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This edition of Ekonomika preduzeća – SEA Journal of Business Economics and Management is dedicated to the project financed by the Ministry of Education, Science and Technological Development entitled "Strategic and tactical measures to overcome real sector competitiveness crisis in Serbia". In accordance with the main tenets of the project, each paper deals with specific problems and solutions for improving competitiveness of Serbia's economy.

The first paper, written by *D. Malinić* and *V. Milićević*, analyses accumulated financial structural problems in the Serbian enterprises, which origin back to the 1990s and which, together with deteriorated institutions, long and controversial privatization of Serbian enterprises, represent a huge obstacle to finding the right path for the exit from the crisis.

S. Janošević and *V. Dženopoljac* explore the impact of intellectual capital on export performance of the Serbian enterprises. The authors assume that intellectual capital is the key driver in achieving and sustaining competitiveness in the long run. The results of similar analyses done previously have shown that the intellectual capital has a significant impact on financial performance. Conversely, the authors confirm here that in the case of top Serbian exporters such correlation has not been found.

The third paper written by *B. Paunović* analyses the role of corporate entrepreneurship in solving the competitiveness crisis in large enterprises. The author examines different forms of corporate entrepreneurship and its development modalities. He also points out that the lack of entrepreneurial focus is not necessarily an outcome of companies' growth and that the loss of entrepreneurial spirit can be postponed or prevented, or that spirit can be retrieved if lost.

The paper written by *I. Bagayev* and *B. Najman* has rather broader scope. Unlike the previous papers concentrating on issues in Serbia's enterprises, this paper describes the main determinants of electricity efficiency in 27 transition countries. The authors provide a detailed analysis of the enterprise electricity intensity patterns. They offer a unique finding on the effect of the poor access to electricity supply on the electricity costs of the enterprise.

D. Lončar and *V. Rajić* have explored concentration and competitiveness of the banking market in Serbia. Since the banking sector is weakly to moderately concentrated, further consolidation can be expected in the future. The authors present possible scenarios for the future consolidation and their impact on the competitive dynamics. They argue in favour of a positive impact of a more moderate consolidation on competition indicators, but also warning the regulator to prevent excessive concentration and cartel arrangements.

The paper written by *Đ. Kaličanin* and *V. Kuč* deals with complementarities between the development strategy of the Serbian oil company "NIS" and the state's energy sector policy. The paper also discusses the problems and challenges faced by the energy sector, with special emphasis on those related to the oil and gas sector in Serbia as well as at more global scale.

The last paper by *L. Korošec* compares Swedish and Slovenian experience in the implementation of environmental policy as part of sustainable development. A comparison of the two countries includes following aspects: state structure, specific societal features, relation to the EU, governmental definition of sustainable development, and key sustainable development indicators and the progress achieved.

Strategic and Tactical Measures to Overcome Real Sector Competitiveness Crisis in Serbia

Current Results of the Project

The main results of the research team engaged on the project under the title "Strategic and tactical measures to overcome real sector competitiveness crisis in Serbia", financed by the Ministry of Education, Science and Technological Development of the Republic of Serbia for the year 2012, are shown as follows:

Due to severity of situation (structural imbalances, twin deficits, output gap, poor competitiveness etc.) as well as inefficiency of so far used approach in conducting economic policies (regulated flexible FX rate, restrictive monetary policy and expansionary fiscal policy), it would be useful to have Plan B in conducting economic policies.

Plan B is necessary because of possible scenarios of events that lead in opposite direction deviating from the assumptions, whose probability increases under double-dip recession in the EU as well as local transitional crisis.

The main problem of Serbia's economy is output gap. Several things stem from the previous fact: constant inflationary pressure, unemployment growth and debt increase. This problem can be solved only with intelligent investments in real sector (public and private). Plan B should contain the first steps and timetable of moves. Consequently, the main assumptions of Plan B are:

1. Industrial policies lead, macroeconomic policies follow:
   a. Macroeconomic policies play the role of the lubricator for industrial policies,
   b. The whole institutional setting (institutions and regulation) adapts to the previous principle.
2. The main tenet of industrial policies is the growth in production of tradable goods:
   a. With anti-import goals,
   b. With export goals.
3. Industrial policies are formulated for industries with comparative advantage (mainly in public sector) and industries with competitive advantage (mainly in private sector).
4. Industries with comparative advantage in Serbia are:
   a. Energy,
   b. Agriculture and food processing,
   c. Infrastructure,
   d. Telecommunication.
5. Industries with competitive advantage in case of Serbia are:
   a. Metal processing,
   b. Transportation,
   c. Logistics.
6. Industrial clusters – formed around big exporters.
7. Investments in industries with comparative advantages, due to absence of fiscal space and hit of the limit of state indebtedness, should be financed through joint ventures, concessions (build-operate-transfer), public-private partnerships, and only exclusively via credits:
   a. The main condition is 50% ownership by the state in emerging business combinations.
8. Monetary and fiscal policy as the main macroeconomic policies function through the so-called automatic stabilizers:
   a. In monetary sphere the main automatic stabilizer is FX rate which should be stable and predictable (Currency board),
   b. In fiscal sphere there are various automatic stabilizers (transfers for unemployed, social transfers, tax benefits for investments etc.),
   c. Other automatic stabilizers in monetary sphere are also important (Freedman rule: when monetary and fiscal policy are in contradiction, economy behaves in accordance to monetary policy), especially those affecting money supply.
9. Financial system stability policy is conducted strictly respecting prudential regulative rules and hard budget constraints (micro and macro).

This approach is not uncommon in the theory and practice of conducting economic policies. Some prosperous countries use this approach for decades now (South Korea, for example).

REVIEW PAPER
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OVERCOMING FINANCIAL STRUCTURAL DISORDERS AS A PREREQUISITE FOR STRENGTHENING THE COMPETITIVENESS OF SERBIAN ECONOMY*

Prevazilaženje finansijsko-strukturnih poremećaja kao preduslov jačanja konkurentnosti srpske privrede

Abstract

From the present point of view, we may conclude that, besides the usual incompleteness of legal framework, lack of corporate culture, extremely long and still unfinished privatization, which was mostly inadequate and implemented inefficiently, accumulated financial structural problems in our companies, whose origin dates back to the early 1990s of the last century, pose an additional burden restraining Serbian economy to finally find the right path for the exit from the crisis. Nowadays, at almost every step, we witness consequences resulted from many years of underestimating financial structural problems and even lack of understanding by those who should point the way towards the recovery of exhausted Serbian economy. All these consequences could be unified by the statement that our economy is still mostly immature to deal with a very tough competition awaiting it at a global level. Without raising the competitiveness of national economy, it is hard to believe the stories of its improvement in any segment, of higher employment, raising standards and any other socioeconomic well-being. The following paper advocates this very idea and offers several concrete solutions, which, along with some other systemic measures, should enable long-awaited recovery of Serbian economy.

Key words: *competitiveness, liquidity, indebtedness, profitability, investment capabilities, capital expenditure, sustainable growth*

Sažetak

Sa ovdašnje vremenske distance može se zaključiti da pored uobičajene nedorečenosti pravnog okvira, nedostatka korporativne kulture, izrazito duge i još uvek nezavršene privatizacije koja je u velikom broju slučajeva neadekvatno i neefikasno sprovedena, nagomilani finansijsko-strukturni problemi u našim preduzećima predstavljaju dodatnu balast koja sputava privredu Republike Srbije da u skorije vreme konačno pronađe prave puteve za izlazak iz krize čiji počeci sežu još od početka devedesetih godina prethodnog veka. Posledice višegodišnjeg potcenjivanja finansijsko-strukturnih problema, pa i nerazumevanja od strane onih koji bi trebalo da trasiraju puteve oporavka iznurene srpske privrede, vidljive su danas skoro na svakom koraku. Sve te posledice mogle bi se objediniti u konstataciji da naša privreda u najvećem delu još uvek nije dorasla za nadmetanje u veoma oštroj konkurentskoj utakmici koja je očekuje na globalnom nivou. Bez podizanja njene konkurentnosti teško je poverovati u priče o bilo kakvom napretku nacionalne ekonomije, većoj zaposlenosti, poboljšanju standarda i svakom drugom društveno-ekonomskom boljitku. Rad koji je pred vama promoviše upravo ovu ideju i nudi nekoliko konkretnih rešenja koja bi u sadejstvu sa nekim drugim sistemskim merama, trebala da omoguće dugo očekivani oporavak srpske privrede.

Ključne reči: *konkurentnost, likvidnost, zaduženost, profitabilnost, investicione mogućnosti, kapitalna ulaganja, održiv rast*

Introduction

It is the fact that we are constantly exposed to information regarding macroeconomic stabilisation, budget deficit, efficiency of economic and financial sector, needs to reconsider growth models, problems of increasing economic activity, necessity of promoting export, addressing unemployment problems and so on. What is common to such issues are very different projections of necessary increase in economic activity and rate of GDP growth. In our opinion, it happens due to a fact that creators of such projections often accept without enough criticism various optimistic scenarios, or without any deeper consideration of problems and potentials of economy and certain sectors belonging to it. Choosing to research thoroughly the

* This edition is dedicated to the project financed by the Ministry of Education, Science and Technological Development titled "Strategic and tactical measures to overcome real sector competitiveness crisis in Serbia" (no. 179050, period 2011-2014).

financial structural and return position of our economy within a reasonable time sequence, we tried to present the problems from the perspective of financial strength of the economy generating GDP.

Undoubtedly, every crisis situation is usually followed by serious financial structural disorders. They are particularly present in the national economies that have not come out of the transition process, where structural reforms have not been finished and where there are no possibilities for differentiating sources and cutting financing costs, due to undeveloped capital markets. Logically, such economies faced the economic crisis completely unprepared, and, consequently, their exit from the crisis is much more complex. This is because in projecting economic measures leading towards the exit of the crisis we cannot, by any chance, ignore financial structural heritage related to indebtedness level, illiquidity, technical and technological outdatedness, presence of operating and financial risks, possibility of sustainable growth and so on. Potential solutions that ignore these problems and neglect analysis of their causes are doomed to a failure at the very beginning.

Having in mind the previous observations, we consider that creating strategy for overcoming the crisis in Serbian economy (hereinafter RS) is not possible without previous evaluation of current state. In that sense, assessment of the existent economic performances aims to provide the insight into the seriousness and depth of financial structural disorders, to reveal us to what extent the inherited situation is a burden in taking the necessary changing steps, as well as to help us, eventually, to find the most efficient solutions. This paper is practically the culmination of our extensive research on financial structural and return position of Serbian economy from 2007 to 2011. We published the results we obtained during the research that lasted more than a year in several papers listed in references. As it is obvious from these papers, we equally dealt with the economy as a whole and with finding the sectors that could become the propellers of economic activity in the years to come. The following paper represents the sublimation of the efforts made in this respect, and it contains only key recommendations grounded on the results of thorough analysis regarding financial statements of economic entities.

Financial structural problems of the economy

Conducted research regarding the movement of performances from 2007 to 2011 allows us, first of all, to point in this paper to several problems representing a huge burden for the exit of many years of crisis for the economy of RS (see more about this in [8] and [10]). Although the list of these problems could be very long, we decided to present, at this point, only the most important, such as: illiquidity problem, indebtedness problem, problem of decreased equity, problem of financial imbalance and lack of Net Working Capital (hereinafter NWC), problem of low profit margins, problem of inefficient management over assets and equity, problem of negative financial leverage and problem of limited possibilities regarding financing growth. Let us look briefly at the most important aspects each of these.

Illiquidity problem has been a huge burden for the economy of RS for many years. With the first strike of economic crisis, precisely in 2008, this problem began to escalate sharply. Based on conducted research of the achievements of economy and its key sectors, at the beginning, we could state that the problem of providing liquidity of our economy has several important aspects.

Firstly, providing long-term economic liquidity complicates the unfavourable financial structural position, i.e. compromised relation between current assets, on one hand, and current liabilities on the other hand. This happens because of growing short-term borrowing, dramatic postponement in payment of liabilities to suppliers and employees, as well as liabilities regarding interests and other operating liabilities. Along with this, we should point out that, in the analysed period (except in 2007), there are negative values of NWC reported, with a strong tendency to continue its deterioration, which speaks for itself in terms of the difficulty to improve liquidity position of the economy for a long-term.

Secondly, insufficient range of operating activity, followed by accumulating inventories which find their way to buyers with more and more difficulty, as by accumulating receivables which are collected with difficulty and long delay due to overall illiquidity, and thus represent a special burden for the liquidity of economy. This happens because

the prolongation of Average No. Days Inventory in Stock and Average No. Days Receivables Outstanding extends the length of operating cycle and, consequently, the period necessary to provide current assets financing. Assuming that the economy will rely on suppliers (to a reasonable degree) as a spontaneous financing source, this also means that, due to extending the length of operating cycle, it will be necessary to provide larger and larger amount of additional, mostly borrowed sources (i.e. loans). Finally, we should not neglect the fact that, due to accumulating inventories and receivables, the inflow of revenues will be cut to a degree that would enable coverage of costs made and obtaining sufficient incomes.

Thirdly, the previous assumption on reasonable use of suppliers as a source of financing operating cycle is not applicable in our economy in the analysed period. Instead, we are free to claim that suppliers are those who bear the greatest burden of illiquidity in the economy of RS. This happens because, in the analysed years, the average period for settling liabilities to suppliers is about four months. In certain sector, that period reaches even seven months [9]. Consequently, cash cycles are negative in sectors of telecommunications, processing industry, construction, commerce and agriculture. At the same time, it means that suppliers, as a spontaneous financing source, are also used for financing some capital expenditure, which is, speaking long term, an unsustainable practice. Such abuse, to put it that way, is present in other sectors as well, but in a smaller degree. To make things worse, similar logic for the defence of own liquidity is also applied by suppliers themselves in their treatment of their own suppliers and so on. Thus, the illiquidity problem in our economy takes on the effect of spiral, pulling all companies to a bottom, especially those closer to its end.

Fourth, the lack of cash flow synchronization, especially regarding cash flow obtained from operating activities, pressures most strongly the liquidity of our economy. Namely, since the economy generates negative net cash flow from operations (hereinafter CFO), there is no possibility of maintaining liquidity, nor any other coverage of current liabilities, interest expenses or capital expenditure. Such achievements raise further not only the short-term financial risks, but also the long-term ones, and make it more difficult to attract new investments. In this regard, there is an especially worrying fact that the economy reports net outflows from income statement in almost each analysed year. To tell the truth, the last analysed year is an exception, but not due to the increase of operating efficiency in the economy, but due to raising the value of dinar on the date of the balance sheet. To be precise, owing to extrusion of foreign exchange losses, the economy reports net income in 2011, which resulted, among others, in the recovery of its net cash flow from operations.

However, something like that definitely cannot be expected in 2012. Namely, since it is certain even now that the value of dinar decreases, in financial statements for 2012, there will be a considerable increase of financial expenses and foreign exchange losses within them, probably reappearance of losses, and, finally, negative net cash flow from operations. All this speaks convincingly enough in favour of the fact that the indication of final balance established between inflows and outflows of cash flow from operations is still far away, as well as the improvement of liquidity position of our economy.

Growth of indebtedness in the economy is a general characteristic of the previous five-year period. We have already underlined that short-term indebtedness was far more expressed. This escalated especially after 2008. Owing to more frequent reaching for expensive, short-term loans, the costs of using borrowed equity rose considerably, and the bar for return achievements was raised to the level which is, as we are about to see later, unattainable for our economy. Along with the growth of indebtedness, burdening of the economy with interest costs, foreign exchange losses and other financial expenses arising from currency clauses of the approved loans, becomes practically unbearable. It is reflected by the fact that the expenses of financing almost tripled in the analysed period, while in the same period, the economy did not manage to provide their coverage, either by the achieved EBIT (Earnings Before Interest and Tax), or by free net cash flow from operations. In the entire analysed period, burdening with foreign exchange losses is so expressed that, in years with the depreciation of dinar value, they annulled all the effort put by the economy to achieve operating incomes. A final

epilogue of this story is the fact that our economy, in the process of repaying accumulated debts, cannot rely in any part on the internal sources (primarily free net cash flow from operations), which speaks for itself about how much the position of long-term financial safety is jeopardised.

Reduction in the value of equity is the back side of the problem regarding growth of indebtedness in the economy and one more unfavourable signal awaiting long-term creditors in the field of long-term financial safety. Having in mind all cumulated losses, we may state that the share of net equity in total equity fell from almost 55% at the beginning of the analysed period to only 37% at the end of it. In order to complete the picture on relative level of equity put at the disposal of our economy, we must state two more relevant facts. Firstly, cumulated losses more than doubled in the analysed period. Except in 2007, cumulated losses took more than one third of equity in each following year. Secondly, we should not neglect the fact that there are a considerable number of companies within our economy which lost the entire equity through their operations. It is interesting to notice that, in previous five-year period, the amount of such losses increased by 3.5 times, where, according to all facts, we can expect this unfavourable trend to continue. Due to the aforementioned, net equity was not enough, in any of these years, to cover long-term, i.e. risky investments in fixed assets (there is a negative net working capital – NWC), which is one more important indicator speaking in favour of compromised long-term financial safety of the economy.

Problem of financial imbalance and the lack of net working capital is a logical consequence of the growth of short-term borrowing and collapse of equity. It is interesting to notice that the gap between necessary long-term financing sources on the one hand, and long-term investments, on the other, has become deeper from year to year. It happens despite the fact that, at the level of the economy in the last five years, investments in fixed assets have grown slightly. Unfortunately, it is also typical of investments in property, plants and equipment, i.e. in production and sales capacities of the economy, which does not indicate bright future, especially if we have in mind that a great part of this increase arises from revaluation. However, regardless of the above-mentioned, the economy of RS can do nothing but to increase the share of short-term sources in financing long-term related assets, which, so far, has sparked even more the negative effects of the previously mentioned problems on long-term financial stability.

Problem of low profit margins is one more characteristic of the economy of RS. Those margins are the consequence of both low profit achievements and small range of activities, i.e. unsatisfactory sales revenues. Let us notice that, up to 2011, the economy reported serious losses.[1] At the same time, the economy generated the excess of revenues over costs in its most important segment, the so-called core business (where, normally, there are main profit sources), in all analysed years. However, in this case it is not enough for profitable economic operations since the margins of gross and net operating income are very modest in all years. So, in the entire period, gross operating income is about 35% and that is certainly not enough. It is because the remainder from 100 in relation to this margin practically reflects the share of variable costs (i.e. costs of material and purchase cost of goods sold) which, on average, equals about 65%. Generally speaking, this is a very low burden to revenues, so we can hardly expect favourable operating profit from the remainder. The situation is even worse with net operating income which does not reach 5% in any of these years. Almost nothing would change, even if we turned our attention towards EBIT margins which, in the analysed period, go from 4.6 to 6.7%. This is because such achievements are definitely insufficient to provide the profitability of economy which is forced, on average, to borrow at higher cost of debt which, in the analysed period and calculated for the average debt amount, goes from 12.8 to 22% [10, p. 139].

Problem of low efficiency in management over assets and equity multiplies the effect of low profit margins to the profitability of economy. In previous explanation of liquidity problem, we have been speaking about the

1 Mind that, in thorough analysis, we established that the net income achieved in 2011 did not appear as the result of increasing operating efficiency of the economy, but as the result of significant reduction of financial expenses compared to 2010. It happened owing to the extrusion of foreign exchange losses, since on the day of balance sheet issue, 31/12/2011, dinar appreciated slightly towards euro, from 105.5 to 104.64 dinars. See more about this and the other consequences of toying with the exchange rate in [10, pp. 138-140].

consequences of delaying Average No. Days Inventory in Stock and Average No. Days Receivables Outstanding. At this point, it is important to state that the main propeller of assets turnover is hushed by delaying these processes. Furthermore, we must notice that a considerable growth of assets turnover did not happen, despite the modest growth of investments in certain parts of assets. To be precise, due to slower growth of sales revenues compared to growth of investments in assets, assets turnover did not exceed 0.80 in the whole analysed period. Besides, it is important to stress that assets turnover fell slowly from the beginning. Such achievements unequivocally indicate the small range of economic activity and insufficient usage of the existent capacities. However, knowing that the major part of our economy is supplied with outdated equipment which, regardless of this fact, is not used enough, the expectations in terms of more significant revenue growth were obviously unrealistic.

Previous two problems, i.e. problem of low profit margins and problem of small turnover of assets and equity, have definitely influenced *the profitability of our economy*, which is the next big problem. The profitability of our economy is simply unsatisfactory and it is manifested through *negative effect of financial leverage* which is present in all analysed years. At the same time, it shows us that the economy is not able to cover the cost of debt by the achieved profit. In other words, return on assets (ROA) is, during the whole period, below cost of debt, so the negative effects overflow to return on equity (ROE), creating the situation where the value of ROE is below the value of ROA. What speaks even more unfavourably of the profitability of our economy are very low values of ROA which do not exceed 5%, while the values of ROE are negative in three out of five analysed years. Due to all of the above-mentioned, instead of normally expected increase in owners' fortune, it is decreased, so it will be very difficult to attract new investors in such circumstances.

Problem of limited investment capabilities considerably limited the economic growth in the analysed period. In normal business circumstances, growth could be financed by combining internal (net cash flow from operations, retained income and amortization) and external sources, as proprietary sources (the issue of shares), as debt funds (bonds and loans). However, due to previously elaborated lack of cash flow from operations excess, lack of incomes and mostly written off financial investments, our economy, during the whole analysed period, could hardly rely on the internal financing sources. At the same time, due to undeveloped capital market, proprietary financing sources also are disappointing. The obvious consequence of such state is the inability to differentiate financing sources on one hand, and reduction of financing costs on the other hand, which significantly limited the maneuvering space for economic entities. In such circumstances, if the economy wants to finance growth, it can do nothing but increase indebtedness with all the accompanying financial structural risks and the risk of generating negative effect of financial leverage. In the analysed period, borrowing was done under extremely unfavourable conditions. The economic crisis, lack of equity at global level and great cautiousness of potential investors took care of a great part of it. Since the indebtedness was followed by currency clause, apart from numerous securities, frequent fluctuations in dinar exchange rate (precisely dinar depreciation) in our circumstances additionally increased the price of such financing, which has already been elaborated.

Key challenges in resolving financial structural disorders

Many national economies felt the consequences of global economic crisis, regardless of the level of their development. The intensity of the effects of crisis and the range of consequences were, of course, different, depending on their (un)readiness to cope with the forthcoming challenges of crisis, inherited structural problems, present financial imbalances, synchronization of the activities in real and financial sector etc. Of course, Serbian economy also suffers serious consequences of the economic crisis. However, in order to adequately perceive the possibilities and ways out of the crisis, we must admit that financial staggering of our economy is not caused only by global economic crisis. We could say that it is much longer process. As financial structural imbalances did not appear only as a result of global economic crisis, so we cannot expect that they will vanish with its termination. Although we would rather

blame someone else for financial structural problems which would vanish with the termination of the crisis, it is, of course, not possible.

Serbia entered the global economic crisis with impotent economy, low competitiveness and high systemic risk [5]. We could freely say that, even before the economic crisis, Serbian economy had quite suffered the consequences of the so-called strategic crisis (deterioration of competitiveness, technical and technological outdatedness, lack of high-quality products, lack of markets, etc.), profitability crisis (fall of returns, burdening with losses, reduction of equity, lack of internal financing sources etc.) and liquidity crisis (inability to service liabilities, difficulties in borrowing, etc.). Years of warnings that financial structural risks were extremely high remained without reply. As time went by, ignoring reality resulted in more complex and painful solutions. Unfavourable transitional heritage did only additionally deepen the consequences of global economic crisis.

On the previous pages, we identified extremely hard financial structural heritage manifested through growing losses, worrying reduction of equity, unsatisfactory profitability (additionally threatened by the insufficient level of operating activities, low efficiency and high financial expenses) and chronic illiquidity, which require serious approach to this problem. With such financial structural imbalances, it is unrealistic to expect from Serbian economy to achieve any serious growth. Of course, the major question is what is to be done in order to solve the identified problems. In that sense, based on research done so far in the field of financial structural problems, we are turning our attention to several key challenges.

Ways of resolving illiquidity problem. Illiquidity is a chronic problem of Serbian economy. However, it is not the first problem in the chain of crisis burst. It appears as the result of fall in competitiveness, fall in profitability and financial structural disorders. However, the illiquidity crisis was manifested with the greatest intensity. Lasting incapability of payment, existing when a debtor cannot service his or her liabilities in 45 days (from maturity date) or when he or she completely suspends all payments in sequence of 30 days, is one of the reasons to start bankruptcy proceedings [14]. Furthermore, the complexity of resolving these problems reflects in the fact that long-term solution of illiquidity problem requires establishing competitiveness, increasing profitability and removing financial structural imbalance.

Resolving the illiquidity problem implies its comprehension. That problem could be simply presented as the imbalance between purchases done and disposable cash. In that sense, advocating multilateral compensations is questionable. To be precise, multilateral compensations cannot solve the illiquidity problem. It is because there would remain huge unsettled balance after performing multilateral compensations, as the result of previously mentioned imbalance between purchase and disposable cash. In favour of this, there is negative cash flow from operations indicating the inability to service liabilities from operating activities, even in case of inappropriate abuse of suppliers. If we also add the need to finance at least a part of capital investments from internal sources, debt repayment and dividend payment, we can get better picture regarding the seriousness of illiquidity problem. In such conditions, applying multilateral compensations could represent a time-limited measure which must not become a rule. By definition, it refers to old debts. In that sense, it can help in partial balance sheet adjustments by compensation participants, but those compensations do not bring fresh money, so they cannot solve future liquidity problems. In other words, multilateral compensations cannot reduce negative balance, as well as the consequences of illiquidity. After all, experience has taught us that the scopes of multilateral compensations in Serbian economy have so far been relatively modest and have not resolved illiquidity problems. Based on these relations, balance sheet adjustments themselves are preferable, but not enough to remove financial structural disorders.

One of crucial conditions for the improvement of liquidity position is strict financial discipline. It is also necessary to prevent the abuse of small suppliers by big, powerful companies. This is necessary to prevent, because the evasion of paying liabilities to suppliers leads even healthy parts of the economy into illiquidity. Financial discipline, as an expression of good business practice, is uncontested. What could be contentious is the regulation of legal deadlines for servicing liabilities.

Whatever the prescribed period (45 or 60 days), it will not be universally applicable. Sectors, even branches within them, are so different that it is impossible to imagine that the deadlines will suit all of them. All those who usually practice longer deadlines in doing business (than those potentially prescribed) will be in trouble. Also, such legal solutions would stimulate a certain number of companies which settle their liabilities in shorter deadline to prolong those liabilities to the prescribed deadline, which is also not good. After all, the analysis of liquidity, performed at the level of whole economy and key strategic sectors, indicates clearly that lengths of operating and cash cycle are very different.

Instead of legally imposed deadlines, perhaps a better solution would be, in conditions of breaking deadlines, to turn so far non-interest-related liabilities into interest-related ones. In that way, the possibility of settling liabilities as a part of contractual obligations would be kept, and the space for abusing suppliers as free financing source would be considerably limited. If we add to all that the necessity of efficient implementation of Law on Bankruptcy Proceedings, we could consider it a good option in establishing financial discipline.

Furthermore, we should consider carefully the consequences regarding thoughtless establishing of certain legal forms of companies. Here we mean particularly private limited liability companies. The latest Company Law prescribed nonsensical 100 dinars as a minimum amount of initial founding capital [13]. We forget that these private limited liability companies have owners who are responsible for taken liabilities only to the amount of initial capital invested. It is not worth wasting words on discussing safety of such companies, their possibilities of borrowing and risks. The facility of company founding increases their number, as well as the number of those who do not settle their liabilities and who practice frauds. The possibility of paying creditors' receivables practically does not exist in bankruptcy proceedings. Of course, here we do not mean those companies which, owing to their profitability or higher stakes, formed a respectable amount of capital in their operations.

We should also mention the need for more rigid control of potential abuses which could affect liquidity. Here we mean the abuse of postponing exchange differences in order to report more favourable incomes and pay them out in form of dividends. These outflows could be significant, especially when it comes to companies whose founders are not companies operating in Serbia. There in a particularly interesting fact that such a possibility is authorized by the government and opposed to the International Accounting Standards whose application is regulated by the law. Of course, dividend payment is not disputable as a corporate decision, but artificial income shaping, with the aim to achieve this, is not allowed. At the same time, this is directly opposed to the logic of corporations' functioning where owners' interests have a residual character.

To all of the above-mentioned, we should add the necessity of efficient cash flow management. In that sense, we should pay attention to managing the cash gap (inventory days on hands + receivables collection period – accounts payable period = cash gap). Through cash gap management, we can understand how the efficiency of performing operating activities affects cash flows [3]. For cash gap, we have to provide additional financing sources, which is mostly done by taking short-term loans. In that case, daily interest costs based on financing the cash gap could be easily calculated. Every day of cash gap reduction means reducing the need for cash and daily savings in interest costs. Raising the efficiency of management over inventories and shortening the period of receivables payment are key management levers. We deliberately do not mention the option of prolonging liabilities to suppliers, since this option has been much abused in Serbian practice.

Improvement of management quality. Accepting market rules of doing business and change of ownership relations as direct results of transition process should have resulted, among others, in raising management quality. The imperative of maximizing companies' value implies program improvements, more intense investments and rational use of resources, which should bring about growth of profitability, employment and GDP. Generally speaking, it did not happen at the national economy level. Modest increase of operating revenues could be attributed to insufficient product and price competitiveness, inherited technical and technological outdatedness, bad positioning, difficulties

in obtaining additional capital etc. It is understandable up to a point, especially if we have in mind the previous years' situation regarding economic sanctions, ravages of war, insufficient development of capital market and so on. However, lagging behind in terms of raising the internal efficiency is not expected. In order to illustrate the problem, it is enough to mention the fact that, in 2011, the range of economic activity grew by 12% (calculated by growth of operating revenues), while operating income margin fell by slightly more than 6% (find more details in [10]). It is widely known that, in conditions of revenue growth, operating income margin has to rise due to degression of fixed costs. In such conditions, it is unrealistic to expect the reaching of price competitiveness.

The improvement of management quality necessarily implies raising the quality of knowledge and continuous professional development. Investing in knowledge belongs to the costs that could bring to the increase of revenues and even faster increase of operating income. Management has to be familiar with new managing approaches and ready to implement them in practice. The implementation of cost calculation, dominantly for the purpose of financial reporting, and calculation of full cost price for the purpose of forming selling prices is far from being sufficient. Managing the company performances implies the overall approach to cost analysis down the whole value chain, including costs before the production process, costs during the production process and costs related to post-sales services [6, pp. 25-27]. Cost reduction and continuous improvement are good ways towards the creation of cost competitiveness.

Management has to be open for the implementation of the whole range of disposable strategic and operational management concepts and instruments, like: life-cycle costing, target costing, kaizen costing, activity-based costing, activity-based budgeting, total quality costing, environmental costing, inventory management, benchmarking, analysis of the competition, just-in-time system, customer profitability, inter-organizational cost management etc (see more about these concepts in [2, pp. 242-253] and [4, pp. 426-482]). Some of these approaches will be very helpful in strategy articulation, implementation and control and in creation of success potential, while many of them will serve to raise the operational efficiency. Having in mind that the efficiency improvement has no alternative, redesigning information supply is inevitable for management. Thereby, it is not management that should deal with creating information supply in terms of operationalizing previous concepts. It is responsible for recognizing needs, providing conditions for the creation and implementation of various concepts, which will require, among others, the appropriate management accounting skills. We could freely say that the implementation of contemporary concepts in performance management represents the inevitable way to the creation of cost competitiveness for companies. Consequently, raising management quality is a relevant profitability determinant. Since profitability also implies the increase of company's equity, it is the determinant of company's safety as well, and an inevitable prerequisite for the establishment of financial structural balance.

Unsustainability of high financial expenses. The performed analysis of profitability and financial position of Serbian economy showed, among others, the increase of indebtedness level and very serious burdening of the economy with financial expenses. In the period from 2006 to 2011, long-term liabilities and short-term financial liabilities increased by 2.5 times (where the increase of long-term liabilities equals 2.3 times and the increase of short-term financial liabilities equals 3 times), while financial expenses increased by 2.4 times. Thereby, cost of debt (for the average amount of debt) goes between 12,8% and 22% [10, pp. 145-147]. In such a situation, no deeper analysis is necessary to prove the unsustainability of such high financing expenses. These margins are inappropriate and even much more developed economies would not take them. Thereby, the height of financial expenses is determined by interest rate level, exchange differences and the incorporated currency clause. Since cost-of-debt level is the key determinant of financial risk, we could state that financial risk is very high. Other important component of financial risk is the inconstancy, i.e. unpredictability of financial expenses' level. During the analysed five-year period, tremendous cost-of-debt fluctuations additionally increase the financial risk.

Previous observations confirm the importance

of macroeconomic stability for proper functioning of the economy. Cost-of-debt fluctuations are primarily the consequence of incorporated currency clauses and exchange differences. The rates of financial expenses were the lowest in 2007 and 2011 (about 12.8%) when the exchange rate was stable. Variations in the exchange rate have dramatic consequences to the economy. Thereby, advocating macroeconomic stability does not imply advocating fixed exchange rate. From our point of view, stability means advocating a clearly defined exchange regime which would reduce, at least, the unpredictability of financial expenses and respective financial risks.

A precondition for the exchange rate stabilization is curbing the inflation, i.e. reducing it to a reasonable level, certainly below 5%. The relations among inflation, interest rates and stock prices are familiar. This connection does not have to be direct and consistent, but it definitely exists [11, pp. 419-422]. It is well-known that credit institutions, in order to maintain targeted real returns, incorporate the inflation into interest rate, which affects the growth of inflation. When companies cannot shift the growth of production costs and financial expenses to their clients (due to price competitiveness), incomes and cash flow are reduced, and stock prices fall. The companies are not interesting to investors any more because shareholders' returns get smaller than the required creditors' returns. In such circumstances, companies slide into bankruptcy.

The unnatural alienation of financial and real sector has to be overcome. If people stopped believing that the long-term survival and development of financial sector is possible in the long term without real sector, it would certainly affect more cautious and responsible behaviour in setting conditions of economy crediting. Along with already mentioned and necessary monetary stability, in the process of creating conditions for cost-of-debt reduction, we should have in mind several important suggestions.

Firstly, the stability of banking system has to remain the strategic goal of banking market regulators. So the regulator, National Bank of Serbia (NBS), must be very cautious in terms of required relaxation of risks in those fields where there is no real ground for that.

Secondly, it is necessary to extend alternatives on the side of financial-source offer in order to reduce the monopolistic position of banking sector. Macroeconomic stability would certainly contribute to the attractiveness of corporate bonds as a financing source, while the appealing production programs could attract investors to common shares. The effect could be visible in the reduction of cost of debt.

Thirdly, it is necessary to raise the responsibility of bank management. By this, we mean the responsibility for wrong investments, since they are in charge of the evaluation of risks regarding investments and collateral and, accordingly, wrong decisions. Possible tendency to shift risks based on low-quality management to clients, through higher cost of debt, is unacceptable.

