecard: a critical analysis of some of its assumptions", *Management Accounting Research*, No. 11(1), pp. 65-88
- Nørreklit, H. (2003). "The Balanced Scorecard: what is the score? A rhetorical analysis of the Balanced Scorecard", *Accounting, Organizations and Society*, No. 28(6), pp. 591-619
- Nørreklit, H., Nørreklit, L., Mitchell, F., Bjomenak, T. (2012). "The rise of the balanced scorecard! Relevance gained?", *Journal of Accounting & Organizational Change*, No. 8(4), pp. 490-510
- Papalexandris, A., Ioannou, G., Prastacos, G., (2004). "Implementing the balanced scorecard in Greece: a software firm's experience", *Long Range Planning*, No. 37(4), pp. 292-293
- Radu, M. (2013), "Balanta scorecard în strategia organizațională", pp. 26-47
- Sainaghi, R., Phillip, P., Corti, V. (2013). "Measuring hotel performance: Using a balanced scorecard perspectives' approach", *International Journal of Hospitality Management*, No. 34(1), pp. 150-159

- Speckbacher, G., Bischof, J., Pfeiffer, T. (2003). "A descriptive analysis on the implementation of Balanced Scorecards in German-speaking countries", *Management Accounting Research*, No. 14(2), pp. 361-387
- Voelpel, S.C., Leibold, M., Eckhoff, R.A. (2006). "The tyranny of the BSC in the innovation economy", *Journal of Intellectual Capital*, No. 7(1), pp. 43-60
- Wu, I.L., Chang, C.H. (2012). "Using the balanced scorecard in assessing the performance of e-SCM diffusion: A multi-stage perspective", *Decision Support Systems*, No. 52(1), pp. 474-485

Quality based credit risk mitigation for bank performance enhancement: empiric study at Indonesia bank

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Abstract. *Purpose-* Risk Mitigation is a risk management system for company performance enhancement. Somehow, there is an ongoing controversy over whether risk mitigation inherently enhances business performance. The aim of this paper is to settle the controversy, and provide insights roles of risk mitigation on corporate strategy.

Design/methodology/approach – Author examined application of risk mitigation at an Indonesia Bank, which the company is using Lean Six Sigma, based on responses from 112 credit analysts and database of company performance indicators. This examination will showing at the end relationship between implication of Lean Six Sigma at credit risk mitigation system and unit banks performance.

Findings – This paper provide research result that Quality Based Credit Risk Mitigation which is risk mitigation using Lean Six Sigma will enhance company performance through improve credit quality and credit process efficiency.

Research Limitation – This research has limitation on scope of work. It was done at 112 business unit at one bank, in reason the wish gain information is categorized as confidential at each of company. Next future research should be doing at companies at same industries or different industries.

Practical implication – The new concept is Quality Based Credit Risk Mitigation (Mitigasi Risiko Kredit Berbasis Kualitas - MRKBK). MRKBK is credit risk mitigation using Lean Six Sigma as guidance to enhance company performance by increasing credit quality and minimize credit process time. It was proven increasing company performance through improve quality of process and products. The result will give better value to company performance, especially banking area, which has interest on operational performance and strategic management.

Social Implication – This research has social implication to increase banking credit facility for industry and society. The credit financing, at the end, could improve economic growth of nations.

Originality/value – The study described in this paper is unique in establishes a statistical valid relationship between credit risk mitigation, Lean Six Sigma and bank performance.

Paper type Research paper

Keywords: lean six sigma, credit risk mitigation banking, quality management, implication strategic management.

JEL Classification: G21.

REL Classification: 11C.

Introduction

Company has a mission to maximize the profit and sales, as well as keep company existence at market, having certain market share, reach profit on certain level which satisfied the stake holders, minimize employee turn over, maximize management wealthiness (Levy and Sarnat, 1988). There are internal and external barriers for company to achieve this mission, and need extra effort to conquer them. *Resources Based View Theory* (Grant, 1991) stated that company need strategy, which using all resources and abilities, to create sustainable competitive advantage. One of corporate strategies is become efficient and effective to keep the company exist at the competition. The effective organisation is one which can achieve the aim (Barnard, 1938; Etzioni, 2007). The efficient organisation is satisfying the share holders (Barnard, 1938) or using certain limited resources to achieve the aim (Etzioni, 2007). Deliver high quality product from efficient process is the main activity to increase company's performance. High quality product can reduce operational cost related with no defect products recycle, and no claim cost.

Risk mitigation (or risk management) is the management tool for the business activities of the company for minimize risk, deliver high quality product, optimize cost, and finally increase company's performance (Hollman and Forest, 1991; Keeton, 1999; Pastor, 1999; Shimko, 2001; Fairchild, 2002; Fan, 2004; Nocco and Stulz, 2006; Utter, 2006; Fioderlisi, 2011). Risk management as consideration to take decisions at complex problems (Mok, 1994), and deliver profit to company (Darmawi, 2005).

Somehow, there is an ongoing controversy over whether Risk Mitigation inherently enhances business performance. The aim of this paper is to settle the controversy, and provide insights roles of Risk Mitigation on company performance. Hollman and Forest (1991) was claimed that enterprise risk mitigation is continue process to reduce company's risk, decrease operational cost, effective operation, reduce non performing loan and finally enhance company performance. Higher business activities will make risk mitigation more intense (Keeton, 1999) and efficient risk mitigation will deliver profit for company (Pastor, 1999; Fan, 2004; Fioderlisi, 2011). Risk mitigation is useful to mitigate total risk and giving value added to company directly (Shimko, 2001; Fairchild, 2002), and indirectly to *shareholders* (Nocco and Stulz, 2006). Risk mitigation is a part of company's strategy to enhance performance (Utter, 2006).

The controversy is that risk mitigation was not giving value added to the company, in reason it only could mitigate specific risk (risk that could controlled internally) but no control market risk (controlled totally by investors at market). Stulz (1996, 2003) said risk mitigation was not enhancing company performance due to high investment at resources and it was not providing big impact to the company (Pagach and Warr, 2010).

This research is directed into banking industry, in reason it is exposed high risk related with its main transaction on money related. Basel Accord II (2004) has encouraged banks to determine the better risk mitigation system. The encouragement by socialized other process instead of minimum capital requirements (Basel, 2000) for banks such as supervisory review process and disclosure information to the market. Economic phenomenon of risk mitigation at Indonesian banks has shown that it was not enhancing company performance yet, especially on credit risk mitigation. Indonesia has applied risk mitigation since year of 1990 based on Basel Accord 1988, and Non Performing Loan (NPL) has decreased as the impact of the risk mitigation application but was not on significant way. Below is the fluctuation of NPL ratio ($= \text{NPL} / \text{Credit}$, Rp. Miliar).

Table 1. *Trend of Credit, NPL, and NPL Ratio in Indonesia, 2006 – November 2013*

	2006	2007	2008	2009	2010	2011	2012	Nov-13
Credit (Rp.Miliar)	792,297	1,002,012	1,307,688	1,437,930	1,765,845	2,200,094	2,707,862	3,214,397
NPL (Rp.Miliar)	30,803	23,148	17,594	18,828	17,982	47,695	50,595	60,431
NPL Ratio	3,89%	2,31%	1,35%	1,31%	1,02%	2,17%	1,87%	1,88%
Growth Kredit		26%	31%	10%	23%	25%	23%	19%
Growth NPL		-25%	-24%	7%	-4%	165%	6%	19%
Growth Ratio		-1,58%	-0,96%	-0,04%	-0,29%	1,15%	-0,30%	0,01%

Source: Processing for this research (Otoritas Jasa Keuangan, 2013).

At 2006 until November 2013, loan was increasing until 25% per year, but NPL ratio (amount of NPL compare with amount of loan) was fluctuating decrease. At 2011, NPL ratio (2.17%) has increase almost double from 2010 (1.02%) and at 2012 until November 2013 (1.87%; 1.88%) they were higher ratio compare with 2008 until 2010 (1.35%, 1.31%, and 1.02%). This phenomenon means that credit risk mitigation still not applies correctly at Indonesian banks. Other economic phenomenon is Indonesian banks still have high overhead cost. Indonesian banks have overhead cost at approximately 3 (three) until 4 (four) percent, meanwhile South East Asia has 1 (one) until 2 (two) percent per sales (Hadad et al., 2003; Retnawati, 2010; Bank Indonesia, 2012).

The controversy and the economic phenomenon are delivering question why risk mitigation (in here Author use the term credit risk mitigation that refer to bank industry which exposed high risk) could not enhancing company performance? Is Quality Based Credit Risk Mitigation is the factor for credit risk mitigation improvement to enhance company performance? To answer these questions, we need theoretical approach to solve the research gap risk mitigation and company performance.

Research objectives

This study is designed to develop new theoretical approach to solve the controversy of the roles credit risk mitigation and company performances enhancement. It will investigate the role of credit risk mitigation that is applied by risk personals in their work (in this case, the personals are credit analysts and the work process is credit analysis). Other thing is how it can improve the process so at the end it will increase company performance.

As such, the research sets to answer two questions:

RQ1. What is the relationship between credit risk mitigation and company performance?

RQ2. Is Quality Based Credit Risk Mitigation influences company performance? To this effect, we first examined the Lean Six Sigma system application in credit risk mitigation at the bank. Then we were looking at database of company performance such as EBITDA, ROE, FBI on certain time (based on years) to examine whether quality based credit risk mitigation can impact to the company performance.

Literature

The literature is reviewed to identify relevant past research results, but also to identify relevant constructs and variables for the data collection to answer the research questions. As such, the literature review covers key concepts and theoretical findings of new concept which will answer the research question. First, it will discuss about corporate strategic management to face competition. One of strategic managements is organization operational efficiency effectiveness (OEE) which makes the company stay different with others, low cost and focus. Second, it will discuss about risk mitigation which is management strategy to minimize risk exposed to the company. The minimization of risk will deliver high product and process and decrease operational cost which is leverage efficiency. Third, we discussed about Lean Six Sigma as the tools management which could convert the wish into reality, such as deliver efficiency and effectiveness to organization thus get it different with others, low cost and stay focus to manage customer satisfaction. Fourth, it is about Lean Six Sigma at bank. We try to take a look on is it Lean Six Sigma is the missing factor toward credit risk mitigation implication at banking business.

1. Operational efficiency effectiveness theory and corporate strategy

Organization is build based on persons who has same interests. Profit organization is digging profit as much as it get, but non organization profit depend on share holder view. Both of types have same process to deliver the purposes which must efficient and effective. Efficient means quick process to satisfied person in organization, effective means achieved organization purpose on the right way to keep focus (Barnard, 1938; Etzioni, 2007). To stay competitive, organization must have generic strategic which is (1) differentiation, (2) low cost, and (3) focus (Porter, 1980). It means organization should operate efficient and effective (OEE-*Operational Efficiency and Effectiveness*), or organization strategy to deliver the right thing to customer (value added) and efficiently with economic cost. The higher OEE, the higher market share, the higher profit with low cost operational. OEE activities which are improving organisation with purpose to deliver value added things to customer and process efficiency, is starting point of quality management tools including Total Quality Management, Six Sigma, and Lean Management. Lean Six Sigma is integration between Six Sigma and Lean Management, which system at organisation to deliver product with low amount of defect products and efficient production process (Arnheiter and Maleyeff, 2005; Bendell, 2006).

2. Risk mitigation

Risk is the probability of loss or accident, or the value of loss or defect probability degree (Kaplan and Garrick, 1981); result variations that occurred on certain time (Williams and Heins, 1985); uncertainty about choice on something that will happened on the future (Charette, 1990); combination of probability occurrence and the impact (Siahaan, 2007). Meanwhile, business risk definition is all risk integration (Ballou and Knechel, 2002); the risk after all risk are identified (Kuritzkes and Schuermann, 2006). In context of strategic management, risk is occurred in reason apply inefficient business strategy such as choosing incorrect strategy (Marshall, 2001; Alexander, 2005), risk is occurred from financial distress because change of competitive environment.

The types of risks depend on industries. Risks of banks are market risk, credit risk, and operational risk. Manufacturing companies' risk are liquidity risk, systemic risk, external environment, business risk, information risk, strategic risk, legacy risk, compliance risk, and reputation risk (Basel, 2000). Risk management is activity of business to identify, measure, and handle the risk in purpose to survive and competitive (Allayanis and Watson, 2001); comprehensive approach to take care of all occasion that will have loss prospect (Clough and Sears, 1994);

application of management that identify, measure, and control reasons and impact of organisation's uncertainty (Tchankova, 2002). Risk management will applied well at industry when it is becoming part of business strategy and mission such as to gain the best rank or integrate into employee evaluation performance (McCuaig, 2010) and one of the way to perform good corporate governance (Demidenko and McNutt, 2010). Risk management could applied at every industrie, such as health, construction, information technology and services.

As mentioned before, risk management support company enhancement but many opposite researches argue that. Hollman and Forest (1991) was claimed that enterprise risk mitigation is continues process to reduce company's risk, decrease operational cost, effective operation, reduce non performing loan and finally enhance company performance. Higher business activities, more intense risk mitigation (Keeton, 1999) and efficient risk mitigation will provide profit (Pastor, 1999; Fan, 2004; Fioderlisi, 2011). Risk mitigation is useful to mitigate total risk and giving value added to company (Shimiro, 2001; Fairchild, 2002), and indirectly giving value added to *shareholders* (Nocco and Stulz, 2006). Risk mitigation also part of company's strategy to enhance performance (Utter, 2006). The debate of these researches above are risk mitigation is not giving value added to the company. The reason is risk mitigation only could mitigate specific risk (risk that could controlled internally) but cannot control market risk (controlled totally by investors at market). Stulz (1996, 2003) said risk mitigation is not enhancing company performance due to high investment at resources and it is not provide big impact to the company (Pagach and Warr, 2010).

3. Lean Six Sigma

Six Sigma was developed at Motorola in 1987 as quality management program. It was followed by other profit organization such as Allied Signal, IBM and General Electric (GE). They were using it as corporate operational strategy as well as change cultural organization (Aboelmaged, 2009). Significant deployments lead by the CEOs at Allied-Signal and GE, which Jack Welch as CEO GE promoted Six Sigma internal and external GE. Limit defect products at Six Sigma is 3,4 part per million and it is difficult for manufactures which depend on regular quality management. To gain this limit, production should follow the Six Sigma procedures at 5 stages, which are Define, Measure, Analyze, Improve and Control (DMAIC). Define is the process to define the main problem; Measure is calculate and collecting data process; Analyze is analyzing data using statistical program to find out the cause of the problem step; Improve is process to run solution to fix problem; and Control is process activities control after fix the problem (Antony, 2004).

Toyota Production System (TPS) has build Lean manufacturing by the engineers Taiichi Ohno and Shigeo Shingo (Arnheiter and Maleyeff, 2005) at 1990s, which actually the history was starting since after World War II. Lean came from Toyota's interest on Ford concept which is very efficient to control the inventory with Just In Time (JIT) system. Ohno and Shingo developed Lean concept based on JIT that make inventory control efficient by eliminate no-giving value added parts of the process, and reduced process time. Lean is continues improvement effort to eliminate waste, value added product/service, and provide customer value (Pepper and Spedding, 2009). TPS has proved Lean system to be best manufacturing system at that time by Japanese cars could conquer market globally instead of USA-Europe cars (Liker, 2004).

Lean integrated with Six Sigma at 1990s until early 2000s (George, 2003). By adding lean concepts, methods and tools into Six Sigma, the approach was strengthened in the areas where improvements could be identified and implemented quickly (one to four weeks). The quick process is applied on the flow of information and materials through a process. Today, Lean Six Sigma is well known as the improvement approach of operational process. Lean concept is emphasized to efficiency process by eliminate waste parts of process, and Six Sigma is emphasized to high quality products (3.4 defects per million of products), so both concepts could complement each other and increasing company performance (Arnheiter and Maleyeff, 2005; Pepper and Spedding, 2009). Combination of Lean eliminate waste and Six Sigma eliminate product variant will deliver concept that improve mistakes on process (Poka Yoke) and become basic on business process improvement (Bendell, 2006). Lean is continues improvement tools to increase the speed of business by analyzing process flow and dismiss the parts that are not giving value added (Arnheiter and Maleyeff, 2005). Six Sigma is management tools to eliminate deffect and variant products using statistical data (George, 2003). Combination of both is Lean Six Sigma, or well known as Lean Management, to deliver efficiency process and good quality products.

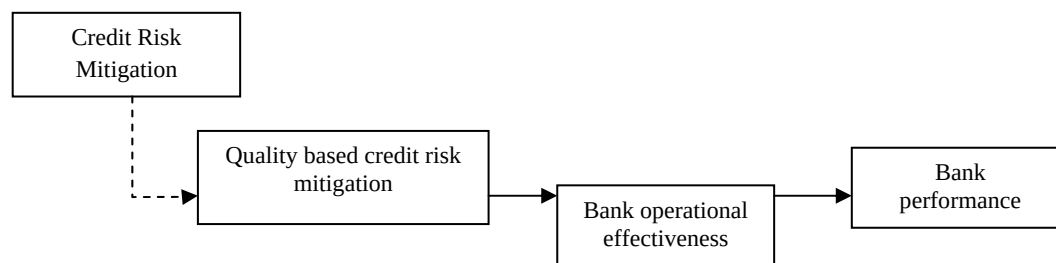
4. Lean Six Sigma at Banks

Lean Six Sigma's involment on corporate main strategy has higher impact to the company performance. Measurement of succesful OEE is high quality product and high efficiency of process with low cost (De Mast, 2006). Lean Six Sigma will support corporate's strategy to achieve OEE purpose by increasing product and process quality. By activities such as define main problem, quantity measure

of the problem, analyze it, and find the solution to improve it, and finally control the whole activities, as well as Lean Six Sigma will eliminate all part of the process that not giving value added to the organisation. Friday-Stroud (2007) said that Lean Six Sigma which integrate into corporate main strategy will make the purposes of performance enhancement will get more progress, in reason all resources including management, human resources and infrastructure will totally focus to application of this strategy into business units. Even Porter (1996) argues that Lean Six Sigma is not corporate strategy, in reason other competitor do the same thing. Goh (2002) and De Mast (2006) didn't agree with Porter's statement in case Lean Six Sigma will build corporate culture which not same among corporates. Lean Six Sigma will develop knowledge based environment by Green Belts and Black Belts programs that are giving knowledges to human resources, and grow to be resources based competency which it will be intangible assets for company. These will be a sustainable competitive advantage for each corporates.

Lean Six Sigma has applied at banks for many years, and it has proven to improve banking performance. De Koning et al. (2008) was doing research at services industries and said that Lean Six Sigma is practical solution and delivered significant result regarding cost reduction and operational improvement. Lean Six Sigma which was integrating with bank activities such as credit process could reduce the credit approval process time (Kumar, 2008), but didnt show any improvement on quality of loan. Heckl *et al.*(2010) was doing research at USA banks and found that Six Sigma has proven increase banking performance by reduce customers' complaint, credit card processing time, *front liners* services fault, and increasing customer for credit card approval. De Mast (2006), Friday-Stroud (2007) and Heckl (2010), Six Sigma will increasing company's performance if it integrated to the management strategy which will keep the application more intense and constant. All resources will focus to the succeed of this project and were not distract to the other things.

Based on theories and researches above, a new concept has developed to solve the research gap risk mitigation roles to company performance enhancement. The new concept is Quality Based Credit Risk Mitigation, or credit risk mitigation that using Lean Six Sigma as guidance to enhance company performance by increasing loan quality and minimize credit process time. The Grand Theoretical Model is shown below:

Figure 1. *The Grand Theoretical Model*

Source: Processing for this research.

Based on this Grand Theoretical model, hypotheses were built to answer the research gap of credit risk mitigation roles to enhance bank performance.

Hypotheses

Hypotheses was built based on the Grand Theoretical Model:

1. The relationship between Quality Based Credit Risk Mitigation with Credit Quality

Non Performing Loan (NPL) was coming up from uncommitted debtor to pay back credit facility to the bank. The reasons are both from internal and external debtor such as management conflict (Breuer, 2005), low management business competency and quality (Moro and Fink, 2010; Chen *et al.*, 2011), company size, age and capital (Bonfirm, 2009), and macroeconomic (Diaz, 2011). NPL should well managed in reason it can make inefficiency company (Berger and Young, 1997) and obligation to prepare capital reserved in case there are NPL phase out (Kopecky and Van Hoose, 2005). NPL anticipations for bank are debtor's fixed asset reserved (Chen, 2006), portfolios diversification (Acharya *et al.*, 2006), and assurance (Williams, 2012).

Risk analysis activities (Fight, 2004) will identify the purpose of credit and the usage, payment resources, cash flow projection and compare with other business condition, include risk. These activities in due to identify business risk of the debtors and could minimize it regarding to credit risk. Quality based Credit Risk Mitigation has steps to identify key risks of debtor business, analyze these factors, and avoid the credit risk. The steps are detail and compliance, but simple and faster to support efficiency. The steps consist of Define, Measure, Analyze, Improve, Control, and mapping the activities of credit process to identify non adding value activities and eliminate it.

Based on these arguments, therefore hypotheses:

H1: Quality Based Credit Risk Mitigation is increasing Credit Quality

2. The relationship between Quality Based Credit Risk Mitigation with Credit Process Efficiency

Efficiency is the way to achieve the mission of business company to get profit. Efficiency has related with factors e.g. ownership (Evans, Altunbas, and Molyneux, 2001), proficiency (Berger and Mester, 1997), company size (Berger and Humphrey, 1997), expansion (Hughes *et al.*, 1998), geographic scale (Bos and Kolari, 2005) and competition (Cetorelli, 2012). Bank as financial services company provide credit facility to the community, and more efficient the process more profit is expected. The higher amount of credit facility is provided by bank, the higher credit risk appear (Keeton, 1999), and the risk need to mitigate. Risk mitigation will increase company performance if it efficient and increasing profit or profit efficiency (Pastor, 1999; Fan, 2004; Fioderlisi, 2011).

Lean Six Sigma is the system to minimize waste, process and product standardization in due to minimize process time, reduce operational cost, and reduce delivery time, fewer infrastructures. Lean eliminates process steps that are not supporting the main purpose of the process (Arnheiter and Maleyeff, 2005, Byrne et al., 2007). Lean concept is powerful for time efficiency, especially applied to credit process approval (Duthoit et al, 2008), and reducing operational cost (De Koning et al., 2008) Lean Six Sigma system at credit risk mitigation will increase efficiency credit process

Based on these arguments, therefore hypotheses:

H2: Quality Based Credit Risk Mitigation is increasing Credit Process Efficiency

3. The relationship between Quality Based Credit Risk Mitigation with business unit performance

Business performance has measured by its profit. The market expansion, the growth of sales, the higher production and low cost of production are triggering profit. Bank is doing the same thing as profit company and deliver higher credit to gain high profit. The negative impact of the growth of credit portofolio is higher credit risk (Keeton, 1999). Some rules to minimize this credit risk should developed (De Lis, 2001). The credit risk is high exposed at highly competitive business environment nowadays and mostly banks just pay attention to how make a bigger credit portofolio. It is hard to pursue bank management to be prudent when it's involved target achievement. Crockett (1997) said that bank destruction will happened in high competition environment if future debtor was not carefully verified as it has high business risk. Credit risk mitigation is needed to minimize

the risk that grows as well as credit growth (Keeton, 1999). The mitigation should be effective, efficient, and delivers good quality credit. Lean Six Sigma which is applied at credit risk mitigation will provide good quality of credit and process efficiency. At the end the quality based credit risk mitigation will enhance the business unit performance.

Based on these arguments, therefore hypotheses:

H3: Quality Based Credit Risk Mitigation is increasing business unit performance

4. The relationship between Credit Process Efficiency with Credit Quality

Quality is an opposite side of efficiency. Mostly companies will do such as additional operational activities to guarantee that they are produce the best quality product or service. But then they realised that operational cost was increasing and cut the profit margin. Another effect is for customer that even satisfied with quality of product but they didn't like the longer time process. They prefer shorter time process with good quality product.

Hughes *et al.* (1998) stated a bank strategy to consolidate on purpose to growing bigger and efficiency is factor to support this. Efficiency influences the expansion of bank (Shaffer, 2001). Competition, ownership, and government regulation are factors which influence bank's performance (Koutsomanoli-Filippaki et al, 2009). Competition could be win if bank efficient (Cetorelli, 2012). Credit process efficiency is indicated by limited credit process time but deliver good quality of credit. The good quality of credit is indicated by low amount of Non Performing Loan. Eliminate some steps of process that is not giving value added for the purpose of process will make the process more simple, efficient, and focus on quality product which is credit.