Fourth, it is necessary to reconsider the return sources of banking sector in order to clarify the lack of interest in real sector's destiny. The regulators' policies in terms of providing greater and cheaper economy crediting would probably, even then, be more effective. Banks must recognize their interest in crediting the economy and see their responsibility in that process.

Fifth, companies burdened with debts should not be inert. They need to keep in touch with creditors and, together with them, find the way for the relaxation of liabilities. It seems that creditors need to see their interest in resolving this problem. The unbearable pressure of high financial expenses is not only the problem of individual economic entities. They will certainly pay the price, but thereby, creditors as well will not be saved in many cases. We remind you that provided collateral, even supposing it is objectively estimated, is worth much less when the company goes bankrupt.

Besides the above-mentioned, we should have in mind that crisis cannot be overcome by extremely expensive loans. It should be vice versa. Money should be cheap. Judging by that, end of the crisis is not on the horizon.

Possibilities of financing sustainable growth of strategically important sectors. The fact is that not all the sectors have the same importance for the economic growth. In Serbia, sectors like agriculture, mining, processing industry and construction are often declared strategically important. Along with that, we would add the so-called infrastructural sectors like energy sector, telecommunications and transportation, which also

possess a strategic character. Their importance comes especially from the fact that they have a multiplying effect on the growth of activities in other sectors. As the key infrastructural sectors, they represent the pillars of national economy development.

The above-mentioned strategic sectors are capital-intensive. It means that they imply large investments in new capacities and revitalization of the existing ones. Such activities could be performed only by financially healthy companies. However, as financial structural disorders are more or less present in all sectors, these sectors are faced with double challenge. Firstly, certain companies within these sectors have to improve their financial performances along the way, and secondly, they must look ahead in order to reach and maintain certain target capital structure. All this opens the issue of providing necessary sources for financing sustainable growth.

Financing sustainable growth in capital-intensive sectors which have already had the unresolved financial structure implies the differentiation of financing sources and their combining according to target capital structure. In that sense, we must count on internally generated and external financing sources. Raising management quality and imposing financial discipline should bring to the increase of cash flow from operations. If, along with that, we would manage to reduce financial expenses to a reasonable degree, it would mean that bigger part of internally generated cash flows remains on disposal for financing the capital expenditure. In certain cases, when financial balance is not significantly impaired and when projects are less requiring in financial sense, internally generated cash flow, in combination with credit sources, could provide maintaining the target capital structure.

For financing more capital-intensive projects, internally generated sources will not be enough. It is necessary to rely on external own financing sources. Regarding companies that already have financial structural problems, the exit should be sought in recapitalization. When it comes to attractive projects combined with necessary prerequisites for the functioning of capital markets, some companies should seek the solution in the issue of shares. At this point, it seems that such activities do not have great chances for success, but we should not rule them out as an option. In order to resolve financial structural problems and provide sustainable growth, a good solution could be the recapitalization by strategic partners. In certain strategically important companies, we should not rule out the State as a potential investor. In infrastructural sectors, we should open space for the inflow of fresh capital based on public-private partnerships.

Finally, partial financing of capital projects from debt as an external source is acceptable as well. Of course, this is an option provided that target capital structure is not impaired and that the effect of financial leverage is positive. However, compared to current situation where credit sources are dominant, the differentiation of borrowed sources is necessary. In that sense, we should rely on long-term debt instruments. Corporate bonds could be particularly interesting. The precondition for that is the development of primary and secondary capital market.

Encouraging healthy parts of the economy. In bringing conclusions on profitability and financial position of the economy based on summary financial statements, one should be very careful, since total net incomes (losses) appeared as the result of offsetting total net incomes with total net losses and that net equity implies the decrease of equity for the amount of losses reported in liabilities and assets of the balance sheet. In other words, it means that there are healthy parts of the economy with above average achievements. Consequently, there are also those other parts of the economy, branches and individual companies, burdened with serious losses which sometimes exceed the amount of equity.

The seriousness of the presented situation is supported by the information that from total number of companies, in 2011, 58.2% reported incomes, 34.1% reported losses, while 7.7% reported the zero income. Thereby, total net incomes were higher than total net losses by only 1.2 times. Let us add that in 2010, net losses were higher than net incomes by 1.3 times [1, p. 9]. Not a small part of companies has losses which are higher than the amount of capital. Such a situation, in the economy that operates according to market principles, is unsustainable for a long term. Tolerating losses is perhaps acceptable in the companies whose survival in society is necessary. In other cases, where losses seriously endanger the height of equity,

there are two options. The first one implies admitting losses in capital, restructuring and recapitalization, of course, in places where it is justifiable and possible. On the other hand, companies that have been unprofitable for years, especially those with losses higher than equity and no future whatsoever, have to be market-sanctioned. From the point of view of national economy, it is generally not the problem to close one company. The problem is if there are no new companies opened, which, in total, would provide the growth of economic activity and the increase of employment. Such activities would reduce the risk that illiquid companies could bring healthy parts of the economy into illiquidity. The number of risky loans would also decrease, which would consequently have a positive influence on the reduction of financing expenses. Furthermore, the economy would get free of balance burden. So, growth should definitely be based on healthy parts of the economy.

Balance sheet adjustments. Previously described activities also represent a kind of balance sheet adjustments. However, by this we particularly mean adjustments in terms of excluding hidden losses. Hidden losses, appearing as the result of assets overrated and liabilities underestimated, are a very dangerous phenomenon. In this way, contaminated balance sheets, ceasing to be a reliable information source, bring the insecurity into decision-making process. It is certainly not in favour of the need to attract foreign investors. The causes of hidden losses could be sought in overrating intangible assets (excessive capitalization of expenses and the activation of expenses where it is forbidden, overrating the brand etc.), keeping the uncollectable receivables, leaving out potential liabilities etc. Responsibilities of management, auditors and accountants in this process are obvious. However, it is quite worrying that the government participates in the legalization of creating hidden losses. Thereby, we mean allowing companies to postpone the effects of foreign exchange losses (or gains) and currency clause for future periods, by separating them in balance sheet. Apart from risk in terms of making wrong decisions by the external stakeholders, there are possible damages based on paying increased tax liabilities, paying out the unearned bonuses and paying out unrealistic dividends [12, pp. 112-135].

Balance reality could also be supported by the objectivisation of excessive hidden reserves, which are essentially totally opposite to hidden losses. However, due to a fact that reasonable hidden reserves are desirable and that potential damages based on excessive hidden reserves are much smaller than damages caused by hidden losses, we will not discuss them further at this point.[2]

Rearrangement of company balance sheet would definitely contribute to raising the reporting power of financial statements. Higher statement credibility would bring to the increase of investor safety and reduction of the risk of adverse selection. Besides, providing safer insight into the financial position of the economy, sectors and individual branches, would reduce the risk of creating inadequate industry policies. Finally, the aim of establishing financial balance should be real performance state.

Conclusion

Financial structural heritage of Serbian economy represents a serious limitation for further growth of economic activities. In general, we could say that financial structural disorders are the result of decreased competitiveness and profitability of Serbian economy. However, there are much more factors that have affected general economic performances so far. Some of them are the result of external factors' activity (sanctions, structural disorders, long transition, crisis, high financing expenses etc.), while the others are internal (low efficiency, inability to find profitable projects, production and price competitiveness and so on). The major consequences are illiquidity, growth of indebtedness, reduction of equity, lack of net working capital, low profit margins, high financial expenses, negative effect of financial leverage, inability to finance sustainable growth and insufficient profitability.

Eliminating financial structural disorders is the prerequisite of growth in economic activities and strengthening the competitiveness of Serbian economy. In this paper, we stressed the key directions in resolving these problems, such as: ways of resolving illiquidity problem, necessity of management quality improvement, suggestions for the reduction of financial expenses,

2 See more about the potential risks based on hidden reserves in [7].

capabilities of financing sustainable growth of strategically important sectors, necessity of encouraging healthy parts of the economy and balance sheet adjustments in terms of excluding hidden losses. Regarding the issues discussed, we also mentioned some institutional assumptions for their solution, like macroeconomic stability, regulation stability, law implementation, development of capital market and raising the quality of financial reporting.

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AN INVESTIGATION OF INTELLECTUAL CAPITAL INFLUENCE ON FINANCIAL PERFORMANCE OF TOP SERBIAN EXPORTERS*

Istraživanje uticaja intelektualnog kapitala na finansijske performanse najvećih srpskih izvoznika

Abstract

Although intellectual capital (IC) is the key issue in achieving and sustaining competitiveness in the long run, the literature is limited in offering empirical data on whether IC affects export performance of the firm. This paper explores the impact of IC, measured using the Value Added Intellectual Coefficient (VAIC), on financial performance, as well as on export performance of 300 Serbian top performing companies in terms of export. The research entailed the analysis of the impact of individual VAIC components on financial performance. Scientific hypotheses are developed according to similar studies on IC and financial performance. Performance measures used in this research are divided into two categories. The first group consists of export-related indicators, such as export volume, and export volume per employee. The second group is made up of traditional measures of corporate performance (return on equity, return on assets, profitability, and employee productivity). Data is analyzed using statistical methods of correlation and multiple regressions. Multiple-regression models are employed to determine the relationship between individual components of VAIC and identified measures of performance. The majority of similar studies have shown so far that IC has a significant impact on financial performance. However, in the case of top Serbian exporters, the significant impact of IC on financial performance was not determined.

Key words: *intellectual capital, intangible assets, export performance, financial performance*

Sažetak

I pored činjenice da intelektualni kapital predstavlja ključno pitanje u postizanju i održavanju konkurentnosti na dugi rok, u literaturi još uvek nema dovoljno empirijskih dokaza o uticaju IK na izvozne performanse preduzeća. U radu se istražuje uticaj intelektualnog kapitala, merenog uz pomoć koeficijenta dodatne vrednosti intelektualnog kapitala (engl. Value Added Intellectual Coefficient, VAIC), na finansijske performanse 300 najvećih srpskih izvoznika. Istraživanje je podrazumevalo analizu uticaja pojedinih komponenti koeficijenta VAIC na finansijske performanse pomenutih preduzeća. Istraživačke hipoteze su definisane u skladu sa sličnim studijama koje su se bavile uticajem IK na finansijske performanse. Merila performansi koja su korišćena u ovom istraživanju su podeljena u dve kategorije. Prva grupa se sastoji od indikatora povezanih sa izvoznim performansama, kao što su obim izvoza i obim izvoza po zaposlenom. Druga grupa je sastavljena od tradicionalnih merila performansi (prinos na kapital, prinos na aktivu, profitabilnost i produktivnost zaposlenih). Podaci su analizirani pomoću statističkih metoda korelacije i višestruke regresije. Modeli višestruke regresije su korišćeni sa ciljem utvrđivanja prirode odnosa između pojedinačnih komponenti VAIC i identifikovanih merila performansi. Većina sličnih studija ukazuje na činjenicu da IK ima značajan uticaj na finansijske performanse. Međutim, u slučaju srpskih najvećih izvoznika značajan uticaj IK na finansijske performanse nije dokazan.

Ključne reči: *intelektualni kapital, nematerijalna aktiva, izvozne performanse, finansijske performanse*

Introduction

Business performance is measured by tangible outcomes, which are the result of different undertaken actions. In addition, business represents the sum of various resources, skills, and competencies, which are driven by activities specified within chosen strategy. Hence, resources are therefore a key factor in the process of strategy formulation and execution. The problem is, however, that employed resources, which are exploited during strategy execution, cannot create value independently. They create competitiveness and value only if they are supported by

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adequate capabilities in organization. Capabilities make resource-based value creation possible; they are often intangible and interpreted as knowledge, information, skills, customer relations, customer loyalty, organizational capabilities, networks, corporate culture, and image.

A knowledge-based economy has one important prerequisite for corporate success: the efficient and effective use of intangible resources in terms of achieving sustainable competitive advantage. In other words, in business models imposed by the information age, intangibles create more value than tangible resources do [17]. Also, the importance and potential of IC as the factor of competitive advantage is unquestionable. Developed market economies base their competitiveness on knowledge, information, commercial innovativeness, corporate strategies, and the sophistication of their business models, and far less on natural resources and cheap labor [18]. In analyzing IC and its impact on financial performance of companies operating in information-age, one must take into account the nature and elements of intangibles, the possibility of measuring intangibles, and their relation to value creation.

According to Hall [16], intangible assets are modern value drivers, which productively transform resources into tangible assets with added value. Lev [23] defines intangibles as resources that will lead to future benefits for the company. He denotes that intangibles consist of the existing knowledge in an organization that is used to create differential advantage. Stewart [31] sees IC as a "collective brainpower" of a company, which includes knowledge, information, intellectual property, and expertise used in the process of value creation. Funk [13] links intangibles to management's credibility, innovation potential, identified brand, ability to attract talented individuals, research leadership, social responsibility and attitude towards environment. Sullivan [32] defines IC as knowledge that can be transformed into profit. Different definitions of IC have one thing in common, and that is the fact that intangibles represent type of assets in a company, which possess the highest potential for future value creation [9, p. 572].

In addition, to fully understand the nature of intangibles, it is important to review their consisting elements. The most widely used classification of IC divides it into three categories [1], [25], [33]: human, structural, and relational capital. Human capital comprises the knowledge and skills of employees, their talents, creativity, enthusiasm, and ability to learn. Structural capital entails components of internal corporate structure: corporate culture, trademarks, patents, software, copyrights, databases, and management processes. Relational capital refers to the numerous relations made with external stakeholders of a company (investors, customers, suppliers, creditors). Examples of relational capital include brands, reputation, customer relations, cooperation with partners, licenses, and distribution channels [19]. The approach that summarizes different categorizations of IC is given in Table 1.

In terms of different measurements that can be used, some researchers define IC as the positive difference between the market value of the company and book value of its net assets [3], [6]. However, this positive difference cannot always be linked to the effects of intangibles on corporate performance. The main disadvantage of this measure, i.e. seeing intangibles as this positive difference, is that it doesn't take into account the fact that market noise might influence the market value of shares and thus the value of intangibles [10]. This implies that further research is needed into the ways in which IC can be measured, as

Table 1: Components of IC

Human capital	Structural capital	Relational capital
- Knowledge and skills	- Corporate culture	- Brand
- Trainings	- Management process	- Market reputation
- Creativity	- ICT systems	- Customer relations
- Ability to learn	- Corporate strategy and plans	- Communication with existing and new customers
- Responsibility, individualism, dedication	- Internal databases	- Ability to appeal to new customers
- Enthusiasm and level of motivation	- Software	- Business networks
- Flexibility and adaptability	- Patents, licenses, authorship rights	- Sales channels
- Attitudes (toward life, family, career, etc.)	- Franchises	- License agreements

Source: [18]

well as its impact on corporate performance in knowledge-based economies. A number of good attempts have been made in the past two decades to identify a suitable IC measurement model to describe its structure, nature, and effects on corporate performance.

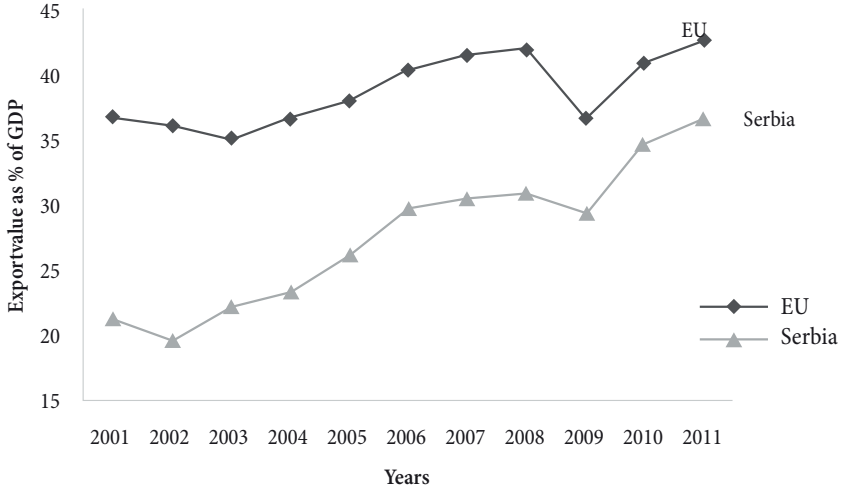
In terms of growth strategies, companies tend to undertake expansion of business operations by searching beyond their domestic markets. These companies tend to focus on high-growth export markets in order to ensure survival and growth. This is why export performance of companies gains much attention while analyzing overall corporate performance [30]. The value of export of goods and service as a percentage of GDP is increasing in European Union during last 50 years. The same situation is also with OECD member states. Comparing these data with the data for Serbia during the same period, we see that export performance in Serbia was going through ups and downs. Unfortunately, the export performance from 1993 till 2011 shows steady decrease, which is why the question regarding export performance analysis should be taken into consideration in order to determine the main drivers of this business activity in Serbia (see Figure 1).

The paper is structured logically and according to the nature of the research. In the first part (Literature review) the paper deals with three major issues. Firstly, attempts to measure the effectiveness of the use of IC in a company are presented. Afterwards, it is logical to continue with exploring the ways in which export performance can be observed and measured. Finally, the authors present the latest empirical studies regarding the issues of relationship between IC and corporate performance of companies. In the second part of the paper (Research methodology) authors focus on presenting the conceptual framework of the research, thus including research objectives and development of hypotheses, definition of variables that are used in the research, and ultimately, data sources and sample description are presented. In the third part, the authors present empirical findings. Finally, there are adequate conclusions, limitations and directions for future research studies in the field.

Literature review

As noted previously, the literature is rich with different approaches to defining, categorization, and measurement of IC within a company. In addition, there are numerous empirical analyses performed in terms of studying impact of intangibles on corporate and market performance of companies. Few research studies stand out regarding this matter, and the structure of this segment of the paper will be adjusted accordingly. Firstly, the paper will briefly present the methods for measuring intangibles' efficient and effective use. Secondly, the paper will identify different approaches to effective measuring of export performance of companies. Thirdly, we will focus on research studies carried out in similar economies, which deal with relationship between IC's exploitation and corporate performance focusing on the influence of various components of IC on export performance.

Figure 1: Export value as percentage of GDP



Source: Authors' calculation according to the data from World Bank [37]

Measuring IC

Many attempts have also been made to find a useful model for measuring the size and impact of IC on overall company performance. One early effort in this area can be seen in the work of Edvinsson [11], who developed a model for measuring IC, known as the Skandia Navigator. Methods for measuring IC can be categorized into four large groups, according to Sveiby [34]: 1) market capitalization methods; 2) direct measurement methods; 3) scorecard approaches; 4) economic value-added approaches. However, the Value Added Intellectual Coefficient (VAIC) method, used in this paper, does not fit into any of the above groups, so Chan [2] has labeled it as a fifth approach to measurement of IC [22].

The approach used in the analysis of effective use of IC within Serbian high performing exporting companies was introduced and implemented by Ante Pulic from the Austrian IC Research Center [27], [28]. This approach uses VAIC as a measure of a company's efficiency in exploitation of IC. The VAIC model is based on the notion that human or knowledge potential positively influences corporate performance and success. In the context of Pulic's model, the starting point is assessment of the value added (VA) achieved by a company. VA is calculated as a difference between total revenues (OUT) and total expenses (IN), except for those related to human resources, which are viewed as an investment, not a cost in terms of this approach. The ultimate goal is to determine the individual contribution of all elements of IC to the creation of VA. Calculation of VAIC thus is implemented through following equations:

(1) $VA = OUT - IN$

(2) $HCE = VA/HC$

(3) $SCE = SC/VA$

(4) $ICE = HCE + SCE$

(5) $CEE = VA/CE$

(6) $VAIC = ICE + CEE$

A company's IC consists of human and structural capital. Calculation of human capital efficiency (HCE) starts with employees' salaries and wages during one fiscal year. HCE is calculated according to equation (2), where human capital, denoted as HC, includes total salaries and wages. In this way, the model highlights the relative contribution of human resources to creation of VA. The next component of intangibles, structural capital, includes hardware, software, organizational structure, patents, trademarks, and all other factors that support or increase employee productivity (EP). Thus, structural capital efficiency (SCE) is calculated as presented in equation (3), where SC stands for structural capital. This equation indicates that SCE is inversely related to HCE. Intellectual capital efficiency (ICE) is obtained by summing the partial efficiencies of human and structural capital, as described by equation (4). Finally, the physical capital component, or capital employed efficiency (CEE), is derived from the ratio of VA to a company's net assets (equation (5)). Here, capital employed (CE) is the capital already invested in a company. In order to enable a comparison of overall value-creation efficiency, the two indicators need to be summed (equation (6)). This aggregated indicator allows us to understand a company's overall efficiency and indicates its ability to create value by using IC. Put simply, VAIC measures how much new value has been created per invested monetary unit.

Measuring export performance

During past decades, a significant number of research studies have been carried out on topic of examining export performance of companies. This serves as the proof of growing importance of this field of research. However, despite the fact that there are many empirical studies in this area, the conclusions from these research studies are often fragmented and contradictory. The main reason for this is lack of unique measure for ranking export performance of companies. In other words, authors fail to agree on the way in which to conceptualize and implement various export performance measures. Mostly, authors made different export measuring schemes, based on different performance dimensions [7]. Since measuring export performance was often labeled as least understood area of international marketing, Sousa [30] performed a broad empirical analysis of approaches that exist in the field of measuring export performance of companies. The author collected the data from 43 different research studies and analyzed the export performance measures used. All the methods were categorized as objective, subjective, general, and miscellaneous. Export performance indicators that are mainly based on absolute values, such as export

intensity, export sales volume, export market share, and alike, are labeled as objective measures. On the other hand, indicators that use perceptual or attitudinal performance like perceived export success or satisfaction with export sales are considered to be subjective.

Objective measures of export performance include 1) absolute measures of export performance (export intensity, export intensity growth, export sales growth, export sales volume, and export sales efficiency); 2) profit-related measures (export profitability, export profit margin, and export profit margin growth); and 3) market-related measures (export market share, export market share growth, and market diversification). On the other side, there are subjective measures of export performance, which are often used when managers are unwilling or unable to provide objective financial data or because of the difficulty in reconciling cross-national or cross-industrial differences in accounting practices, variations in exchange rates, and financial reporting between home and host countries [38]. Besides these two main categories, there are indicators marked as *general measures*. These include managers' degree of satisfaction with overall export performance, overall export performance compared to competitors, export success, meeting expectations, how competitors rate firm's export performance, and strategic export performance. Finally, several *miscellaneous* measures were used across analyzed studies. These are contribution of exporting to the quality of firm's management, quality of distributor relationships, customer satisfaction, and reputation of the firm compared to competitors, among others [30].

IC and corporate performance

The relationship between appropriate use of IC and various indicators of corporate performance has been widely studied in the literature. For the purposes of the present research, we will focus on studies carried out in similar economies to Serbia's as well as on studies analyzing the impact of intangibles on export performance.

Firer and Williams [12] conducted research on a sample made up of 75 companies listed on the Johannesburg Stock Exchange. This study is particularly interesting since the economy of South Africa was, at the time (2003), in the same stage of transition that the Serbian economy is experiencing today. The results revealed that in general, empirical findings suggest that despite efforts to improve its intellectual capital base the business environment and market in South Africa still appears to place greater weigh to corporate performance based on physical capital assets. An interesting study performed by Goh [14] presented the efficiency of intangibles' use in domestic and foreign banks in Malaysian territory. This research found that domestic banks were generally less efficient at exploitation of IC. A similar study [29] was conducted on Egyptian software companies to analyze how intangibles affected the organizational performance of selected companies. The results confirmed positive correlation between human capital indicators and firm performance.

On the other hand, the studies carried out in Serbia regarding the impact of IC on firm performance are very scarce. However, there are a couple of research studies stressing out this issue for different types of samples. A study carried out within Serbian industrial (real) sector, analyzing one hundred of Serbian most profitable companies in 2010 [18] revealed that net profit did not depend on HCE, SCE, and CEE and thus was not the consequence of the efficient use of IC. The situation is similar when operating revenue and operating profit and their relationship with VAIC were analyzed. However, the research revealed that human capital and physical capital influenced return on equity, with physical capital more influential than human. On the other hand, return on assets was mainly determined by structural component of VAIC. An extent to the mentioned study, a survey was implemented again among most profitable Serbian companies in 2011 [21]. The empirical study revealed that that corporate performance was primarily affected by physical capital and in small proportion by structural capital. This serves as the proof that Serbian companies are still using the business model that promotes relying on physical, instead on IC. In addition, a study was undertaken among Serbian companies labeled as top performing in terms of market indicators. The research was aimed at discovering the relationship between IC and corporate performance among firms that make up the so-called Belex15 index. This study also failed to confirm the existence of a strong positive correlation between VAIC and corporate

performance [19]. Finally, when analyzing the practices regarding usage of IC in last several years in Serbia [20], it was confirmed by the analysis of median values over the four-year period (2007-2010), that Serbian companies are increasingly reliant on IC. However, when analyzing different industries, the study failed to prove significant difference among industries in terms of sources of value creation. In other words, there is no industry that relies more on intangibles than the other. Final conclusion made by the mentioned study was the fact that, although there was no significant impact of intangibles on corporate performance, companies with higher values for VAIC tend to have better corporate performance.

The relation between IC and export performance was given special attention as well. A study implemented among 388 firms from Florida [15] revealed that the manner in which human resources strategy is implemented plays a significant role in subsequent export performance. Mavridis [24] analyzed the difference in business models between Greek localized firms and globalized ones. The study pointed to the conclusion that that localized firms are the distinct small technocratic, blue-collar intellectual performers while the globalized ones are the large plutocratic, white-collar intellectual performers. The more recent research undertaken by Pucar [26] showed that there was positive influence of VAIC and its components on the export growth in the sector of food and beverages and manufacturing of furniture and wood products in Bosnia and Herzegovina. However, for other sectors there is no significant relation between IC and corporate performance.

Research methodology

Research objectives and hypotheses

The research had two main objectives. The first was to determine whether IC affects export performance among Serbian top 300 exporters during 2011. In order to examine whether export volume and export volume per employee are affected by IC, we chose the elements of VAIC as independent variables. These variables are human capital efficiency, structural capital efficiency, and capital employed efficiency. Bearing this in mind we define the first two hypotheses:

H1. Companies with greater value for VAIC tend to have higher export volume

H2. Companies with greater value for VAIC tend to have higher value for export volume per employee

The second objective of the proposed research model was to investigate whether top exporting companies base their competitiveness on foreign markets on intangible or tangible resources. In order to determine this, we examined the relationship between volume of IC existing in the company and the corporate performance.

The components of VAIC will again serve as independent variables. In this regard, we formulated the following hypotheses:

H3. Companies with greater value for VAIC tend to have higher ROE

H4. Companies with greater value for VAIC tend to have higher ROA

H5. Companies with greater value for VAIC tend to have higher profitability level

H6. Companies with greater value for VAIC tend to have higher EP

Defined research hypotheses were tested through statistical analysis, which included analysis of descriptives, correlation analysis, as well as multiple regression analysis. The gathered data were processed by IBM SPSS Statistics 20 software.

Definition of variables

The proposed model includes dependent and independent variables. The chosen dependent variables for the defined research objective are return on equity (ROE), return on assets (ROA), profitability, and employee productivity (EP). These variables will act as dependent ones. These dependent variables are calculated as follows:

- ROE: net profit divided by the book value of average stockholders' equity
- ROA: the ratio of pre-tax income to the company's total assets
- Profitability: the ratio between operating profit and operating revenues
- EP: the ratio of pre-tax income to total number of employees.

Independent variables used are components of VAIC,

described previously in the part of the paper entitled Measuring IC. For the purposes of accomplishing the second goal of the research, we chose suitable measures of export performance for the presented model in the form of export volume and the ratio export volume per employee. These two indicators will serve as two extra dependent variables in the research.

Data sources and sample description

The sample consists of 300 companies with the highest absolute level of export during 2011. Data source for external trade statistics is the Single Administrative Document on exports and imports of goods obtained from Chamber of Commerce and Industry of Serbia [35]. The data were gathered through detailed analysis of official financial reports published through web site of Agency for business registers [36], and through detailed analysis of these reports performed by the authors.

The companies that make up the defined sample are of the various legal forms and sizes. The Serbian top exporting performers achieved significant contribution to overall business activity in Serbia. Serbian top exporting performers significantly affect the overall employment rate. Out of total of 1,173,000 employed in Serbia, top 300 exporting companies make up 12.46% (146,149). The top ten exporters employ 14.57% of total number of workers hired by these 300 companies. In addition, the top ten exporters realized 18.53% out of all sales achieved by the top 300 exporters during 2011.

During 2011, the total value of all exported goods and services was 8,081.4 million Euros, while the value of export of 300 top performing exporters makes up 79% of this. In terms of net profit, the top exporting performers realized net profit in the amount of 10.99% of total realized value of net profits of all business subjects in Republic of Serbia during 2011. The average value for return on assets (ROA) of 300 top exporting companies in Serbia is 4.59%, while the average ROA for the whole Serbian economy in 2011 was 2.1%. Among top 300 top performing exporters, 80% realized positive net profit in 2011, while 20% were either at zero level in terms of net profit, or achieved net loss. In terms of financial performance, only two companies that are among top ten exporters in 2011 are among top ten companies in terms of realized net profit in the same year. Furthermore, only three companies from top ten exporting group are among top thirty firms ranked according to net profit. This implies that top Serbian exporting companies are not necessary among the best ones when it comes to net profit, and vice versa. In addition, two biggest exporting companies in 2011 realized heavy losses in the same year.

Empirical findings

Descriptive statistics

The initial statistical test performed on the defined sample assesses the normal distribution of data within the sample. The objective here is to determine the nature of the data and to select an appropriate type of correlation analysis.

Kolmogorov–Smirnov and Shapiro–Wilk tests of normality (see Table 2) clearly suggest none of the analyzed

Table 2: Tests of normality for observed variables

Tests of Normality						
	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Dependent variables						
Export volume	.282	243	.000	.549	243	.000
Export volume per employee	.426	243	.000	.128	243	.000
ROE	.420	243	.000	.110	243	.000
ROA	.166	243	.000	.793	243	.000
Profitability	.399	243	.000	.147	243	.000
EP	.281	243	.000	.464	243	.000
Independent variables						
HCE	.299	243	.000	.403	243	.000
SCE	.290	243	.000	.368	243	.000
CEE	.372	243	.000	.178	243	.000
a. Lilliefors Significance Correction						

variables has normal distribution of data. This indicates that the analysis requires non-parametric statistical tests. This implies that it is necessary to apply Spearman's correlation analysis in the next step.

Table 3 presents the values of descriptive statistics for the sample analyzed within this research. The descriptive statistics presented entail minimum and maximum values, mean values, standard deviation, and variance.

Correlation analysis

Table 4 presents the results of correlation analysis using Spearman's coefficient of correlation, for data without a normal distribution. Values for the correlation coefficient are interpreted according to Cohen [5]. The results indicate that there is weak correlation between export volume and physical capital invested (0.166). On the other hand, export volume per employee expresses significant moderate positive correlation with human and structural capital, but only weak with physical capital. ROE positively correlates with all elements of VAIC. Specifically, there is strong positive correlation with human and structural capital, and weak correlation with physical capital employed. Similarly, ROA has strong positive correlation with HCE, moderate correlation with SCE, and weak one with CEE. Productivity strongly correlates with all components of VAIC. Finally, employee productivity strongly correlates with human and structural capital, while there is weak correlation with physical capital.

In order to examine the nature of relationships between the dependent and independent variables, the

Table 3: Descriptive analysis

Descriptive Statistics						
2011	N	Minimum	Maximum	Mean	Std. Deviation	Variance
Export volume	300	4644494.48	652110263.54	22222937.99	47898532.93	2294269457208125.00
Export volume per employee	300	0.00	17757632.53	287761.17	1188582.07	1412727334373.35
ROE	276	-36.08	2.42	0.002	2.23	4.98
ROA	293	-0.58	0.93	0.046	0.12	0.01
Profitability	276	-32.31	4.27	0.09	2.04	4.16
EP	299	-99178.22	451866.02	9798.44	38653.35	1494081379.78
HCE	258	-55.08	23.63	2.52	4.49	20.12
SCE	259	-2.37	11.83	0.49	0.86	0.75
CEE	275	-0.14	54.84	1.01	3.64	13.27
Valid N (list wise)	243					

Table 4: Correlation analysis

		HCE	SCE	CEE
Export volume	Correlation Coefficient	.095	.098	.166**
	Sig. (2-tailed)	.126	.114	.006
	N	258	259	275
Export volume per employee	Correlation Coefficient	**.403****	**.353****	**-.128***
	Sig. (2-tailed)	.000	.000	.034
	N	258	259	275
ROE	Correlation Coefficient	**.608****	**.542****	**.133***
	Sig. (2-tailed)	.000	.000	.027
	N	243	244	275
ROA	Correlation Coefficient	**.619****	**.469****	**.292****
	Sig. (2-tailed)	.000	.000	.000
	N	258	259	275
Profitability	Correlation Coefficient	**.660****	**.597****	**.640****
	Sig. (2-tailed)	.000	.000	.000
	N	243	244	275
EP	Correlation Coefficient	**.804****	**.649****	**.188****
	Sig. (2-tailed)	.000	.000	.002
	N	258	259	275

Correlation is significant at the 0.01 level (2-tailed).**

Correlation is significant at the 0.05 level (2-tailed).*

next section of the paper presents the results of multiple-regression analysis. The conclusions that will be drawn from regression analysis will significantly alter the ones made from correlation analysis.

Regression analysis

The multiple-regression model used in this study has, as dependent variables, export volume, export volume per employee, ROE, ROA, profitability, and EP, while the independent variables are components of VAIC, which are HCE, SCE, and CEE. The research model includes six regression models whose primary goal is to examine the nature of the relationships between selected indicators of performance and IC.

Regression model 1:

Independent variable – export volume

When observing regression model no. 1 (see Table 5 and Table 6), which has export volume as independent variable, there are several important remarks that need to be pointed out. The model has poor quality in terms of fit, since the value for R squared is only 0.002. This implies that the changes in VAIC can only explain 0.2% of changes in the export volume. In addition, none of the components of VAIC significantly affects export volume.

Regression model 2:

Independent variable – export volume per employee

Similar conclusions can be made when analyzing second regression model, with export volume per employee as dependent variable (see Table 7 and Table 8). Model fit is poor (R square is only 1.5%), while there is also lack of influence of intangibles on export volume per employee. The factor with the closest level of impact is human capital component with the level of significance of 0.095 and beta with 0.108 values. The general conclusion regarding the impact of IC on export performance is that it does not exist. This serves to prove that export performance depends on other factors, different from VAIC components.