Based on these arguments, therefore hypotheses:

H4: Credit Process Efficiency is increasing Credit Quality

5. The relationship between Credit Quality with business unit performance

The profit is indicator of companies' growth. More aggressive the company run after profit, the higher of business growth and the higher risk will expose (Foos, 2010). Quality of product mostly neglected to run after amount of orders. To stay at the competition is hard and maintaining the orders or even achieve higher target is the only way to stay at the competition.

The credit quality increase on uncompetitive environment (Zarutskie, 2004). It means that bank expansion always followed by bad credit quality. Fast credit expansion is the main reason of nonperforming loan (De Lis, 2001). Cetorelli (2012) has research on relationship between credit quality and quantity. Bank will

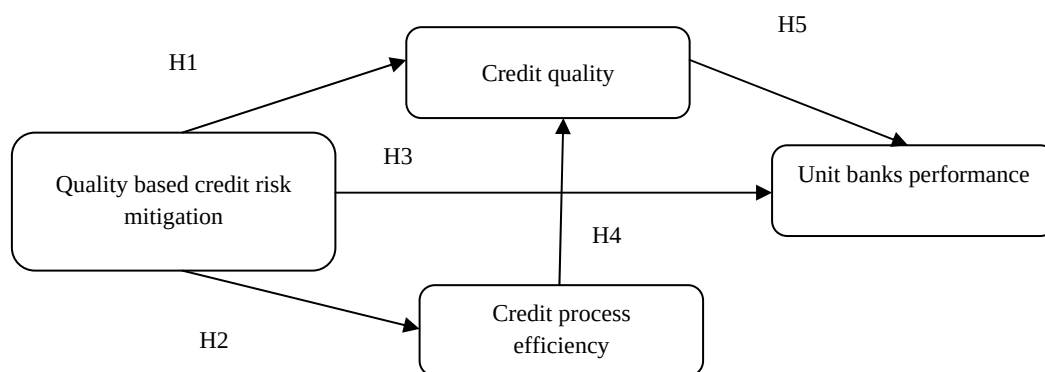
compete to get customer (quantity) but this will decrease if credit is not good quality. On the other side, the productive performance will decrease if there is non performing loan in reason bank should have capital reserved that will reduce fund for credit availability.

Based on these arguments, therefore hypotheses:

H5: Credit Quality is increasing Business Unit Performance

The research model based on hypotheses is shown below:

Figure 2. *Research Model*



Research Method

This research was conducted on respondents who worked as credit analyst at risk taking units at an Indonesian Bank. The Indonesian Bank is state ownership bank which deliver productive and consumer loan to local community. The Indonesian Bank was selected to be research object based on its experience to run Lean Six Sigma at credit process application since year 2006. Selection of the banking industry as the research object is based on the assumption that bank industry was exposed by high risk consequences in due to the main activity of money lending. The population is 224 credit analysts at 112 risk taking units at Indonesian bank. Each of risk taking units has taken two credit analysts, but only one was selected as sample. The risk taking unit is business unit at Indonesian Bank that proceeds the application of credit, which consists of business banking units, risk units, credit remedial and recovery units.

The method of sampling is a purposive sampling, which the sample is conforms to certain criteria. The criteria of respondents were personnel at risk taking units that worked as credit analyst. For information, the personnel who has been marketing the loan at risk taking units is categorized as relationship manager; and credit analyst is processing loan application. Credit risk analyst criteria were picked with

purpose to determine the application of Lean Six Sigma at credit risk mitigation in loan processing. This research was using sample of 112 credit analysts at risk taking units Indonesian Bank which the questionnaire has distributed. The questionnaire is about Lean Six Sigma application at credit process. Other parts of questions were asking about the application of early warning system (EWS) and the compliance of standard operating procedure (SOP). The credit analysts were responding to the questioners.

The scale of questionnaire in 1 to 4 scales and the questionnaires were inserted by open questions as information assistance. Analysis factor was used to test the validity test. Structural Equation Model (SEM) was used to test the hypothesis in reason SEM is model that proper to test simultaneously relation latent variable represented by indicators. It is chosen because SEM is a proper model to test the relation simultaneously for latent variable represented by their indicators. WarpPLS 3.0 was used to perform SEM test.

The variables have operated like shown below:

1. The Quality Based Credit Risk Mitigation (MRKKBK - Mitigasi Risiko Kredit Berbasis Kualitas) is the credit risk mitigation that using Lean Six Sigma steps in due to enhance company performance by increasing credit quality and credit process efficiency. The indicators are steps of risk identification (DEF), risk measurement (MES), risk analyze (ANY), risk improvement (IMV), risk control (CONT). These steps has include credit process mapping to determine which parts of the process that are not value adding and should be removed for efficiency purpose.
2. Credit quality (KK - Kualitas Kredit) is quality productive and consumptive loan at Indonesian Bank. The indicators are degree of personnel credit risk taking units to obey the standard operating procedures (SOP), the sensitivity of personnel credit risk taking units to find out the early warning indicator of nonperforming loan (EWS), and nonperforming loan itself (NPL).
3. Credit process efficiency (EPK - Efisiensi Proses Kredit) is the credit process time efficiency at Indonesian Bank. The indicators are operational cost (BOPO) and credit process time (POK).
4. Unit bank performance (KP - Kinerja Perusahaan) is performance of each risk taking units at Indonesian Bank. The indicators are earning before interest tax and depreciation (EBITDA), fee based income (FBI) and return on asset (ROA).

Several softwares were used on this research such as WarpPLS ver.3.0, IBM SPSS Statistic 21, and Microsoft Excel 2010. The statistic calculation system is using Structural Equation Model (SEM) and using WarpPLS ver.3.0 to test the system. The ordinal data from questioners result was converting into internal data

using scale using Method Successive Interval –MSI (Hays, W.L., 1967). All interval data from indicators of each latent variable has united into single indicator for each latent variable by using composite index. The formula is :

Composite Index = (Factor Weight 1 x Factor Loading1) + (Factor Weight 2 x Factor Loading 2) +... + (Factor weight n x Factor Loading n)

For example, indicators of latent variable MRKBK are DEF, MES, ANY, IMV, and CONT which united into single indicator named MCN. All latent variables have single indicator. Latent variable KK has single variable KCN, latent variable EPK has single variable ECPB, and latent variable KP has single variable KUC. The purpose of single indicators was to take the data distraction away and keep the data normal.

Research Findings

Data characteristic of the respondents was shown as follows. First, 55% of respondents are between age of 20 to 30 years old. Second, man and woman are almost equal on amount with man 54% of respondents. Third, high education of respondents with 81% has graduate degree, and the rest is master degree of university. Fourth, the credit experience of respondent is equal between less than 5 years and more than 5 years with comparison 57%:55%.

Based on response questionnaire, below the index steps of Quality Based Credit Risk Mitigation that was applied on average intensity which the scale below 3 on average:

Table 1. *Index Quality Based Credit Risk Mitigation*

Indicators	Response frequency				Indeks
	1	2	3	4	
Define (DEF)	0,00	0,25	2,25	0,49	3,00
Measure (MES)	0,01	0,36	2,22	0,29	2,88
Analyze (ANY)	0,00	0,30	2,36	0,24	2,90
Improve (IMV)	0,00	0,34	2,37	0,13	2,85
Control (CONT)	0,00	0,51	2,14	0,11	2,76
Average					2,88

Other response was represented Credit Quality Index, as shown at table below:

Table 2. *Index Credit Quality*

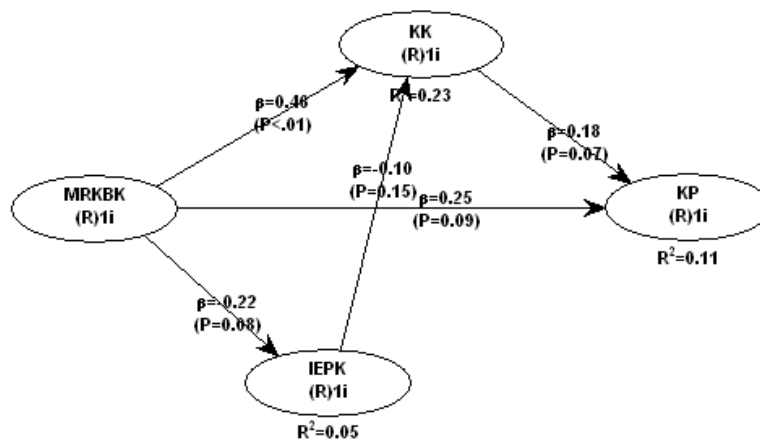
Indicators	Response Frequency				Indeks
	1	2	3	4	
Degree of SOP compliance (SOP)	0,02	0,45	2,08	0,25	2,80
Sensitivity of Early Warning System (EWS)	0,02	0,64	1,84	0,20	2,70
Average					2,75

The proposition Quality Based Credit Risk Mitigation has developed five hypotheses, named Quality Based Credit Risk Mitigation has positive impact to credit quality, Quality Based Credit Risk Mitigation has positive impact to credit process efficiency, Quality Based Credit Risk Mitigation has positive impact to business unit company performance, credit process efficiency has positive impact to credit quality, and credit quality has positive impact to business unit company performance.

Table 3. Hypotheses Testing Result

HYPOTHESES	PATH COEFFICIENTS (β)	STANDARD ERROR (SE)	T STATISTIC (β/SE)	T COUNT (P 0,1; 1-TAILED)	P (P<0,1)	CONCLUSION (TSTAT>TCOUNT; P<0,1)
MRKBK <-- KK	0.458	0.066	6.94	1,29	<0,001	ACCEPTED
MRKBK <-- EPK	-0.215	0.154	(1.40)	1,29	0,082	ACCEPTED
MRKBK <-- KP	0.249	0.185	1.35	1,29	0,09	ACCEPTED
EPK <-- KK	-0.096	0.091	(1.05)	1,29	0,147	REJECTED
KK <-- KP	0.179	0.122	1.47	1,29	0,073	ACCEPTED

Figure 3. Structural Equation Model Full Model



1. H1: Quality Based Credit Risk Mitigation is increasing Credit Quality

Credit Quality which has described by risk taking unit personnel's degree of standard operating procedure compliance, risk taking unit personnel's sensitivity of credit quality's early warning system, and ratio of Non Performing Loan, has influenced by Quality Based Credit Risk Mitigation with coefficient path 0.458, probability less than 0.01 and T statistic 6.94. Quality Based Credit Risk Mitigation is risk mitigation that using Lean Six Sigma as part of the strategy to increase bank performance by increase credit quality and credit process efficiency. It is very clear that this research show proof of the Quality Based

Credit Risk Mitigation definition emphasize on credit quality. Each steps of it consist of risk definition, risk measurement, risk analyze, risk improvement, and risk control will improve and enhance credit quality or trying to reduce the possibilities of the debtor can't fulfill his obligation to bank. This finding is relevant with Arnheiter and Maleyeff (2005) who stated that Lean Six Sigma will improve product quality to improve services quality and finally satisfy the user and customer (Heckl et al., 2007, Parast, 2010).

2. H2: Quality Based Credit Risk Mitigation is increasing Credit Process Efficiency

Credit process efficiency which has described by amount of credit process day and operational cost has influenced by Quality Based Credit Risk Mitigation with coefficient path -0.258, probability less than 0.082 and T statistic -1.40. Minus sign at coefficient path means of reverse course relation among indicators operational cost and credit process day with latent variable Credit Process Efficiency (reversed indicator variable). It can explain that the higher operational cost, the lower credit process efficiency. To adapt with this condition the variable latent of Credit Process Efficiency become Credit Process Inefficiency.

Quality Based Credit Risk Mitigation has steps that mapping the whole credit process and the whole debtor's system process. The purpose of credit mapping process is to identify which part of that don't give value added for the process, and eliminate it so the process time will reducing. The purpose of debtor's system mapping is to quick identify risk at the process and mitigate it soon. These mapping activities can reduce credit process time and operational cost. This finding is relevant with former research Duthoit et al. (2008) about Lean Six Sigma contribution for increasing credit process approval and De Koning et al. (2008) that Lean Six Sigma is reducing operational cost and provide operational process improvement.

3. H3: Quality Based Credit Risk Mitigation is increasing Business Unit Performance

Business Unit Performance which has described by EBITDA, ROA and FBI, has influenced by Quality Based Credit Risk Mitigation with coefficient path 0.249, probability less than 0.09 and T statistic 1.35. Quality Based Credit Risk Mitigation is risk mitigation that using Lean Six Sigma as part of the strategy to increase bank performance. This research showed that business unit performance was increasing after applying Quality Based Credit Risk Mitigation. It is relevant with former research that credit risk mitigation is needed to minimize the risk that grow as well as credit growth (Keeton, 1999) and some rules to minimize credit risk should developed (De List, 2001)

Result of T-Test business unit performance after applying Quality Based Credit Risk Mitigation is better with P less than 0.1. Below table has shown the result:

Table 4. T-Test

		Paired Differences					t	Df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	TP1 - TP2	-.0926	.0928	.0088	-.1100	-.0752	-10.559	111	.000
Pair 2	SMR1 - SMR2	-.2012	.1136	.0107	-.2224	-.1799	-18.734	111	.000
Pair 3	PK1 - PK2	-.1523	.0697	.0066	-.1653	-.1392	-23.134	111	.000
Pair 4	TA1 - TA2	.0781	.1395	.0132	.0520	.1042	5.922	111	.000
Pair 5	TONE1 - TONE2	.0322	.1830	.0173	-.0021	.0664	1.860	111	.066
Pair 6	NPL1 - NPL2	-.0252	.0333	.0031	-.0314	-.0189	-8.005	111	.000
Pair 7	RECOV1 - RECOV2	-.1155	.1600	.0151	-.1455	-.0856	-7.641	111	.000
Pair 8	OS1 - OS2	-.5954	.4530	.0428	-.6802	-.5106	-13.909	111	.000
Pair 9	YIELD1 - YIELD2	-.2748	.2601	.0246	-.3235	-.2261	-11.180	111	.000
Pair 10	POK1 - POK2	.0986	.0818	.0077	.0833	.1139	12.762	111	.000
Pair 11	BOPO1 - BOPO2	.2057	.1532	.0145	.1771	.2344	14.212	111	.000
Pair 12	EBITDA1 - EBITDA2	-.4961	.3959	.0374	-.5702	-.4220	-13.262	111	.000
Pair 13	FBI1 - FBI2	-.1695	.1648	.0156	-.2004	-.1386	-10.883	111	.000
Pair 14	ROA1 - ROA2	-.1856	.1730	.0163	-.2180	-.1532	-11.356	111	.000

Source: Processing for this research

Mediation test (Baron and Kenny, 1986) has shown that Quality Based Credit Risk Mitigation is increasing business unit performance directly as well as indirectly. Indirectly relation should pass through credit quality (indirect effects paths of two segments) and credit process efficiency (Indirect effects paths of three segments). Coefficient path total effect is 0.29 with probability 0.03, and it reduce to direct effects coefficient path 0.25 with probability 0.09. It means credit quality and credit process efficiency partial mediation variable of relationship between Quality Based Credit Risk Mitigation and business unit performance.

Figure 4. Direct Effects Quality Based Credit Risk Mitigation (MRKBK) to Business Unit Performance (KP)

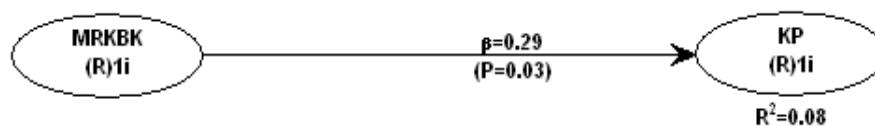


Figure 5. Indirect Effects paths of two segments Quality Based Credit Risk Mitigation (MRKBK) to Business Unit Performance (KP) with Variable Mediation Credit Quality (KK)

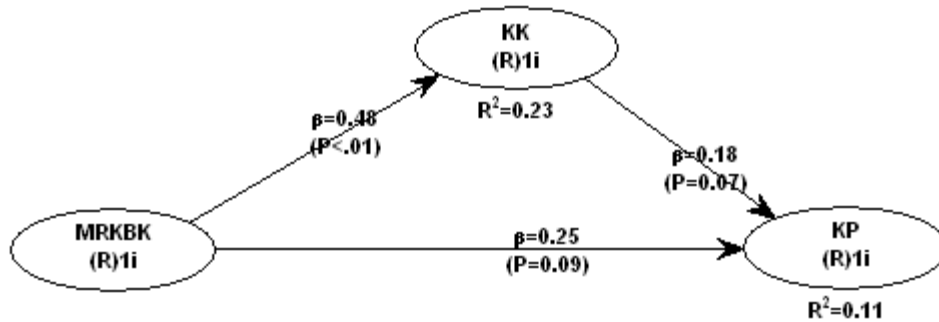
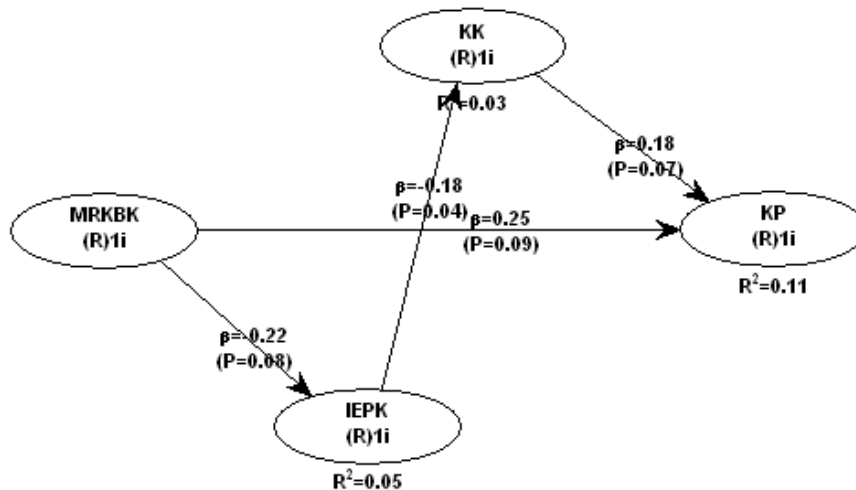


Figure 6. Indirect Effects paths of three segments Quality Based Credit Risk Mitigation (MRKBK) to Business Unit Performance (KP) with Variable Mediation Credit Quality (KK) and Credit Process Efficiency (EPK)



4. H4: Credit Process Efficiency is increasing Credit Quality

This research could not prove the significance relation between credit process efficiency and credit quality, with coefficient path 0.096, probability 0.147 (higher than cut off value $P < 0.1$, one tailed), and T statistic 1.05. It can explain by the fact that reducing credit process time has nothing to do with the credit quality. Or, reducing operational cost will not decrease credit quality. It will convince credit analyst to do the credit process as quick as possible but still comply with SOP without worrying quality of credit will decreasing.

5. H5: Credit Process Quality is increasing business unit performance

Credit Process Quality has proven to influence business unit performance with coefficient path 0.179, probability 0.073, and T statistic 1.47. It can explained that the compliance of credit analyst to SOP and high awareness to early warning system will improve performance of business unit performance that is indicated by EBITDA, FBI and ROA. It is relevant with former research Cetorelli (2012) that bank will compete to get customer (quantity) but this will decrease if credit is not good quality

Discussion

Literature study has conduct to answer the research problem and provide one proposition and five hypotheses. The proposition was Quality Based Credit Risk Mitigation, means risk mitigation using steps on Lean Six Sigma to enhance company performance by develop good quality products and process, and minimize the length of credit process. Four hypotheses has proved to solve the research problem (with one hypotheses is rejected) as below explanation:

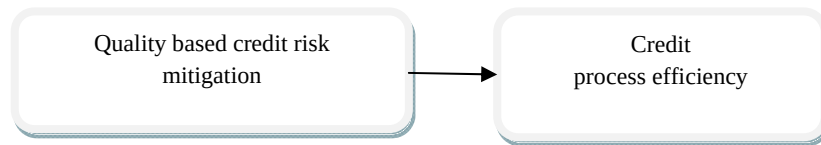
First, Quality Based Credit Risk Mitigation will enhance company performance by increase loan quality. Hypotheses which provide these are Hypotheses 1 therefore Quality Based Credit Risk Mitigation is increasing the credit quality, and hypotheses 5 therefore credit quality is increasing business unit company performance. The business units are represented company performance. The explanation is that the steps DMAIC on persistence is the key to manage non performing loan and increasing loan quality. Quality Based Credit Risk Mitigation will support the expansion of business in reason it is using very simple steps as *Lean Six Sigma* do.

Figure 7. *Quality Based Credit Risk Mitigation is increasing Company Performance by increasing Credit Quality*



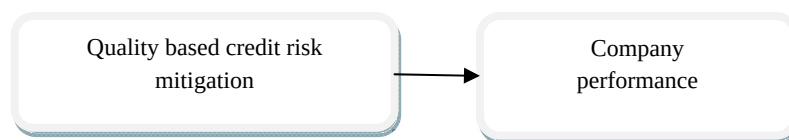
Secondly, Quality Based Credit Risk Mitigation is increasing credit process efficiency. Hypotheses 2 was accepted. By using simple steps of DMAIC, the efficiency of process will achieved. The process will not consuming time and reducing operational cost of loan human resources, including electrical electricity, phone, and infrastructure cost. This efficiency will increasing performance company in reason loan will delivered to society in limited time and reducing bank's cost of good sale.

Figure 8. *Quality Based Credit Risk Mitigation is increasing Credit Process Efficiency*



Third, Quality Based Credit Risk Mitigation is increasing company performance directly. Means the impact of this factor wider on other area instead of loan quality and loan efficiency to increasing company performance. Other area such as human resources and the quality of corporate governance will increasing the performance too. The indicator test using both area was showing that there are better performance after the application.

Figure 9. *Quality Based Credit Risk Mitigation will increasing Company Performance*



Conclusions

Quality Based Credit Risk Mitigation is a new factor that developed from credit risk mitigation which is using Lean Six Sigma to enhance company performance by increasing the quality of credit and maximize the efficiency of credit process. This new concept has theoretical implication to resolved research gap between credit risk mitigation and company performance, beside literature quality and risk management enrichment. The managerial implication is that Quality Based Credit Risk Mitigation will improve quality of credit and efficiency of credit process. Banks with ambitious target to be expansive but wish to risk prudent should use this concept to mitigate credit risk.

There are some left issues to be topic on future research. First, the research should be done at different industries with different policies. Second, factors instead of credit quality and credit process efficiency as variable mediation between quality based credit risk mitigation and company performance should be explored further.