Table 5: Assessing the model fit

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.046	.002	-.010	29061982.92011
a. Predictors: (Constant), CEE, HCE, SCE				

Table 6: Summary of the regression model no. 1

Coefficients								
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig. Tolerance	Collinearity Statistics	
B		Std. Error	Beta				VIF	
1	(Constant)	20643360.196	2473693.113		8.345	.000		
	HCE	197295.935	410261.038	.031	.481	.631	.992	1.008
	SCE	635090.328	2205344.068	.019	.288	.774	.985	1.015
	CEE	-173678.839	486542.746	-.023	-.357	.721	.991	1.009
a. Dependent Variable: Export volume								

Table 7: Assessing the model fit

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.121	.015	.002	1193493.9562239
a. Predictors: (Constant), CEE, HCE, SCE				

Table 8: Summary of the regression model no. 2

Coefficients								
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig. Tolerance	Collinearity Statistics	
B		Std. Error	Beta				VIF	
1	(Constant)	109718.792	101587.624		1.080	.281		
	HCE	28201.012	16848.268	.108	1.674	.095	.992	1.008
	SCE	62236.144	90567.282	.044	.687	.493	.985	1.015
	CEE	6123.656	19980.943	.020	.306	.760	.991	1.009
a. Dependent Variable: Export volume per employee								

Regression model 3: Independent variable – ROE

When analyzing the corporate performance of top Serbian exporters, measured by ROE, the situation is changing (see Table 9 and Table 10). The model fit is better compared to first two regression models, since R square is 7.4%, meaning that ROE changes could be explained by changes in applying IC in 7.4% of cases. In addition, there is significant impact of structural and capital employed efficiency on ROE during 2011.

Regression model 4: Independent variable – ROA

The fourth regression model reveals that changes in values of ROA are caused in 8.8% of cases by alterations in values of VAIC. When examining the nature of these

Table 9: Assessing the model fit

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.272	.074	.062	2.2959961
a. Predictors: (Constant), CEE, HCE, SCE				

Table 10: Summary of the regression model no. 3

Coefficients								
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig. Tolerance	Collinearity Statistics	
B		Std. Error	Beta				VIF	
1	(Constant)	-.221	.195		-1.129	.260		
	HCE	.023	.032	.045	.717	.474	.992	1.008
	SCE	.492	.174	.177	2.825	.005	.985	1.015
	CEE	-.111	.038	-.181	-2.898	.004	.991	1.009
a. Dependent Variable: ROE								

Table 11: Assessing the model fit

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.296	.088	.076	.1116150
a. Predictors: (Constant), CEE, HCE, SCE				

Table 12: Summary of the regression model no. 4

Coefficients								
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig. Tolerance	Collinearity Statistics	
B		Std. Error	Beta				VIF	
1	(Constant)	.037	.010		3.932	.000		
	HCE	.006	.002	.222	3.573	.000	.992	1.008
	SCE	.023	.008	.169	2.708	.007	.985	1.015
	CEE	-.001	.002	-.043	-.693	.489	.991	1.009
a. Dependent Variable: ROA								

Table 13: Assessing the model fit

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.224	.050	.038	2.1150595
a. Predictors: (Constant), CEE, HCE, SCE				

Table 14: Summary of the regression model no. 5

Coefficientsa								
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig. Tolerance	Collinearity Statistics	
B		Std. Error	Beta				VIF	
1	(Constant)	-.082	.180		-.458	.648		
	HCE	.032	.030	.068	1.074	.284	.992	1.008
	SCE	.351	.160	.139	2.184	.030	.985	1.015
	CEE	-.080	.035	-.143	-2.252	.025	.991	1.009
a. Dependent Variable: Profitability								

relationships (see Table 11 and Table 12), we can see that ROA depends significantly on human and structural capital component. In other words, knowledge, skills, enthusiasm, organizational structure, databases, and so on, primarily affect return on total assets of Serbian top 300 exporters.

Regression model 5: Independent variable – profitability

Given that R square for regression model no. 5 has the value of 0.05, we can say that the model has poor quality. However, there is significant impact of structural capital and physical capital on profitability (see Table 13 and Table 14). This impact is statistically significant, but due to the low model fit, in practice this relation does not possess practical value.

Regression model 6: Independent variable – EP

The regression model with the best quality so far is the last one, examining the nature of relationship between employee productivity and components of VAIC (see Table 15 and Table 16). The changes in the value of employee productivity can be explained by changes in managing intangibles, measured by VAIC, in 13.3% of cases. Furthermore, human capital possesses significant influence on employee productivity, while structural capital is close to significant level (sig. = 0.065). Physical capital does not affect the level of employee productivity at top Serbian exporters. Finally, findings confirming the research hypotheses can be summarized as in Table 17.

Table 15: Assessing the model fit

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.365	.133	.122	38887.0795514
a. Predictors: (Constant), CEE, HCE, SCE				

Table 16: Summary of the regression model no. 6

Coefficients								
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
B		Std. Error	Beta			Tolerance	VIF	
1	(Constant)	2551.394	3309.984		.771	.442		
	HCE	3056.428	548.960	.337	5.568	.000	.992	1.008
	SCE	5461.905	2950.913	.112	1.851	.065	.985	1.015
	CEE	-127.733	651.030	-.012	-.196	.845	.991	1.009
a. Dependent Variable: EP								

Table 17: Confirmation of research hypotheses

Independent variable	Dependent variable	R^2	β	Level of significance	Hypothesis	Hypothesis confirmed
HCE	Export volume	0.002	0.031	0.631	H1	NO
	Export per employee	0.015	0.108	0.095	H2	NO
	ROE	0.074	0.045	0.474	H3	NO
	ROA	*0.088*	*0.222*	*0.000*	*H4*	*YES*
	Profitability	0.050	0.068	0.284	H5	NO
	EP	*0.133*	*0.337*	*0.000*	*H6*	*YES*
SCE	Export volume	0.002	0.019	0.774	H1	NO
	Export per employee	0.015	0.044	0.493	H2	NO
	ROE	*0.074*	*0.177*	*0.005*	*H3*	*YES*
	ROA	*0.088*	*0.169*	*0.007*	*H4*	*YES*
	Profitability	*0.050*	*0.139*	*0.030*	*H5*	*YES*
	EP	0.133	0.112	0.845	H6	NO
CEE	Export volume	0.002	-0.023	0.721	H1	NO
	Export per employee	0.015	0.020	0.760	H2	NO
	ROE	*0.074*	*-0.181*	*0.004*	*H3*	*YES*
	ROA	0.088	-0.043	0.489	H4	NO
	Profitability	*0.050*	*-0.143*	*0.025*	*H5*	*YES*
	EP	0.133	-0.012	0.845	H6	NO

Conclusion and limitations

During industrial age, economists described the basic resources necessary for industrial firm in terms of three classic types of assets: land, labor, and capital (here capital stands for financial and other economic assets). The idea of intellectual capital was a new one, since it emphasizes the brainpower assets of an organization, recognizing them as important as traditional land, labor, and tangible assets [32]. Since the 1990s, the issue of intellectual capital has gained much academic and professional attention, and in knowledge-based economy, intangibles are the pillar stones of sustainable competitive advantage. The rules of the game are changing in times of global economic crisis, but intellectual capital still represents the only valid way in which to regain strength of national economies. Serbia was already in a transitional recession when it entered global economic crisis of 2008. The global and domestic crises, caused by structural imbalances before and during the transition, multiply each other's negative effects. This is why companies find themselves exposed to increasing systemic risk [9]. In order to cope with the current situation the real sector of economy must focus and rely on resources that have the potential for creating and sustaining value in the long run. The main driving force must be intellectual capital.

Unfortunately, the results of this empirical study fail at confirming that Serbian top performing exporters create competitive advantage on intellectual capital management. For the purposes of this paper, we examined the impact of each component of Value Added Intellectual Coefficient in order to see which component has prevailing influence on exporters' financial performance. Specifically, we observed financial performance through two separate types of indicators. The first group of measures consists of performance indicators based on export volume. Here, we analyzed absolute volume of export and export volume per employee. The results of the study failed to confirm that export volume and export volume per employee were under the influence of any of the VAIC components. The closest impact to significant is the impact of human capital efficiency on export volume per employee.

In the case of the second group of performance indicators, they consist of traditional measures of corporate performance. We observed the impact of VAIC components on return on equity, return on assets, profitability, and employee productivity. However, we must take into account a few drawbacks of VAIC. The most significant one is that VAIC is calculated using companies' financial statements, which implies that the coefficient is a measure of value created in the past and not that of value-creation potential. Another criticism is that VAIC highlights the contribution of each component of IC to value creation and cannot include synergistic effects of its components. In addition, the model fails to offer an adequate analysis of the creation of VA for those companies that have negative values for equity and operating profit [4].

The study confirmed that return on assets is under significant impact of human capital component, as well as structural capital segment of VAIC. Human capital also influences employee productivity. In addition, structural capital significantly determines the values of return on assets and profitability, while capital employed efficiency affects return on equity and profitability. The main limitation of these results is the quality of all of the regression models in question. Model fit, measured by R square, ranges from 13.3%, in case of relationship between HCE and EP, to 5% in case of examining the impact of CEE on profitability. This is why only two companies that are among top ten exporters in 2011 are among top ten companies in terms of realized net profit in the same year, while only three companies from top ten exporting group are among top thirty firms ranked according to net profit. This leads to the general conclusion that the impact of intellectual capital on financial performance of Serbian top 300 exporters is extremely weak and vague at the present time. Partially, this conclusion can be attributed to the limitations of the VAIC methodology itself, but the main problem lies in economy's underestimating the importance of appropriate exploitation of existing level of intellectual capital, as well as neglecting the necessity to invest in it in the future.

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THE ROLE OF CORPORATE ENTREPRENEURSHIP IN SOLVING THE COMPETITIVENESS CRISIS OF LARGE COMPANIES*

Uloga korporativnog preduzetništva u rešavanju krize konkurentnosti velikih preduzeća

Abstract

The purpose of this paper is to highlight importance of entrepreneurship in gaining and maintaining competitive advantage in large companies. The paper examines following four forms of corporate entrepreneurship and its development modalities: Corporate venturing, Intrapreneurship, "Bringing the market inside", and Entrepreneurial transformation. The paper has demonstrated that lack of entrepreneurial focus is not necessarily an outcome of company's developmental growth, i.e. that lack of entrepreneurial spirit can be postponed, prevented, or retrieved if lost and that entrepreneurial transformation entails profound and complex changes in organizational structure. Even more, entrepreneurial behavior is becoming more and more a company's growth factor. Growing entrepreneurial transformation need will ultimately require new organizational forms and wider range of applicable solutions.

Key words: *corporate entrepreneurship, corporate venturing, intrapreneurship, "bringing the market inside", entrepreneurial transformation, innovations*

Sažetak

Cilj ovog rada je ukaže na značaj preduzetništva za sticanje i održanje konkurentske prednosti velikih preduzeća. U radu se razmatraju sledeća četiri oblika korporativnog preduzetništva i načini njihovog razvoja: Korporativno investiranje u nova preduzeća, Unutrašnje preduzetništvo, Uvođenje tržišta, i Preduzetnička transformacija. Rad pokazuje da gubitak preduzetničkog fokusa ne mora biti nužna posledica rasta preduzeća, odnosno da se gubitak preduzetničkog duha može odložiti ili sprečiti, a ako je izgubljen onda vrati kao i da preduzetnička transformacija podrazmeva korenite i složene promene strukture preduzeća. Čak i više, preduzetničko ponašanje postaje sve više uslov rasta preduzeća. Sve veće potrebe za preduzetničkom transformacijom preduzeća u budućnosti nužno će tražiti nove forme organizacije i širi spektar mogućih rešenja.

Ključne reči: *korporativno preduzetništvo, korporativno investiranje u nova preduzeća, unutrašnje preduzetništvo, uvođenje tržišta, preduzetnička transformacija, inovacije*

Introduction

Narrowly defined, entrepreneurial process includes all functions and activities related to the perception of business opportunities and creation of business start-ups in order to seize identified opportunities and generate value. Based on this approach to the entrepreneurial process, entrepreneurship is often associated with starting a new business or activities of small and medium enterprises. Even though this characterization can be justified by the fact that starting a new business is the most evident and widespread form of entrepreneurial activity, subduing entrepreneurship to a new business start-up is major simplification of the phenomenon.[1] To be exact, although the functions and activities of new business start-up – from perception of business opportunities, their evaluation, ensuring required resources, to the operating

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1 The fact that in the US every hour of every business day one thousand new businesses are founded supports the notion that starting a new business is a very intensive activity. See: [8, p. 1]. Even in Serbia, where new businesses do not emerge as often as in the US and other developed and large countries, entrepreneurial process is quite intensive as, during the last few years, there were on average two hundred registered new businesses and entrepreneurial units per day (calculation based according to the data on the number of registered companies and shops from 2006 to 2010, see: [13, p. 10]).

start – are indisputably important, they are only a part of the entire entrepreneurial process that defines assumptions for capitalizing on identified business opportunities. Hence, comparing entrepreneurship with the process of new business start-up represents a significant simplification in understanding the entrepreneurship phenomenon.

A more comprehensive approach to complete understanding of the essence and economic function of entrepreneurship implies wider consideration of the entrepreneurial process that – aside from the activities preceding a company start-up – entails consideration of all activities following operating start and management of a company in its different growth and development phases, and ultimately ending when entrepreneurs leave a company. This approach also has its limitations, as it mainly refers to the activities of small and medium enterprises, while it ignores large organizations. Explanation of the approach lies in the paradox that many companies that base success on entrepreneurial behavior lose these success features with developmental growth. With growth and development, companies become bureaucratic, more conservative and avoid risk-taking, which leads to losing one of their major driving forces for further growth and development. Lack of entrepreneurial spirit, i.e. bureaucratization of an organization, represents one of the conclusions of numerous theoretical and empirical studies on company's growth cycles, conceptualized in the so-called company growth phases models or company life-cycle models. For example, two well-known and frequently cited models, developed by Greiner [11] and Churchill and Lewis [10], foresee bureaucratization, i.e. lack of entrepreneurial spirit, as a final developmental crisis of a company.

As a consequence of expressed views, entrepreneurship is often tied to new business start-ups and activities of small and medium enterprises, while importance of entrepreneurship for acquiring and maintaining competitive advantage of large organizations is largely ignored. Such views obviously contradict with the fact that many important innovations, especially resource intensive technologies, emerged in large companies, and not in small enterprises.

Following the aforementioned, the purpose of this paper is to highlight importance of entrepreneurship in gaining and maintaining competitive advantage in large companies. The paper should demonstrate that lack of entrepreneurial focus is not necessarily an outcome of company's developmental growth, i.e. that lack of entrepreneurial spirit can be postponed, prevented, or retrieved if lost. With that in mind, the paper examines different forms of corporate entrepreneurship and its development modalities.

Definition, characteristics and basic types of corporate entrepreneurship

"Corporate entrepreneurship" refers to different types of entrepreneurial behavior in existing, large organizations (corporations) aimed at achieving – through encouraging innovation – competitive advantage at all levels: corporate, divisional, business unit, business functions and project teams [5, p. 471]. Although since the late 1980s some authors argued that entrepreneurial activities could not be associated with large corporations, there were a growing number of corporate entrepreneurship concept advocates, so in the last decade of the 20th century the term "corporate entrepreneurship" became quite commonly used. At the same time, a growing number of authors argue that companies of all sizes need entrepreneurial behavior in order to survive and perform in a competitive environment [2, p. 421]. Although in the meantime a growing body of corporate entrepreneurship literature emerged, there is no unanimity on the meaning of the term, i.e. on activities characterizing corporate entrepreneurship, or – in other words – on corporate entrepreneurship types. Even so, the majority of authors agree that corporate entrepreneurship is characterized by several groups of activities, such as: the birth of new companies/businesses within existing companies/businesses; the transformation or strategic rebirth of existing organizations; the birth of new ideas at different organizational levels, etc. Besides, some authors differently classify same or similar entrepreneurial activities. According to a group of authors, there are three types of corporate entrepreneurship [16, p. 521]. The first type is a new business creation within an existing organization. Change initiators are individuals or smaller groups, acting within existing organizations, capable of influencing other employees to change their behavior, which affects creation

of new corporate resources. The second type of corporate entrepreneurship entails comprehensive transformation activities, or (rebirth and) renewal and restructuring of existing organizations. It implies a thorough and more expensive approach to the entire process, which changes resource use pattern in order to achieve better economic performance. The third type of corporate entrepreneurship implies change in "rules of competition" in Schumpeter's terms. This type of corporate entrepreneurship entails radical changes not only in an organization, but also in its entire environment, i.e. scope of its business or industry in which an organization operates. It is typical of emerging industries and companies entering an industry, but also common for organizations operating longer-term in mature industries. Innovations that change competition rules usually involve new combinations such as, for example: higher quality and lower price, minimizing and cost-cutting, fashion and mass-markets, etc [16].

Following a broader view of corporate entrepreneurship, seen as development of new business ideas and opportunities within large and established corporations, Birkinshaw [3] identifies the following four approaches, or – as he classifies them – the schools of thought on corporate entrepreneurship:

- Corporate venturing,
- Intrapreneurship,
- "Bringing the market inside", and
- Entrepreneurial transformation.

Corporate venturing, as one of corporate entrepreneurship forms, entails different activities related to investing in start-up and management of new small firms by a large company. This form of corporate entrepreneurship is applied when a large company has to manage a new business venture independently from its core business. New business ventures emerge from investments of large corporations in strategically important small firms or other forms of corporate venturing. The need to spur independent small enterprises, while simultaneously harmonizing their operations with those of a large company, highlights the significance of development of adequate organizational arrangements for this form of corporate entrepreneurship. This approach to corporate entrepreneurship considers different types of new ventures and their harmonizing with operations of existing corporations [1].

Corporations rarely invest in new business ventures to achieve short-term financial gain; their motives are primarily tied to use of innovations in order to achieve strategic objectives. By investing in new business ventures or buying innovative small enterprises, large corporations acquire possibility to capitalize on advantages gained through innovation in critical technology development areas. Today, this form of corporate entrepreneurship is quite common in pharmaceutical, electronics and other high-technology sectors.

Intrapreneurship is a form of corporate entrepreneurship based on readiness and preference of individuals employed in a large company to assume entrepreneurial behavior. This approach follows an assumption that systems and structures preventing entrepreneurial behavior are typical in large companies, so individual entrepreneurs need to actively confront these entrepreneurial behavior barriers. The approach considers different tactics used by corporate entrepreneurs in order to encourage entrepreneurial behavior in large companies, as well as large corporations' management reactions to such incentives. It also considers personality and style characteristics shaping individuals into good corporate entrepreneurs.

The term "intrapreneurship" was introduced in 1985 by Gifford Pinchot in his eponymous book.[2] In brief, intrapreneurs are entrepreneurs in large companies. They are similar to entrepreneurs, but their position is specific as, on the one hand, they create entrepreneurial structures and culture around them, and on the other, they are required to communicate with the bureaucratic organization they work for in order to overcome bureaucratic barriers to development of new products and services and enable their rapid market entry [5, p. 473].

Bringing the market inside, as the third form of

2 At the beginning of his book, Pinchot defines intrapreneurs as "the dreamers who do". According to him, intrapreneurs are responsible for innovation of any type in a company. Intrapreneur might be an innovator, but is always a dreamer who creates solutions to convert ideas into ventures yielding tangible results. The notion that there are no essential differences between an intrapreneur and an entrepreneur is supported by Pinchot's definition of an entrepreneur according to which an entrepreneur is an individual assuming the role of an intrapreneur outside the organization. See: [14].

corporate entrepreneurship, focuses on implementing structural changes in an organization in order to encourage entrepreneurial behavior. The word "market" in this form of corporate entrepreneurship aims at emphasizing the importance of market approach to managing resource allocation in large companies and wider use of techniques based on market principles, such as spin-offs and operations with corporate venture capital.

Entrepreneurial transformation, as a form of corporate entrepreneurship, emphasizes importance of adapting to an ever-changing environment; for a large company, the best way to adapt is through coordinated changes of organizational structure and culture, so as to encourage entrepreneurial behavior of individuals it employs. According to advocates of this approach, the three previously reviewed approaches are merely a tool or technique utilized to bring about entrepreneurial transformation of an organization.

The paper further reviews characteristics of the above-mentioned corporate entrepreneurship forms in detail, as well as their appropriate methods and development instruments. In doing so, entrepreneurial transformation is regarded as the most complex form of corporate entrepreneurship.

Entrepreneurial transformation in large companies

As noted earlier, entrepreneurial transformation implies adapting of large organizations to an ever-changing environment, which is achieved through coordinated changes of organizational structure and culture in order to encourage individual entrepreneurial behavior. According to this approach, the aspects influencing individual entrepreneurial behavior and comprising the so-called "entrepreneurial architecture" are: leadership, strategies, systems, structures and organizational culture [5, p. 473].

Broadly defined, the term "architecture" implies set of relations – within and around an organization – among different stakeholders, such as: staff, customers, suppliers, and similar. These relations are long-term, not necessarily contractual, often partially defined, and based on stakeholders' interest to mutually cooperate. The basis of these relations is mutual trust among stakeholders, although individual stakeholders are in pursuit of self-interest. Pursuit of self-interest represents protection from stakeholders' opportunistic behavior, since the breach of mutual trust leads to ruptured mutual cooperation. These relations largely affect employees – whether and how they manifest entrepreneurial behavior. Just as individual entrepreneurs use their relation networks with different stakeholders to benefit from perceived opportunities, an organization uses entrepreneurial architecture to rapidly react to a changing environment and seize business opportunities generated by these changes.

Entrepreneurial architecture contributes to the creation of a dynamic ability of an organization to adapt to a changing environment which is, given that it is not formalized and is based on complex personal relations within an organization, difficult to copy. Dynamic ability to adapt grows with creation and accumulation of knowledge within an organization and with development of routine practices, which should facilitate implementation of changes without disruption. Aware that changes are good for an organization, employees are motivated to initiate and implement them. By institutionalizing relations among different stakeholders, entrepreneurial architecture contributes to creating and sustaining competitive advantages of an organization.

Knowledge is an important factor of the entrepreneurial process. Individual entrepreneur acquires knowledge by performing tasks. Speaking of individuals, acquired knowledge is transferred quickly and without obstruction. However, as an organization grows in size, continuous knowledge transfer among staff confronts higher barriers. Therefore, creating an organization that will encourage staff learning – so they could continuously change, adapt and evolve in line with needs and requirements of others within and around an organization – is an important element of entrepreneurial architecture and entrepreneurial transformation presumption. A learning organization can easily and rapidly adapt to a changing environment. Just as one of the main features of a successful entrepreneur is the ability to change and learn [17, p. 166], a learning organization is a true entrepreneurial organization. Such an organization facilitates learning and change

for its staff by encouraging systematic problem solving, experimentation and new approaches, learning from past experience and history, learning from best practice and outside experience, and knowledge transfer within the organization. Besides, a learning organization develops mechanisms for information gathering and their distribution to staff, on the way experimental, creative work contributes to organization's increased performance results [15, p. 803].

The key role in the process of building entrepreneurial architecture is that of an *entrepreneurial leader.* Entrepreneurial leader sets structures (including systems and processes), creates organizational culture and facilitates strategy development and implementation. The role of an owner or a manager does not automatically suppose an entrepreneur with a leadership role in an organization. In order for an entrepreneur to be a leader, s/he has to be voluntarily and conscientiously accepted by staff. Like authority, leadership is also attained by particular behavior and results. There is no universal leadership style. On the contrary, when playing the role of a leader, an entrepreneur has to nurture specific relationship with every subordinate, adjusting the style to specific circumstances and staff traits. Therefore, failure of an entrepreneur as a leader usually demonstrates a lack of variety in leadership styles or unwillingness of an entrepreneur to adjust his/her leadership style to particular circumstances and staff traits. This is why a continuous adjustment of a leadership style is vital as organization grows and employs new people.

In stimulating workforce to achieve organizational goals, it is necessary that entrepreneur constantly pays attention to individual employee motivation. Many entrepreneurs make a common mistake by an inaccurate assumption that everyone is as motivated as they are and do little to motivate people in their organizations. Besides, many entrepreneurs wrongly assume that motivation at the beginning of employees' professional careers remains at the same level during later stages of their employment [15, p. 796]. Being concrete activity involving direct, constant work with people, leadership entails particular skills, requiring from an entrepreneur particular leadership style, communication skills, technical knowledge and an array of entrepreneurial traits.

By building entrepreneurial architecture, entrepreneurial leader creates incentives for systematic search for business opportunities and innovation at all large company levels, starting from corporate level, divisions and business units, to business functions and project teams' level, so as to create and develop competitive advantages of the company. Entrepreneurial architecture encourages development of entrepreneurial management style, i.e. shift from traditional to entrepreneurial management. Among other things, this means transition from control and penalties to encouraging search for new business opportunities; from focus on efficiency and effectiveness to emphasizing importance of value drivers; shift from contractual to overall relationships and relations within and around an organization; shift from training to learning; from fostering uniformity and conformity to empowering vision and questioning status quo [5, pp. 478-479]. Besides, transition from traditional to entrepreneurial management style entails an entirely different attitude to risk, uncertainty and ambiguity – instead of fostering certainty, risk-avoidance and nonambiguity, entrepreneurial management style tolerates uncertainty and ambiguity, while employees are empowered to become risk-takers. Formal control of creative acting is reduced to a minimum, as it is emphasizing and tracking failure, while penalizing failure is absolutely avoided. Entrepreneurial management style is affirmed by primacy and leading role of creative, innovative approach to a daily business routine; it develops formal systems that will empower search for superior solutions and secure time and resources for research and experimental work [15, p. 803].

Entrepreneurial architecture focuses on employees, developing sense of belonging to an organization and job security. Prime contributors are common goals and generally accepted strategies by staff.

Due to their ability to manage relationships and relations in the environment, entrepreneurial organizations successfully exchange knowledge with other organizations from their environment thus increasing flexibility and ability to adapt. This enables entrepreneurial organizations to connect with other organizations from the environment, creating various network structures, from global supplier and distribution networks, to clusters of small firms in a particular geographic region.

Organizational culture is the next important part of entrepreneurial architecture. Basic elements of a culture that fosters entrepreneurial behavior are: creativity and innovation, empowering employees to perform, solid relations and relationships, continuous learning and measured risk taking. Such culture empowers employees to work effectively ("doing the right thing") and efficiently ("doing things right") for the organization and for their own benefit. As organization grows, culture of individual entrepreneur changes and develops into entrepreneurial organizational culture. This transition is achieved by gradual change of the following key dimensions of organizational culture [5, pp. 481-482]:

- Transition from individualism to collectivism – as a result of organizational growth, its increased complexity and, hence, higher dependence of an entrepreneur on a team.
- Low power distance, i.e. egalitarian, loose organizational structure, open and informal relations and open communication channels.
- Low uncertainty avoidance, i.e. increased tolerance to risk and ambiguity, prone to change, empowering individual initiative and readiness to accept occasional failure.
- Creating balance between "masculine" and "feminine" values in order to build a "can-do" culture based on cooperation and close relationships within a group.[3]

Structure is the next key element of entrepreneurial architecture. Since structure depends on a number of constituting elements and their links and relationships, as organization grows its structure becomes more complex. Complex structure of large companies slows down information flow, extends decision-making processes, discourages initiative, etc. In order to remove these entrepreneurial behavior barriers, large corporations split their structure into a number of smaller organizational units of different independence levels. By decomposing their organizational structure, large corporations aim to gain flexibility (characteristic of small enterprises) and encourage entrepreneurial behavior of their organizational parts. Over the past twenty or so years there is a growing trend in downsizing and restructuring of large corporations by splitting their structures into smaller organizational units and applying different externalization strategies such as: outsourcing, forming strategic alliances with small firms, creating project-based organization, etc.

Organizational structure and management style change as conditions in which organizations operate change. Traditional hierarchical structures are *mechanistic*, bureaucratized and rigid, and these are appropriate to stable conditions. In such conditions, organizational management is characterized by numerous rules and procedures, while the structure is a clear hierarchy of authority. Management is centralized, and top management delegates authority to middle and lower management levels. However, entrepreneurial organizations often operate in turbulent environments characterized by frequent, hasty and nonsystemic changes. In such environments it is impossible to define rules that will apply to changed conditions; *organic* organizational structure and informal and adaptive management style are more appropriate to operating in changing environments. Precise features of an organic organizational structure are difficult to define given that it is constantly re-shaping and changing in order to adapt to a changing environment. Number of hierarchical levels is fewer, i.e. organizational structure is less formal than traditional mechanistic structure. Structure of control and authority in organic structures is not clearly defined, while decision making is decentralized. Within this management system there are not many rules and procedures, while employees are empowered to work in teams and jointly solve problems they encounter at work. Work tasks are not precise – employees contribute to defining them, while tasks adapt to changed circumstances during the work process. Unlike mechanistic structure, characterized by vertical communication, organic structure promotes horizontal communication among employees at the same hierarchical level.[4] With organic structure and such organization of management function, entrepreneurial organizations increase the ability to constantly adapt to a changing environment.

3 Masculine ("to act") values are achieving success, focus on material gains, etc., while feminine ("to be") are balance and harmony, harmonious interpersonal relationships, etc. See: [7, p. 360].

4 More on characteristics of mechanistic and organic management systems see in [6, pp. 43-55].

Intrapreneurship

Widely speaking, intrapreneurship is recognized as entrepreneurship in existing large organizations. It can be an isolated activity, like a project for introducing a new product to the market, a part of an existing organization or an organization independent from a large company. On the other hand, it can also be understood as spirit of entrepreneurship in existing organizations, part of wider repositioning or restructuring strategy of the entire organization or even entire industry in which the organization operates. This type of corporate entrepreneurship can, too, be practiced at all levels – corporate, divisional, business units, business functions and project teams.

By their economic function, intrapreneurs are not significantly different from other entrepreneurs. As other entrepreneurs, intrapreneurs identify opportunities for new business ventures, and initiate and lead activities that should facilitate realization of identified opportunities. The major difference between intrapreneurs and other entrepreneurs is, however, in the method identified opportunities are realized and the position these two types of entrepreneurs have in the process. While entrepreneurial ideas are realized through activities of new firms, and entrepreneur, to a large degree, independently manages the entire entrepreneurial process, intrapreneurs' ideas are realized in the existing, large corporations. In order to implement these ideas, an intrapreneur must successfully communicate with other parts of the organization s/he works for, so as to gain support for ideas by removing bureaucratic barriers to new product and service development and, hence, secure their rapid market entry. In that sense, intrapreneurs are the link between innovators and management of large companies. As other entrepreneurs, intrapreneurs are rarely innovators, but they identify innovations that have potential to become successful business ventures, promote them within an organization, and lead innovation development process into new products, services and technologies all the way to prototypes. Further business development is taken over by managers while intrapreneurs go back to new ideas to build base for new businesses – management of which would, again, be handed over to managers.

Significant support to intrapreneurs in accomplishing their function in large organizations comes from *sponsors*. Sponsors might be different level managers and experts with diverse profiles. Intrapreneurs might have several sponsors at the same time – lower level sponsors who support daily intrapreneurial activities and high-level sponsors, such as top management, that supports strategic-level ideas. Sponsors provide support to intrapreneurs in various ways like, for example: support in presenting an idea to company's management, support in addressing technical problems, support in defining market options, securing financial resources, etc.

Literature on intrapreneurship pays special attention to character and personality of intrapreneurs. Fundamentally, many personal characteristics of intrapreneurs are not different from characteristics of other entrepreneurs. So, for example, it is usually stated that intrapreneurs – like other entrepreneurs – are dedicated to work, result oriented, long-term oriented, ambitious, rational, comfortable with change, have clear goals, etc [5, pp. 489-490], [14, pp. 32-64]. Similarities between intrapreneurs and entrepreneurs are related to a higher tolerance to risk and failure. Intrapreneurs do not accept failure as a personal defeat, but as a learning experience.

Although intrapreneurs and other entrepreneurs are goal-oriented and guided by self-interest, the main disparities between intrapreneurs and entrepreneurs are in the fact that intrapreneurs receive monetary incentives and recognition from a company. Intrapreneurs have clear vision and are action oriented – at the same time they are thinkers, workers, planners and doers [14, p. 43].

Intrapreneurs are often regarded as those who play an integrating role in organizations as they cross boundaries of different organizational units by connecting and coordinating their activities, often doing work that is officially other people's job. Additionally, intrapreneurs have interpersonal skills, which are of great importance in harmonizing relationships with managers.

Intrapreneurship, i.e. status of an intrapreneur, has advantages, but disadvantages, too, compared to other forms of entrepreneurship and status of an entrepreneur [14, pp. 87-96]. These advantages come to the fore when entrepreneurial ideas are specific and tied

to a particular organization – like the ideas on business operations improvement of a certain company. An intrapreneur should stay with the existing company if his/her need for security is superior to independent venturing challenges and aspirations for higher profits. Advantages of intrapreneurship are also evident when entrepreneurial venture involves high risk, and when it is easier to access internal than external sources of finance for a new business venture. Additionally, intrapreneurship's advantages over other forms of entrepreneurship become apparent when critical business success factors are related to a particular organization, including company name, sales and distribution channels, access to organization's protected technology, etc. On the other hand, entrepreneurs enjoy higher independence and ownership benefits. Ownership benefits reflect in greater wealth and autonomy secured by ownership rights.

Bringing the market inside

When large organization approves a new business venturing idea, the question imposed relates to defining types and means of relationships with the new venture. Basically, these relations can be internal – when new business venture is integrated, or external – when new business venture is spun-off. In the first case, coordination between the new venture's resources and other company' units is achieved through internal management structures, while in the other case coordination of resources between independent organizations is regulated by the market. Aside from these apparent, extreme solutions, there is a variety of solutions lying between the extremes. Whether an organization resorts to market regulation of relationships with its venture and to what extent – i.e. whether and to what extent it "brings the market" into the relationship – depends on strategic importance of the venture to the company, on one hand, and the level of operational relatedness of the new venture to the company, on the other. Strategic importance of a new venture reflects in its contribution to achieving company's strategic objectives, while degree of relatedness of the new venture to the parent company shows the extent to which entrepreneurial venture requires skills and abilities that differ from strategic abilities and skills of the parent organization. Generally, the higher strategic importance of a venture and the higher the level of its operational dependency on a parent company, the higher is the probability that the new venture will be integrated. And vice versa, when the level of strategic dependency of a business venture on its parent company is low or does not exist, a business venture will be spun-off and the parent company will claim no ownership. Therefore, the likelihood of business units' independence is higher when core skills are embodied in human resources, than in cases where core skills are incorporated in physical assets, since knowledge is more easily transferred to new organizations. Similarly, in a favorable market environment, the likelihood of business units' independence is higher in mature industries, engineering, technology, design, etc. that are well-known to employees, whose knowledge is then easily transferred to new ventures.

Table 1 summarizes the conceptual corporate venturing assessment framework, i.e. status and relationship of a new venture with a parent company, depending on its strategic importance and its operational dependency on a parent company.

As Table 1 shows, different levels of strategic importance and operational relatedness create different conceptual alternatives. The major characteristics of these alternatives are the following [4, pp. 162-164]:

Table 1: Corporate venturing assessment framework

Operational relatedness	Very important	Uncertain	Not important
Unrelated	3. Special business unit	6. Independent business unit	9. Complete spin-off
Partly related	2. New product/ business department	5. New venture division	8. Contracting
Strongly related	1. Direct integration	4. Micro new venture department	7. Nurturing and contracting

Strategic importance

Source: [4, p. 161]

1. Direct integration. Due to high strategic importance and high operational relatedness, administrative and operative relationships between a new venture and its parent company are solid, which requires direct integration with mainstream operations. The need for direct integration is expressed in highly integrated companies whose strategic position may be endangered by, for example, new products or technologies.