References

- Acharya, V., Hasan, I. Saunders, A. (2006). "Should banks be diversified? Evidence from individual bank loan portfolios, *Journal of Business* 32, pp. 1355-1412
- Alexander, C. (2005). "The present and future of financial risk management, *Journal of Financial Econometrics*, Vol. 3, No. 1, pp. 3-25
- Allayannis, G., Watson, J. (2001). "The Use of Foreign Currency Derivatives and Firm market Value, review of *Financial Studies*, Vol.14, No. 1 (Spring 2001) pp. 243-276
- Antony, J. (2004). "Some pros and cons of Six Sigma: an academic perspective, *The TQM Magazine*, Vol. 16 No. 4, pp. 303-6
- Arnheiter, E.D., Maleyeff, J. (2005). "The Integration of Lean Management and Six Sigma, *The TQM Magazine*, Vol. 117, No. 1, pp.5-18, Emerald Group Publishing Limited
- Ballou, B., Knechel, W.R. (2002). Ceskoslovenská Obchodní Banka, as: applying business risk audit techniques in an emerging market economy. *Issues in Accounting Education*, 17(3), pp. 289-313
- Bank Indonesia (2012). *Perbankan RI Kalah di ASEAN Bank-bank Nasional Harus Lebih Tingkatkan Efisiensi*, Kompas, Selasa 26 Juni 2012
- Barnard, C. (1938). *Functions of Executive*, Copy Right on 1938, By President and Coleagues from Harvard, US
- Baron, R.M., dan Kenny, D.A. (1986). "The moderator–mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations, *Journal of Personality & Social Psychology*, 51(6), pp. 1173-1182
- Basel Committee on Banking Supervision (2000). *The standardized approach to credit risk*, Bank for International Settlements
- Basel Committee on Banking Supervision (2004). June, Basel II: International convergence of capital measurements and capital standards: A revised framework. Bank for International Settlements, p. 239
- Bendell, T. (2006). "A review and comparison of Six Sigma and the Lean Organization, *The TQM Magazine*, Vol. 18, No. 3
- Berger, A.N., Humphrey, D.B. (1997). "Efficiency of Financial Institutions: International Survey and Directions for Future Research", *European Journal of Operational Research*, 98, pp. 175-212.
- Berger, A.N., Udell, G.F. (1995). Relationship Lending and Lines of Credit in Small Firm Finance", *Journal of Business*, 68(3), pp. 351-381
- Berger, A.N., Mester, L.J. (1997). Inside the Black Box: What Explains Differences in the Efficiencies of Financial Institutions?", *Journal of Banking and Finance*, 21, pp. 895-947
- Berger, A.N., DeYoung, R. (1997). "Problem Loans and Cost Efficiency in Commercial Banks, *Journal of Banking and Finance*, 21, pp. 849-870
- Berger, A.N., Humphrey, D.B. (1991). "The Dominance of Inefficiencies over Scale and Product Mix Economies in Banking, *Journal of Monetary Economics*, 28, pp. 117-148
- Bonfirm, D. (2009). "Credit risk drivers: Evaluating the contribution of firm level information and of macroeconomic dynamics, *Journal of Banking & Finance*, 33, pp. 281-299
- Bos., J.W.B., James W. Kolari (2005). "Large Bank Efficiency in Europe and the United States: Are There Economic Motivations for Geographic Expansion in Financial Services?, *The Journal of Business*, Vol. 78, No. 4 (Juli, 2005), pp.1555-1592
- Breuer, J.B. (2005). "Problem bank loans, conflicts of interest, and institutions, *Journal of Financial Stability*, 2, pp. 266-285

- Byrne, G., Lubowe, D. Blitz, A. (2007). *Using a Lean Six Sigma approach to drive innovation, Strategy & Leadership*, Vol. 35, No. 2
- Cetorelli, N., Peretto, P.F. (2012). "Credit quantity and credit quality: Bank competition and capital accumulation, *Journal of Economic Theory*, 147 pp. 967–998
- Charette, R.N. (1990). *Applications Strategies for Risk Analysis*, McGraw-Hill, Inc. New York, NY, USA, ©1990 ISBN:0070109125
- Chen, Y. (2006). "Collateral, loan guarantees, and the lenders' incentives to resolve financial distress, *The Quarterly Review of Economics and Finance*, 46, pp. 1-15
- Chen, Y., Zhu, S., Wang, Y. (2011). "Corporate fraud and bank loans: Evidence from China", *China Journal of Accounting Research*, 4, pp. 155–165
- Clough, R.H. Sears, G.A. (1994). *Construction Contracting*. (6th edition), John Wiley & Sons Inc., New York
- Crockett, A. (1997). *The Theory and Practice of Financial Stability*, Essays in International Finance, No. 203, Princeton: International Finance Section, Princeton University
- Darmawi, H. (2005). *Manajemen Risiko (cet.9)*, Bumi Aksara, Jakarta
- De Koning, H., Does, R., Bisgaard, S. (2008). "Lean Six Sigma in financial services, *International Journal of Six Sigma and Competitive Advantage*, Vol. 4, No. 1, pp 1-17
- De Lis, S.F., Pagés, J.M., Saurina, J. (2001). "Credit growth, problem loans and credit risk provisioning in Spain, *BIS Papers*", No. 1, Marrying the macro and Microprudential, dimensions of financial stability, Monetary and Economic Department March
- De Mast, J. (2006), *Six Sigma and Competitive Advantage*, Institute for Business and Industrial Statistic of the University of Amsterdam, Amsterdam, The Netherlands, Total Quality Management, Vol. 17, No. 4, pp. 455-464, May
- Demidenko, E., McNutt, P. (2010). The ethics of enterprise risk management as a key component of corporate governance", *International Journal of Social Economics*, Vol. 37, No. 10, pp. 802-815, Emerald Group Publishing Limited 0306-8293 DOI 10.1108/03068291011070462
- Díaz, A., Perera-Tallo, F. (2011). Credit and inflation under borrower's lack of commitment", *Journal of Economic Theory*, 146, pp. 1888-1914
- Duthoit, C., Goyal, D. Ketterer, H. Reichert, Ramachandran, T.S. Rehberg, B. (2008). *Banking on Lean Advantage*, Boston Consulting Group, New York
- Engineering, City Polytechnic of Hong Kong, Kowloon, Hong Kong
- Etzioni, E. (2007). *Modern Organization*, Phi Learning, ISBN: 8120301935
- Evans, L., Altunbas, Y. Molyneux, P. (2001). "Bank Ownership and Efficiency", *Journal of Money, Credit and Banking*, 33, pp. 926-954
- Fairchild, R. (2002). *Financial risk management: is it a value-adding activity?*, Balance Sheet 10.4.2002, pp. 22-25 @ MCB UP Limited 0965-7967, DOI 10.1108/09657960210450754
- Fan, L., Shaffer, S. (2004). "Efficiency Versus Risk in Large Domestic US Banks", *Managerial Finance*, Vol. 30, No. 9
- Ficht, A. (2004). *Credit Risk Management*, Butterworth-Heinemann, 22 Nov
- Fioderlisi, F., Marquay-Ibanez, D., Molyneux, P. (2010). "Efficiency and risk in European banking", *Working Paper Series*, No. 1211, European Central Bank
- Foos, D., Norden, L., Weber, M. (2010). "Loan growth and riskiness of banks", *Journal of Banking & Finance*, 34, pp. 2929-2940
- Friday-Stroud, S.S., Sutterfield, J.S. (2007). "A Conceptual framework for integrating six-sigma and strategic management methodologies to quantify decision making", *The TQM Magazine*, Vol 19, No. 6, pp. 561-571, @ Emerald Group Publishing Limited, 0954-478X, DOI. 10.1108/09544710828412
- George, M.L. (2003). *Lean Six Sigma for Service*, McGraw-Hill, New York, NY

- Goh, T.N. (2002). "A strategic assessment of six sigma", *Quality Reliability Engineering International*, Vol. 18', No. 5, pp. 403-10
- Grant, R.M. (1991), "The Resources-based Theory of Competitive Advantage: Implications for Strategy Formulation", *California Management Review*, Vol. 33 (3), p. 114
- Hadad, M.D., Santoso, W. Besar, S.D. (2003). *Studi Biaya Intermediasi Beberapa Bank Besar di Indonesia: Apakah Bunga Kredit Bank Umum Overpriced?*, Kertas kerja Bank Indonesia, Oktober
- Hays, W.L., dan Hays, W.L. (1967). *Quantification in psychology*, Brooks/Cole Publishing Company
- Heckl, D., Moormann, J., Rosemann, M. (2010). "Uptake and success factors of Six Sigma in the financial services industry", *Business Process Management Journal*, Vol. 16, No. 3, pp. 436-472, Emerald Group Publishing Limited 1463-7154, DOI 10.1108/14637151011049449
- Hollman, Kenneth W., Forrest, Jack E. (1991). "Risk Management in a Service Business", *International Journal of Service Industry Management*, Vol. 2, No. 2, MCB University Press
- Hughes, J.P., Lang, W., Mester, L.J., Choon-Geol Moon (1998). *The Dollars and Sense of Bank Consolidation*, Financial Institute Centre, The Wharton School, University of Pennsylvania, PA.
- Kaplan, S., Garrick, B.J. (1981). *On The Quantitative Definition of Risk, Risk Analysis*, Vol. I, No. I
- Keeton, W.R. (1999). "Does Faster Loan Growth Higher Loan Losses?", Federal Reserve Bank of Kansas City, *Economic review*, Second quarter
- Kopecky, J.K., Van Hoose, D. (2005). "Capital regulation, heterogeneous monitoring costs, and aggregate loan quality", *Journal of Banking & Finance*, 30, pp. 2235-2255
- Koutsomanoli-Filippaki, A., Margaritis, D., Staikouras, C. (2009). "Efficiency and productivity growth in the banking industry of Central and Eastern Europe", *Journal of Banking and Finance*, 33, pp. 557-567
- Kumar, S., Wolfe, Anthony D., Wolfe, Katherine A. (2008). "Using Six Sigma DMAIC to improve credit initiation process in a financial services operation", *International Journal of Productivity and Performance Management*, Vol. 57, No. 8, 2008 pp. 659-676, Emerald Group Publishing Limited, 1741-0401, DOI 10.1108/17410400810916071
- Kuritzkes, A., Schuermann, T. (2006). *What we know, don't know and can't know about bank risk: a view from the trenches*, in Diebold, F.X., Herring, R.J. (Eds), *The Known, the Unknown and the Unknowable in Financial Risk Management*, Princeton University Press, Princeton, NJ
- Levy, H., Sarnat, M. (1988). *Principles of Financial Management*, Prentice-Hall
- Liker, J.K. (2004). *The Toyota Way*, Mc.Graw Hill-USA, Penerbit Erlangga, Jakarta
- Marshall, C. (2001). *Measuring and Managing Operational Risk in Financial Institutions*, Wiley, New York
- McCuaig, B. (2010). "Making Risk Management Stick", *Risk Management*, Vol. 8, No. 5, Balance Sheet
- Mok, C.K. (1994). *The application of risk management process in building services cost estimation*, MSc Engineering Management Dissertation, Department of Manufacturing
- Moro, A., Fink, M. (2010). *Perceived competence and credit access of SMEs: can trust change the rules of the game? Small Business, Entrepreneurship and Economic Recovery: A Focus on Job Creation and Economic Stabilization*, 26-27 Oct, Atlanta
- Nocco, B.W., Stulz, R.M. (2006). *Enterprise Risk Management : Theory and Practice*, Chief Risk Officer, Nationwide Insurance, and Reese Chair in Banking and Monetary Economics, OhioState University, NBER and ECGI
- Otoritas Jasa Keuangan (2013). *Statistik Perbankan Indonesia*, Vol.11 (2), November

- Pagach, D., Warr, R. (2010). *The Effects of Enterprise Risk Management on Firm Performance*, Jenkins Graduate School of Management, North Carolina State University, Raleigh
- Parast, M.M. (2010). *The effect of Six Sigma projects on innovation and firm performance*, Int. J. Project Manag, DOI:10.1016/j.ijproman.2010.01.006
- Pastor, J.M. (1999). "Efficiency and risk management in Spanish banking: a method to decompose risk", *Applied Financial Economics*, 9, pp. 371-384
- Pepper, M.P.J., Spedding, T.A. (2009). "The Evolution of Lean Six Sigma", *International Journal of Quality & Reliability Management*, Vol. 27, No. 2, pp. 138-155, © Emerald Group Publishing Limited 0265-671X DOI 10.1108 / 02656711011014276
- Porter, M. (1996). *What is Strategy?*, Harvard Business Review
- Porter, M.E. (1980). *Corporate Strategy*, New York, Free Press
- Retnawati, A. (2010). *Persaingan Pasar, Margin Bunga and Stabilitas Sistem Keuangan di Indonesia*, Departemen Akuntansi Fakultas Ekonomi Universitas Airlangga Surabaya
- Shaffer, S. (2001). "Banking conduct before the European single banking license: A cross-country comparison", *The North American Journal of Economics and Finance*, 12(1), pp. 79-104
- Shapiro, A., Titman, S. (1998). *An Integrated Approach to corporate risk management*, in Stern, J. Chew, D.H. (Eds), *The Revolution in Corporate Finance*, 3rd., Blackwell Oxford
- Shimko, D. (2001). *NPV No More: RPV for Risk-based Valuation*, Mimeo, Risk Management Partners, New York, NY
- Siahaan, Hinsa (2007). *Manajemen Risiko Konsep Kasus Implemen*, Elex Media, ISBN 9789792717099 / 9789792717099
- Stulz, R.M. (2003). *Risk management & derivatives*. South-Western Pub
- Stulz, R.M. (1996). *Rethinking Risk Management*, Bower Fellow, Harvard Business School; Reese Chair in Banking and Monetary Economics, The Ohio State University; Research Associate, National Bureau of Economic Research
- Tchankova, L. (2002). "Risk identification - basic stage in risk management", *Environmental Management and Health*, Vol. 13, Iss: 3, pp. 290-297 <http://dx.doi.org/10.1108/>
- Utter, J.S. (2006). *Enterprise Risk Management in 2005 – Moving Beyond Market and Credit Risk*, Chapter 7, Enterprise Risk Manager, Great Plains Energy Inc. Kansas City, MO, USA
- Williams, C.A., Heins, R.M. (1985). *Risk management and insurance*, New York: McGraw-Hill
- Williams, R.T. (2012). *An Introduction to Trading in the Financial Markets: Global Markets, Risk, Compliance, and Regulation*, Chapter 4, Risk Mitigation, Academic Press, 1 Apr
- Zarutskie, R. (2004). "Evidence on The Effects of Bank Competition on Firm Borrowing and Investmens", *Journal of Financial Economics*, 81, pp. 503-537

Natural capital in the global crisis context

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Abstract. *The global economic crisis has created conditions for the emergence of new perspectives on economic growth in the context of sustainable development. Theoretical and practical confrontation between economic growth theory and the theory of conservation of the natural environment revealed some unknown, uncertainties and interpretation errors. Although it is often used by economists, the term “natural capital” interpreted differently by users and therefore the approaches about its efficient use are different, ranging from proposals to limit growth in the purpose of the conservation of natural capital to liberal attitudes based on the principle of neoclassical theory letting prices to establish economic and social importance of the environment. The global crisis has demonstrated that equilibrium between economic growth and reducing environmental impact is difficult in conditions of instability. Consequently, the problem of finding the optimal level of balance between social benefits of development and costs of environmental protection is intractable when the economic variables know a high volatility and political decision must take into account more the social factor. Global economy during the crisis has shown that the solution represented by measures to reduce the rate of deterioration of ecosystems is consistent only under conditions in which is accompanied by investment in recovery of natural capital and the environment is integrated by this way in the whole economic and social process. It outlines a new model of development in which politico-economic-financial system can positively influence natural capital stocks by increasing the quality of policy makers and investment in knowledge capital.*

Keywords: natural capital, economic growth theory, economic crisis.

JEL Classification: Q56, O12, E60.

REL Classification: 15C, 8E.

1. Introduction

The economic theory has given a special attention to the natural capital only recently, although one of the first forms of capital used was natural capital, with respect to the land. The nature of public goods assigned to some elements of natural capital has created difficulties in assessing the value of natural capital, of the non-tradable goods and services provided by nature (Blaug, 1992: pp. 630-644). Most often were counted the destructions of natural capital caused by environmental externalities generated by the industry. Therefore the economic policies that took into consideration the environment focused on the internalization of these externalities, taking into consideration for this purpose, incentives as well as punitive financial instruments. Also, in our opinion the view according to which as the resources will be used they will also have a gradual substitution, as a result of technological progress and have a continuous increase in the efficiency of their usage along with the economic growth process, it is optimistic to an extent which is not justified (Constantinescu, 1976, pp. 48-62).

2. Natural capital – an invaluable wealth

In the actual understanding of natural capital it represents the extension of the economic concept of capital for the goods and services provided by nature. It is generally regarded as an indispensable stock of resources and benefits provided by ecosystems, which produces a flow of environmental useful goods and services. Among the services provided by the natural capital one can count waste recycling, soil erosion control, water retention and creating hydrological reserve holdings. Currently, there are two errors which occur with regards to the value of natural capital. One of them is trying to express the value of natural capital only in monetary terms. This results some times in ignoring the value of the natural capital for making things simpler and due to the lack of accurate assessment tools, and other times the value of natural capital is assessed only by looking at a part of it. The other error establishing the value of the natural capital is the exclusive assessment of some goods or services provided by nature, whose market value can be determined easily. We shouldn't leave aside, however, the fact that the structure and diversity of ecosystems represent components of the natural capital, so that providing a flow of services by nature requires an overview of how ecosystems work as a whole.

The ecosystems stock and flow of goods and services provided by ecosystems which represent the natural capital is the foundation without which the global wealth creation would not be possible. The exploitation of natural capital produce effects which cannot be found in the balance sheets of businesses. However, the environmental impact can affect climate, security of elementary resources for survival of the population, food resources, water and energy resources. On the

other hand, the consequences of irrational exploitation of the natural resources affect ecosystems' resources at a global level. Rational exploitation of land and forests leads to water shortages for hydroelectric power station and agriculture, to a decrease in the storage capacity of CO₂ and to an increase in emissions of greenhouse gases (Ciobotariu and Socolescu, 2008: pp. 127-144).

In times of economic crisis and in the context of globalization more and more diverse and serious consequences of increasingly irrational use of natural capital have emerged. The consumption of oil palm fruit increased 8 times in the last 30 years, being the most frequent oil produced in the world, surpassing the production of soybean and rapeseed oil. The deforestation in Malaysia and Indonesia with the purpose of obtaining palm oil to have negative consequences on ecosystems, endangering orangutans habitats⁽¹⁾. The impact of the activity of oil producing companies on biodiversity has created reactions which have damaged the image and caused losses for those respective companies. Reputational risk can cause adverse effects in financial terms, leading to a decrease in share price of a company, a lower rating on the stock market or higher interest rates for loans. This is how the companies that have achieved certificates for products made through sustainable industrial processes have gained an advantage, as examples one can count the exploitation of rubber trees, or caviar exploitation.

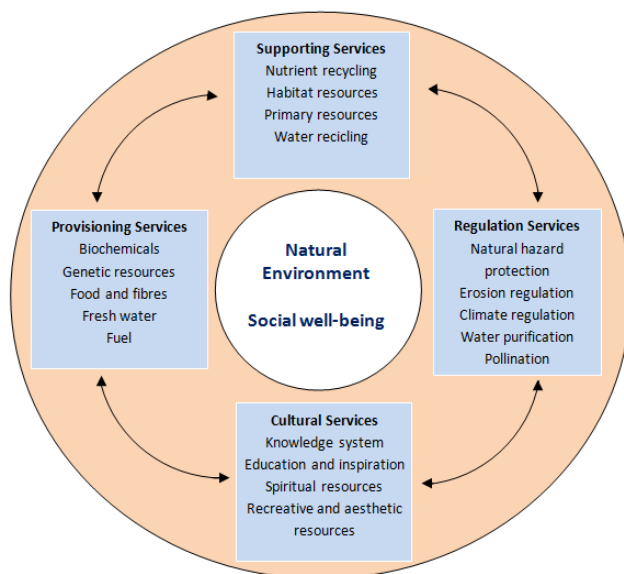
3. Risks relating to natural capital

The decrease in the stock of resources and exponential growth of the population creates a growing pressure on global natural capital, which has determined the increase in of its financial value during the last years (Câmpeanu et al., 2004: pp. 11-54). The effect is reflected in the firms' financial plans for future periods. The price increases for raw materials leads to shrinking profits for many businesses and creates difficulties for supply chains. This situation represents a risk factor for investors, which needs to be considered together with other risk factors in the context of economic crisis. The condition of public goods of many of the natural capital components makes it difficult to estimate the price evolution. In the same context, sustainable capital investment seeks to impose a competitive market. "Sustainable companies are those that create long-term sustainable value by building economic, social and environmental capital to provide ever better goods and services in a way that is profitable, ethical and respects the environment, individuals and the communities in which they operate." (Tomorrow's company)

The global crisis has determined the financial markets to examine more carefully the risk exposure (Cohen, 1998: pp. 136-138), which made the orientation towards sustainable capital investments be more frequent. The companies' actions became sustainable along with the increase in companies' capacity to integrate the natural capital which they have and along with including the sustainability criteria in

evaluating the company. The climate changes and extreme weather conditions which became more and more frequent were identified as the biggest market failure in history (Soroceanu, 2000: pp. 123-132). As a consequence, the investors began to realize more and more how important are the consequences of climate change on portfolio performance and how important is the effect of carbon dioxide on the economy. This is directly related to individual consumption, with the level of energetic intensity of production and to how carbon – intensive energy is the energy used. Previous financial crises, just as this one, have confirmed the vulnerability of financial markets to shocks. A sharp rise of prices for some raw materials, or resources belonging to natural capital, can cause systemic shocks in the absence of effective risk management tools, including price risk. This makes very important having a correct estimation of the importance of goods and services offered by the ecosystem, including the social and political responsibility, and the value of natural capital conservation programs should increase in order to allow an improvement in the financial stability in socio-economic context (Ostrom, 2007: pp. 16-23).

Figure 1. *Ecosystem services*



Source: OECD 2013.

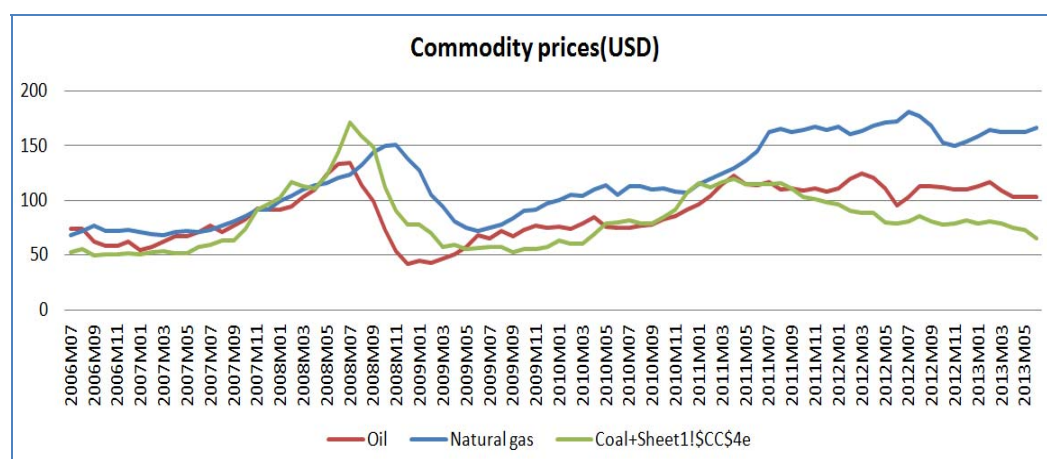
The investment in the natural resources exploitation, mining projects, for example (Răgălie and Muscalu, 2003), or hydra-electric power stations or similar constructions have to consider among other types of risks also the environmental risks (Chambers, 2003). Another area of risk for the company is represented by the external effects of their activities and the costs they incur for their internalization (Negrei, 2004: pp. 13-24, 35-58, 83-100). This is why they are related to policies regarding economic sectors which are environmentally sensitive, such as industries with a high degree of pollution, such as chemical industry, and mining industry.

The economic crisis has prompted investors to grow the degree of prudence for their decisions, but it wasn't yet considered a systematic approach in the way in which the financial institutions and insurance companies must consider the risks dependent on natural capital. During the economic crisis the pressures on natural capital stock, which was decreasing, were larger and were overlapping the problems created by the economic downturn. Therefore, economies faced decreasing water resources from aquifers layers and surface waters. As a consequence a sizeable decline of drinkable water was registered along with a decrease in the production of energy from hydropower and fishing industry. This contributed to the instability of global financial markets and increased price volatility.

4. During crisis risks increase

The Risks generated by the degradation of natural capital through the decrease in the amount of goods and services offered by ecosystems are important for companies, therefore understanding these risks and limiting them can lead to an important market advantage (Chambers, 2003). Opportunity losses compensation caused by the global crisis can be created by generating additional profits through businesses transformation in sustainable businesses (Moran, 2006). Considering this on a long term, the approach may have a role in stabilizing markets that are dependent on natural resources (EUB, 2003). This requires the introduction of natural capital in the accounting standards so its contribution can be highlighted for the output and make it easier, in the same time, to assess the profitability of companies. However, with increase in the energy and raw material prices, investment in new technologies, which are more efficient, reduce environmental impact of industrial processes.