2. New product/business department. High strategic importance and partial operational relatedness of a new venture and a parent company require combination of strong administrative and semi-strong operational bonds. New venture is integrated due to its high strategic importance, while operational reasons dictate creation of a new department. New department is established within a larger organizational unit (a division, for example) that offers highest potentials for sharing capabilities and skills with the new venture. An example of this type of a relationship is product range expansion.

3. Special business unit. Establishing a new business venture, independent from a parent company, usually requires hiring of new staff with diverse knowledge and skills, and creation of a special business unit that will be operationally independent. Due to high strategic importance of a new venture to its parent company, it is mandatory to establish strong administrative relationships between them, so the new venture's growth could contribute to achieving clearly set strategic objectives within a certain timeframe. Over time, several such special business units might merge into one division that will become part of corporate structure.

4. Micro new venture department. When strategic importance of a new business is unclear, while its operational relatedness with a parent company is high, the situation should be resolved and, meanwhile, new business kept integrated pending the resolution. This is typical for "peripheral" projects emerging in operating divisions of an organization. Administrative relationships between these projects and a company are usually loose, so management of such units – unhindered by divisional or corporate strategy – should be granted freedom to independently develop a strategy respecting budgetary and time limits. Operational relatedness should remain strong in order to capitalize on existing capabilities and skills so that newly developed capacities could "return" to the company.

5. New venture division. This form is recommended in situations of uncertain strategic importance of a new venture to a company and their mutual relatedness. Pending decision on its fate, new venture division often functions as a nucleus developing new businesses that require additional investments. Whether the division is spun-off or integrated into company's mainstream operations depends on final assessment of its strategic importance to a company. Administrative relatedness with parent company is quite loose. Division management is expected to develop adequate middle level strategies for new businesses by, for example, bringing together several projects – that either exist in various parts of the corporation or can be acquired externally – and building sizable new businesses. Operational relatedness with the corporation is loose, but strong enough to encourage relevant knowledge and skills transfer from the corporation to the division and vice versa.

6. Independent business unit. Business ventures whose strategic importance is unclear and that have no relationship to present corporate activities are suitable for complete independence. Independent business unit is often set up by a joint venture with corporate strategic partners. The independent business unit founding company, as per ownership rights, participates in managing bodies of the unit which, among other things, enables a satisfying level of strategic control without administrative relatedness.

7. Nurturing and contracting. In certain cases a new business venture might be strategically irrelevant to a corporation in spite of its strong operational relatedness to corporate activities. Business ventures are usually those focusing on small market segments and hence, are unattractive to a corporation, but might be profitable for small enterprises. This form is recommended when company's core competencies are physical assets or processes that have little or no strategic importance. Hence, such assets or processes might be offered to other companies on a contractual basis. Due to strategic irrelevance to a corporation, top management supports autonomy of such ventures, helping entrepreneurs to start their own business.

High operational relatedness might facilitate transfer of new and advanced knowledge from entrepreneurs to a corporation.

8. Contracting. When operational relatedness between a corporation and a new venture is loose and strategic importance of a new venture is low, probability of support to the new venture is also low. In spite of that, the opportunities for profitable contractual arrangements between the corporation and the business venture still exist, as well as the possibilities for exchange of advanced knowledge through certain forms of operational cooperation.

9. Complete spin-off. If both strategic importance and operational relatedness of a new venture are negligible, then complete spin-off of a new venture is the most appropriate thing to do.

Corporate venturing

Corporate venturing is one of the large organizations' entrepreneurial transformation forms. Key success factor to investing in business start-up and development of small enterprises by large corporations is a good strategic fit between venturing and venture companies. Strategic fit is differently achieved: through strong relationships with core competencies of the venturing company, or through acquiring skills, technologies, markets, etc. that complement strategic direction of the venturing company – i.e. when requirements for synergy effects are met [5, p. 492].

Corporate venturing is defined by two characteristics. These are *investment objective* and *degree of linkage* between the venturing company and the start-up company's operations. Although new venture's investment objectives may be different, they can be brought down to two key investment objectives. The first is strategic, made to increase revenues or profits of the core business. A company making a strategic investment seeks to exploit synergies by investing in a new venture. The other objective is financial, wherein a company is looking for attractive return on investment.

The second defining characteristic of corporate venturing is the degree to which companies in the investment portfolio are linked to the investing company's current operational capabilities – that is, its resources and processes. For example, a start up might make use of manufacturing plants, distribution channels or technology of the investing company.

Characteristics outlined above are key dimensions of the conceptual framework for assessing corporate venturing, shown in Table 2.

As Table 2 shows, given the investment objective and the degree of linkage between the start-up and operational capability of the venturing company, there are four types of corporate venturing, their major features being the following [9, pp. 94-98]:

Driving investments. This type of investment is characterized by a strategic rationale and tight links between a start-up and operations of the investing company. For example, in the beginning of the 2000s Microsoft invested over $1 billion in start-up firms that developed different Internet services, expecting the firms to set standards for the next generation of Internet service providers. Disadvantages of driving investments surface during changes in corporate strategy, as they disrupt strategic transformation.

Enabling investments. In this mode of investing a company makes investments for strategic reasons, but does not couple the new venture tightly with its own operations. The theory behind this type of investment is in the notion of complementarity between the new venture and the investor. By investing in development

Table 2: Mapping corporate investments in new ventures

		Corporate investment objective	
		Strategic	Financial
Link to operational capability	Tight	Driving Advances strategy of current business	Emergent Allows exploration of potential new businesses
	Loose	Enabling Complements strategy of current business	Passive Provides financial returns only

Source: [9, p. 95]

of its suppliers, custom and third-party developers, a company stimulates demand for its own offerings. For example, in the early 1990s Intel started investing in start-ups whose products – such as video, audio and graphics hardware and software – used microprocessors, and thereby stimulated demand for its own products.[5] Success of these investments depends on the ability of start-ups to achieve considerable sales growth of its own products.

Emergent investments. Companies make this kind of investments in start-ups that have tight links to its operating capabilities but that offer little to contribute to its current strategic objectives. However, if the business environment shifts or if a company's strategy changes significantly, new ventures might become strategically valuable to the investor. This kind of corporate venturing might be used for investing in start-ups that will develop a market for the investor. Instead of exploring the potential of new markets, which is often difficult for companies focused on serving their current markets, the company invests in a start-up that will serve a new market. Immediate benefits of such investments are financial, and if new market expansion is successful, then the ultimate return on investment may result from exercising strategic options. As many emergent investments never become important to a company's strategy, it is important to achieve a balance between financial objectives and strategic potential for investing in start-ups.

Passive investments. Companies led by financial objectives make this kind of investments, investing in new ventures that are not connected to their own operating capabilities. Consequently, the investor lacks the means to actively improve its own business through these investments. In that sense, the investor is equal to any other investor in the private equity market who strives to generate high investment yield, but this opens a discussion whether it would be the best use of shareholders' funds.

Corporate venturing in strategically important small firms is mutually beneficial [5, p. 492]. Advantages for small firms include easy access to resources – not only financial, but also managerial, advisory, etc., easy access to markets, technologies, and so on. Advantages for large companies include the following:

- Knowledge and innovation import;
- External sources of finance may be easier to access;
- Easier creation of semi-autonomous operational units with their own cultures, incentives, business models, etc., and
- Involvement of highly motivated staff in the process.

Disadvantages for investors include:

- Requires investments, normally equity;
- Requires investment in venture mechanisms that set up management, networks, evaluation and generate information, etc., and
- Lack of total control over a new venture.

This form of entrepreneurial transformation might be used to spin-off business potentials that are the result of the company's research and that are distinct from the company's core business. Finally, some corporations have separate investment funds used to address other, non-economical issues such as, for example, new job openings in areas where the company has contributed to layoffs. These activities, however, are not motivated by the need for entrepreneurial transformation of a company, but the need to achieve other, mainly social objectives.

Conclusion

Although up to two or three decades ago Schumpeter's distinction of entrepreneurial and administrative ("bureaucratic") economic activity seemed convincing and apparent, recent economic development turbulence has challenged these findings that no longer appear compelling and obvious. Not every small new company needs to be innovative – i.e. entrepreneurial, and not every corporation is necessarily a bureaucratic organization (i.e. an antipode to entrepreneurial organization). An entrepreneurial organization with its growth does not unconditionally retain its entrepreneurial spirit, just as lack of entrepreneurial focus is not necessarily an outcome of company's developmental growth. As an organization grows, the loss of entrepreneurial spirit can be postponed or prevented, or retrieved if lost. It is largely accepted that entrepreneurial behavior is a company's growth factor. Findings

5 By the end of that decade Intel made over 800 such investments. See: [9, p. 95].

in this paper have demonstrated that there are several types of corporate entrepreneurship and that entrepreneurial transformation entails profound and complex changes in organizational structure. A growing need for entrepreneurial transformation will ultimately require new organizational forms and wider range of applicable solutions.

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ELECTRICITY (IN)EFFICIENCY IN TRANSITION ECONOMIES: EVIDENCE FROM A FIRM'S SURVEY

Energetska (ne)efikasnost u tranzicionim ekonomijama, sa osvrtom na istraživanje sprovedeno u preduzećima

Abstract

The paper describes the main determinants of electricity efficiency / inefficiency in 27 transition economies. We use the BEEPS enterprise survey done in 2008-2009 over 2400 enterprises. We provide a detailed analysis of the enterprise electricity intensity patterns. In particular, we shed light on the role played by firm characteristics and some key economic drivers, such as bad management and local financial constraint. We present an original analysis and findings on the effect of the poor access to electricity supply on firm's electricity costs.

Key words: *Electricity costs, electricity efficiency, local electricity constraint, financial constraint, institutional reforms, transition economies*

Sažetak

U ovom članku predstavljamo osnovne faktore energetske efikasnosti / neefikasnosti u 27 zemalja u tranziciji. Koristimo podatke iz ankete preduzeća BEEPS sprovedene u periodu od 2008-2009 u 2400 preduzeća. Ispitujemo energetsku efikasnost preduzeća kao udeo troška električne energije u ukupnim prihodima (energetska intenzivnost). Pružamo detaljnu analizu obrasca troška električne energije. Naročito ukazujemo na ulogu karakteristika same firme i nekih ključnih ekonomskih parametara kao što su kvalitet upravljanja i finansijsko ograničenje. Predstavljamo originalnu analizu i nalaze u vezi sa efektima lošeg snabdevanja na trošak električne energije u preduzeću.

Ključne reči: *troškovi energije, energetska efikasnost, lokalne barijere, finansijsko ograničenje, institucionalne reforme, tranzicione ekonomije*

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Introduction: Energy in transition

The energy efficiency is a crucial question for the next decade. Not only for environmental and health priorities but also for the competiveness of firms. The European Union fixed a set of energy objectives for 2020 among them is the reduction of energy consumption [12]. In this paper we will use the firm level statistics from new EU members and transition economies.

Transition economies were well known for large energy expenditures during the pre-transition period. In transition countries, the energy waste is a legacy of the planned economy. Those countries use over seven times more energy to produce each unit of GDP comparing to the Western Europe levels. Energy inefficient productive processes and obsolete technologies characterize their industrial sector. Insufficiently implemented market constraints and a lax institutional framework do not allow them to struggle against energy waste and misallocation. Furthermore, many of those countries have based their growth strategies on extremely energy-intensive sectors. This policy is inherited from the socialist planed economy, which favoured the development of heavy industry used to over-consume low-cost raw materials and energy [10].

Enterprises in central planned economies experienced large energy costs due partly to technology backwards but also low energy prices [11]. They benefit from large subsidies (soft budget constraint) and still today, in some sectors and some countries, do not consider as priority to reduce energy costs.

If all of those countries reached West European levels of energy efficiency, the global energy consumption might decrease of 7%, despite a relatively small share of the production of this region in worldwide GDP [8]. But, the forecasted needs of transition countries are expected to increase their energy consumption by over 60 to 80% during the 20 next years [9].

There are three main barriers to energy efficiency in Eastern Europe and Former Soviet Union according to the 2010 World Bank report: energy prices, lack of information and inadequate financing. More precisely, the report shed light on the enormous energy saving potential of those countries and, besides, emphasizes the business obstacle representing by electricity supply.

In this paper, we use firm-level information from the Business Environment and Enterprise Performance Survey (BEEPS) database to focus on several electricity related issues in new EU new members, CIS and SEE (South Eastern Europe) countries. First, we shed light on some patterns of electric consumption in the macroeconomic and microeconomic levels, as well the electric reform changes in those countries. Secondly, and more generally, we explore the determinants of energy intensity of firms. Our empirical approach is inspired by the recent literature. As regarding the issues of this paper and the used dataset, the work of Bloom et al. [4] and Martin et al. [19] served as reference for the econometric specification. We want to assess the role played by many previously used firm characteristic variables. In particular, the firm size, the size of locality, the age, the ownership structure and other inputs are taken into account. We also expect to identify the key economic forces driving changes in electricity intensity. Specifically, this paper focuses on the impact of bad management, quality of the access to electric power and regional financial constraint.

The world development report 2013 underlines the importance of the financial access and the power shortage for the development of enterprise [30]. Financial constraint represents the most binding constraint on formal private sector businesses. And the electricity access is the second top constraint declared by enterprise managers.

We study the energy intensity, defined as energy costs over total sales. This measure is a standard manner for any input in the production process. We use electricity as the main energy source because electricity has the same quality, apart the delivery, which is sometime problematic. We also use electricity, because it is not possible to stock electricity.

Our main findings are that poor access to local finance and local constraint on electricity increase the energy inefficiency of firms. The same factors also increase the share of electricity cost in total variable costs.

We also find out micro-level evidence that insufficiently reformed power sector leads to an inefficient use of electricity by firms.

The paper is organized in five parts: next section discusses the main contributions of the literature on energy efficiency on the firm level. We present in section 3 the main descriptive statistics for energy intensity, and in section 4 we discuss the methodology and we describe the database. In the section 5, we discuss in detail our econometric results and the last section conclude.

Literature review: Explaining the firm-level energy efficiency determinants

There is a wide energy economics literature dealing with the relationship between energy consumption and growth, the price elasticity of the energy demand, the relationship between energy consumption and the climate change, etc. Because it is the closest to our research question and the policy issues at stake, for our purpose, it seems enough to focus on the studies treating the firm level energy efficiency determinants and drivers.

A large strand of energy literature focuses on the factors influencing energy efficiency in microeconomic perspective. This approach is, from our point of view, the most interesting because it goes to the roots of the issue. We can subdivide this literature in two groups. Some papers focus only on energy intensity relation to firm characteristics, while others also try to provide an identification of barriers to improvement of energy efficiency. This is privilege way for our research and our paper is contributing to the discussion on the characteristics and barriers to improve firm energy efficiency.

Firm characteristics and energy intensity

There are several papers on firm level energy intensity determinants made on India. After Kumar [18], Sahu and Narayanan [22], [23] and Golder [15] have investigated this question. Departing from a reduced form model of the determinants of the energy intensity in industrial firms, they have applied multiple regression analysis to identify the main firm characteristics related to Indian manufacturing energy intensity. A very similar empirical strategy has been undertaken by Papadogonas et al. [21] to analyse the energy intensity of Greek manufacturing firms. The energy intensity variable is approximated by the fuel and power expanses over total sales ratio. The evidences about the main firm-level channels influencing energy inefficiency are summarized below.

The results strongly indicate that when firms are more capital intensive, they are more energy intensive. Capital intensity seems to be positively related with energy intensity, as well as expenditure on repairs and the age of firms. It can be argued that capital-intensive industries use more energy due to complementarities between both factors. Repairing implies older and worn plant and machinery, which are probably less energy efficient. And past and more energy intensive processes characterize aged firms.

The relationship between the size and the energy consumption is not obvious from those papers. Indeed, larger firms have an energy cost advantage only in the low energy consuming industries since Papadogonas et al. [21]. A negative relationship is found in Kumar [18] and Golder [15]. Bigger firms may benefit from economies of scale with decreasing returns in the use of energy, but this effect is not strongly related in those papers. We probably should take into account labour and capital factors in the estimation to shed light on this effect.

Foreign firms are more energy efficient in Kumar [18], Sahu et al. [22] and Golder [15] but not in Sahu et al. [23]. The impact of foreign ownership on energy consumption is not obvious regarding those results. It could depend on the country environmental regulation and energy prices. Moreover, it should be interesting to look at the impact of ownership structure on energy efficiency, as differences can emerge between private and public structures.

Drivers and barriers to energy efficiency improvements

Using a different approach compare to the previous set of papers, other authors tries to analyse the most relevant drivers and barriers influencing the firm-level energy intensity. This is the core set of references for our paper.

Vanden et al. (2004) uses a structural model of a Cobb-Douglas cost function for the functional form of their estimation to identify drivers determining the decrease in energy intensity of 2500 medium and large-sized Chinese industrial firms. From a cost minimization program, they derive the firm-level factor demand for energy. They have found that changes in relative energy prices and R&D expenditures are the main contributors to the decline in firm-level energy intensity. To a lesser extent, shifts in output across industry, in ownership and region have contributed to the variation in energy intensity.

Morikawa [20] underlies a positive relationship between population density and the energy efficiency consumption in service enterprises. When the population density of the locality doubles, the author estimates a 12% decrease of firm-level energy intensity in services sector. He also emphasizes a negative link between capital and labour intensities and energy efficiency.

A large economic literature tries to understand the so-called "energy-efficiency gap". This term refers to the difference between cost-effective energy efficient investments and the level of such investments actually implemented. Related academic papers disentangle the barriers explaining this gap between market failures, market barriers [7], [5] and, more recently, management practices [1], [19]. Market failures refer to all the situations violating the neoclassical assumptions (rationality, perfect information and no transaction costs). The market barriers to energy-efficient use concern three main problems: the low priority of energy issues, incomplete markets for energy efficient products and the capital market obstacles.

Barriers related to access to capital have been stressed as very critical. Energy efficiency technologies and investments need funds to be implemented. But, lack of capital limit funds to be devoted to energy efficiency measures, which are furthermore considered as low on priority list [7]. The paper of Trianni and Cagno [25] also highlights this kind

of evidence departing from an investigation of Italian small and medium sized firms. They find, after controlling for some firm's characteristics, that access to finance is the more severe obstacle to energy efficiency investments. In over than 128 interviewed manufacturing enterprises, the lack of capital is perceived as the main constraint to energy efficiency measures.

Finally, recent empirical papers emphasize the crucial role of organizational structures and management best practices on enhancing firm-level energy efficiency. Using information about firm's managerial quality and census data containing energy consumption expenditures of UK establishments, Bloom et al. [4] find that better-managed plants are significantly less energy intensive. This relationship seems to be related to the firm's productivity. Better-managed firms adopt modern and energy-efficient measures, which increase their productivity. The authors estimate that an improvement from the bottom to the top quartile of their management variable is associated with a 17% increase in energy efficiency.

The paper of Martin et al. [19] provides further evidence about the negative link between management practices and energy intensity. They argue that better management is also related to the firm's energy efficiency innovations (process and product). Moreover, they provide another finding about the role played by organizational structure. Firms where energy issues are devoted to the environmental manager (when such a function exists) have more climate-friendly management practices.

Bloom et al. [4] and Martin et al. [19] used two different proxies for energy intensity. Both energy cost over total sales and energy cost over total variable cost are used in their regressions. In order to ensure for the robustness of our results we also run our analysis with both variables.

To summarize, energy intensity is related to some firm characteristics, such as input composition, firm's size and age, the ownership structure and the population density. Moreover, several economic factors such as financial constraints, management practices or other market barriers seem to be important drivers of firm-level energy efficiency. In order to explain the determinants of firms' electricity intensity in Transition economies, we will try to assess those different effects in our regressions.

In the next section, we present the main country and sector features of electricity intensity across Transition countries.

Electricity intensity trends and power sector reform evolutions

In this section, we want to address an overall overview of the pattern of the electricity consumption, at the country and sector levels, and the evolutions of power sector reforms in our sample of countries. At first, we will look at the macro trends of electricity intensity. From 1990 to 2009, except for the group of South Eastern European countries, the overall electricity intensity has decreased for all the countries. But, since 2005 there is a slow-down of this decrease, while the overall level of consumption is still, by far, higher than the OECD average level. In a second part of this section, we look more closely to the pattern of electricity intensity inside the manufacturing sector. Finally, in the last sub-section we look at the evolution of power sector reform indicator since 1990. Regarding this indicator, the groups of CIS and South Eastern European countries perform less well than the EU new member countries.

Electricity intensity: A macro perspective

We present, first, the electricity intensity data from 1990 to 2009 (World Development Indicators, World Bank).

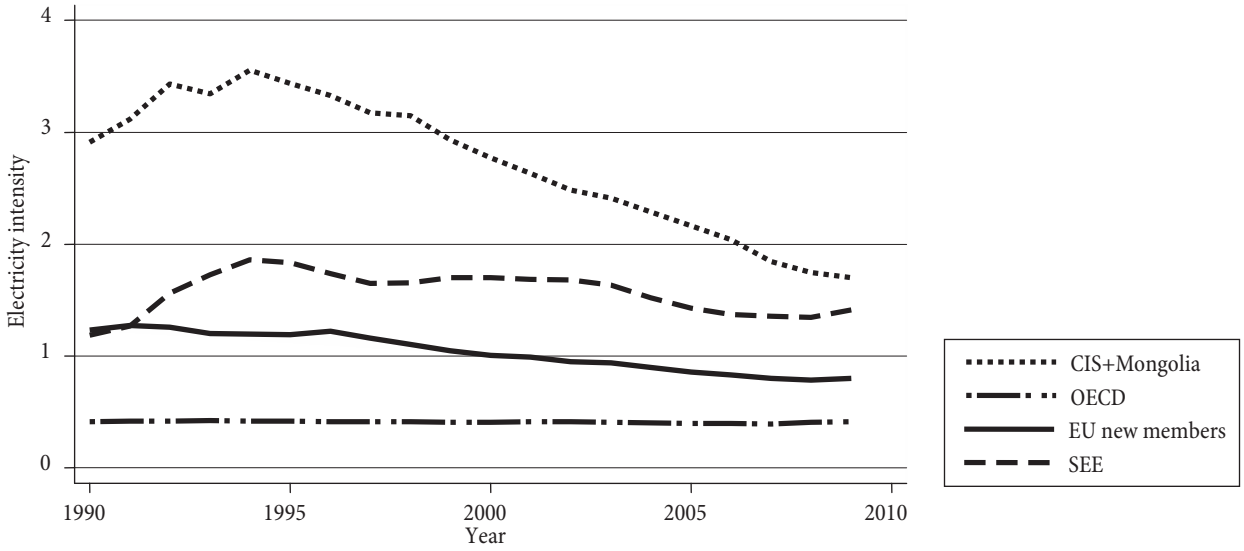
The figure 1 shows the results for three groups of countries over the region, EU new members, CIS and Mongolia group, and countries from South Eastern Europe. Detailed country figures for SEE and the list of countries are displayed in the appendixes (see tables 6 and 7, figure 5).

The evolutions in the figure 1 are pretty consistent with the global trends – convergence – in those economies. Comparing to the rest of the region, the EU new members group has the lower electricity intensity. But in recent years, since 2007, we can see a stabilization of the electricity intensity evolution. The EU new members are converging with one clear outlier: Bulgaria. Bulgaria, and, to a lesser extent, Romania and Czech Republic, have not improved so quickly their electricity efficiency. Possible

reasons are the lack of foreign investment, but also the delay in implementing reforms in the electricity sector. An additional reason may be the development of the unrecorded economy, which is using electricity without declaring any output [17].

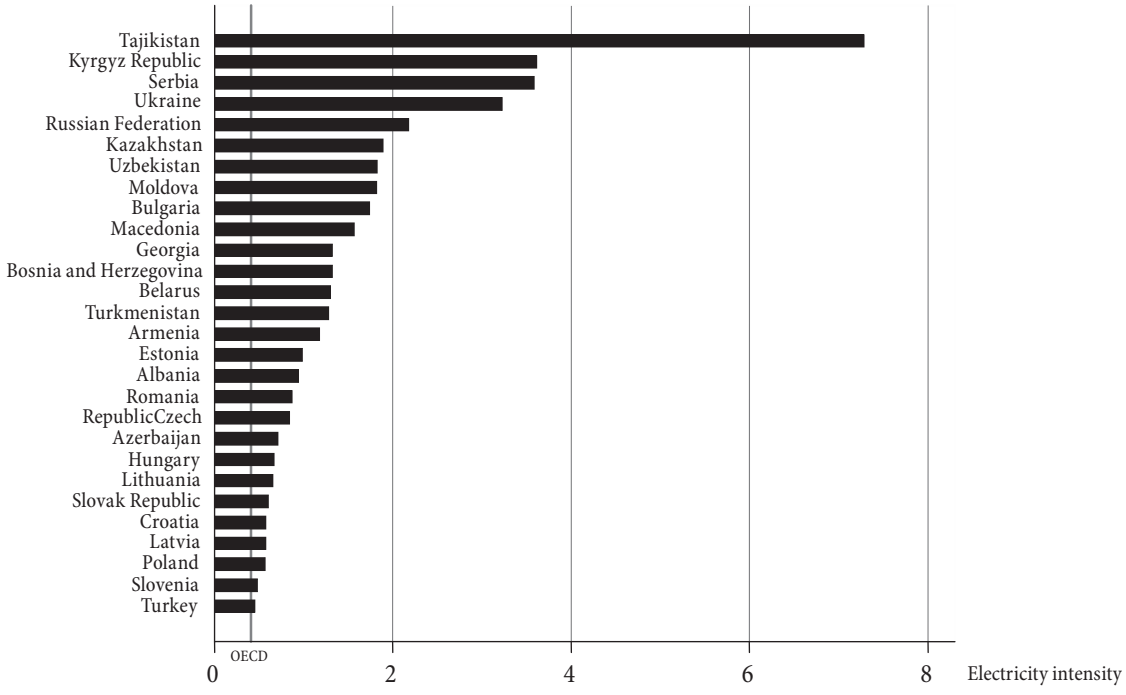
South East European countries did not experience the same convergence as EU countries. The main reason is probably the wars in former Yugoslavia (1991-1999). Serbia is a clear example of war outliers. The war period had created unrecorded economy, electricity trade and enormous efficiency losses. In 2009, Serbia is still one of the less efficient countries in our sample, due to its

Figure 1: Electricity intensity
(Electric power consumption in Kwh per constant 2000 US$) during the period 1990-2009



Notes: Tajikistan & Kyrgyz Republic are excluded; FYR Macedonia & Montenegro are missing due to data unavailability
Source: WDI, World Bank, authors' calculations

Figure 2: Electricity intensity
(Electric power consumption in kWh per constant 2000 US$) by country, in 2009



Source: WDI, World Bank, authors' calculations

implication in three different conflicts between 1991and 1999 (see figure 5 in appendixes).

Finally, CIS countries are by far the less efficient countries among transition economies. As in SEE, the countries with an experience of war have the worse results (i.e. Tajikistan). But the first period of transition (1990-96) was also, for those economies, a shock in terms of electricity intensity. Most of the countries have only improved their situation after 1995. It can be noted that there are two outliers – Tajikistan and the Kyrgyz Republic – with electricity intensity up to nine times higher than some CIS countries.

Overall, we observe for all the groups a slow-down or a little increase (for SSE) of the electricity intensity evolution, whereas all the countries of the region are still far from the average level of electricity consumption intensity of OECD countries. We can also notice a break in 1994-1995 of the evolution of electricity intensity and economic growth in the whole region.

The figure 2 confirms the overall high level of electricity consumption in the CEEC, CIS and SEE countries. In 2009, the less electricity intensive country (Slovenia), has still consumed more electricity in order to produce one dollar of production, compare to the average of OECD countries. Looking carefully at the figure, it may be noted that non EU countries have more electricity oriented economies and, there is no doubt that those countries, especially CIS and SEE countries, carry a high level of waste and inefficiency in their use of electric power.

The electricity intensity in the industrial sector

In this section we focus only on the different sub-sectors composing manufacturing activity of those countries. In order to compute our sectoral electricity intensities, we use both data of sectoral electricity consumption from IEA (International Energy Agency) and sectoral value-added information from UNIDO (United Nations Industrial Development Organization). The IEA and UNIDO datasets use different industrial classification standards and different levels of disaggregation, 2-digit ISIC rev.2 and 4-digit ISIC rev.4 respectively. We should therefore rearrange both databases in order to have a valid measure of industrial electricity intensity.

Table 1 provides the ranking of sectoral electricity intensities. Scores are averaged across the countries and over the period.

We can see that four sectors are on the top of the distribution: non-specified industry, chemicals, manufacture of basic metals and non-metallic minerals. The "non-specified industry" is an aggregate of several sub-sectors, which can be particularly electricity intensive such as rubber and plastic products or recycling industries. Overall, this ranking is in line with some evidence highlighted by UNIDO [26] about manufacturing energy intensity. Indeed, the four sectors cited below are among the most energy intensive sectors in the whole manufacturing activity. Such inter-sectoral variations call to add industry dummies in our regressions.

Institutional and reform changes in transition economies

Figure 3 presents the evolution of electric power reforms in transition economies. In each country, the electric power reform index assesses the independence of the electricity regulator, the tariff setting rules and the market liberalization of the sector. The EU countries (see table 7 in appendix for the list of countries) do have the best results mainly due to the *acquis communautaire* regulations. However some countries may experience a reverse reform process, for example Hungary or Estonia. The institutional framework is crucial for the energy pricing and the quality of the services.

Table 1: Average electricity intensity (electric power consumption in kWh per constant 2005 US$ of value added) by sector, over the period 2004-2007

UNIDO-IEA mix (ISIC rev.4 & ISIC rev.2)	Average score
Non-specified industry	9,02
Chemicals	7,11
Manufacture of basic metals	6,11
Non metallic minerals	5,82
Machinery	1,88
Paper, pulp and print	1,81
Wood and wood products	0,94
Food and Tobacco	0,79
Transport equipment	0,59
Textile and leather	0,50

Source: IEA, Unido, author's calculations

In South East Europe, the evolution of reforms was unstable, due to the wars (1991-1999) in the former Yugoslavia. Many reforms were delayed by five or even ten years. The electricity market is still not very transparent in the region, and this probably impacts the electricity cost for the enterprises.

As we can see, countries in the CIS region have experienced very different reform path. Most of the Central Asia and South CIS countries have delayed their reforms in the electricity sector compared to Russia, and Ukraine. However, we observe some backward policies in the region.

We use the quality of the electricity service at the local level in our regressions as a proxy for the institutional reforms. This indicator affects significantly the firm's electricity efficiency (following table 4).

Data, descriptive statistics and methodology

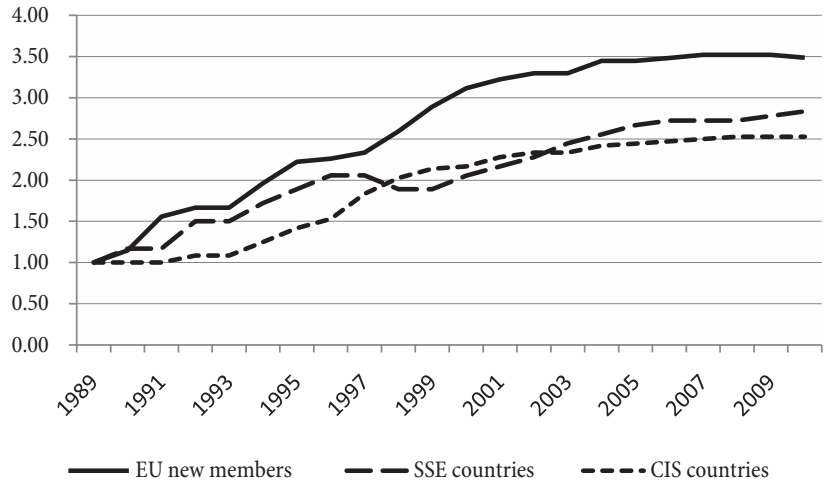
Data

The data presented in the following two sections provide from the BEEPS survey (EBRD). The European Bank for Reconstruction and Development and the World Bank create the Business Environment and Enterprise Performance Survey (BEEPS) on a representative sample of private sector firms in twenty-nine countries of Eastern Europe and Central Asia (for the last round of the BEEPS, in 2008-2009). The survey covers a large set of topics, including corruption, access to finance, crime, justice and some firm performances measures. Thus, the objective of the BEEPS is to collect firm-level information in order to assess the influence of enterprise's characteristics and several institutional factors on firm behaviours and performances. There were four rounds of survey undertaken since 1999-2000, over a sample of 4000 to around 12000 firms in 2008-2009. There are a relatively small proportion of observations allowing us to build real panel data, especially concerning our research question. Indeed, we are constrained to use only the last round of the survey, which includes questions concerning firm's electricity expenses.

To build the firm-level electricity intensity variable we have used two questions. The first one concerning the firm's electricity consumption: "For fiscal year 2007, please provide the following information about this establishment: total annual costs of electricity". The second question concerns the sales turnover: "In fiscal year 2007, what where this establishment's total annual sales?"[1] These two questions allow us to construct our dependent variable as the ratio of electricity expenses over total sales during the year 2007 (see table 5 in appendixes for detailed description of variables). Before analysing econometrically the determinants of firms' electricity intensity, it is informative to look at the raw distribution of our dependent variable as regarding some firm characteristics.