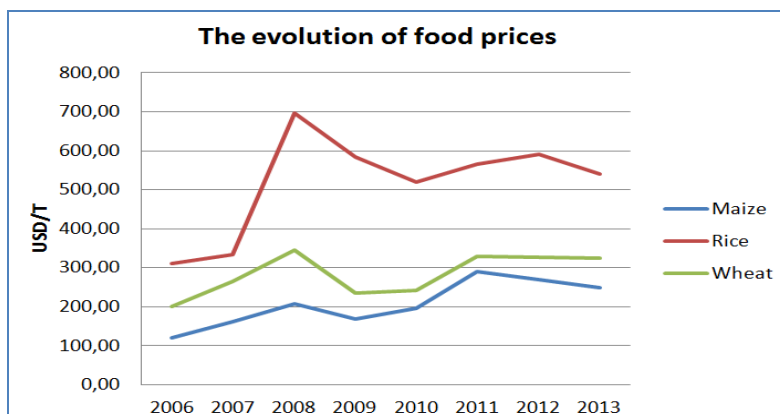
Figure 2. *Commodity price during the economic crisis*



Source: World Bank.

In order to preserve the natural capital sustainable economic reforms are necessary, reforms which are based on political decisions, which need to consider the economic crisis as an opportunity for a paradigm shift. The current economic model, built on the premises that it is possible to have an unlimited increase in the exploitation of resources, has generated an ecological deficit which is constantly growing (Bran, 2013: pp. 109-186). The austerity measures imposed to countries which were in a crisis have a major negative impact on the environment. Also environmental remediation costs are rising, which leads to the conclusion that it is necessary to adopt measures to internalize the environment externalities through effective policies, based on indicators that reflect the status of natural capital. The efficiency of the measures taken for economic adjustment, taken as a response to the crisis, depends on their level of sustainability. Some measures, such as those referring to increasing the level of efficiency for usage of energy, generate besides financial savings, also conditions for preserving the natural capital. In order to emphasize them, special attention needs to be given to the economic indicators which are more comprehensive than GDP or GNI, because it is difficult to estimate the value of goods and services provided by ecosystems, which is the case for species diversity. Therefore, it is important to revise the role of nature in the production of food, fuel, fiber and construction materials, forcing us to question whether the economic growth is not achieved at the expense of human well-being.

Figure 3. *The evolution of food prices during the economic crisis*



Source: FAO.

Comparing the huge amounts spent to rescue the banking system with the amounts spent for saving the ecosystems shows the inconsistency of public politics.

During the economic crisis the industrial activity has considerably decreased and so has the energy consumption, but the cheap energy obtained from fossil fuels, greenhouse gases generator has been used. The carbon market works slow, and

the interests and asymmetric points of view, make the effort of reducing the current carbon emissions harder. On the other hand, the pigouvian principle states that for the negative environmental externalities the polluters should pay a price equal to the marginal social damage they cause (Walsh and Stiglitz, 2005: pp. 397-407). Thus, they will not pollute beyond the point where marginal cost for reducing the emissions is lower than that price, thus balancing the social cost and social benefit. In the context where the largest part of this amount of greenhouse gases has historical origins and the responsibility belongs today to states that have a high level of industrialization, the problem of taking the responsibility occurs (Ciobotariu and Socolescu, 2008: pp. 127-144).

Also the discrepancy between the carbon price at the moment when it is calculated and the carbon price at the moment of greenhouse gases accumulating in the future needs to be considered.

As a consequence the investment decisions in the energy field need to consider the carbon price in the future, which is expected to grow in terms real, no matter if talking about energy produced from renewable sources, or talking about fossil fuels.

The constant increase in the price of fossil fuels is not likely to compensate the upgrade of carbon emission price, but it will increase the resistance to it. In addition to the mentioned measures, stimulants for reducing the impact on the environment are considered; the stimulants can be received for example by tropical countries for stopping, or reducing the exploitation of fossil fuel. The irrational exploitation of forests is responsible of 12% of carbon emissions⁽²⁾.

5. Conclusions

The damage caused by climate changes and extreme weather events have increased the losses caused by the economic crisis, which caused the degradation of natural capital to add in a financial form of to total losses of enterprises. In these circumstances those who are the poorest suffer disproportionately more and are also willing to sacrifice a larger amount of natural capital. As a consequence it is being estimated that the world economy is losing more money through rational exploitation of forests in comparison to the banking crisis, taking into account all the ecosystem goods and services (TEEB 2008). Therefore the proverb which says that „we do not see the forest because of the trees” is quite contemporary. This is how the need for a market for goods and services provided by ecosystems, a market similar to that of carbon trading becomes tangible. The existence of this market can take place in the conditions in which property rights are being specified in such a way in which their trading could become possible.

Notes

- (1) See http://www.lexpress.fr/styles/saveurs/nous-consommons-toujours-autant-d-huile-de-palme_1095083.html
- (2) See <http://biology.duke.edu/jackson/ng09.pdf>

References

- Blaug, M. (1992). *Teoria economică în retrospectivă*, București, Editura Didactică și Pedagogică
- Bran, F. (2013). *Abordarea entropică a valorificării resurselor naturale*, București, Editura Economică
- Câmpeanu, V. (coord.), Albu, C., Andreescu, E., Bratu, M., Cartas, M., Câmpean, R., Davidovici, A., Frâncu, M., Gheorghiu, R., Ghibuțiu, A. Iordache, L., Liușnea, D. S., Mazilu, A., Moldoveanu, M., Paladian, S., Papatulică, M., Pencea, S., Popa, N., Rădulescu, L., Rădulescu, O., Sălăgean, D., Turlea, G., Velciu, R. (2004). *Dimensiunea europeană și mondială a dezvoltării durabile*, București, Editura Expert
- Chambers, D. (2003). "Technical comments on the feasibility study and the description of the Roșia Montană Project", Bozeman, MT: Center for Science in Public Participation
- Ciobotariu, V., Socolescu, A. (2008). *Poluarea și protecția mediului*, București, Editura Economică
- Cohen, D. (1998). *Bogăția lumii, sărăcia națiunilor*, București, Editura Eurosong & Book
- Constantinescu, N.N. (1976). *Economia protecției mediului natural*, București, Editura Politică
- Dornbusch, R., Fischer, S., Startz, R. (2007). *Macroeconomie*, București, Editura Economică
- Moran, R.E. (2006). "Review of the Rosia Montana Environmental Impact Assessment. Report with a focus on water and water quality-related issues", "No Dirty Gold" Campaign, Washington, DC: Earthworks Organization
- Negrei, C. (2004). *Economia și politica mediului – ediție revăzută*. București, Editura Academiei de Studii Economice
- Ostrom, E. (2007). *Guvernarea bunurilor comune*. București, Editura Polirom
- Pohoață, I. (2003). *Filosofia economică și politica dezvoltării durabile*, București, Editura Economică
- Răgălie, S., Muscalu, S. (2003). "Aspects concerning the economic efficiency of the Roșia Montană Project", Bucharest, Romania: Paper submitted to the Romanian Parliamentary Commission, May 28
- Rojanschi, V., Bran, F. (2004). *Elemente de economie și managementul mediului*, București, Editura Economică
- Soroceanu, V. (2000). *Creșterea economică și mediul natural*, București, Editura Economică
- Walsh, C.E., Stiglitz, J.E. (2005). *Economie*, București, Editura Economică
- Ecological University of Bucharest (EUB) - Analysis Collective (2003). "Economic Development Opportunities – The Roșia Montană preliminary study", http://www.acad.ro/rosia_montana/pag_rm03_pv.htm

The development of Human Capital in the global crisis context

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Abstract. *The method is “the way to follow in the joint work of educator and students in order to achieve the goals of education, i.e. education and information of students”, believes the reputed teacher Constantin Cucos (1998). Modern strategies of teaching-learning-evaluation put great emphasis on interactivity. This gives students the opportunity to demonstrate what they know as a set of understandings, skills and abilities (competencies). This paper tries to compare the teaching – learning – assessment traditional methods with the modern methodology in Economics learning. This paper will highlight the advantages and disadvantages of conventional and modern methods used in the study of Economics based on their application on various topics. I’ll try to find an answer to the question: Are the modern methods complementary to traditional ones?*

Keywords: assessment, competence, learning, method, teaching

JEL Classification: A21, I21, I25.

REL Classification: 4A, 4B, 5A.

1. Introduction

This paper contains a description of some traditional methods of teaching-learning-assessment, as well as some modern methods. It also tries a comparison between traditional and modern methods of Economics learning. It has been used traditional and modern methods in teaching – learning process for the “Unemployment” theme, as well as in the evaluation process, for “The cost” theme. This paper includes: in section two – the state of knowledge in the specialised literature, in section three are traditional methods of teaching-learning-assessment, as well as modern ones, and finally the conclusions are presented.

2. Literature review of teaching - learning – assessment methods

The specialised literature has addressed over time the teaching – learning – assessment methods. Etymologically, the word comes from the Greek word “method”, which means “the way to” (Jinga and Istrate, 1998: p. 257). Teaching methods can be defined as “ways of action by which students, independently or under the guidance of the teacher, acquire knowledge, develop their skills and abilities, attitudes, their view about world and life” (Ionescu and Chiş, 2001: p. 126). The method is also defined as “road or way to follow in the joint work of the educator and the educated ones, to achieve the goals of education, i.e. for the information and the training of the educated people” (Cucos, 1998: p.143). “The method is the path chosen by the teacher and implemented by lessons or extracurricular activities with the students help and in their benefit, and in all cases requires cooperation between teacher and student” (Văideanu, 1986: pp. 3-4). We can find approaches to teaching methods also in the Pedagogy manual, where the method is “a way the teacher follows to enable its students to often find themselves their own way to follow in the learning process” (Cerghit, 1980: p. 10). Based on these definitions I think it is very important how the working method is selected. Given the reforms that took place in the Romanian education system, the current trend is to create skills and abilities (competencies). To do this, there is a need for some changes also in the activity of the teacher. George Văideanu makes clear these changes. “The move from a school with one actor (or a main actor) to a bipolar, two actors, a process that gives students the right to learn through participation, is about to become a reality throughout the school.

The teacher is and remains the leader and organizer of teaching and learning, but it fulfills its educational role only in so far as it helps students to discover their latent resources, to acknowledge their errors and shortcomings, to assimilate the techniques and rules of intellectual work, to participate in the search for truth, to learn individually and in groups, making efforts and achieving success and satisfaction” (Văideanu, 1988: p. 210).

The methods used in teaching-learning-assessment process can be classified according to several criteria. Given the teaching aim pursued, the methods can be divided into teaching-learning assessment methods and evaluation methods. By the degree of the learner participation in his own training action, the methods are expository methods and active methods.

Teaching and learning methods:

- a) Traditional: didactic exposure, teaching conversation, demonstration, observation, working with the manual, exercise.
- b) The more recent (modern): problem-solving, case study, discovery learning

Assessment methods:

- a) Traditional: current oral check, current written verification, periodic review
- b) The more recent (modern): check at the end of the chapter, docimologic verification tests (current or periodic).

Depending on the nature and content of training objectives, we distinguish three types of methods:

I. Methods of transmitting and knowledge acquiring

1. Oral communication methods:

- Exhibition: - story teaching
- description
- explanation
- lecture
- Dialogue (conversation): - conversation
- Debate kind seminar
- Problem-solving

2. Written communication methods:

- Explanatory reading
- Independent reading

II. Methods of exploration and discovery

1. Methods of direct exploration of objects and phenomena:

- direct observation
- research documents
- experiment
- Case Study

2. Exploration methods by reality substitutes:

- demonstration
- modeling
- algorithmic

III. Methods based on practical action (skills training):

1. Active methods:

- academic year
- Case Study
- The lesson
- I know / I want to know / I've learned
- cluster
- Phillips 6-6

2. Simulative methods:

- Role play
- modeling
- simulation

3. Methodology

In this paper we try applying both traditional and modern methods in the study of Economics and the comparison between the two types. Based on the comparison made, it will be identified a number of advantages and disadvantages of these methods.

A. Methods of teaching - learning:

a) Traditional:

Lecture - is a systematic exposition of information. Communication is uninterrupted, systematic and coherent content of ideas that fit within a theme in the school curriculum. Lecture resort to scientific methods of presentation and interpretation of knowledge (hypotheses, theories, logical arguments).

Unemployment

1. What is unemployment?

- Definition
- What is the unemployed?