1 See the EBRD website for more details about the survey.

Figure 3: Index of electric power reform in transition countries



Notes: Missing data for Czech Republic and Kosovo
Source: EBRD 2012, Transition indicators, authors calculations

Descriptive statistics

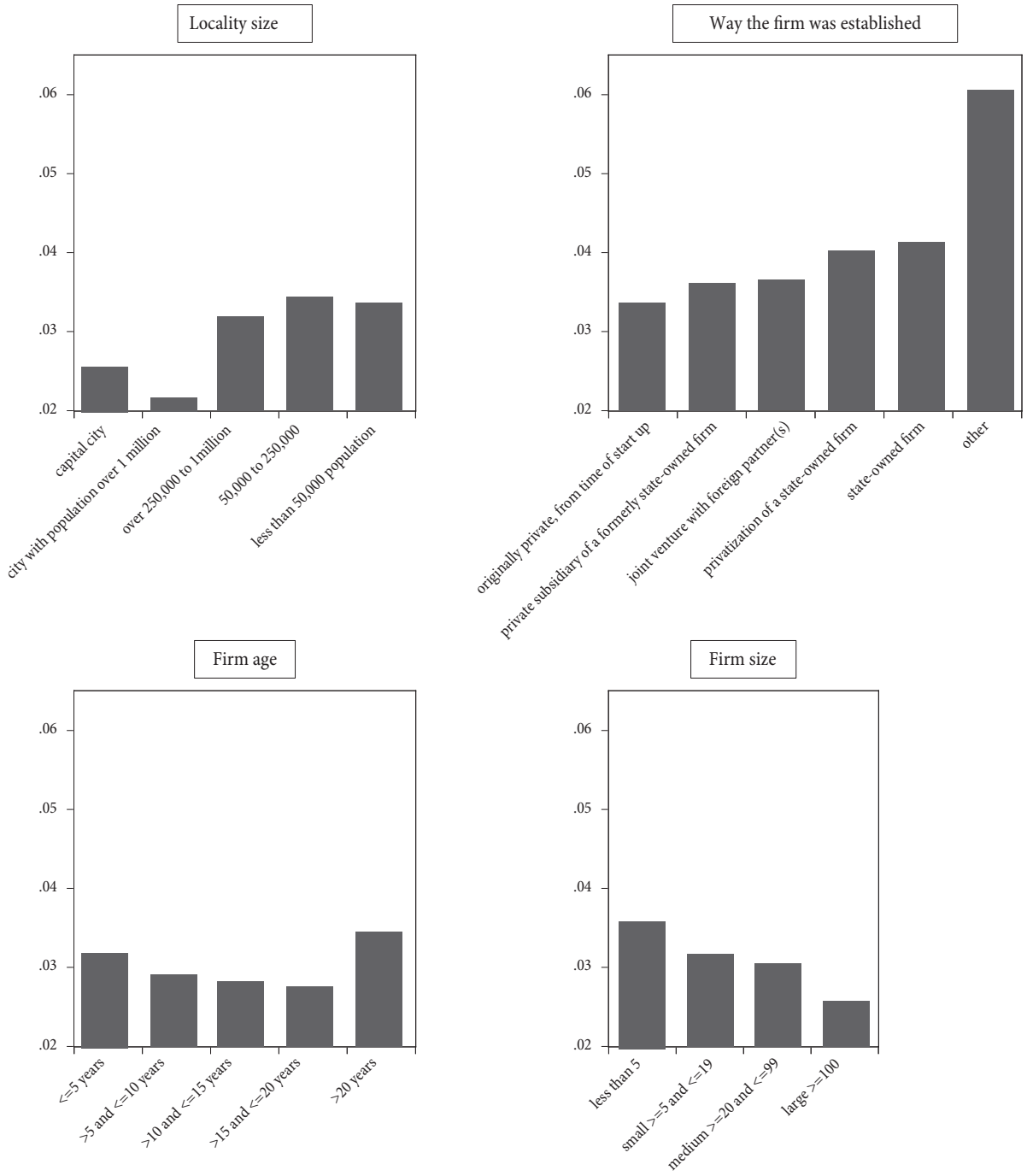
Figure 4 shows the average distribution of firm electricity intensities conditional to the size of locality, the size and the age of the firm and the way the firm was established.

As we can see in small cities, the use of electricity is rather inefficient compare to big cities. Transition appears to be more "succesful" in large cities, where also probably technologies and electric sector are more developped.

We can also remark, that private *de novo* firms are on average by far the more electricity efficient. As expected state-owned and formerly state-owned firms are the more electricity intensive, due probably to a weaken budget constraint and remaining consumption behaviors from the planned economy system.

Following the figure, the enterprise's age affects efficiency in two different ways. We observe that the

Figure 4: Firm characteristics and average electricity intensity from BEEPS (2009) data



Source: BEEPS survey, 2009, EBRD, authors' calculations

more energy intensive firms are at the extremes of the age distribution. Enterprises created before the USSR collapse (more than twenty years ago) are more energy intensive maybe due to their overall specialization in energy intensive sectors, and also because of inherited obsolete processes and technologies. In the other side, the younger firms are less energy efficient, probably because of a scale effect accompanying a smaller size on average of younger companies. Between those two extremes, firms seem to be more energy efficient without real gaps across the groups.

Finally the energy intensity is negatively correlated with firms' size. Large enterprises tend to be more efficient in their use of energy. Beneffiting of economies of scale, large firms are more able to implement new technologies and increase their overall productivity.

A simple empirical model

To investigate the determinants of firms' electricity intensity and assess specific effects of power sector and financial constraints, we consider the following econometrical specification:

$$\text{electricity intensity}_{ijc} = \beta_0 + \beta_1 y_{ijc} + \beta_2 l_{ijc} + \beta 3\, k_{ijc} + \delta Z_{ijc} + D_j + D_c + u_{ijc} \quad (1)$$

where electricity intensity = electricity expenditure over total sales, Y = total sales, L = labour (number of employees), K = capital (net book value of machinery, vehicles, equipment, land and buildings). Lower case letters indicate natural logarithms, for example $y = \ln(Y)$. Z is a vector of control variables that could affect electricity intensity, i.e. a set of firms' characteristics (age, share of employees with university degree, ratio of current annual sales to annual sales three years ago, way the firm was established) and a proxy for population density (dummy variable for the size of the locality). The estimation also includes 2-digit industry dummies and country dummies respectively indexed by j and c. The detailed description of variables is given in appendixes.

There is no selection bias due to the fact that almost no enterprise declares zero electricity costs (1,7 % answered they have zero electricity costs).

Our specification is based on the approach adopted in the energy related literature [4], [19],[20]. Nevertheless, from our electricity cost share equation might arise a number of concerns[2]. We repeat our regressions using different specifications and it does not change fundamentally our main findings[3].

In the following section, we present our first regression's results and we discuss and comments them.

Regressions results (see tables 2 to 4)[4]

We organise the econometric analysis in the following way: first we present a simple specification with and without a management variable, then we include the local financial obstacle and finally we include the constraint of electricity access at the local level.

Preliminary regression's results (see table 2)

We have more than 2300 observations on the enterprise level. The basic results are displayed in table 2. We can control for sectors and countries specific effects. We present the results without dummies for countries and sectors (column 1) and controlling for industry dummies (column 2), country and industry dummies (columns 3 and 4). Except for employment size the results are similar for the electricity intensity and the share of electricity cost.

We found out that the enterprise number of employees does significantly affect the electricity intensity. When we take into account for country and sector fixed effects the number of employees is significant and increases the inefficiency. Furthermore, the amount of capital tends

2 Because in the BEEPS dataset we do not have firm specific prices, our dependent variable captures both variations in quantities and prices. Electricity intensive firms might be able to charge higher prices for their products and thus reducing the electricity cost share, as expressed above. In order to take into account such a mark-up effect, we use an alternative measure of electricity intensity, the electricity expenditures over variable costs (total cost of labour, intermediates, fuel, power and other utilities) as the dependent variable. (see our working paper for the detail results). Second, to ensure that our results are not driven by the choice of variables used in our basic specification we repeat our regressions with an alternative specification. The main justification for using the cost share equation (1) is that such a specification is in line with the usual translog factor demand equation. But, we also try to test our results with another econometrical specification, including a proxy for wage and investment measures instead of labour and capital variables.

3 Results are available in the working paper version.

4 All the variables are in local currency unit, when we use a common currency the results remains very similar. Country dummies capture almost all the nominal effects.

Table 2: Dependent variable: log electricity intensity, i.e. log electricity cost over total sales (OLS)

Log elec. cost over total sales	**(1)**	**(2)**	**(3)**	**(4)**
Log total sales	-0.288	-0.284	-0.661	-0.662
	(11.89)***	(12.23)***	(25.15)***	(24.27)***
Log number of employees	0.006	0.005	0.503	0.490
	(0.18)	(0.15)	(13.10)***	(12.00)***
Log capital	0.207	0.198	0.122	0.121
	(9.22)***	(9.13)***	(6.12)***	(5.90)***
Firm age	-0.001	-0.001	0.001	0.001
	(0.87)	(0.66)	(0.77)	(0.46)
Univ. level in total employment	-0.002	-0.001	-0.002	-0.002
	(1.00)	(0.58)	(0.98)	(0.96)
Log enterprise performance	-0.163	-0.169	-0.075	-0.066
	(4.73)***	(4.88)***	(2.64)***	(2.31)**
Management quality certification				0.096
				(1.60)
Way the firm was established (ref=state owned or privatization of a state owned)				
Originally private, from start up	-0.558	-0.549	-0.341	-0.368
	(7.05)***	(7.26)***	(5.15)***	(5.53)***
Priv. subsidiary of a state-owned firm	-0.352	-0.303	-0.246	-0.227
	(1.72)*	(1.51)	(1.26)	(1.14)
Joint venture with foreign partner(s)	-0.287	-0.257	-0.079	-0.177
	(1.62)	(1.51)	(0.49)	(1.06)
Other type of establishment	-0.083	-0.123	-0.225	-0.260
	(0.41)	(0.60)	(1.06)	(1.22)
Size of locality dummy (ref=capital city)				
Over 1 million – other than capital	-0.264	-0.298	0.056	0.032
	(2.33)**	(2.66)***	(0.54)	(0.31)
Over 250.000 to 1 million	0.034	0.024	-0.078	-0.099
	(0.32)	(0.23)	(0.79)	(0.98)
50.000 to 250.000	0.106	0.087	0.065	0.046
	(1.23)	(1.08)	(0.87)	(0.59)
Less than 50.000	0.085	0.093	0.025	0.014
	(0.96)	(1.05)	(0.33)	(0.17)
Constant	-2.207	-2.384	4.840	5.220
	(9.36)***	(10.38)***	(8.22)***	(9.95)***
		With industry dummies	With country and industry dummies	With country and industry dummies
R^2	0.19	0.20	0.36	0.36
N	2,344	2,344	2,344	2,261

Robust standard errors clustered by country-industry in brackets

* $p<0.1$; ** $p<0.05$; *** $p<0.01$

to increase the inefficiency. Capital and labour seems not to be used in order to produce at lower energy costs. It seems that more labour and capital intensive firms are more electricity intensive. Similar relationships were fund by Bloom et al. [4] and Morikawa [20] between energy intensity, capital and labour variables. Those results also echo the empirical evidence of Berndt and Wood [3] among others. They found that energy and capital are complementary and that energy and labour are weakly separable. This last point implies that more employment also needs more energy consumption[5].

The age of the firm does not have any statistical significance; there is probably a non- linear effect of age on the energy efficiency (see figure 4 in the previous section).

5 There has been extensive research on the substitutability or complementarity between energy and other inputs. Unfortunately, our database limitations do not allow us to strongly relate our findings to this literature. Indeed, we are unable to deal properly with the issue of elasticity between energy and other production factors because we lack input prices information.

A more optimistic result is provided by the sales: larger sales tend to increase the efficiency. We are probably capturing some economies of scale. In addition, the performance of the firm in terms of actual sales compared to three years ago seems to reduce the inefficiency. A possible explanation is that firm performance decreases the electricity intensity through its effect on total sales.

Originally, private firms (from start up) are less spending on electricity per unit sold. This finding is strong, significant and stable over all of our estimations. This result echoes previous literature treating of the effect of *de novo* privatization on different variables of firm's performances like growth, productivity, innovation, etc. [13].

Our paper contributes to the discussion on the management quality and allocation of resources; we do not find any significant effect of the management on the electricity efficiency neither on the share of electricity cost. This result might differ from the previous studies of Bloom et al. [4] and Martin et al. [19] because of our proxy of management quality[6].

All our results remain stable with or without Russia; this robustness check is important since Russia is a much larger country compared to others in our sample[7].

Local indicators of financial and electricity constraints (see tables 3 and 4)

Following a recent World Bank report [30], finance and electricity are among the most severe obstacles faced by firms. In this section, we try to test whether financial and electric local constraints are related to firms' ability to use electricity efficiently.

The role of local financial constraint on electricity efficiency

One of the main obstacles to energy efficient use is the financial constraint facing by firms [29]. The quality of the financial intermediation could be a prerequisite to enhance energy intensity. Indeed, standard financial theory emphasizes two main advantages of efficient financial markets. On the one hand, the financial sector development allows slacking firms' budget constraints and on the other, it plays a role of screening and monitoring efficient investment projects.

Hence we may have several potential drivers explaining a positive impact of financial markets on energy efficiency. An easier access to financial system may allow to finance new and energy saving technology *i.e.* to replace obsolete machinery or to invest in a new one. In a long run perspective, if firms perform better, efficient financial markets may be able to select and finance energy saving projects and favour the less energy intensive enterprises. This is crucial, especially in countries where energy supply is a major issue.

The BEEPS dataset contains information about how far access to finance represents a binding constraint for a firm. Unfortunately, it is not an exogenous variable indicating the financial development environment facing by firms.

To deal with this issue, we use the method developed by Guiso et al. [16]. Distinguishing differences in financial development between different regions of Italy, their paper highlights the positive impact of the development of local financial markets on several microeconomic variables (competition, entry of new firms, growth). This approach estimates regional financial development indicators by adding regional dummies in individual subjective assessments of financial obstacle in order to obtain regional scores. Ranking those regional dummies allows having a good proxy for regional financial development. This method has been used by Villegas-Sanchez [28] to highlight the role of local financial markets in externalities conveyed by the FDI.

Following this literature, we have estimated, from the base of BEEPS 2002, 2005 and 2009, a regional financial constraint indicator. To do this, we calculated, with a probit model, the probability that access to finance is a binding constraint for a company[8]. The econometric specification of the firm-level determinants of financing obstacles is based on the paper of Beck et al. [2].

There are several advantages of using, in our regressions, a regional indicator of financial development, instead of the direct answer. First, companies whose report may be constrained by access to finance are more

6 The variable of management is a dummy equal to 1 if the establishment has an internationally- recognized quality certification (like ISO 9000 or 14000 for example).

7 Results are available upon request to the authors.

8 Results are available in the working paper version

likely to need financing. This is the case for the most growing firms. And we can expect those companies to be more energy efficient. This implies a downward bias of the impact of access to financial markets on electricity consumption, the less electricity intensive firms declaring to be constrained by external funding needs. On the other hand, electricity intensive firms might plausibly be less productive overall. If the financial market is able to detect firms' productivity levels, we can expect the less electricity efficient firms to get a lower access to external finance. A difficult access to financing is also more crucial for small firms and younger firms. So, using the direct measure of access to financial markets implies restricting the analysis on small and young businesses, which are more energy intensive. The direct approach might therefore have an important endogeneity bias (downward and upward) with our dependant variable. By cons, information reported by firms is still a valid measure of the variation of inter-regional access to finance. In addition, the database used to construct regional indicators is much larger (there are almost three times more observations), which enhances the quality of the estimated coefficients.

Table 3: Dependent variable: log electricity intensity, with local financial constraint indicators (OLS)

Log elec. cost over total sales	(1)	(2)	(3)
Log total sales	-0.284	-0.308	-0.342
	(12.23)***	(14.91)***	(14.46)***
Log number of employees	0.005	0.027	0.056
	(0.15)	(0.95)	(1.66)*
Log capital	0.198	0.203	0.217
	(9.13)***	(10.00)***	(9.29)***
Firm age	-0.001	-0.001	-0.001
	(0.66)	(0.76)	(0.75)
Univ. level in total employment	-0.001	-0.002	-0.004
	(0.58)	(1.45)	(2.00)**
Log enterprise performance	-0.169	-0.166	-0.149
	(4.88)***	(5.07)***	(4.03)***
Local financial constraint		0.431	
		(3.80)***	
Local financial constraint (t-1)			0.563
(from BEEPS 2002 & 2005 exclusively)			(3.43)***
Way the firm was established (ref=state owned or privatization of a state owned)			
Originally private, from start up	-0.549	-0.514	-0.471
	(7.26)***	(6.57)***	(5.07)***
Priv. subsidiary of a state-owned firm	-0.303	-0.343	-0.197
	(1.51)	(1.53)	(0.71)
Joint venture with foreign partner(s)	-0.257	-0.139	-0.009
	(1.51)	(0.74)	(0.04)
Other type of establishment	-0.123	-0.167	-0.307
	(0.60)	(0.90)	(1.25)
Size of locality dummy (ref=capital city)			
Over 1 million – other than capital	-0.298	-0.172	0.231
	(2.66)***	(1.73)*	(1.55)
Over 250.000 to 1 million	0.024	0.050	-0.052
	(0.23)	(0.50)	(0.41)
50.000 to 250.000	0.087	0.171	0.094
	(1.08)	(1.91)*	(0.94)
Less than 50.000	0.093	0.148	0.018
	(1.05)	(1.65)*	(0.18)
Constant	-2.384	-2.455	-2.188
	(10.38)***	(11.30)***	(8.86)***
	With industry dummies	With industry dummies	With industry dummies
R^2	0.20	0.22	0.25
N	2,344	2,081	1,401

Bootstrapped standard errors in brackets (non-parametric bootstrap with 500 replications)
* $p<0.1$; ** $p<0.05$; *** $p<0.01$

Furthermore, to check for the robustness of our local financial indicator, we rebuilt the same variable but using exclusively the BEEPS of 2002 and 2005 rounds. As there is a very little number of overlapping firms in the different rounds of this survey, this allows us to compute an indicator based on completely different set of observations and in a previous time span.

Main results (see table 3)

The main results of the impact of local financial constraint on firm's electricity intensity are given in the table 3.

Our results are robust if we compare column 1 and columns 2 and 3. We find similar coefficient even when we introduce the financial constraint estimated indicator. When the local access to finance is more difficult, the energy intensity of firms is significantly higher (column 2). To test the robustness of our financial indicator, we use an alternative variable of local financial constraint (local financial constraint (t-1)), measured exclusively from the previous rounds of the BEEPS[9] (column 3). By using a local financial indicator over a previous period, we can check for some endogeneity problem that could arise in column 2. Furthermore, the local financial constraint (t-1) avoids the potential effect of the global financial crisis of 2007-2008. Therefore, this second variable of local

9 The first step estimation is not reported here. Results are available upon request to the authors.

financial constraint also indicates a 1% significant effect. It is supporting our assumption that financial access is crucial for firm investment in energy savings.

The size of the estimated effect is substantial. An improving of the financial constraint indicator from the top quartile (the more financially constrained) to the bottom quartile (the less financially constrained) is associated with a 17.3% increase in electricity efficiency[10]. The magnitude is even larger in column 3: increasing the financial constraint (t-1) variable from the 25th to 75th percentile is associated with a 20.8% reduction of electricity intensity. Our results have some policy implications: if transition countries want to improve the firm's energy efficiency, they need to facilitate the access to finance for new investment and to promote high labour productivity activities. The relation between banks and firms is essential for the improvement of energy uses by firms.

The electricity supply constraint at the local level and firm-level electricity intensity

The energy intensity related literature [6] highlights the role played by the electricity sector in maintaining high levels of energy consumption in Transition economies. In the same way, the EBRD [11] special report argues that power sector underdevelopment is one of the main drivers explaining electricity inefficiency in this region, especially in former Soviet Union countries. Indeed, insufficient reforms and underinvestment in the electricity sector could lead to the deterioration of the electric power supply. In this case, a low electricity price goes hand in hand with low quality of the provided service, involving disruptions, inadequate quality and bureaucratic disturbances.

In this last sub-section, we try to test whether firms facing higher regional power sector underdevelopment experience higher electricity intensity –or inefficiency. To deal with this issue, we have decided to keep the same methodological approach as previously. Using in our estimation the direct response of the firms' constraint can lead to some endogeneity concerns, as electricity intensive firms might feel more constrained when the supply of their main input is problematic. In order to take into account for the quality of electricity supply faced by firms, we compute a regional indicator reflecting local electric power underdevelopment. This approach seems to be particularly fitting for the structure of the electricity sector. Indeed, inside each country, we can expect a large variation of the quality of the electricity service depending of the local development of the electricity market and infrastructures.

To catch up these regional effects, we computed the probability that electricity is a major or very severe obstacle to the current operations of a firm[11]. As previously, we used region dummies to compute our indicator of local electricity access. The increase of the local electricity constraint variable indicates a deteriorating development of the electricity sector at the local level.

Main results (see table 4, columns 1 and 2)

In table 4, we present the results of the regression, where we include the quality of the electricity service at the local level. Our main finding is that poor access to electricity supply tends to increase the inefficiency at the enterprise level (column 2). All the other results in table 4 are stable compared to the results from the basic specification (column 1).

The quality of the electricity service at the local level is for us a good proxy of the institutional reforms in the electricity sector. Hence, our results provide an instructive and original finding about the firm's behaviour in front of electric power local access. Moving from the 25th to the 75th percentile of the electricity sector constraint distribution predicts an 11.5 percentage points increase of the firm-level electricity intensity[12].

Country power sector reforms and electricity intensity (see table 4 columns 3 and 4)

The negative effect of local electricity sector underdevelopment on electricity intensity should be related to the level of institutional reforms undertaken in the power sector. Indeed, insufficiently reformed power sector is characterized by tariff below the cost

10 The estimated effect is given by: [exp(0.371*0.431)-1]*100=17.3%, where 0.371 is the interquartile range of the local financial constraint indicator and 0.431 is the coefficient of the local financial constraint indicator in table 3, column 2.

11 Results are available in the working paper version.

12 The estimated effect is given by: [exp(0.217*0.497)-1]*100 = 11.5%, where 0.217 is the interquartile range of the local financial constraint indicator and 0.497 is the coefficient of the local electricity constraint indicator in table 4, column 2.

Table 4: Dependent variable: log electricity intensity, with local electricity constraint indicator (OLS), countries with well/insufficiently reformed power sector

Log elec. cost over total sales	(1)	(2)	(3)	(4)
Country sample	Overall	Overall	Well reformed	Insufficiently reformed
Log total sales	-0.284	-0.310	-0.315	-0.306
	(12.23)***	(14.59)***	(10.63)***	(10.05)***
Log number of employees	0.005	0.030	0.017	0.076
	(0.15)	(1.05)	(0.43)	(1.77)*
Log capital	0.198	0.203	0.201	0.194
	(9.13)***	(9.65)***	(7.17)***	(6.44)***
Firm age	-0.001	-0.001	-0.001	0.001
	(0.66)	(0.61)	(0.48)	(0.44)
Univ. level in total employment	-0.001	-0.002	-0.000	-0.006
	(0.58)	(1.50)	(0.14)	(2.08)**
Log enterprise performance	-0.169	-0.167	-0.176	-0.151
	(4.88)***	(4.88)***	(3.94)***	(3.00)***
Local electricity constraint		0.497	0.064	1.072
		(2.54)**	(0.28)	(3.05)***
Way the firm was established (ref=state owned or privatization of a state owned)				
Originally private, from start up	-0.549	-0.523	-0.681	-0.283
	(7.26)***	(6.42)***	(6.23)***	(2.38)**
Priv. subsidiary of a state-owned firm	-0.303	-0.356	-0.239	-0.345
	(1.51)	(1.50)	(0.46)	(1.36)
Joint venture with foreign partner(s)	-0.257	-0.163	-0.510	0.055
	(1.51)	(0.88)	(2.06)**	(0.22)
Other type of establishment	-0.123	-0.109	-0.115	-0.206
	(0.60)	(0.56)	(0.40)	(0.65)
Size of locality dummy (ref=capital city)				
Over 1 million – other than capital	-0.298	-0.240	-0.139	0.122
	(2.66)***	(2.44)**	(1.15)	(0.58)
Over 250.000 to 1 million	0.024	0.063	0.221	0.005
	(0.23)	(0.63)	(1.67)*	(0.03)
50.000 to 250.000	0.087	0.168	0.287	0.121
	(1.08)	(1.81)*	(2.33)**	(0.92)
Less than 50.000	0.093	0.140	0.419	-0.084
	(1.05)	(1.66)*	(3.38)***	(0.67)
Constant	-2.384	-2.382	-2.113	-2.757
	(10.38)***	(10.23)***	(6.58)***	(7.82)***
	With industry dummies	With industry dummies	With industry dummies	With industry dummies
R^2	0.20	0.22	0.22	0.22
N	2,344	2,108	1,244	864

Bootstrapped standard errors in brackets (non-parametric bootstrap with 500 replications)
* $p<0.1$; ** $p<0.05$; *** $p<0.01$

recovery, inadequate supply and bad infrastructures. Thus, insufficient reforms (in the power sector) will lead at the same time to firms' electricity over-consumption and a bad quality of the provided service. We expect to find a negative impact of local power sector underdevelopment on electricity efficiency only in low reformed countries. For this purpose we split our sample according to the level of undertaken power reforms in 2008 as indicated by the EBRD reform indicator.

The threshold level is 3: insufficiently reformed = [2;3] and "well" reformed =]3;4[. The choice of this threshold is based on two different reasons. We believe that an insufficiently reformed power sector corresponds to an indicator equal or inferior to 3[13]. It may be noted

13 The power sector is still a state-owned monopoly, the rules for cost-reflective tariff setting are not formulated or implemented and there is no regulator, at least an independent one.

that almost all the new EU members are comprised in the "well" reformed group, except Slovenia[14].

When we divide the sample according to the quality of the reforms in the electricity sector, we find very interesting and convincing results (columns 3). If one is in the group of countries without doing reforms in the power sector (column 4), the local constraint to access electricity is increasing the electricity intensity. The effect of the local constraint is not significant anymore for the group of countries implementing the power sector reforms (column 3). This provides micro-level evidence that insufficiently reformed power sector leads to an inefficient use of electricity by firms.

Conclusions and policy recommendations

Our main findings are that good access to local finance and local constraint on electricity increase the energy inefficiency of firms. The same factors also increase the share of electricity cost in total variable costs.

The financial development at the local level seems to be a crucial driver of electricity efficiency improvement. We estimated a potential reduction of one-fifth of firms' electricity intensity associated with an improvement from the 25th percentile to 75th percentile of the distribution of the local financial access variable.

We also find out micro-level evidence that insufficiently reformed power sector leads to an inefficient use of electricity by firms.

Transition countries also need to improve the access to electricity at the local level, especially when the power sector is not reformed, or when the local firms are more than twenty years old.

Our policy recommendations are in line with the World Bank reports of 2012 and 2010 and the EBRD report 2011. We underline the importance of reforms in the power sector especially the problems of competition [11] and shortages in power supply. We also link the energy efficiency with the access to bank credits and good quality of financial intermediation.

14 We also try to split our sample between countries belonging to the EU and countries outside the EU, but this last partition provides less robust results.

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Appendixes

Table 5: Description of variables

Variable	Definition/description	Related label in the BEEPS	Expected sign
Log electricity intensity	Logarithm of the ratio of electricity expenses to sales	n2f/d2	
Log number employees	Logarithm of the number of employees	l1	-
Firm age	Difference between the firm year creation and the year of the survey	a14y - b5	+
Log total sales	Logarithm of the total sales	d2	-
Log capital	Logarithm of the net book value of the capital	(n6a + n6b)	-
Univ. level in total employment	Share of university level employees in total employment	ecaq69	-
Log enterprise performance	Logarithm of the ratio of total sales during the last fiscal year to sales 3 years ago	d2/n3	-
The way the firm was established	Dummy variable for the initial (or after privatization) status of the establishment	ecaq5	
Size of locality	Locality size dummy variable	a3a	-
Industry	Industry dummy (12 sectors)	a4b	
Country	Country dummy variable	a1	

Table 6: Countries included in the study

EU new members in 2008	South Eastern Europe (SEE)	Commonwealth of Independent States (CIS)
Bulgaria*, Czech Republic, Estonia*, Hungary*, Latvia*, Lithuania, Poland*, Romania*, Slovak Republic* and Slovenia*,	Albania***, Bosnia and Herzegovina***, Croatia**, FYR Macedonia** , Serbia***, Montenegro*** Turkey **	Armenia, Azerbaijan, Belarus, Georgia, Kazakhstan, Kyrgyzstan, Moldova, Russia, Tajikistan, Turkmenistan, Ukraine and Uzbekistan

*EU new members, ** EU candidates and *** Potential EU candidates

Table 7: List of countries included in the OECD mean calculation

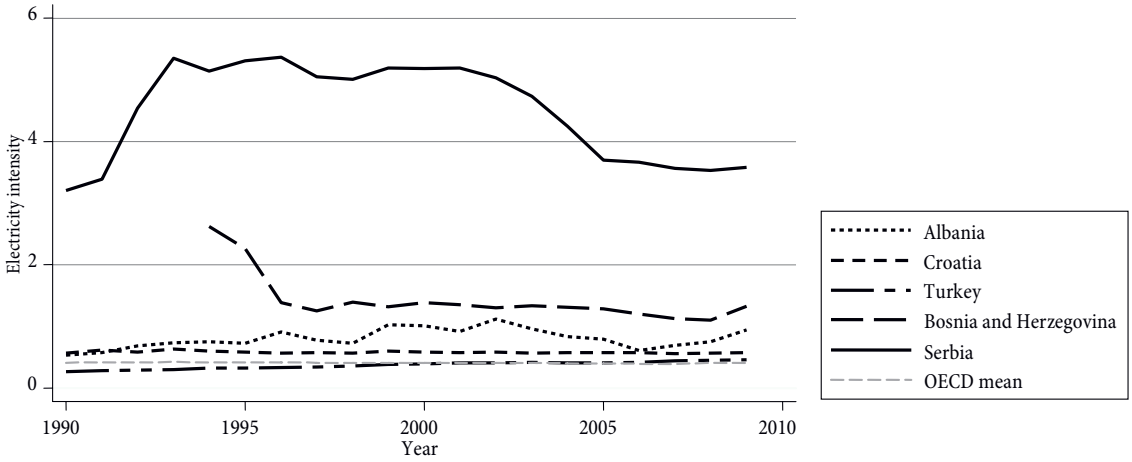
Counterfactual: High Income OECD members	For ease of comparison the following OECD members were excluded:
Australia, Austria*, Belgium*, Canada, Denmark*, Finland*, France*, Germany*, Greece*, Iceland, Ireland*, Israel, Italy*, Japan, Korea Republic, Luxembourg*, Netherlands*, New Zealand, Norway, Portugal*, Spain*, Sweden*, Switzerland, United Kingdom*, United States	Czech Republic*, Chile, Estonia*, Hungary*, Mexico, Slovak Republic*, Slovenia*

*EU new members

Data:

The electricity intensities are computed as a ratio of GDP to country level electricity consumption. The GDP is expressed in constant 2000 US$ and the electric power consumption in kWh. Data come from the World Development Indicators and are extracted online from the World Bank data service.

Figure 5: Electricity intensity (Electric power consumption in kWh per constant 2000 US$) in South Eastern Europe, 1990-2009



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CONCENTRATION AND COMPETITIVENESS OF THE BANKING MARKET IN SERBIA: CURRENT SITUATION AND POSSIBLE FUTURE CHANGES UNDER THE INFLUENCE OF MARKET CONSOLIDATION*

Koncentracija i konkurentnost bankarskog tržišta Srbije: postojeće stanje i moguće promene pod uticajem buduće tržišne konsolidacije

Abstract

Serbia is a bank-centered financial market, which means that the analysis of concentration and competition is important. Currently, the banking market is weakly to moderately concentrated or mildly oligopolistic. In the future, we can expect a consolidation of the banking market in terms of reducing the number of banks and strengthening the market power of the largest banks. Possible channels of consolidation are the sales of the remaining state owned banking package, takeovers between banks and the disappearance of some banks as a result of competitive selection. The paper analyzes the possible scenarios for the future consolidation and their impacts on the competitive dynamics. The authors argue in favor of a positive impact of a more moderate consolidation on competition indicators, but are also warning the regulator to prevent excessive concentration and cartel arrangements.

Key words: *banking market, consolidation, Serbia, concentration, competition*

Sažetak

Srbija je bankocentrično finansijsko tržište i analiza koncentracije i konkurencije time dobija na značaju. Trenutno, bankarsko tržište je nisko do umereno koncentrisano ili blago oligopolizovano. U budućnosti se može očekivati konsolidacija bankarskog tržišta u pravcu smanjenja broja banaka i jačanja tržišne snage najvećih banaka. Mogući kanali konslidacije su prodaja preostalog državnog bankarskog paketa, međusobno preuzimanje posotjećih banaka i nestanak nekih banaka kao rezultat konkurentske selekcije. Rad analizira moguća scenarija buduće konsolidacije i njen uticaj na konkurentsku dinamiku. Autori iznose argumente u prilog pozitivnog uticaja dodatne umerene konsolidacije na konkurentske indikatore, ali i upozorenja regulatoru radi sprečavanja prekomerne koncentracije i kartelskih aranžmana.

Ključne reči: *bankarsko tržište, konsolidacija, Srbija, koncentracija, konkurencija*

Introduction

Perfect competition in all areas of economy, according to the theoretical postulates, leads to optimal allocation of resources, protection of consumers' interests and results in general social welfare. Therefore, the trend in all countries of the world is to protect competition through regulations and standards of good practice. It is important to emphasize at this point that the issues of competition in financial markets are governed by the National Bank of Serbia, not the Competition Commission [11].

The financial system in Serbia is dominated by banks since the balance sheet assets of the banking sector comprise about 90% of Serbia's total balance sheet assets. Only a little over 10% of balance sheet assets refers to the share of all other financial intermediaries (insurance companies, voluntary pension funds, investment funds and leasing companies). It is clear that Serbia is "bank-centered" and that the key for the financial system stability in Serbia is the stability of the banking sector. In this context, the analysis of concentration and competition in Serbian banking market becomes more important.

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Currently, there are 33 banks in Serbian market, and none of them with a higher than 20% share. Although at first glance it can be concluded that market concentration is not high, it is interesting to look at the possible scenarios of future consolidation of the banking sector affected by the sales of the remaining state capital and the dynamization of mutual takeovers, and how these might affect the competitive dynamics within the industry. It is also interesting to analyze specific aspects of concentration (for example according to the origin of the owner) and their effect on the stability of the banking sector.

The research was conducted on the basis of the data available from the National Bank of Serbia and other competent authorities, as well as 'insider' data from individual commercial banks which have developed analytical monitoring of important market and financial indicators.

The paper itself consists of four sections. The first section provides an overview of the major trends and indicators of the banking market in Serbia. The second part indicates the methodological approaches to measuring the concentration of the banking market and the values of the key measures of concentration. The third part looks at possible scenarios for the consolidation of the banking market and discusses possible impacts on the level of competition. The final part briefly summarizes the main results of the analysis.

The diagnosis of the situation in the Serbian banking market

Global economic recession is still present and causing lack of liquidity in the financial sector, the decline in the real sector lending and a general contraction of economic activity. Present economic situation in Serbia is quite discouraging. Regardless of the current low level of GDP, it is projected to fall by 2% in 2013. Export has not yet reached the pre-crisis levels, while the balance of payments deficit remains significant. Employment rate is in constant decline, while inflation is above targeted for this year by 10%. Since 2010, the budget deficit and public debt are on an exponential growth path and significantly exceed the legal limit [10].

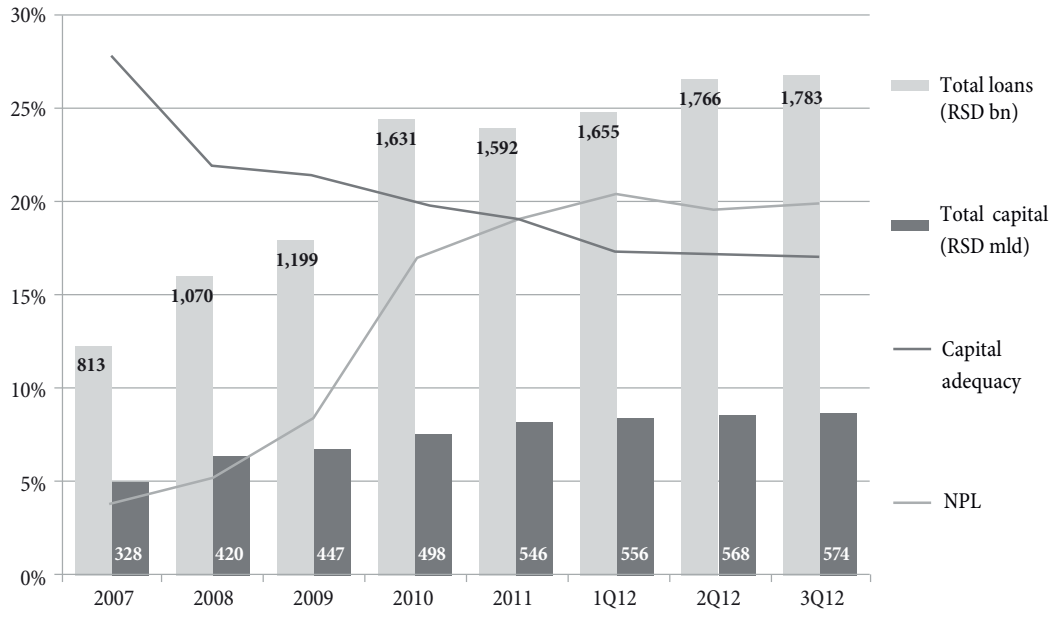
As a result of the increased uncertainty, the domestic real and financial sectors are further exposed to interest rate and exchange rate risks. In the first three quarters of the 2012 year-on-year, the dinar already depreciated against the euro by 13.7% [21]. The exchange rate risk remains the strongest market risk, primarily because of low exposure of banks to capital market through which it would be easier for them to hedge open positions. Foreign banks have held their overall foreign exchange position stable through transactional operations with their parent banks abroad. Namely, in order to protect themselves against exchange rate risks, local banks concluded foreign exchange swaps with their parent banks, in which they simultaneously negotiated forward and spot foreign exchange transactions. Thus, open foreign exchange position is controlled or disciplined to some extent.

Because of a decrease in money supply, the domestic sector is exposed to additional liquidity risk. Namely, due to its low operating profitability, which has been further burdened by high interest rate costs, the domestic economic sector has no room for rest and recovery. On the retail side, the discretionary income has been drastically reduced, which narrows the space for new loans and makes the repayment of the existing debts more difficult. The National Bank statistics says that there are 16% legal entities and entrepreneurs who are at least 90 days behind with repayments, and about 8% individuals with the same delay [20].

Half of the credit supply is being directed to the corporate sector, while slightly less than 30% is being directed to the retail sector. On the deposit side, the biggest creditors of banks are individuals with a total share in the deposit mass of about 60%. The positive trend of the retail deposit mass growth in the last five years occurs mainly due to favorable deposit interest rates which attract capital from abroad.

While the total capital of banks and loans stagnate or grow modestly (they are in fact falling due to inflation and negative exchange rate scissors), the already approved loans are burdened by increased credit risk due to increased share of non-performing loans in the total loans of both corporate and retail sectors. In parallel with the increase of NPL share, there is a decline in the capital adequacy

Figure 1: The NPL share and capital adequacy trends in Serbian banking sector



Source: The National bank of Serbia, 2012, internal data.

of banks, which is clearly illustrated in the following presentation (see Figure 1).

Such risks, although increased, have not activated the systemic risk in the banking sector in terms of compromising its stability and the atmosphere of trust. However, they have led to a mild, in some cases (Agrobanka or Razvojna banka Vojvodine) even significant undercapitalization of banks. This has resulted in increased interventionist measures of the National Bank in order to strengthen the resilience of the banking system, primarily through capital strengthening and consolidation of the assets structure.

An additional stabilizing mechanism is the Vienna Initiative launched in 2008, which required that Serbian banks maintain the level of credit loans, and prevented a sudden outflow of capital from the country's banking capital. To some extent, the Vienna Initiative prevented the crisis spillover from the financial into the real sector by facilitating the restructuring of loans granted to the corporate sector. It is necessary to know that foreign banks are prevented from withdrawing capital to their parent banks through dividend payments (Decision on Classification, Decision on Capital Adequacy), but that foreign banks have been doing this in other ways, such as by placing available liquid assets to their parent banks or by increasing the costs of various services based on the parent bank policy and withdrawing money on that basis.

A key anchor of stability in the banking sector is its reliance on Basel Accords [1]. Basel focuses on deposit insurance by strengthening the capital base. The crisis has caused a new analysis of Basel II adequacy and its improvement through Basel III regulations. It is a document that sets out options to strengthen the capital base of banks (with a stronger focus on ordinary shares), the regulation of the banking sector liquidity, leverage optimization and stricter risk control of regular banking activities and capital market activities. Basel Accords focus especially on providing quality, consistency and transparency of regulatory rules and adequate application of disclosure standards. As for the capital requirements, starting from 1st January 2013, the banks will be required to adhere to minimum standards of capital relative to risky assets in the following ratios: ordinary shares compared to risky assets at the level of 3.5%, Tier 1 capital (primarily ordinary shares plus retained earnings) compared to risky assets 4.5%, and total capital compared to risky assets 8%. Many banks in Serbia are still not ready to implement Basel III standards.

At the end of the third quarter, the banking sector in Serbia comprises 33 commercial banks with total assets of nearly 25 billion euro. Composite earnings before tax (EBT) in the first three quarters amounted to 106 million euro, which is as much as 57% less than the EBT in the first

three quarters of 2011. The total capital is 5 billion euro, which is a year-on-year decline of more than 5%. Total deposits, including transaction deposits of 3.5 billion euro, were at the level of 14.2 billion euro, which is a year-on-year decline of 4%. Finally, total loans amounted to 15.5 billion euro, a year-on-year decline of 2.3%. Based on preliminary statistical indicators for the first nine months of the 2012, summarized in Table 1, it is clear that Serbian banking market is in a mild contraction. It should be noted that all of the previously presented data were derived on the basis of the financial statements that commercial banks submitted to the National Bank of Serbia.

When we talk about profitability of banks in Serbia we should bear in mind that the overall profit consists of operating profit and profit from capital. Namely, the mentioned 5 billion in capital is in RSD directed in risk-free securities at 2-week repo rate. It means that this revenue is integrated into income statement although it is not a result of banking activities, but regulatory requirements. The consequence is that true (operating) profit, after deducting profit from capital activities, is much lower and shows true profitability state of banks doing business in Serbia.

The National Bank adheres rigorously to prudent policy that partially considers the specifics of the banking market in Serbia. Specifically, the National Bank forces the New Keynesian model characterized by the dominance of monetary policy, primarily with the aim of targeting inflation. The main shock absorbing instrument in economy is the reference interest rate modification. This policy was not successful in the past, because the rigidity of changes in prices and earnings leads to the situation where monetary policy only affects real economic variables, only in the long term and only slightly. Also, rational expectations of economic agents are generally in line with the intentions of the policy makers, further neutralizing the effect monetary measures have on real economic variables.

Table 1: Performance indicators for Serbia's banking sector in the first three quarters of 2012

Number of banks	Total assets	Total capital	Total deposits	Loans	EBT
33	25 EUR bn	5 EUR bn	14,2 EUR bn	15,5 EUR bn	106 EUR bn

Source: National Bank of Serbia, 2012.

The analysis of market concentration and competition in Serbia's banking sector

The analysis of market concentration in the banking sector typically branches off into two directions in the literature. One direction is a structural approach based on the so-called SCP paradigm (structure-conduct-performance), the hypothesis on market efficiency and a range of other formal approaches in the theory of industrial organization [2]. The SCP paradigm analyzes whether a higher level of market power concentration leads to tougher competition between large banks and better overall market performance for clients (primarily through lower interest rates). This paradigm highlights the theoretical relationship between the structure (concentration levels), behavior (competition) and performance (for example, profitability of banks). The Efficient Market Hypothesis analyzes whether competitive pressure increases the efficiency of banks and thus improves their performance. As a reaction to the inadequacy of structural models, there are Non-Structural models, especially the Panzar and Rosse model (P-R model). The idea is to determine the level of market concentration and analyze the dynamics of competitive struggle between banks, without explicit analysis of the banking market structure. The greatest value of this model is that it attempts to empirically determine the relationship between the level of market concentration in the banking sector and the level of competition [3].

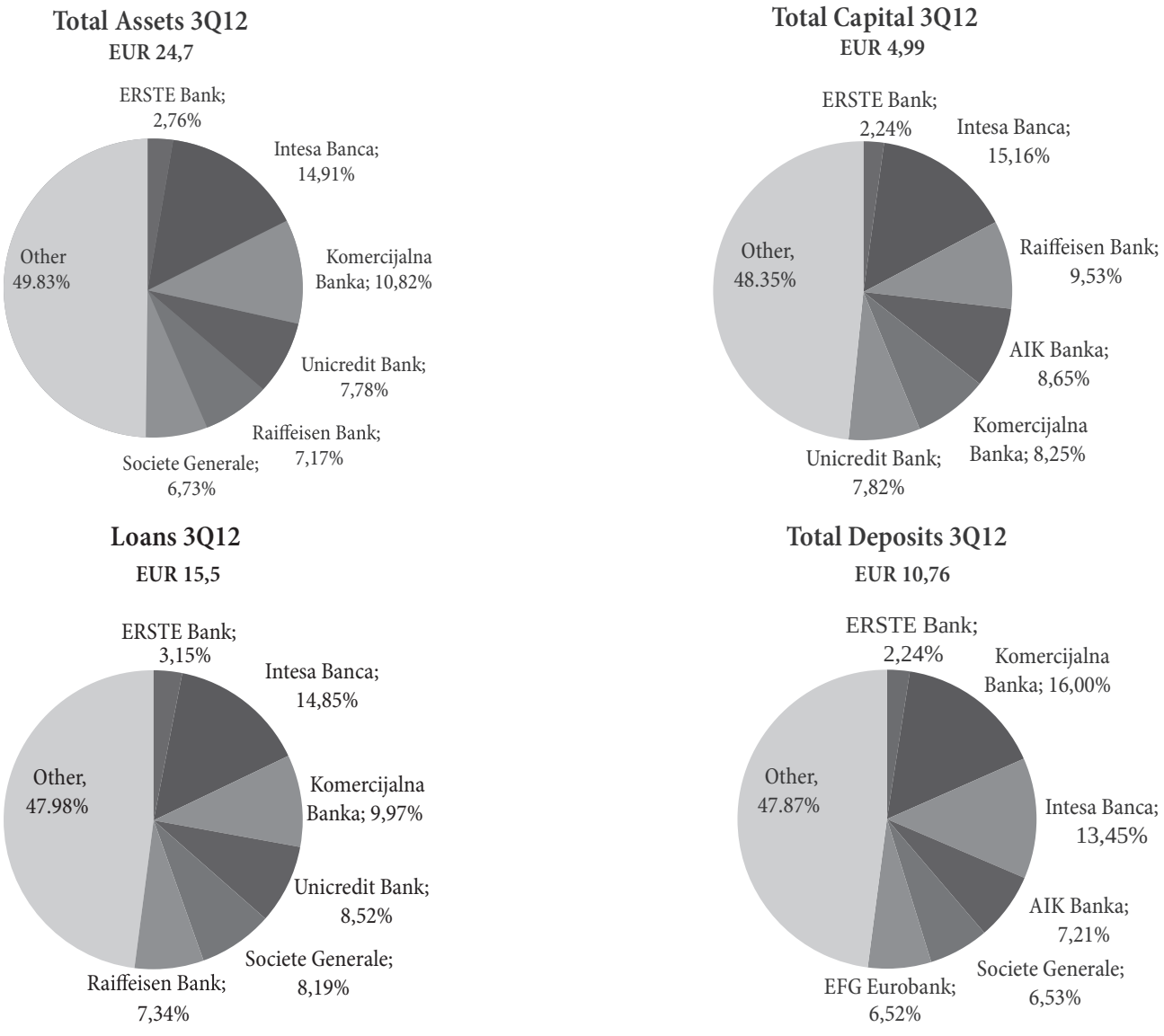
Regardless of the fact that the P-R model is the most widely used tool for the analysis of concentration and competition in the banking market [18], it has several major limitations for which it cannot be applied in the case of the analysis of the banking market in Serbia. Firstly, this model assumes that each bank has only one commercial product. Secondly, the assumption of this model is that all banks have the same cost function. The problem is that the practice shows that input prices do not necessarily correlate with the quality of service or income of the bank. In this case, the H statistics, which is calculated in the model, becomes biased. Thirdly, it has been shown empirically that this model very often wrongly assesses the level of competition based on the level of concentration [4].

That is why this paper focuses on standard instruments for determining the market concentration levels, and on a qualitative discussion on possible impacts of alternative banking market consolidation scenarios or instability of a part of the banking market on the level of competition. These typically include the following parameters of concentration levels: the concentration ratio of k companies (CR_k), the Herfindahl-Hirschman Index (HHI), the concentration curve and the Gini coefficient, the Horvath Index (CCI) and measures of entropy (E).

Basis for the calculation of market concentration indicators stated above is the definition of the relevant banking market. Defining the relevant market includes its determination in terms of products (relevant product market), but also its geographic and spatial determination (the relevant geographic market).

When it comes to relevant geographic market for the sake of simplicity of the analysis and availability of data, we are assuming that it is the banking market of Serbia, although it makes sense to separately consider markets of major cities and regions where there is a significant concentration of bank branch offices. As far as the relevant market for products is concerned, we will adhere to the logics for commercial banks licensing. In other words, all licensed commercial banks in Serbia (33 of them) will be considered as factors in relevant banking market, despite the fact that a part of them is also registered for other types of financial services (leasing, for example) and that

Figure 2: Market share of banks in Serbia according to the amount of total assets, total equity, loans and deposits



Source: National Bank of Serbia, submitted financial reports of commercial banks

not all licensed banks have the same range of banking services and the same range of clients (some banks have developed only retail sectors, while most banks have both retail and corporate sectors).

Market power distribution in the banking sector in Serbia is best described in Figure 2.

The charts above lead to some interesting conclusions. Firstly, according to the four market indicators, it is clear that the market is dominated by five banks (Intesa, Raiffeisen, Komercijalna, Unicredit, and Societe Generale). This is particularly conspicuous in the distribution of assets and loans. Intesa is a striking leader with a share of almost 15%. It is followed by other four banks with individual shares between 7 and 10%. Secondly, it is interesting to observe the distribution of partially altered structure of deposits distribution, where the obvious leader is Komercijalna banka with 16% share. Newly emerging important players are EFG Eurobank and AIK Bank. The reason is easily explained. A more aggressive interest rate policy on retail deposits attracts deposits towards these two banks. In last year's week of savings, the interest rates in these banks were on average higher than the interest rates in the abovementioned quintet of banks by more than 100 bps. Thirdly, in terms of the size of capital, once again AIK Bank 'pushed' itself among the five banks. Intesa is a pretty convincing leader with more than 15% market share.

As far as market concentration indicators are concerned, there will be only a few general words about the essence of the most important ones that we have calculated and interpreted here.

The concentration ratio of four or eight (CR4 or CR8) leading companies is calculated as the sum of the percentage of market share of the four or eight largest firms in the market. An unwritten rule says that if four largest firms control more than 40% of the market, it is an oligopoly. If the value of this ratio is higher than 90% it is a pure monopoly.

The Herfindahl-Hirschman Index (HHI) is considered the most reliable indicator of market concentration. The value of this index is defined as the sum of squares of individual market shares of all the competitors who participate in the market:

$$HHI = \sum_{i=1}^{n} s_i^2, \quad (1)$$

where s_i is the market share of an i^{th} competitor, and n is the number of competitors in the market.

Unlike CR4 or CR 8, the HHI value depends on the number of competitors in the market and the differences in their relative market powers. The HHI value decreases as the number of competitors in the market increases. Also, the value of this index increases as the differentiation in size of the market power increases, because large companies have a greater weight in the calculation due to the fact that market shares are squared. Markets are usually classified into one of the following three categories: unconcentrated (if the HHI<1,000), moderately concentrated (if the 1,000<HHI<1,800) and concentrated (if the HHI>1,800) [9].

The concentration curve is a popular tool for visualizing the level of market concentration and identifying the disparities in market power. The point is to rank competitors based on market share (from the smallest to largest), to cumulate market shares of competitors and to graphically connect the points obtained. The resulting concentration curve is then placed in relation to the curve of equal market shares ('line 45°'), which is obtained in the hypothetical case of perfect competition. The concentration curve is the basis for calculating the Gini coefficient as a measure of market power inequality. The first step is to measure the area of the curve between the actual concentration and the concentration curves with equal market shares. When this area is placed in relation to the whole area under the equal market share curve (triangle area), it gives the value of the Gini coefficient. In the case of perfectly equal distribution of market power, the Gini coefficient would be zero, since the concentration curve coincides with the curve of equal market shares. If there was total inequality in which one competitor could choose the market share that suits him (if that was possible), the concentration curve would coincide with the lower horizontal and the right vertical axis, so that the Gini coefficient would reach a maximum value of 1. It should be noted that these two extremes rarely occur in practice, so that the value of the Gini coefficient is almost always in the range between 0 and 1 [8].

The following index that we mention is the Horvath Index or the CCI (Comprehensive Concentration Index). This index measures the relative dispersion of banks and highlights the importance of the largest banks in the industry [14]. It is calculated using the following formula:

$$CCI = s_1 + \sum_{i=2}^{n} s_i^2 (2 - s_i) \quad (2)$$

where s_i is the market share of the largest bank. It takes the value of 0 to 1 ($0<CCI\leq 1$). The closer this value is to 0, the greater the concentration.

The entropy measure measures the ex-ante distribution of market power [2]. It is calculated using the following formula:

$$E = -\sum_{i=2}^{n} s_i \log_2 s_i \quad (3)$$

It takes the values from 0 to $\log_2 n$. The entropy values are inversely related to the level of concentration. If there is a monopoly in the market, its value is closer to 0, and if there is a uniform market share, its value is then closer to $\log_2 n$.

The values of the previously explained indicators (CR4, CR8, HHI concentration curve, and Gini coefficient) will be presented for seven key parameters (assets, capital, loans, deposits, total revenues, net income from interest and non-interest income).

In terms of the CR indicators, the situation is fairly uniform for all the parameters analyzed (see Table 2). The CR4 indicator is slightly over 40%, indicating a slightly oligopolistic structure. The CR8 indicator is about 65%, confirming the previously stated thesis.

Table 2: The CR4 and CR8 indicators for banking market in Serbia in the first nine months of 2012

Parameter	Assets	Capital	Loans	Deposits	Total revenue	Net income from interests	Non-interest income
CR4	40.68%	41.60%	41.54%	43.19%	42.06%	42.05%	42.09%
CR8	64.86%	68.90%	65.87%	64.60%	63.62%	64.51%	61.68%

Table 3: The Hefindahl-Hirchman index for the banking market in Serbia in the first nine months of 2012

Parameter	Assets	Capital	Loans	Deposits	Total revenue	Net income from interests	Non-interest income
HHI	672	713	686	732	691	711	674

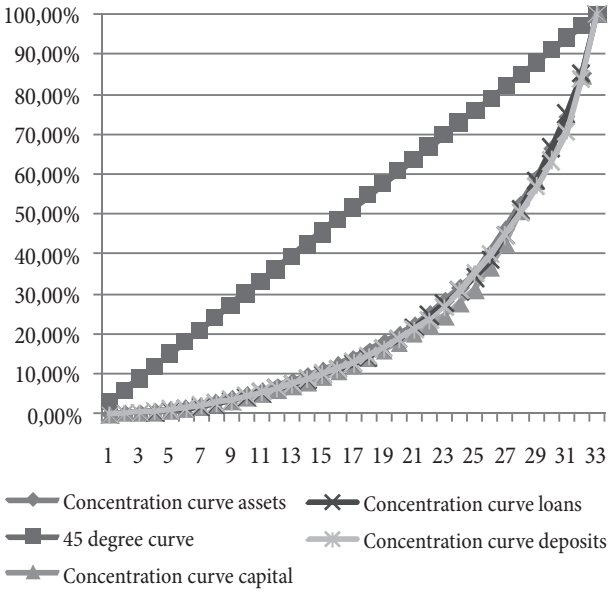
The HHI for the observed indicators is around 700 points (see Table 3), which, based on the established norms for market structure classification, is a weakly concentrated market. The reason for such low HHI value is the absence of one or several dominant leaders in the market that would have more than 20 or 30 percent market share. Interestingly, the HHI is the largest for deposits market, which can be explained by aggressive deposit policies of several banks.

We have prepared the concentration curve for four parameters (assets, capital, loans, and deposits). The position of the concentration curve indicates an oligopolistic market structure given that the curve is rather convex towards the abscissa (see Figure 3). The concentration curve shape is almost identical for the parameters of assets, capital, loans and deposits. The Gini coefficient was estimated at 0.5, which confirms the thesis that it is an oligopolistic market structure.

The Horvath index takes values between 0.2359 for assets and 0.2513 for deposits. These values indicate a lower level of concentration, i.e. a pretty even distribution of market share.

The entropy measure varies between 4.235 for capital and 4.324 for assets. Given that for the 33 banks,

Figure 3: The concentration curve with four parameters

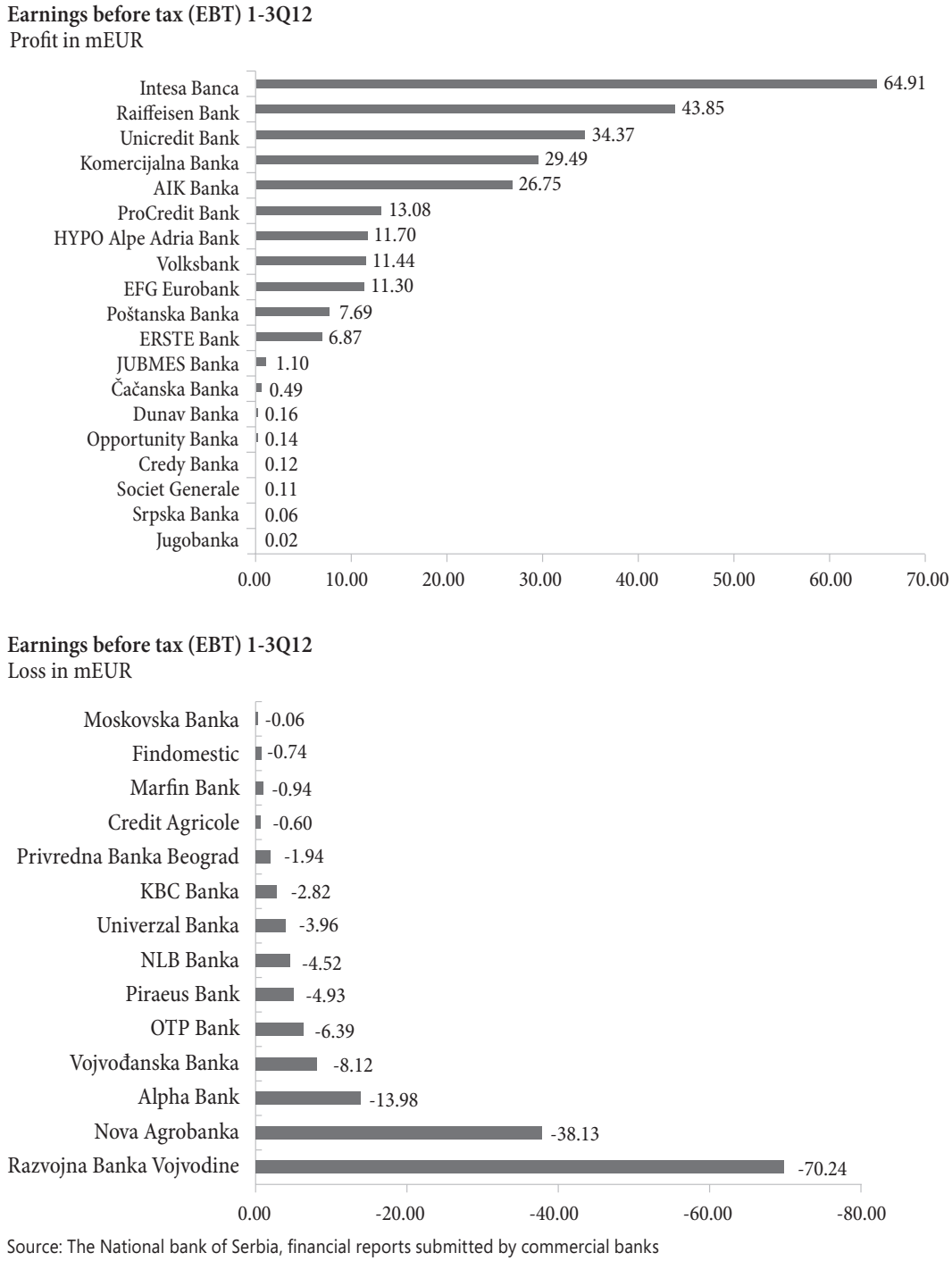


the maximum entropy value is $\log_2 33 = 5.04$, it is clear that the calculated value of entropy is very close to the maximum value. It is an indicator of equitable distribution of market power.

In total, all of the above concentration indicators point more or less to the fact that the banking market in Serbia is slightly oligopolistic. The banking market is, as a whole, weakly to moderately concentrated.

In addition these standard instruments, it would be useful to also mention other indicators of market power distribution and financial strength. The plus and minus sides of the income statement show financial health of the banks in Serbia (see Figure 4). It is clear from this view that the largest banks are also the most profitable as measured by the EBT indicator (Earnings Before Taxes). The biggest loss makers are Razvojna banka Vojvodine

Figure 4: Earnings before tax for banks doing business in Serbia (first three quarters of 2012, EUR millions)



Source: The National bank of Serbia, financial reports submitted by commercial banks

and Nova Agrobanka (taken over by Postanska Stedionica Bank by the decision of the Government of the Republic of Serbia). Also, it is evident that the Greek banks, with the exception of EFG Eurobank, are showing significant losses, which will be further addressed later in this paper.

With respect to their ownership structure, the banks can be divided into three categories: predominantly foreign banks, the predominantly state-owned banks and banks predominantly owned by domestic natural or legal persons. The share of these three categories, according to total assets, loans and deposit potential, are given in Table 4.

It is clear that banking market in Serbia is dominated by foreign banks. This motivates us to look more closely into the share of foreign banks by their country of origin (see Table 5).

It is evident that Serbian banking market is dominated by banks from three countries: Italy, Austria and Greece. Together, these banks take 56% of the market from the perspective of the balance sheet total, 58% of the loans market and 55% share of deposits market.

Table 4: Market share of banks according to their ownership structure

Parameter	Category	Share
Balance sheet total	Foreign banks	74%
	State owned banks	18%
	Private banks	8%
Credit activity	Foreign banks	77%
	State owned banks	16%
	Private banks	7%
Deposit potential	Foreign banks	69%
	State owned banks	22%
	Private banks	9%

Source: The National Bank of Serbia

Table 5: Share of foreign banks by their country of origin

Country	Share in balance sheet total	Share in loans	Share in deposit potential
Italy	21%	23%	21%
Austria	18%	18%	15%
Greece	17%	17%	19%
France	8%	9.5%	5.5%
Germany	3%	3%	2.5%
Slovenia	3%	2%	3%
Hungary	1.5%	1.5%	1%
Belgium	1%	1.5%	1.5%
Cyprus	1%	1%	0.5%
Russian Federation	0.5%	0.5%	0.0%

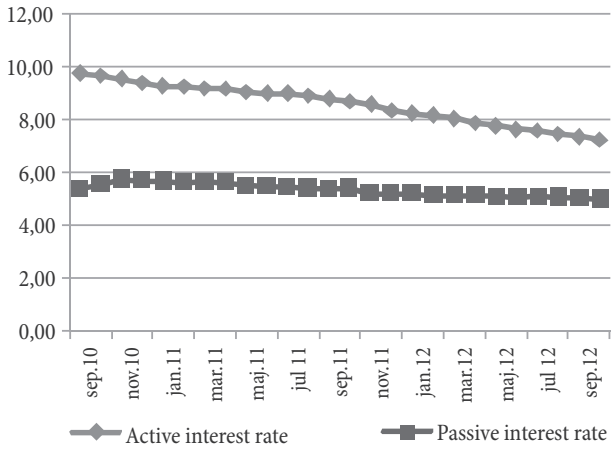
Source: The National Bank of Serbia, derived data

If we tried to link the level of concentration in the domestic market with the level of competition, perhaps the most logical way to do that would be to look at the trend of the link between lending and deposit interest rates. For instance, if we look at the link between the weighted lending interest rate on household loans in euro and weighted deposit interest rates on deposits in euro for the period between 2010 and 2012, we would get the following figures (Figure 5). It shows that the interest margin on retail loans is constantly narrowing, which may indicate a trend of increased competitiveness of the banking sector in Serbia. It should be noted that the weighted average interest rate on loans does not include the interest rate on the revolving loans, overdrafts on current accounts and overdrafts on credit cards. If we included these interest rates in the calculation of the difference between lending and deposit interest rates would have increased significantly, but for us, in this case, trend was more important than the absolute value of the interest margin.

Possible trends of consolidation of the banking sector in Serbia and their impact on the competitive dynamics

In the banking sector in Serbia since 2001, there has been a trend of consolidation, but it is slower than expected. The consolidation trend is mainly related to the banks that are majority or minority state owned, as well as the banks owned by domestic entities. The number of

Figure 5: The trend of the link between lending and deposit interest rates on retail loans and deposits in foreign currency



Source: The National Bank of Serbia, 2012, interest rates

foreign banks is generally stable and ranges between 20 and 22. There is still a large number of banks on the market, out of which at least half have no significant effect on the banking market trends. For example, when in terms of the size of assets, 15 smallest banks together form only 11% of the total mass, while the smallest 20 banks make only 20% of the total assets. In the loans and deposits markets the weakness of the banks are even more pronounced (9% and 18%, respectively).

It is clear that Serbia is waiting for further consolidation of the banking sector. Maybe it is not a bad idea to briefly check the experience of the neighboring Croatia regarding the consolidation of its banking market. Subic [19] gave an overview of the Croatian banking sector consolidation affected by the entry of foreign banks. In short, in 1998, there were 60 banks in Croatia. Under the influence of market consolidation, this number halved in 2010. Although the number of banks declined, their strength measured by the value of assets, has consistently increased from about 100 billion to nearly HRK 400 billion today. The consolidation happened under due to the entry of foreign banks, which have taken over the leading domestic state-owned banks, with the key takeover wave in 1999 and 2000 when foreign banks took over four largest state-owned banks. Today, foreign banks have in their possession 91% of the total banking assets in Croatia, and the HHI in Croatian banking market is at the level of 1,400 points. The first six largest banks are foreign banks (dominated by Austrian banks with a share in total banking assets of as much as 60%), and among the top twelve banks, only one is state-owned. These data indicate that the consolidation of the banking sector in Croatia is a few years ahead of the consolidation in Serbia, which makes the example of Croatia even more interesting. The author of the analysis addressed the question of the sudden impact of consolidation on the competition level within the banking sector. The author concludes that the entry of new foreign players brought a higher level of market concentration, but it did not upset the competitive dynamics, but on the contrary, it intensified the competition in the market. Some of the indicators are: expansion of the banking network, modernization of operations (the introduction of online banking, for example), then a larger influx of cheaper foreign capital through their parent banks, enabling local customers easier access to foreign markets and foreign corporate strategic partners, as well as expanding range of financial services relying on basic banking services. We should not neglect the introduction of new management principles and know-how and their transfer to local managers and staff. On the other hand, the key risk lies in the over dependence of the banking system on foreign banks and the inability to affect the financial health of their parent banks.

If we considered the examples of consolidation of the banking markets in other countries in Southeast and Central Europe, we would come to similar observations. These markets are penetrated by established European banks which buy the largest domestic state-owned banks. It is, for example, interesting to observe that the eight largest foreign banks present in Croatian market are also present in Serbian market. These are: UniCredit, Intesa, Erste, Raiffeisen, Hypo, Societe Generale, OTP and Volksbank.

It is expected that foreign banks increase their share in the banking market in Serbia in the next few years. From the perspective of concentration, it does not matter whether further consolidation is done by banks already present in the market or whether new foreign players appear. Targets for consolidation will be the remaining state owned banks, with the state as the majority or minority shareholder, as well as smaller privately owned banks. The state is expected to offer packages foreign investors quite soon. The only exception might be Komercijalna banka, whose state owned package will be offered for sale in the medium term.

What could be the motives of other banks for acquisitions? Of course, it depends on the particular case being analyzed, but in general, the key motive would be to increase the market power and the ability to achieve this through powerful economies of scale and economies of scope. According to [13] a bank considers takeover of another bank for four possible reasons. One reason may be to optimize the cost through economies of scale and lowering financing costs. Another reason would be to strengthen their income through economies of scope, to conclude large contracts more easily and to impose their pricing policies more aggressively as larger players. The third type of motivation stems from the economic

context. Usually, concentrations are more frequent after a crisis ends or during the rise time of an economic cycle. Finally, the motives for takeover can be specific and related to personal motives of the management or the need for strategic retaliation. A common motivation of foreign banks to penetrate into the domestic market in the form of external growth is asymmetric information, given that the local target bank has information about the market dynamics and specific regulations. Another motive is definitely impatience to quickly master a significant market power, which would not be possible through organic growth, particularly in the part of developing a network of branch offices.

Consolidation partly occurs because small banks wind down, but predominantly it happens through horizontal mergers of the existing banks and the existing or new banks that take over. Also, there is an option where strategic partners in the form of international financial institutions penetrate the market according to the model that has already been seen with Komercijalna or Cacanska banka. Such a scenario is realistic for the Postanska stedionica, which is attractive because of the large number of active current accounts. The state is, most likely, not interested in remaining the majority shareholder in Privredna banka Beograd and a tender for a consultant can be expected quite soon, and they will continue to look for a strategic partner. Razvojna banka Vojvodine is in very poor condition with the NPL ratio of over 80%. It is possible that the state applies the same model as in the case of Nova Agrobanka [12], which involves the transfer of adequate good quality assets and liabilities into one of the private banks, which would be a transparent process for the stakeholders. The problem in practice is that the government of Vojvodina believes that it possible to solve the problem through recapitalization, which in our opinion is very difficult given the condition of the bank at the moment. Recapitalization is not a permanent and sustainable solution and is definitely not a solution that is in the best interest of the taxpayers in Serbia. Other banks that are partially state owned (Srpska banka, Jubmes and other) will also be subject to sales in the near future or establishing strategic partnerships. All in all, the current market share of state-owned banks, except for Komercijalna banka, is minute. Current developments in this part of the banking market cannot significantly affect the market concentration, unless one of the existing large banks buys one or more banks in which the state holds a majority stake. This is also highly unlikely given the vast liquidity problems and problems with collecting loans that state owned banks have. One possible way of solving the problem of state owned banks is the formation of the so-called Bad bank, which would be a separate SPV and which would absorb all the bad loans of the state banks. Its job would be to deal only with the collection of bad loans, while the healthy assets of the state owned banks would merge into one large state-owned bank.