2. Elements that characterize unemployment

- Unemployment level
- Duration of unemployment
- Structure of unemployment
- Intensity of unemployment

3. Processes that generate unemployment

- Job losses
- Increasing the supply of labor force

4. Measures to reduce unemployment

- Creating new jobs
- Retraining
- Securing jobs

Advantage: usage of scientific methods of presentation and interpretation of knowledge;

Disadvantage: providing large amounts of information.

b) Modern (alternatives):

Method “Phillips 6-6” - is a method that helps to express the student personality. The teacher has the role of directing the learning.

Steps taken:

1. The class is divided into heterogeneous groups of 6 students.
2. Announcing the theme / subject.
3. The teacher briefly explains the purpose and conduct of the activity, specifying the duration (4 minutes - organizing, 6 minutes - discussion group, 2 minutes - presentation the report of the each group by a student delegate).
4. Every group designates a coordinator and spokesman.
5. 6 minutes of group discussions take place, sharing ideas.
6. It is drawn (after 6 minutes) a report showing the result reached.
7. Group spokesman submit the report to other groups.
8. Teacher and rapporteurs present a synthesis of reports setting out the final solution.

The learning unit: “Unemployment”

1. The class is divided into heterogeneous groups of 6 students.
2. The teacher announces the topic: **“Unemployment - a necessary evil?”**.
3. Teacher explains briefly that this work will help to identify the market in which the imbalance occurs, correlations between macroeconomic imbalances. It also presents the conduct of activity, specifying the duration (4 minutes - organizing, 6 minutes - discussion group, 2 minutes - presentation of the each group report by a student delegate).
4. Each group shall designate a coordinator and spokesman.
5. 6 minute group discussions take place, sharing ideas.
6. It is drawn (after 6 minutes) a report showing the result reached.
7. Teacher and rapporteurs present a synthesis of the reports, setting out the final solution i.e., unemployment is bad, but necessary as it leads to increased competition in the labor market, which is reflected in increasing the quality and quantity of goods on the market, reduce inflation.

Advantage: obtaining many ideas by stimulating the imagination of all participants

Disadvantage: failure to comply within the time limit imposed (6 minutes) and non-involvement of all students.

I know / I want to know / I've learned

1. Professor announces the topic: **"Unemployment"** - 2 minutes.
2. He divides the class into pairs - 3 minutes.
3. Students are asked to make a list of what they know about the topic - 10 minutes.
4. During this time the teacher makes on the board a table with the following columns (**I know / I want to know / I've learned**).
5. Students present what they wrote, and the teacher completes the first column of the table - 5 minutes.

I know	I want to know	I learned
1. Unemployment is a sum of money.		
2. Unemployment affects people.		
3. Unemployment appears on the labor market.		
4. Unemployment payment is received by the people without a job.		

6. Students are asked to complete a list of what they want to know about this topic - 5 minutes.

7. Teacher completes the second column of the table - 5 minutes.

I know	I want to know	I learned
1. Unemployment is a sum of money.	1. What is unemployment?	
2. Unemployment affects people through job losses.	2. Who affect unemployment?	
3. Unemployment appears on labor market.	3. Are we unemployed?	
4. Unemployment payment is received by the people without a job.	4. When a person is declared unemployed?	
	5. What's the number of unemployed in Romania?	
	6. How high is unemployment?	
	7. How long are granted unemployment benefits?	

8. Students are asked to read from the manual the first part of the lesson Unemployment. – 5 minutes.

9. Students return on answering questions while the teacher completes the third column. - 5 minutes.

I know	I want to know	I learned
1. Unemployment is a sum of money.	1. What is unemployment?	1. Unemployment is a macroeconomic imbalance affecting the working population by losing their jobs or by not finding a job.
2. Unemployment affects people through job losses.	2. Who affect unemployment?	2. Unemployment affects the working population.
3. Unemployment appears on labor market.	3. Are we unemployed?	3. Students who do not search for a job, do not want to work, are not unemployed.
4. Unemployment payment is received by the people without a job.	4. When a person is declared unemployed?	4. A person is unemployed if: - Is able to work; - Has the legal age of employment; - Is willing to work; - Is looking for a job and can not find it; - Has applied to the Bureau of Labor Placement.
	5. What's the number of unemployed in Romania?	
	6. How high is unemployment?	
	7. How long are granted unemployment benefits?	

10. Students are not answered questions 5, 6 and 7.

11. Students compare what they knew of what they learned in that time - 5 minutes.

12. Students have the task to consult other materials and answer questions 5,6 and 7. Next class the discussion about Unemployment will continue, based on these answers.

Advantage: involving students in completing the table using personal knowledge;
Disadvantage: difficult to formulate relevant questions about the topic under discussion.

B. Assessment methods:

a) Traditional:

Written verification - is achieved by an assessment test. It consists of several items. Items used may be objective (dual choice, pair type, multiple choice), half-objective (short response/completion, structured questions) and subjective (problem solving type, essay type items).

Test of continuous/formative assessment

Economics, class. XI

Learning Unit: producer behavior**Topic: The cost****Skills assessed:**

- Analysis of the factors of production efficiency- Designing a rational and efficient conduct of the manufacturer / developer, adequate to supply-demand ratio, consumption – production.
- Comparison of specific economic dynamics phenomena and processes.

All subjects are compulsory. 10 points are granted automatically.

Working time is 50 minutes.

I. For each of the items 1 to 3, write the answer of corresponding letter on worksheet:

1. As production increases, the difference between CTM and CVM:

- a) increase;
- b) decreases;
- c) is constant;
- d) can not be determined.

5 points

2. Total cost function is:

$$CT = 400 + 2Q + 2Q^2 + Q^3.$$

When production is 5, CFM:

- a) 80;
- b) 100;
- c) 400;
- d) can not be determined.

5 points

3. Participate in the formation of variable costs:

- a) rent of the unit costs;
- b) raw material costs;
- c) heating unit costs;
- d) depreciation of fixed capital.

5 points

II. Show, using numeric values, the development of average total cost, where production is growing faster than the variable cost.

20 points

III. Assign the correct terms in column A with data in column B.

A	B
1. CFM	a. CFM + CVM
2. CVM	b. $(CT_1 - CT_0)/(Q_1 - Q_0)$
3. CTM	c. CF/Q
4. Cmg	d. CTM - CFM

10 points

IV. Be the following formula:

a) $CTM = CT/Q$;

b) $Cmg = (CV_1 - CV_0)/(Q_1 - Q_0)$;

c) $CT = Cmat + Csal$.

- Define indicators whose formulas are mentioned in points a, b, c

15 points

V. Marginal cost is 25% higher than CTM_0 . CF represents 25% of CT_0 and 20% of CT_1 . Knowing that $Q_0 = 10,000$ pcs, $CV_0 = 2, 25$ mil, calculate the marginal cost and absolute change of production.

30 points

Advantage: allows an objective assessment;

Disadvantage: students are asked to reproduce certain concepts and use them mechanically.

b) Alternative:

The Project

The project is an active-participatory methodology that encourages transfer of knowledge, skills and abilities, interdisciplinary approaches, strengthening the social skills of students.

A project implementation involves the following steps:

1. Identification of a problem/issues/subject;
2. Collecting, organizing, processing and evaluation of information on the topic chosen;
3. Developing of a set of possible solutions to the problem;
4. The solutions assessment and choosing an option for "the best solution".

After completing each stage in the project, it is useful to have a discussion/debate in which students are encouraged.

At the beginning of the chapter “Manufacturer”, I present its content to the students and how they will be evaluated. They will be evaluated in the traditional way and using one of the alternative methods of assessment (the Project).

The project to be realized: **A cost analysis in a commercial company**

Students will be informed about the project they have to achieve it. Also, data will be presented about when the parts of the project will be discussed.

Students will work along the way on the project and will complete a certain part of the project only after they learn about these concepts (e.g. costs will be calculated once they learn the Cost).

The project contains:

1. General profile of the Commercial Company...

Students will choose a company from which they will collect information (the set up form, capital, activity, production and so on - based on knowledge gained from Entrepreneurship education).

Students will present available data collected and organized to date.

2. Analysis of the level, dynamics and structure of cost

They will calculate the production costs, based on data collected up to a date announced.

Students will present production costs of firms analyzed and the cost per unit of product.

3. Ways to reduce the costs of the Commercial Company...

They will identify specific ways to reduce the cost of the firm and will calculate again the cost in order to compare its current level to previous level.

They will present the results obtained and the final conclusion.

Each part of the project will be checked and evaluate along the way by the teacher. If necessary, the student/students will be helped, guided to do homework. The mark obtained will be composed of notes received for each part of the project (what they worked and their presentation).

Advantage: emphasizes practicality/application of learning but is also an assessment tool;

Disadvantage: the emergence of discussion among students about the contribution of each one to the project (in the case of group projects).

The cluster is a graphic organised method of the students learning by which are highlighted new associations of concepts and ideas.

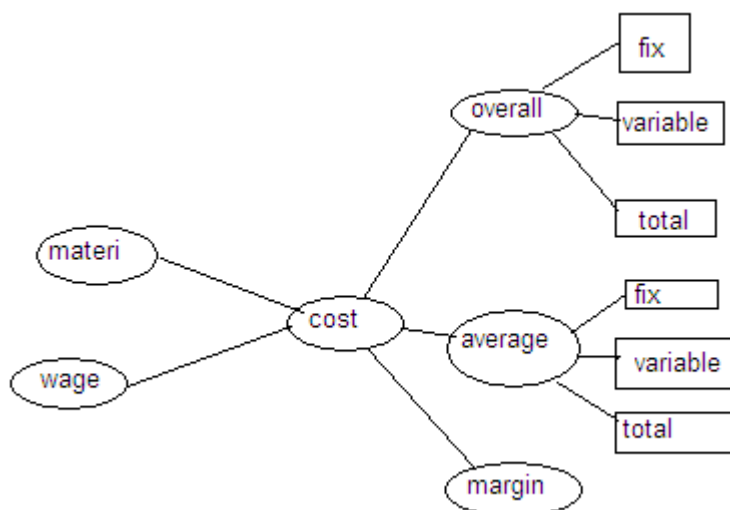
Applying this method involves the following steps:

- Write a word in the middle of the board.
- Note around the word chosen the ideas the students come to mind about the topic discussed, then pulling the lines between them and the original word; lines highlight the connections between ideas.

This method can be applied to the discipline Economics at the end of the lesson Cost to emphasize the understanding level of concepts by the students.

The Cluster that can be achieved is shown below.

Figure 1. Graphical representation of the Cluster method applied on the topic “Cost”



Advantage: allows the ideas structuring and fixing;

Disadvantage: lack of all students involvement in a class.

4. Conclusions

It is noted that the in the traditional method “Lecture” is transmitted information on the subject under review, while in the method “I know/I want to know/I’ve learned”, some information comes from students and all students ask questions about what they do not know. Among evaluation methods we used “written verification” as traditional method, but also the modern method the “Project”. The first assessment method requires the student the information he has learned,

requires the definitions of some indicators, while the “Project” stimulates the student “to do”, “to identify”, etc.

Analyzing the two categories of methodology we can draw the following conclusions:

- traditional methodology aims the informative side of education, while modern methods aim the formative side;
- traditional methods are focused on teacher work while modern methods lie the student at the heart of the action, thus developing participatory spirit;
- traditional methods allows students to retrieve information as it is, without connecting it with practice, while modern methods focus on learning through discovery and develop critical thinking. Modern methods also develop self-assessment and inter-assessment.

Taking into account that the modern strategies of teaching - learning - assessment focus on interactivity, which allows students to show what they can do, while the traditional methods offer information, I believe that the traditional methods should not be replaced but used in conjunction with modern ones. Modern methods are a viable alternative to traditional ones, being complementary to them. Complementary methods have a formative role and a great capacity to motivate students by engaging them in the teaching-learning-assessment activities.

References

- Cerghit, I. (1980). *Educational methods*. EDP, Bucharest
- Cucoş, C. (1998). *Psihopedagogy for eraly completion and academic degrees*. (second edition, revision and completed edition), Polirom, Iaşi
- Ionescu, M., Chiş, V. (2001). *Pedagogy. Supports for teachers training*. Cluj University Press, Cluj-Napoca
- Jinga, I., Istrate, E. (1998). *Manual of pedagogy*, ALL Educational, Bucharest
- Văideanu, G. (1986). “The technology educational process” in *Pedagogy, guide for teachers*, vol. 2, University Alexandru Ioan Cuza, Iaşi
- Văideanu, G. (1988). *Education at the border of the millenniums*, Politică, Bucharest