Further sale of the state capital in banks makes sense for many authors [15], who found that the presence of the state capital in the banking system is considered as a restriction of competition because it established control from one single center, which at least in the countries in transition, does not exhibit the ability of the introducing and implementing good corporate governance model.

In addition to the possible sale of state owned banks, another way of future consolidation of the banking sector is takeovers of private and foreign banks by the existing foreign banks. Specifically, in Greece they are currently considering an option that EFG Eurobank is taken over by the National Bank of Greece - NBG (the largest Greek bank majority owned by the state of Greece), which would also mean the takeover of its network in Serbia. This would have direct implications on the structure of the top ten banks by market share, especially after the earlier takeover of Vojvođanska banka by NBG. The new entity would then take the third place in terms of market share. This potential transaction opens up the earlier question of specific market concentration according to the country of origin of the banks (see Table 5). Namely, the Bank of Greece has around 20% market share according to the analyzed parameters. They are especially important players in the deposit market, due to a more aggressive policy of deposit rates. With such share, they have systemic importance for Serbian financial market and any instability in their business can be a significant source of instability in the entire banking, and more broadly, the financial system. It is known that Greek banks are significantly dependent

on funding from the European Central Bank (ECB), as well as that they are under tremendous pressure from the crisis in Greece and the Eurozone. We can say that the deteriorating situation in the parent banks would inevitably lead to a deterioration of the situation in their branches in Serbia, primarily from the perspective of liquidity. Another potential takeover is related to the possibility that Erste Group buys certain Hypo Group banks, with unofficial indications are that their target could be the Hypo Bank in Serbia. In the case this transaction occurs, Erste Bank would jump to the third or fourth place in the market according to most of the parameters analyzed.

At this point, we should mention the possible withdrawal of certain domestic or foreign banks. This is supported by the list of loss makers in Figure 4. These are mostly large banking groups, which failed to reach a market share that they expected in Serbia. Some of them are KBC, OTP, Credit Agricole, and Nova Ljubljanska banka.

If we assume that all of the previously mentioned scenarios occurred, we are interested in how this would affect the change in concentration indicators. Assuming that the two currently largest banks (Intesa and Komercijalna) 'suck in' the rest of the state owned package in the banking sector and that the two takeover transactions mentioned above occur, the HHI would increase to 1,291 and 1,705 points for the credit and deposit markets, respectively. We deliberately did not calculate the HHI for assets and capital, because it is expected that after merger and acquisition their aggregate value is not equal to the simple sum of the two elements, due to the logics of rationalization and determining the right size of the consolidated system. It is clear that such a consolidation scenario would substantially increase the level of market concentration, particularly in the deposits market, suggesting to the regulatory body (the NBS) to be careful when granting approvals for concentration when they appear.

Assuming that such a scenario of consolidation occurs, the question is what would be the impact on the competitive dynamics of the industry. The general thesis is that the higher the level of concentration the greater slowdown in the competitive dynamics. Previous researches focused on the banking market have failed to prove this [6]. These authors failed to prove a negative correlation between concentration and competition in a large sample that included banking sectors of fifty countries. On the contrary, they have proven more concentrated banking sectors to actually be more competitive.

Ljubaj [16] gave a very interesting review of the possible impact of possible banking market concentration on the development of the financial sector, the stability of the banking system, the concentration in other sectors and economic growth. Analyzing the relevant sources in the field and concrete practical examples, the author concludes that a certain degree of concentration in the banking market is natural and useful because a higher level of concentration means that market participants are large banks, which stimulate the economies of scale, economies of scope, application of modern knowledge in the area of developing and providing banking services that help solve the problem of asymmetric information, and which perform good credit ratings analyses of their clients based on these. All of the above has a positive effect on the development of the financial system. Given that it is easier to regulatory control and monitor a smaller number of banks, a higher concentration, if the banks are under tighter monitoring, can also mean a greater stability of the banking system. Concentration in the banking sector may also affect the concentration in other sectors of the economy, especially in the case of less developed countries, as is the case in Serbia. Namely, the Cetorelli [5] analysis showed that large and powerful banks in developing economies may affect the penetration of new companies in certain industries by stimulating or discouraging credit policies. Finally, the concentration of the banking market also affects economic growth of the countries. Deidda and Fattouh [7] showed that the concentration in the banking sector is negatively correlated with economic growth in underdeveloped countries, while in developed economies such correlation has not been established.

Based on all this, we can conclude that additional moderate increase in market concentration can have a positive impact on the competitiveness of the banking market in Serbia, assuming that the possibility of cartel agreements is prevented.

Conclusion

General indicators of market concentration show that Serbian banking market is weakly to moderately concentrated, i.e. that it can be characterized as mildly oligopolistic. In terms of the ownership concentration, there is a greater concentration of banks from Italy, Greece and Austria, which should be considered primarily in terms of possible transfer of instability from their countries of origin to the subsidiaries in Serbia.

The analysis in this paper suggests that we can expect further increase of banking sector consolidation in Serbia, which, if carefully dosed and regulated by the National Bank of Serbia, might give positive results on the side of competitive dynamics and stability of the banking system. This is supported by the example of Croatia, and Serbia as well, where the concentration of growth in the last few years is constantly lowering the interest margin. Possible forms of further consolidation are the sales of the remaining state owned capital in banks and mutual takeovers of banks directly in Serbia (less likely) or indirectly through parent banks (more likely).

Therefore, in the medium term, we can expect further decline in the number of banks and increase in the market power of the largest banks. The National Bank of Serbia should monitor the dynamics of concentration and competitiveness and apply the fine control measures for concentration levels, through careful consideration when granting approvals for mergers and acquisitions, when defining capital threshold and by meticulous application of licensing policy for banks. Particular attention should be paid to monitoring and identifying possible cartel forming trends, which may occur with this kind of market structure, especially in the area of defining the interest rate policy and market sharing. Any change in the concentration levels should be viewed through the competitiveness indicators (interest margins, for example), stability factors (amount of capital, assets quality, management structure, profit and liquidity), and social implications (for example, to prevent negative impacts in terms of reducing the supply of related banking services).

The analysis of concentration and competition is related to integral commercial banking sector in Serbia. Future studies could consider separate analysis of retail banking market and corporate banking market. This way, we could get more precise picture of concentration within commercial banking segments.

The other thing woth of mentioning here is related to portfolio investment segment of banking market, which was not elaborated in this paper. There are several foreign banks, without licence to work in Serbia, which are allowed to invest in state securities (such as Barclays, Deutsche or CitiBank). The other segment is direct credit segment, where supranational investors (e.g. EBRD or IFC) directly give loans to large corporate clients. This is significant chunk of loan market in Serbia. The first mentioned segment is one of the main generators of short-term instability and fluctuations in exchange rate (apart from chronic current account deficit), because their 'hot money' is attracted only by high interest rates (as is the case with our National Bank reference rate). This charge and discharge phenomenon has immense influence on shallow Serbian financial market. The other segment of cross-border financing by supranational investors is also very important for supporting large corporate clients and large projects, where local commercial banks are not interested or not capable of crediting large loans with long time horizon. More detailed analysis of these segments of banking market, especially in terms of their influence on dynamics and stability of overall financial system, might be a topic of future related research projects.

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COMPLEMENTARITIES BETWEEN THE DEVELOPMENT STRATEGY OF "NIS" AND THE ENERGY POLICY OF SERBIA*

Komplementarnost razvojne strategije NIS-a i energetske politike Srbije

Abstract

The continuous growth of energy consumption, intensive exploitation of non-renewable energy sources, geopolitical turmoil, global recession have resulted in the fact that the days of cheap energy are over. This paper discusses the problems and challenges the energy sector faces, with special emphasis on those related to the oil and gas sector in the world and in our country.

Serbian energy policy objectives, established by the new Energy Law, include the promotion of energy security, energy efficiency, competitiveness of the energy market, use of renewable energy resources and environmental protection. With regard to each goal, a series of regulatory measures, programs and acts have been adopted that comply with the requirements of European energy regulations. What follows is an intense work on the implementation of the adopted measures and programs. In terms of the implementation of the energy development strategy, "Naftna industrija Srbije" (NIS) is the most advanced. Therefore, the focus of this paper is on analyzing the development strategy of NIS in the context of the Energy Sector Development Strategy of the Republic of Serbia.

Key words: *energy sector, oil, natural gas, industrial policy, Energy Law, Energy Sector Strategy of the Republic of Serbia*

Sažetak

Kontinuirani rast potrošnje energije, intenzivna eksploatacija neobnovljivih izvora energije, geo-politička previranja, globalna recesija doveli su do toga da su dani jeftine energije prošlost. U ovom radu bavićemo se problemima i izazovima energetike koji se primarno odnose na sektor nafte i gasa u svetu i kod nas.

Ciljevi energetske politike Srbije, utemeljeni novim Zakonom o energetici, su unapređenje: energetske sigurnosti, energetske efikasnosti, konkurentnosti energetskog tržišta, korišćenja obnovljivih izvora energije i zaštite životne sredine. Za svaki pojedinačni cilj usvojen je niz regulatornih mera, programa i akata koji su usklađeni sa zahtevima evropske regulative iz oblasti energetike. Ono što sledi jeste intenzivan rad na implementaciji usvojenih mera i programa. Na polju implementacije strategije razvoja energetike najdalje je otišla Naftna industrija Srbije (NIS). Stoga, u fokusu ovog rada biće analiza razvojne strategije NIS-a u kontekstu Strategije razvoja energetike Republike Srbije.

Ključne reči: *energetski sektor, nafta, prirodni gas, industrijska politika, Zakon o energetici, Strategija razvoja energetike Republike Srbije*

Introduction

Investment in the energy sector is an investment in the development of the entire economic system of a country. Without access to adequate and cost-effective energy resources no economy can count on significant growth, based on increased production of tradable goods and investments [15, p. 99]. Oil is the most valuable source of energy. Oil is a "strategic resource" without which the highly industrialized society cannot survive, and whose availability must be provided, if necessary, even by using military force. None of all other possible resources can provoke a conflict between states in the 21st century as oil can (and does) [17, p. 1]. The majority, or more than 80% of total energy, is derived from non-renewable fossil fuels, and a significant change is unlikely to happen by 2030, not even by 2050 either. The International Energy Agency (IEA) forecasts that the share of oil and gas in total energy consumption will be reduced from 58%, at

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present, to about 51%. This, however, does not mean that oil consumption will also be reduced, on the contrary. This is a consequence of the expected increase in the production of energy from alternative (renewable) resources, which will only change relative shares in the overall energy mix. The IEA forecasts that by 2030 world oil consumption will have increased to 106 million barrels per day. To satisfy a growing trend of consumption, it is necessary that by 2030 we invest and build production capacities six times larger than the current production potential of Saudi Arabia, until recently, the global leader in oil production [18, p. 6].

The energy position of EU countries is far from enviable. The activities of oil companies in the EU are governed by a number of regulations that hinder their operations and reduce their competitiveness compared to other parts of the world. These are: the European Commission Directives (on trade, fuel quality, industrial emissions, etc.), the Roadmap for moving to a competitive low-carbon economy, the White Paper on the future of transport and others. Rigorous EU regulations could force the refining sector to reduce its capacity and/or to relocate, which will adversely affect the security of supply, competitiveness of the EU and employment [18, p. 10]. It is estimated that EU energy import dependency will increase from the current 50% to 65% in 2030. In the same period, oil imports are expected to rise from 82% to 93% and imports of gas to rise from 57% to 84% [1]. The future prospects of EU energy policy lie in renewable energy resources, since the EU is a global leader in this energy sector with a turnover of EUR 20 billion and 300,000 employees[1].

Energy sector of Serbia includes: oil and gas, coal mines, electric power industry and decentralized systems of district heating plants and industrial energy. The following data best illustrate the role and importance of the energy sector in Serbia: it generates 7.5% of GDP, employs about 80,000 people, increases the trade deficit by more than USD 3 billion, and annual total investment by this sector exceeds EUR 500 million [15, p. 99]. Consequently, any halt or postponement of investments in the energy sector would jeopardize energy security and economic prospects for Serbia.

The oil sector comprises the activities related to exploration and exploitation of domestic oil reserves, import, transport and refining of crude oil and petroleum products, as well as distribution and sales/exports of petroleum products. The declining trend of domestic exploration and exploitation of oil and gas is a result both of underinvestment in research projects and obsolete technology. This trend has started to change with the arrival of Gazprom, which is discussed at a greater length in the second part of this paper. The total installed generation capacity of domestic refineries is around 7.8 million tonnes per year (4.8 million tonnes in Pancevo and 3 million tonnes in Novi Sad). Their operating capacities are reduced as a result of the 1999 bombing and at present amount to 6.6 million tonnes per year [6].

The scope and structure of energy reserves and resources of Serbia are unfavorable because high quality energy reserves such as oil and gas account for less than 1% of the total balance reserves. Almost the entire energy reserves consist of various types of coal, dominated by low-quality lignite (92%). Serbia's energy sector is characterized by lack of harmonization between consumption and production of adequate energy generating products, especially during the winter when energy demand exceeds the production capacities of electric power facilities and district heating plants. This situation is a consequence of decades-long underinvestment in maintenance and modernization of the existing energy infrastructure. It is estimated that the geological reserves of oil and natural gas amount to 60 Mtoe, while mineable reserves amount to 20 Mtoe. Serbia's most important renewable energy source is its hydropower potential with around 17,000 GWh, of which about 10,000 GWh have been used so far. It is estimated that the total energy potential of renewable energy resources (biomass, hydropower potential, geothermal energy, wind and solar energy) in Serbia is quite considerable and amounts to over 3 Mtoe per year [6].

Industrial policy in the energy sector

One of the greatest issues affecting oil industry is oil price volatility. Oil prices reached a record high of 145 dollars per barrel in July 2008, early in 2009 it dropped down to about 40 dollars per barrel and in 2010 it soared to over

1 In wind energy, EU companies have 60% of the world market share [1].

100 dollars per barrel [18, p. 16]. Brent crude oil price on 26 November 2012 amounted to about 111 dollars per barrel[2]. Volatility of oil prices is caused by the global economic and financial crisis. A decline in the consumption of oil was accompanied by a growth in production. Economic logic says that when a growth in supply is accompanied by a decrease in demand prices of goods fall, but that did not happen this time[3]. Analysts and experts explain the high oil price in various ways. According to the IEA, this is an outcome of stronger investment in raw materials on stock exchange. Large investors and stock exchange speculators withdrew their funds from the depressed real estate markets and redirected them to oil and other raw materials (wheat, gold, etc.) [18, p. 17].

The recession has led to profound changes in the global energy sector. Russia has become global leader in the production and export of oil, replacing Saudi Arabia. China has also exploited its position and has become the world's largest consumer of energy due to the expansion of its national companies and major investment, replacing the United States. All this has been achieved with direct financial and political aid from the governments of Russia and China. At the same time, Europe's refineries have been struggling to maintain profitability, while in the United States five major refineries have been closed [18, p. 18].

The emergence of the economic crisis, followed by a slow and uncertain recovery, has led to significant changes not only in the global market environment, but also in the rules of competition. After decades of advocacy and faith in the action of "the invisible hand of the market", once again we have witnessed a situation where the state undertakes support measures and makes market interventions. It has become clear even to the most obstinate market fundamentalists that market imperfections, further intensified by global economic crisis, cannot be solved without an adequate support from the government. Industrial policies are one of the effective instruments.

The theoretical foundation for a new model of industrial policy in the developed economies has been found in the theory of endogenous growth, as the dominant contemporary theoretical option for defining development policy, particularly the industrial one. In modern economic theory, industrial policy involves the application of a set of measures and policies implemented by public institutions in order to create a favorable business environment, and encourage creation of new enterprises [8]. The aim of these measures is to establish an institutional framework that will help strengthen small and medium-sized enterprises, encourage innovation and investment in order to contribute to the improvement of economic competitiveness.

Industrial policies often promote cooperation between companies, between companies and the state, as well as cooperation between different countries. As a reminder, the initiative for the establishment of the EU came from a joint industrial policy in the field of coal and steel, which was later extended to nuclear industry as well. Governments of many countries have long realized the importance of the energy sector and have been active not only as regulators, but also as strategy developers, partners and investors. "Energy is too important to be left to the market!" is Robinson's famous statement on energy [16, p. 2]. Governments need well-articulated strategies to provide the specific inputs that markets need in order to foster the structural transformation that drives economic development [9].

In order to enhance their competitive advantages, many private and state-owned enterprises enter strategic partnerships. National oil companies usually offer access to resources, while multinational companies take the risks, bring money, knowledge, technology, and manage complex projects. A proof that interests can reconcile even the biggest rivals is the "historic" partnership between America's and the world's largest oil company (Exxon Mobil) and Russia's largest state-owned oil company (Rosneft), concluded in August 2011. The result of this partnership is the establishment of the Arctic Research and Design Center for Offshore Development (ownership structure is 33.3%: 66.7%) to be used in the "inaccessible" part of the world [20, p. 4]. There are numerous examples of successful cooperation between national and multinational oil companies [20, p. 16]:

- BP and Statoil have established a joint venture for the exploration and production of oil in the world,

2 See: http://www.oil-price.net/index.php?lang=en

3 Already in 2008, oil consumption fell by 1 million barrels a day.

- ADNOC (Abu Dhabi) and Occidental (60:40) have a 30-year contract for the exploitation of one field in the south of the country,
- Conoco Phillips has acquired 9.9% stake in LUKOIL,
- Eni and PetroChina have signed a Memorandum of Understanding to develop unconventional energy resources in China and abroad, and so on.

A large number of developed countries, especially developing countries, have long recognized the importance and effectiveness of industrial policies, whose effectiveness is reflected in the success and position of their players (companies, sectors). Therefore, the usefulness and the necessity of the implementation of industrial policies in Serbia are indisputable, but the only question is how to prepare and implement industrial policy measures in order to avoid mistakes from the past, support economic development and achieve the desired changes in economic structure [23, p. 63].

The primary strategic goal of Serbia is sustainable and dynamic development of the industry, which should be fit for the single EU market and able to cope with competitive pressure from its market players [8]. A new model of industrial growth in Serbia for the period 2011-2020 is export-oriented and includes: dynamic increase in investment, high rates of exports of goods and growth of industrial employment. Economic recovery and economic growth in Serbia must be based on investments in activities where there is already a competitive advantage. Comparative advantage should be transformed into a competitive advantage by applying adequate measures. According to [3], [4], the first place in the priority list belongs to energy sector, followed by agriculture, food processing industry, telecommunications, infrastructure[4], logistics and tourism. Pierce Riemer, the Director General of the World Petroleum Council, points out that due to many uncertainties that the energy sector faces, there is no universal solution that can address all the challenges, but we need a synergy of three factors: investment, innovation and collaboration [18, p. 6]. Sustainable economic growth and macroeconomic stability in Serbia are not achievable without a steady growth of the energy sector, its impact on imports/exports, and thus on the balance of payments.

The new legislative framework of the Serbian energy sector is in full compliance with the EU legislation, regional regulations and international principles of creating non-discriminatory conditions for transmission, transport and trade of electricity and natural gas in the entire region. Guiding principle for the development of the energy system in Serbia is the Energy Sector Development Strategy of the Republic of Serbia by 2015 (hereinafter referred to as the Strategy). The main elements of the Strategy are objectives, priority programs, measures and instruments for the implementation of priority programs, i.e. Serbia's energy policy/strategy objectives [6]. The objectives are set and differentiated into three groups: basic – energy objectives; specific – technological and environmental objectives and general – development and strategic objectives. In order to achieve these objectives, the Strategy defines five priority programs: 1) continuous technological modernization of the existing power generating facilities, infrastructure and resources, 2) rational use of good quality energy generating products, and 3) the use of renewable energy resources and the use of modern energy-efficient and environmentally sound technology; 4) extraordinary investment in new electric power sources, and 5) the construction of new energy infrastructure, and its integration into national and regional energy system.

The development of the energy sector in Serbia designed in the Strategy is based on two scenarios: a dynamic and slow economic growth. Unfortunately, the non-anticipated global economic and financial crisis has made even the slowest development scenario too optimistic, so that the projections do not reflect reality. The main result is that the implementation of individual projects had to be postponed, and only the top priority projects need to be implemented in the newly adopted, feasible deadlines [10].

The Strategy must be implemented in accordance with the Energy Law and the Mining Law, and under the supervision of the competent Ministry and the Energy Agency, with the support of the Energy Efficiency Agency. The key innovation in the Energy Law [7] is the separation

4 An important goal for the country is to build roads and infrastructure network since their active construction in Bulgaria, Romania, Turkey and other countries has endangered Serbia's role of the main transit player in the region. Ignoring this fact would certainly jeopardize the energy sector, and the economy in Serbia as a whole.

of competences for the formulation of energy policy and competences for its implementation. Also, the new law stipulates the restructuring of public energy companies, abolishes monopolies and introduces market competition in the energy sector, where it objectively may exist. In industries where there is a natural monopoly, the activities of these companies must be under the supervision of the Energy Agency, as an independent state institution.

Unlike the electricity market, the oil market has been liberalized since 1 January 2011. Since import barriers have been removed and the state no longer regulates the prices of petroleum derivatives, conditions have been created to open Serbia's petroleum products market. The EU accession process and the process of European partnership have also contributed to the liberalization of the petroleum products market towards the creation of the conditions for free trade in petroleum products. The expected reduction in oil prices, due to increased competition in the domestic market, did not happen since the beginning of the period of liberalization of petroleum products retail prices in Serbian market coincided with the rise of crude oil prices and the dollar exchange rate.

The adopted Strategy of development must be amended by a series of measures (industrial policy) that will directly or indirectly support and energize the development of important, strategic players in our economy. The reason for this is the fact that market liberalization and open market competition themselves do not lead to increased competitiveness of companies and local economy, in the conditions when big foreign players enjoy the support of their sovereigns and there is a significant structural imbalance in economy. One of the strategic players in the domestic economy is NIS (Petroleum Industry of Serbia), and its importance and role in the energy sector and the overall economy of Serbia, will be analyzed in the next part of the paper.

Place and importance of NIS in the energy sector of Serbia

NIS in its present form was established in 1991 as a company for exploration, production, refining and sale of oil, petroleum products and natural gas. The company that preceded NIS was Naftagas, established back in 1949. The historic core activities of NIS are the exploration and exploitation of oil and gas, and in this sense it is the only company in Serbia engaged in these activities. In this company's history the important dates are:

- Beginning of the exploitation of natural gas in 1951,
- Beginning of the construction of the first filling stations in 1953,
- Start up of the refineries in Pancevo and Novi Sad in 1968,
- Beginning of oil production in Angola (concession) in 1985,
- Becoming a joint stock company in 2005,
- Gazprom Neft became the owner of 51% of NIS shares and the company was listed in Belgrade Stock Exchange in 2010,
- Construction of a complex for hydro-cracking and hydro-treating in Pancevo Oil Refinery, which started the modernization of NIS refineries in 2011.

NIS a.d. Novi Sad is one of the largest vertically integrated energy companies in Southeast Europe. It includes a range of activities in the value chain characteristic of the oil industry. Precisely, NIS covers exploration, production and refining of oil and gas and sales of petroleum products. In addition, NIS makes new breakthroughs in the field of energy in terms of the design and implementation of the projects in the field of renewable energy. This means that today NIS is walking down the road of transformation from an oil company to an energy company with a vision to "become a leader in Europe, not only in the oil and gas industry, but also in the energy sector" [12, p. 7].

All activities of NIS are organized within blocks, with decentralized and centralized functions suggesting a hybrid organizational model that provides a high level of efficiency on the one hand, and flexibility that leads to effectiveness, on the other. There are five business units called blocks. These are: Upstream, Oilfield Services, Refining, Sales and Distribution, and Energy.

Since its establishment, NIS took up the position as one of the most important companies in the energy industry of the Republic of Serbia, and the position of the most important company in the oil and gas sector. Today's picture of the place and importance of NIS in the Serbian

energy sector could be viewed through an analysis of its market position, capital investments, financial results and its contribution to creating value for the owners, particularly in the period since the last substantial transformation of its ownership structure in 2008.

On 24 December 2008, the Republic of Serbia and Gazprom Neft signed the Contract on Sale and Purchase of Shares of the NIS. Under this agreement, Gazprom Neft has acquired 51% of the total share capital of the Company for a total amount of EUR 400 million [2]. On this day, the owner of 49% of the capital remained the Republic of Serbia. Regardless of the minority ownership, the Republic of Serbia as the Seller has retained a significant level of participation and accountability in governance, although the responsibility for the operational management of the company was transferred to the Buyer. The Contract stipulates that as long as the Republic of Serbia owns at least 10% of shares in the share capital of NIS, a positive vote is required form the Seller with regard to the following: adoption of financial and audit reports, changes in the Founding Act in the Statute of the Joint Stock Company, increase and decrease of capital, changes in status, acquisition and disposal of the Company's high value assets, changes in the seat and core business activity, liquidation or bankruptcy. Under the same conditions, the Seller (the Republic of Serbia) has the right to appoint the Internal Auditor of the company or to appoint the Chairman and the majority of the members in the Supervisory Board of the Company.

The Buyer, among other things, has taken on considerable social and investment obligations. In terms of investment obligations, the Contract stipulates that the buyer is required to provide an amount of EUR 500 million through loans until 31/12/2012, at an interest rate equal to EUR LIBOR Twelve + 2% at 14 years. The Contract also defines the strategic intent of the Seller. Thus, it stipulates that by 2020 the Buyer shall (depending on cooperation with the Seller) make commercially reasonable efforts to ensure: continuity of production and investment in exploration activities, that NIS shall not cease to operate in the Company's refineries, that the amount of crude oil in NIS can satisfy the demand of domestic market for basic petroleum products, that the market share of trade in derivatives in the Serbian market shall not be lower than the level that NIS had in this market in 2008. Also, the Buyer shall implement the program of reconstruction and modernization in NIS.

In terms of the obligations to the owners, the Contract stipulates that the Buyer shall distribute the dividends of NIS for each fiscal year in the amount of not less than 15% of net income per year[5]. On 06 January 2010, pursuant to the decision of the Government of the Republic of Serbia, 19.08% of the share capital or 31,116,611 shares were transferred to the minority shareholders, i.e. the citizens of the Republic of Serbia, the employees and former employees of NIS. Following the submission of bids for the purchase of the shares of minority shareholders, the minority shareholders deposited 5.15% of their shares until the closing date for the bid on 16 March 2011, after which date these shares were bought back, resulting in a new ownership structure: Gazprom Neft 56.15%, The Republic of Serbia 29.87% and minority shareholders 13.98%.

The number of state-owned oil companies that have been privatized, i.e. which sold the majority of the capital, is not negligible. Apart from NIS, with a similar share of the state-owned capital (about 30%), the following companies have also been privatized: OMV (30% Austria), Hellenic Petroleum (35% Greece), Eni (30% Italy), Inpex (29% Japan) and others [24]. There has been an extensive research related to comparing profitability of the state-owned and private oil companies, as well as how privatization affects the performance of oil companies. The results of such research, presented by Victor [22], Eller at el, [5] and Wolf [24] suggest that privatization leads to an increase in the financial and operational performance of oil companies, i.e. that private companies are more efficient than the state-owned ones. Such a thesis is confirmed by the privatization of NIS as well.

The total number of shares is 163,060,400 with nominal value of RSD 500. All shares are ordinary shares. Each share is entitled to one vote in the shareholders' meeting. On 12 December 2012, the market value of a share was

5 NIS operated at a loss 2008 and 2009, and there were no dividend payments. In 2010 and 2011 NIS operated with profit, but the Managing Board decided to allocate the profits for covering the losses from previous years.

RSD 735. Among other things, NIS has won the award for the best relations with the investment community and quality of corporate governance, given by Belgrade Stock Exchange for two consecutive years (2011 and 2012).

The analysis of the market position that NIS takes in Serbian market, examines the derivatives market excluding the derivatives that NIS does not produce. In 2010, this market in the Republic of Serbia accounted for 3,356 thousand tonnes, and in 2011, it accounted for 3,224 thousand tonnes, which shows a decline of 3.9%. The data for the first nine months of 2012 show that this market accounted for 2,167 thousand tonnes, which is by 8% less than in the first nine months of 2011, when it accounted for 2,355 thousand tonnes. It is obvious that the bad economic situation and the general downturn in economic activity had a significant negative impact on the consumption of petroleum products. The overall drop in purchasing power as a result of the reduction in real wages due to inflation trends and the depreciation of the local currency with high unemployment rates have intensified the negative impact and led to the cumulative contraction of the oil product market in Serbia, observed in two years, will reach around 12%.

NIS has a leading position in the derivatives market of the Republic of Serbia. It is about 70%. In 2010, it accounted for 67.9%, or 2,280 thousand tonnes, and in 2011, it accounted for 68.3%, or 2,202 thousand tonnes, and for the first nine months of 2012, it amounted to 71.4% or 1,547 thousand tonnes. These results indicate that NIS has retained its dominant position in the market after 01 January 2011, until which date the Seller had the contractual obligation to maintain restrictions on imports of petroleum products.

In 2010, the retail market of the Republic of Serbia accounted for 1,593 thousand tonnes, in 2011, it accounted for 1,640 thousand tonnes, and for the first nine months of 2012, it accounted for 1,193 thousand tonnes. Therefore, in 2011, this market grew by 3% compared to 2010, while in 2012 it records sales at approximately the same level as in 2011. In the retail market in 2010 the share of NIS was 35.2%, with sales of 560 thousand tonnes. In 2011, NIS reported a share of 31.7% with the sale of 519 thousand tonnes. This decline in market share is attributed to the significant substitution of the D2 fuel with fuel oil (quite inexpensive fuel that is not subject to the excise regime), liberalization of imports, leasing 69 filling stations and renovating the existing stations. However, in the first nine months of 2012 already, the share of NIS in retail increased to 35.4% as a result of the reconstruction of the filling stations under the brand of NIS Petrol, a new brand of the restaurants and shops and so on. At the same time, a positive effect reflected in market share growth is also attributed to the "low cost" strategy which involves lower price offers from NIS compared to its direct competitors.

The financial position of NIS today is a direct result of internal factors in terms of the efforts made in the implementation of the adopted development strategy and restrictions originating from general and competitive environments. At the end of 2011, NIS recorded improvement of financial indicators as compared to 2010, and this trend was maintained in the first three quarters of the 2012. The summary of financial indicators is provided in the Table 1.

In the first nine months of the 2012, the realized net profit was RSD 32.2 billion, which is an increase of 18.6% compared to the same period last year when net profit amounted to RSD 27.1 billion. If we observe the EBITDA indicator, NIS has achieved a significant growth. For the first nine months of 2012, the EBITDA amounted to RSD 48.1 billion, which is more than in the same period of 2011 when this indicator was RSD 32.3 billion by 49%. The improvement of these indicators during this period of observation is attributed to the following accomplishments in business processes:

- The growth of domestic oil and gas production,
- The growth of sales revenue and market share growth,

Table 1: Financial indicators of NIS

Financial indicators	2011	2010	Change
Net profit, bln. RSD	40,6	16,5	+146%
EBITDA, bln. RSD	52,4	32,4	+62%
Sales (excise tax excluded), bln. RSD	186,9	161,2	+16%
OCF, bln. RSD	35	17,8	+97%
CAPEX, bln. RSD	34,4	19,7	+75%
Total debt to banks, mln. USD	446	611	-27%
Total bank indebtedness (total debt+credentials), mln. USD	458	644	-29%

Source: [12, p. 60]

- Cost reduction (increased operational efficiency),
- Increased collection of liabilities,
- Lower imports of crude oil[6].

In accordance with the Contract on Sale and Purchase of Shares, NIS made capital investments together with the new owners, which increased its competitiveness, all in accordance with the Adopted Business Model and Development Strategy from 2011. The major investments are in the Upstream sector with the aim of increasing oil and gas production and increasing reserves. In the domain of refining, investments are directed to the reconstruction and modernization of the oil refinery in Pancevo and environmental projects. In the field of sales and distribution, investments are focused on the development of the retail network.

In 2011 and 2012, as planned, NIS performed the overhaul of the oil refinery in Pancevo. A new facility for hydro-cracking (MHC/DHT) was commissioned, which results in the quality of petroleum products in accordance with the Euro-5 standard. For this capital investment and investment in overhauling the refinery in Novi Sad and environmental projects, NIS borrowed from its parent company Gazprom Neft in the amount of EUR 500 million. The amount of capital expenditure (CAPEX) in 2011 was RSD 34.4 billion. At the same time, simultaneously with capital investments, NIS allocated substantial funds to investment in socially significant projects. This orientation of the company is the result of the adopted philosophy and practice of sustainable development.

Analysis of the development strategy of NIS in the context of the Energy Sector Strategy of the Republic of Serbia

The Serbian energy policy objectives, established by the new Energy Law [7], are the promotion of energy security, energy efficiency, competitiveness of the energy market, use of renewable energy resources and environmental protection. For each goal, a series of regulatory measures, programs and acts have been adopted that comply with the requirements of European energy regulations. What follows is an intense work on the implementation of the adopted measures and programs.

In terms of the implementation of the energy development strategy, NIS is the most advanced. The objectives and long-term development strategy of NIS reflect the expectations and interests of the majority shareholder. The main goal of NIS is to become the most effective, fast-growing, energy-efficient company in the field of the production of energy generating products, oil, gas, petroleum products and petrochemicals, while maintaining a leading position in the Serbian market and securing a significant market share in the market of Southeast Europe. The new Development Strategy of NIS is based on five components of success, the so-called "5 Fives" and implies that the following is realized by 2020: annual production of 5 million tonnes of crude oil and gas, 5 million tonnes refined, 5 million tonnes of petroleum products sold, the value of one share of 5 thousand dinars, and the Euro-5 standard of processes and outcomes. The realization of such goals without a doubt leads to the achievement of the macro objectives of the Serbian energy policy listed above. In other words, the goals and development strategy of NIS are complementary to the Energy Sector Development Strategy of the Republic of Serbia.

Improving energy security is the primary energy sector goal of Serbia, and also the mission of NIS. In 2011, the energy import dependency of Serbia amounted to about 30%, while the dependency on imported oil was also very high and was around 70%, while the dependency on gas imports was as much as 86%. In such circumstances, energy stability can be provided by forming adequate reserves[7] and by diversifying the supply sources. With the privatization of NIS, i.e. with increasing levels of domestic production of oil and petroleum derivatives, dependency on import is reduced year after year, so that, compared to the level before privatization (2008) Serbia's dependency on oil imports fell by about 23%. A summary of the trends in the key energy indicators in Serbia in the past six years is given in Table 2.

6 There was also a reduction in total indebtedness to banks, which at the end of Q3 of 2012 amounted to 354 million USD and total indebtedness to banks on that same day was 367 million USD.

7 The total storage capacity for crude oil and petroleum products in Serbia is about 1.4 million m^3.

According to its development strategy, NIS is planning to achieve the volume of oil production of 3 million tonnes per year by 2020, of which the share of domestic production is going to be between 30-50%, while the rest will be manufactured in the neighboring countries (concessional production). In the same period, the plan is to process and sell 5 million tonnes of petroleum products per year, which is double the current level, as well as to provide reserves covering 10 years of current production [19]. The implementation of these plans will provide long-term energy stability for Serbia. Not only will it reduce imports, but will result in export growth, which will significantly improve Serbia's foreign trade indicators. In order to raise the level of production and secure strategic oil and gas reserves, NIS has allocated significant resources to the research of energy resources, not only in the area of the Pannonian basin, but also in new potential sites to the south of the Sava and Danube rivers. Its activities go beyond national borders. Since 2011, NIS has expanded its scope by establishing strategic subsidiaries in the neighboring countries, in the Republic of Srpska, Bulgaria, Romania and Hungary. Also, NIS is the first Serbian company to open an office in Brussels in an effort to help Serbia's European Integration and to affect the energy policy of sound and sustainable development.

The business activities of NIS are not only the foundation of energy stability, but also of the financial stability for Serbia, since it is the largest contributor to the budget. The excise taxes are an important source of finance for the Republic of Serbia with the share of about 23% of total public revenues. Most of the excise revenue is collected from the excise taxes on petroleum products. In 2011, on this basis, NIS contributed about 81 billion dinars, which represents about 11% of Serbia's total budget revenue. In June 2011, the Excise Tax Law was amended to ensure its compliance with the EU standards. The Law stipulated equal excise taxes for domestic and import fuel, i.e. equal excise taxes were set for all types of engine petrol (gasoline) and diesel fuel, which led to an increase in the excise tax on the fuel processed in local refineries. With respect to the strategic plan, it is expected that the doubled production and distribution of petroleum products by 2020 will bring Serbia the reciprocal increase in budget revenues.

In addition to being the largest taxpayer, NIS is one of the largest investors in Serbia. In the past three years, NIS has invested EUR 1.5 billion (EUR 500 million annually), and plans to invest the same amount over the next three years. The most important and the most valuable project is the modernization of the processing facilities and the

Table 2: The main energy indicators of Serbia

Parameters	2006	2007	2008	2009	2010	2011
Total primary production (Mtoe)	**8.847**	**8.796**	**9.441**	**9.487**	**10.539**	**11.073**
Solids	7.044	7.12	7.369	7.33	7.228	7.779
Oil	0.655	0.64	0.66	0.686	0.94	1.103
Natural gas	0.21	0.2	0.231	0.232	0.308	0.412
Renewable energy sources	0.938	0.836	1.181	1.239	2.063	1.779
Net import (Mtoe)	**5.843**	**6.127**	**6.713**	**5.559**	**5.241**	**5.203**
Solids	0.955	0.899	0.945	0.619	0.727	0.761
Oil	2.593	2.638	3.074	2.636	2.006	1.457
Oil products	0.635	0.888	0.912	0.903	0.941	1.27
Natural gas	1.66	1.702	1.782	1.401	1.567	1.715
Gross inland consumption (Mtoe)	**14.571**	**14.811**	**15.619**	**14.658**	**15.531**	**16.186**
Solids	7.999	8.019	8.13	8.026	7.751	8.54
Oil	3.764	4.054	4.291	3.956	3.901	3.904
Natural gas	1.87	1.902	2.013	1.55	1.852	1.996
Other	0.938	0.836	1.185	1.126	2.027	1.746
Gross inland consumption/capita in toe/inhabitant	**1.955**	**1.993**	**2.094**	**1.973**	**2.134**	**2.224**
Total energy import dependency (%)	**40.1**	**41.37**	**42.98**	**37.92**	**33.75**	**32.15**
Oil import dependency (%)	**85.76**	**86.98**	**92.89**	**89.46**	**75.54**	**69.85**
Natural gas import dependency (%)	**88.77**	**89.48**	**88.52**	**90.39**	**84.61**	**85.92**

Source: [modified 11, p. 313]

construction of a hydro-cracking and hydro-treating plants in the refinery in Pancevo. In the scope of this project, they have also completed the construction of storage tanks for liquefied petroleum gas which will also have the capacity to store (reserves) of at least 6,000 m^3 of liquefied petroleum gas.

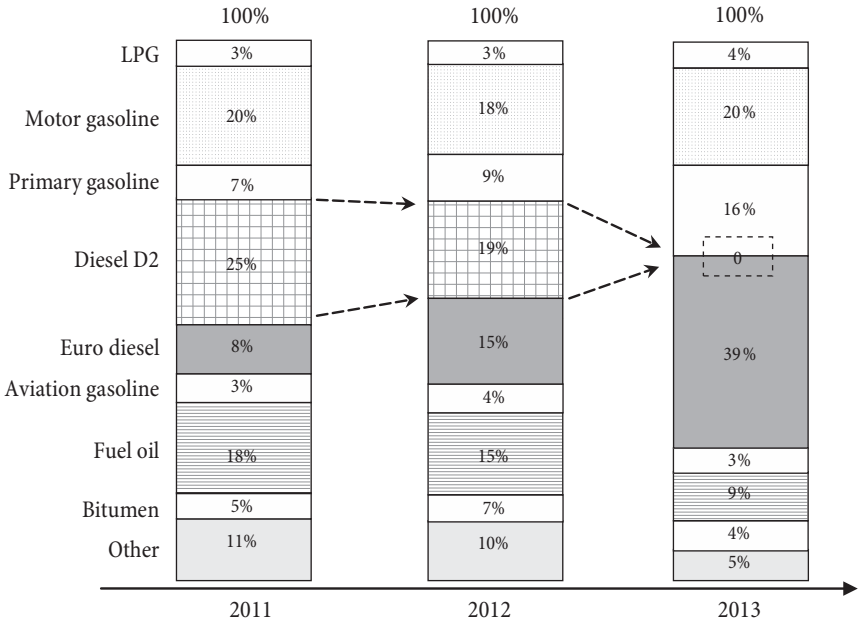
In completing the modernization of the refinery in Pancevo, Gazprom Neft, as the strategic partner, has fulfilled its obligation under the agreement on strategic cooperation in the energy sector, which was signed between Serbia and Russia in 2008. At the same time, NIS operated with a net profit of RSD 16.5 billion in 2010, i.e. RSD 40.6 billion in 2011, with a trend of growth in 2012. The realized profit always raises the issue of the dividend policy. In previous years, the profit was used to cover the losses from previous years and to fund the company's development.

The completion of construction and commissioning of the newly constructed plant in Pancevo allowed NIS to produce fuels which are entirely in keeping with the highest EU standards. Also, the portfolio of petroleum products will be significantly changed, i.e. improved. The total production will be dominated by high-quality fuels such as Euro Diesel, whose share will increase from the current 8% to 39% in 2013, followed by the primary petrol and engine petrol. On the other hand, the D2 diesel, which now accounts for 25% of total fuel, will be completely eliminated from the production (see Figure 1). In a relatively short period of time, the competitiveness of the Serbian energy market will be increased to a higher level.

An integral part of the effective management strategy in NIS is sustainable development and environmental protection. Modernization of the existing and construction of new infrastructural facilities and power plants in NIS have been done in compliance with the principles of sustainable development. In the period 2010-2012, more than EUR 7.4 million was invested in the improvement of the environment, which allowed the installation of the most modern monitoring systems and increased the level of environmental safety [14]. The consequences are already visible: the emission of solids is reduced by almost 3 times, the refining complex in the refinery has been reconstructed, and the number of environmental accidents has been reduced by 24% [13, p. 5]. In addition to these measures, which increase the environmental protection during the manufacturing process, by enabling final consumption of fuels that comply with the highest environmental standards, NIS indirectly contributes to reducing the emissions.

NIS does not just expand in terms of geography, but also through diversifying its operations by penetrating the related business. NIS has started cooperation with the state-owned company "Petrohemija" in the production of

Figure 1: Planned change in the NIS petroleum products portfolio



Source: [modified 21, p. 9]

base oils, which is why the project to adapt the capacity of the refinery in Novi Sad is being designed. Next year, they are going to start building the plant for the production of base oils in this refinery, whose value will be about EUR 100 million [14].

One of the new directions for the development of NIS in the future is renewable energy resources. In accordance with the requirements of the *Renewable Energy Sources Directive* (2009/28/EC), Serbia is obliged to continual development of the energy production from renewable energy resources with the aim that the total share of renewable resources in final energy consumption is at least 20% by 2020. Last year, NIS formed a block called "Energy", which is supposed to offer new prospects to the company. The activity of this center is the production and sale of electricity and heat energy from cogeneration and renewable energy resources (biomass, wind and thermal water). Together with its strategic partners, NIS was expected to invest at least EUR 35 million this year [19, p. 6], nevertheless, significant effects of this energy industry are to be expected in a few years.

Finally, an important prerequisite for the development of this branch of the energy sector in the country and the region is to build adequate infrastructure to facilitate the transportation of oil and gas. Transportation of oil derivatives in Serbia is mostly done by tank trucks (65%), inland waterways and to a lesser extent by rail [11, p. 320]. There are two strategic development projects in this area, the implementation of which is yet to come, and these are the petroleum product pipeline construction and Pan-European Oil Pipeline construction.

Conclusion

A large number of developed countries, especially developing countries, have long recognized the importance and effectiveness of industrial policies, whose effectiveness is reflected in the success and position of their players (companies, sectors). Governments of many countries have long realized the importance of energy and have been active not only as regulators, but also as strategy developers, partners and investors. Therefore, the usefulness and the necessity of the implementation of industrial policies in Serbia are indisputable, but the only question is how to prepare and implement industrial policy measures in order to avoid mistakes from the past, support economic development and achieve the desired changes in economic structure.

Economic recovery and economic growth in Serbia must be based on investments in activities where there is already a competitive advantage. Comparative advantage should be transformed into a competitive advantage by applying adequate measures. According to Đuričin [3], [4], the first place in the priority list belongs to energy sector, followed by agriculture, food processing industry, telecommunications, infrastructure, logistics and tourism. Due to many uncertainties that the energy sector faces, there is no universal solution that can address all the challenges, but we need a synergy of three factors: investment, innovation and collaboration. Sustainable economic growth and macroeconomic stability in Serbia are not achievable without a steady growth of the energy sector, its impact on import/export, and thus the balance of payments.

Serbian energy policy objectives, established by the new Energy Law, are the promotion of energy security, energy efficiency, competitiveness of the energy market, use of renewable energy resources and environmental protection. For each goal, a series of regulatory measures, programs and acts have been adopted that comply with the requirements of European energy regulations. In terms of the implementation of the energy development strategy, NIS is the most advanced.

The main goal of NIS is to become the most effective, fast-growing, energy-efficient company in the field of the production of energy generating products, oil, gas, petroleum products and petrochemicals, while maintaining a leading position in the Serbian market and securing a significant market share in the market of the Southeast Europe. The new Development Strategy of NIS is based on five components of success, the so-called "5 Fives" and implies that the following is realized by 2020: annual production of 5 million tonnes of crude oil and gas, 5 million tonnes refined, 5 million tonnes of petroleum products sold, the value of one share of 5 thousand dinars, and the Euro-5 standard of processes and outcomes. The realization of such a goal without a doubt leads to the achievement of the macro objectives of the Serbian energy policy listed above.

With the privatization of NIS, i.e. with increasing levels of domestic production of oil and petroleum derivatives, dependency on import has been reducing year after year, so that, compared to the level before privatization (2008) Serbia's dependency on oil imports fell by about 23%. The implementation of "5 fives" plans will provide long-term energy stability for Serbia. Not only will it reduce imports, but will result in export growth, which will significantly improve Serbia's foreign trade indicators. In order to raise the level of production and securing strategic oil and gas reserves, NIS has allocated significant resources to the research of energy resources, not only in the area of the Pannonian basin, but also in new potential sites to the south of the Sava and Danube rivers. Its activities go beyond national borders. Since 2011, NIS has expanded its scope by establishing strategic subsidiaries in the neighboring countries, in the Republic of Srpska, Bulgaria, Romania and Hungary. Also, NIS is the first Serbian company to open an office in Brussels in an effort to help Serbia's European Integration and to affect the energy policy of sound and sustainable development.

The business activities of NIS are not only the foundation of energy stability, but also of the financial stability for Serbia, since it is the largest contributor to the budget. Most of the excise revenue is collected from the excise taxes on petroleum products. In 2011, on this basis, NIS contributed about 81 billion dinars, which represents about 11% of Serbia's total budget revenue. With respect to the strategic plan, it is expected that the doubled production and distribution of petroleum products by 2020 will bring Serbia the reciprocal increase in budget revenues.

NIS is one of the largest investors in Serbia. In the past three years, NIS has invested EUR 1.5 billion (EUR 500 million annually), and plans to invest the same amount over the next three years. The most important and the most valuable project involves the modernization of the processing facilities and the construction of hydro-cracking and hydro-treating plants in the refinery in Pancevo. The completion of construction and commissioning of the newly constructed plant in Pancevo allowed NIS to produce fuels which are entirely in keeping with the highest EU standards. Also, the portfolio of petroleum products will be significantly improved. Therefore, in a relatively short period of time, the competitiveness of Serbian energy market will be increased to a higher level.

In accordance with the requirements of the *Renewable Energy Sources Directive* (2009/28/EC), one of the new directions for the development of NIS in the future is renewable energy resources. Last year, NIS formed a block called "Energy", which is supposed to offer new prospects to the company. The activity of this center is the production and sale of electricity and heat energy from cogeneration and renewable energy resources (biomass, wind and thermal water).

Finally, sustainable development and environmental protection constitute an integral part of the effective management strategy in NIS. In the period 2010-2012, more than EUR 7.4 million was invested in the improvement of the environment, which allowed the installation of the most modern monitoring systems and increased the level of environmental safety. The consequences are already visible and significant. In other words, the goals and development strategy of NIS are complementary to the Energy Sector Development Strategy of the Republic of Serbia.

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COMPARISON OF SWEDISH AND SLOVENIAN EXPERIENCE IN THE IMPLEMENTATION OF ENVIRONMENTAL POLICY AS PART OF SUSTAINABLE DEVELOPMENT

Poređenje švedskih i slovenačkih iskustava u implementaciji ekološke politike kao dela održivog razvoja

Abstract

The objective of this paper is to analyse, compare and present different practices of sustainable development in EU member states. The paper is represented as a comparative study of policies of sustainable development in Sweden and Slovenia. These two countries were selected based on the difference in their sustainable development models. Sweden is a country characterised by a longstanding tradition of commitment towards environmental protection and sustainable development. Sweden has proven in practice that it is possible to combine a high level of economic and social welfare with the protection of the environment. Slovenia is included in the comparison as a country at the beginning of the process of implementing sustainable development, and could benefit from Sweden's experience. Using the comparative method, the foundations of sustainable development policy are presented for both countries on the basis of the analysis and interpretation of documents; certain comparisons between official policies and the actual implementation and effects of such policies in practice are given based on various other sources (professional articles, internet sources, etc.). A comparison of the two countries will include: state structure, specific societal features, relation to the EU, governmental definition of sustainable development, and key sustainable development indicators and the progress achieved.

Key words: *case study, sustainable development, Slovenia, Sweden, state structure, governmental definition of sustainable development, key sustainable development indicators*

Sažetak

Cilj ovog članka je da analizira, uporedi i predstavi različite prakse održivog razvoja u državama članicama EU. Članak predstavlja komparativnu studiju politike održivog razvoja u Švedskoj i Sloveniji. Ove dve zemlje su odabrane na osnovu razlike modela održivog razvoja. Švedska je zemlja koju karakteriše dugogodišnja tradicija posvećenosti zaštiti životne sredine i održivom razvoju. Švedska je kontinuirano dokazivala svoju posvećenost održivom razvoju kroz svoje delovanje i politiku. Švedska je u praksi pokazala da je moguće kombinovati visoki nivo ekonomskog i socijalnog blagostanja sa zaštitom životne sredine. Slovenija je uključena u poređenje kao zemlja na početku procesa implementacije održivog razvoja, a koja može imati koristi od iskustva Švedske. Korišćenjem komparativnog metoda, temelji politike održivog razvoja su prikazani za obe zemlje na osnovi analize i tumačenja dokumenata; određena poređenja između zvanične politike i stvarne primene i efekata takve politike u praksi data su na osnovi raznih drugih izvora (profesionalni članci, internet izvori itd.). Poređenje dve zemlje će obuhvatiti: državnu strukturu, određene društvene funkcije, veze sa EU, vladinu definiciju održivog razvoja, ključne indikatore održivog razvoja i postignuti napredak.

Ključne reči: *studija slučaja, održivi razvoj, Slovenija, Švedska, državna struktura, vladina definicija održivog razvoja, ključni indikatori održivog razvoja*

Introduction

The objective of this paper is to analyse, compare and present different practices of sustainable development in EU Member States. The paper is represented as comparative study of policies of sustainable development in Sweden and Slovenia. These two countries were selected based on the difference in their sustainable development models. Sweden is a country characterised by a longstanding tradition of commitment towards environmental protection and sustainable development. Sweden was already handling environmental protection issues in the first half of the 20th century, namely, the local effects of industrial emissions. In 1972, Sweden was the host of the first international conference on the environment. Within the frame of that conference the foundations of sustainable development

were built. Since then, Sweden has continuously proven its commitment to sustainable development through its actions and policies. Sweden has proven in practice that it is possible to combine a high level of economic and social welfare with the protection of the environment. This is also the reason the case study of Sweden was included in this research. Slovenia is included in the comparison as a country at the beginning of the process of implementing sustainable development, and could benefit from Sweden's experience. Using the comparative method, the foundations of sustainable development policy are presented for both countries on the basis of the analysis and interpretation of documents; certain comparisons between official policies and the actual implementation and effects of such policies in practice are given based on various other sources (professional articles, internet sources, etc.). A comparison of the two countries will include:

1. Introduction:
- State structure,
- Specific societal features,
- Relation to the EU.

2. Governmental definition of Sustainable Development:
- Definition of sustainable development in the national strategy,
- Monitoring the strategy for sustainable development,
- Link to the EU Strategy for Sustainable Development.

3. Key sustainable development indicators and the progress achieved.

4. Conclusion.

SWEDEN

Introduction

State structure: Sweden is a parliamentary monarchy. The Swedish Constitution declares that all public power derives from the people and that the Riksdag – the Swedish Parliament – is the foremost representative of the people. The Riksdag holds legislative power. In terms of administration, Sweden is divided into counties. Each county is governed by the administrative committee appointed by the government. Each county also has a county council with elected representatives from the municipalities. Each district is divided into municipalities. There are no hierarchical relations between municipalities, county councils and regions, since all have their own self governing authorities with responsibility for different activities. They have a considerable degree of autonomy and independent powers of taxation.

Development situation: Sweden has one of the most globalized and competitive economies. A high-tech local economy and a comprehensive system of welfare benefits allow Sweden to enjoy one of the highest standards of living in the world. From the early 1990s until 2008, Sweden enjoyed a sustained economic upswing fueled by strong exports and rising domestic demand. In 2008, Sweden entered a recession. Heavily dependent on exports of cars, telecommunications, construction equipment and other investment goods, Sweden was hard hit by the contraction in external demand due to the global financial and economic crisis.

Exports and investments in machinery and transport equipment, chemical and rubber products, food, clothing, textiles and furniture, and wood products are rapidly increasing, and the Swedish export market is expected to grow by 8% each year through 2013.

Specific societal feature: Sweden has a history of strong political involvement by ordinary people through "popular movements". The latter part of the 19th century saw the birth of the major popular mass movements, frequently inspired by similar movements in other countries. In a narrow sense, the popular movements in Sweden are divided into two groups. The older of these is generally associated with the powerful Swedish labour movement, but it also includes the Free Church movement. The more recent grouping includes the women's movement and the environmental movement [10, p. 224]. The significance of such movements is apparent by the state giving certain financial support to popular movements that are to the benefit of the citizen. In Swedish political discourse the popular mass movements and the non-profit sector are viewed as important schools for democracy, instruments for promoting both mutual and individual interests, and an integral part of the democratic civil society [10, p. 229].

Relation to the EU: Because of their long and positive experience with the policy of neutrality, the Swedes are

traditionally sceptical with regard to integration into the structures of the European Union. The advocates of stronger integration received their last big damper with the referendum on membership in the European Monetary Union: a clear majority of the population voted against replacing the Swedish Krona with the Euro [1, pp. 159-160].

Governmental definition of sustainable development

Sustainable development is an overall objective of Government policy. The Government introduced the concept of sustainable development (SD) in the early 1990s. The first national strategy for sustainable development, "A Swedish strategy for sustainable development", was presented by the Government in 2002. Due to the UN World Summit on Sustainable Development in Johannesburg, the strategy was revised in 2004 and in March 2006 the Government presented the most recent strategy for sustainable development: "Strategic challenges: A further elaboration of the Swedish strategy for sustainable development" [1, p. 160].

Institutional position of sustainable development: Sweden's sustainable development effort has given rise to institutional changes. Sustainable development was adopted in 2003 as an overall objective of Government policy. The task of implementing Sweden's strategy for sustainable development is the responsibility of the Government Offices as a whole. The government has set up a special body in the Prime Minister's Office, the Coordination Unit for Sustainable Development, to coordinate international and national efforts in this field and strengthen strategic initiatives.

Definition of sustainable development in the national strategy: In the national Strategy for Sustainable Development (SDS) the Government's vision of sustainable development is defined as an overall objective of Government policy, both nationally and internationally. "The policy objectives of the vision of a sustainable society are solidarity and justice in every country, among countries and among generations". The basic assumption is that members of one generation should not conduct their lives in a way that prevents their children or future generations from enjoying a decent standard of living. Sustainable development is considered as a holistic approach to society's needs and problems. The Government points out four strategic challenges to be prioritised: building sustainable communities (promoting good living), encouraging good health on equal terms for all citizens, meeting the demographic challenge (taking measures across a range of policies), and encouraging sustainable growth (recognition that growth is driven by dynamic markets, a forward-looking welfare policy and a progressive environmental policy). Since the strategic challenges extend across a number of different policy areas, the Swedish Government stresses the need to act at the local, regional, national, EU and global levels to successfully confront them.

Monitoring the strategy for sustainable development: Sweden developed a system of 87 indicators to monitor the implementation of the adopted sustainable development strategy. Twelve indicators are selected as headline indicators: average life expectancy, violence, energy efficiency, investments, employment rate, public debt, growth, risk of poverty, demographic support ratio, greenhouse gases, hazardous substances and development assistance. The main indicators cover six key areas of Sweden's sustainable development in accordance with the strategy: health, sustainable consumption and production, economic development, social cohesion, environment and climate and global development.

Link to the EU Strategy for Sustainable Development: The European Council's declaration on Guiding Principles for Sustainable Development from June 2005 served as guidance for Sweden's strategy. Several areas of the EU Sustainability Strategy largely correspond to the Swedish national strategy (sustainable consumption and production, social inclusion, demography and migration, global poverty and sustainable development challenges).

Key sustainable development indicators and the progress achieved

Trends in sustainable development are positive in many areas (see Table 1). For example, life expectancy in Sweden has been consistently increasing. Sweden also has one of the lowest unemployment rates in the world, which is a result of

an active policy of settling the problem of unemployment; it is one of the most competitive economies in the world, yet it managed to separate the growth in GDP from energy consumption and greenhouse gas emissions. Sweden has been especially active in eliminating hazardous substances. Sweden participates in a range of cooperation schemes in the EU, in its neighbourhood, globally and bilaterally with individual countries. Adaptation toward sustainability is under way, but much work remains. Sweden has seen negative development in some of the traditional welfare indicators such as risk of poverty and demographic support ratio in the environment area, including limiting the positive climate impact.

Health

Life expectancy: Life expectancy in Sweden has risen by four years for men and three years for women over the past 20 years. The expectancy for years of healthy life has increased by two years for women and remained unchanged for men. Both men and women had healthy life years expectancy of approximately 62 years in 2003. The country's life expectancy is a clear sign that Swedes generally enjoy good health and well-being.

Violence: There are major differences among various groups – young men are most at risk, whereas older men and women are rarely at risk. No general trend is discernible – except in the case of young women, for which it is negative.

Table 1: Key indicators for sustainable development and their trends

HEADLINE INDICATORS	TREND
HEALTH	
Life expectancy	Positive
Violence	Neither positive nor negative
SUSTAINABLE CONSUMPTION AND PRODUCTION PATTERNS	
Energy efficiency	Positive
Investment	Neither positive nor negative
ECONOMIC DEVELOPMENT	
Employment rate	Neither positive nor negative
Public debt	Positive
Growth	Positive
SOCIAL COHESION	
Risk of poverty	Negative
Demographic support ratio	Negative
ENVIRONMENT AND CLIMATE	
Greenhouse gases	Neither positive nor negative
Hazardous substances	Positive
GLOBAL DEVELOPMENT	
Development cooperation	Positive

Source: [14, pp. 18-19]

Sustainable consumption and production patterns

Energy efficiency: Energy intensity has decreased during the past five years, indicating stepped-up production with less energy per unit manufactured. Over a longer period of time, oil's percentage of the total energy supply has fallen, while the biofuels' percentage has risen. The production of hydroelectric power varies from one year to the next and reflects precipitation differences.

Investments: Sweden's investments in physical capital have remained fairly constant over the past ten years, albeit lower than before the economic crisis of the early 1990s. Investments in education have been steady at 7% of GDP. Since 1993, R&D expenditures have remained above the Lisbon strategy's target of 3% of GDP. The figure passed 4% in 2001 and was down somewhat in the period 2003-2004. The private sector accounts for approximately three quarters of the R&D effort.

Economic development

Employment rate: The employment rate indicator shows no discernible positive or negative trend. The Government's 80% employment of women and men has risen in recent years. One complementary employment measure is the number of hours worked per person of working age. The measure also captures various types of absenteeism. The trend is negative for men and essentially unchanged for women.

Public debt: Sustainable public finances are fundamental to welfare systems and to the national economy as a whole. Since the budget reform of the 1990s, the public debt has trended downward. That is necessary if Sweden is to handle its rising demographic support ratio. Gross public debt, which jumped from 43% of GDP in 1990 to 78% in 1994, stabilised around the middle of the 1990s and started to come down again more significantly beginning in 1999. In 2000 it fell below the key level of 60% and had continued to decline to a level of 37% of GDP as of 2007. For the past five years, the public debt has been below the reference value of 60 percent of GDP set by the Maastricht Treaty.

Growth: During the 1970s and the 1980s, Sweden had a lower GDP growth rate than both the average growth of the EU and the average growth of the OECD area. The recession in Sweden in the beginning of the 1990s led to a low mark regarding economic growth as the GDP growth rate actually fell during three years. Between 1990 and 1993, the GDP fell by about 4% in terms of volume. After 1993, the growth rate in Sweden accelerated again and was comparable to the growth rate of the OECD. During the period 1998-2000, the volume growth rate was actually higher than in comparable countries, at just over 4% per year. After years of economic growth, the Swedish economy, as the rest of the developed world, was again affected by a sharp economic downturn because of the IT-crash in the beginning of 2000. The crisis was followed, however, by an economic boom. World trade increased sharply, which resulted in rapid export growth for Sweden. The Swedish GDP growth rate reached 4% in both 2004 and 2006. In 2007 the economic growth slowed down again and in late 2008 the financial crisis resulted in a deep recession. The GDP growth fell during 2009, however, it recovered somewhat during 2010 [2].

Social cohesion

Risk of poverty: The risk of poverty indicator in the area of social cohesion reflects the percentage of Swedes living in households that earn less than 60% of the country's median income. The indicator has risen to 12% since the early 1980s. But that is the second lowest in the EU and remains well below the 15% average for the EU 25 countries. The 60% cut-off point is not intended as a measure of absolute poverty, but represents an assessment of the level below which normal consumption and integration in the community are difficult to maintain. In absolute terms, such households may enjoy a decent standard of living well above what poor countries have to offer.

Demographic dependency ratio: The demographic dependency ratio indicator measures the number of children, young people and elderly who are dependent on the working age population. The ratio of children and adolescents aged 19 or less to the working age population (20–64) has been declining for a long time. The percentage of children and adolescents in the total population is expected to remain essentially unchanged for the next 50 years. The working age population will also be fairly constant. But Sweden has the oldest population followed by Italy, amongst the EU Member States. As Swedes live longer and healthier lives, the age and size of the population increases. But that also translates into a higher support ratio.

Environment and climate

Greenhouse gases: Swedish greenhouse gas emissions per head of population are among the lowest in OECD Member States. The emissions have shown a declining trend in recent years, while economic growth has increased. This means decoupling the two phenomena which represents the desired model of low carbon growth. In 2009, Sweden emitted 60 million tonnes of greenhouse gases. Compared with 2008, this is a decrease of 3.6 million tonnes. Emissions were around 17 percent below 1990 levels. GDP has grown by around 3 percent per year since 1994, except in 2008 and 2009. Despite economic growth, emissions of greenhouse gases have still reduced over the same period. Emissions have fallen as a result of a change-over from oil to biofuels in the production of district heating. Sweden is now increasing the pace of work on the transition to a low-carbon society. The aim is to make the country independent of fossil energy, and Sweden therefore has to make its own contribution to international efforts to reduce emissions to the levels the climate requires. Sweden has earmarked SEK 4 billion over the period 2009-2012 for climate measures within their international development cooperation. This money will be spent in particular on adaptation measures in developing countries aimed at reducing the vulnerability of the population, for example, through investments in health, sanitation and access to clean drinking water.

Hazardous substances: Since the 1980s, Sweden has followed key principles for the management of products and waste: the precautionary principle, the substitution principle, the waste hierarchy and producer responsibility. Sweden has been especially active in eliminating hazardous substances from products and waste, an area of growing significance as primarily the consumer products have become a major source of pollution. Sweden stresses the role of producers in chemicals management and, more

recently, in the ecocycle policy – an approach that gives producers general responsibility and broad flexibility in implementing measures. More recent Sweden's statistics show that the number of products hazardous to health and available to consumers is already decreasing. Among the chemical products available to consumers which were imported and produced at the beginning of the 1990s, about half were qualified as hazardous to health. By the end of the 1990s, this share had decreased and now is 39 percent [15].

Global development

Global environmental cooperation is important to Sweden. The country has very effectively promoted international cooperation on environmental protection issues and has supported its international programme with significant levels of human and financial resources.

Official development assistance: The Swedish sustainable development policy presented a policy for global development, the goal of which is to contribute to equitable and sustainable development. It is proposed that this goal should apply to all policy areas. It focuses on those who have not benefited from the prosperity generated by globalization. Poor people and countries, especially the poorest among them, must be empowered and have greater opportunity to benefit from the advantages that increased global trade has yielded. Sweden contributes 1 percent of its GDP to development assistance. That is high in comparison with the rest of the world. Only a few countries have met the UN target of at least 0.7 per cent of GNP. As a percentage Sweden is the largest donor among developed countries.

Conclusion

Awareness of one's own involvement in the causing of environmental problems is a prerequisite for a person to change to a proper behaviour pattern. With such awareness, it is easier to implement the system measures of environmental policies which can change the existing development trends. The example of Sweden proves that environmental protection is not in contradiction with the goal of high competitiveness in the economy. Sweden is one of the most environmentally aware countries in the world; the Swedes have ecological incorporated awareness in their lifestyles, and Sweden is one of the most competitive countries in the world. A high level of public awareness of environmental problems has dictated the changes in the behaviour of the state and the enterprises. The Swedes did not focus on solving the environmental problems, but they saw in them a challenge to introduce preventive social, technological and economic reforms. Sweden has managed to connect environmental and economic challenges by creating new sources of growth. Environmental policy for Sweden is a part of sustainable development. Sweden represents an opportunity for innovation, and it has been using this opportunity. Due to strict environmental standards, Sweden is forced to search for advanced solutions to environmental problems. New and innovative environmental technologies contribute to economic growth in various ways. By decreasing the costs of environmental protection, Sweden enables "more environmental protection for less money", i.e. reaching the accepted environmental standards in a more cost-effective way. Financial resources saved in this way can be used anywhere in the economy. Innovative technologies, on the other hand, also create new markets by promoting the demand for green technologies, goods and services. Environmental technologies have contributed to the breaking of the causative connection between pollution of the environment and economic growth, along with respecting the limitations of environmental standards. This is the essence of sustainable development.

SLOVENIA

Introduction

In terms of political system, Slovenia is a democratic republic; with its powers divided among the legislative, executive and judicial. The highest legislative authority is the National Assembly (90 members), which passes laws. The President of Slovenia represents the Republic of Slovenia and is the Commander-in-Chief of its armed forces. The National Council (40 members) is appointed to carry out the advisory role and represents the social, economic,

professional and local interest groups. The Government represents the executive authority and reports to the National Assembly. In January 2011, Slovenia comprised 211 municipalities, which represent a form of local autonomy set forth by Articles 138 to 144 of the Constitution of the Republic of Slovenia. Municipalities are usually financed by the municipal budget, and for certain purposes, the Financing for Municipalities Act envisages co-financing from the national budget. A municipality is also a holder of power within its competences, which are a reflection of the decentralisation of public administration; however, a municipality is a part of the state and is thus not a sovereign power holder but dependent on the state. Local issues, which fall within the competence of municipalities, are being sufficiently implemented and the system rather works well. At the local level, the municipalities are responsible for sustainable consumption and production issues. The problem is that the competences of municipalities are actually never finally determined. Limitation of tasks to national and local is performed in every legislative procedure, and this is not followed by the provision of financial resources for the performance of municipal tasks and even less by the adaptation of organisational possibilities and types of task performance.

Development situation: By entering the European Union, Slovenia started to catch up with the EU and gradually increase its national competitiveness. At the beginning of the 1990s, macroeconomic stability and institutional changes of the transition economy were at the forefront. Until 1999, Slovenia recorded a high level of economic growth. At the beginning of the recession, its own developmental inconsistencies led to a significant drop in the economic growth along with more expressed macroeconomic imbalances. This applies particularly to the above-average level of inflation as compared to the EU and aggravation of the state's financial position. In the last decade, Slovenia has gained a significant lag in the area of structural reforms, especially the public, financial, and entrepreneurial sectors [4, p. 1]. The Slovenian economy is based on traditionally work-intensive industrial branches and privatised post-socialist enterprises; its share of modern technological areas and economically successful small and medium-sized private enterprises is too small. Therefore, Slovenian productivity, export competitiveness and added value per employee are still substantially lower than in comparable EU-15 members. Orientation on technological restructuring, innovation and the increase in added value were too low, which strongly aggravated Slovenia's competitive position during the economic crisis. This explains why the Slovenian economy is still recovering more slowly than the average of the EU Member States.

Specific societal feature: The greatest direct impact on changing perspectives on environmental issues in Slovenia was its accession to the EU, when Slovenia was adopting its legal order and standards in the area of the environment, and ecological awareness of the Slovenian population was developing. Serious ecological problems raised awareness in Slovenia indicating that the environment needs attention and protection. The key problem of Slovenia is that a developed ecological awareness does not necessarily mean suitable orientation of people towards the natural environment and appropriate actions. It is not enough for an individual to only be aware of problems, but he/she must also act in accordance with the requirements of the natural environment. The path from awareness to action can be very long. In Slovenia, we cannot refer to a developed ecological awareness: in many cases, people fail to see a direct connection between daily decisions and actions, and ecological problems, and they might not even know that some products harm the environment. The key role in this context lies in different interest groups. In Slovenia, the number of activities of civil society participation has been increasing: NGOs, local communities, and other interest groups are focused in solving problems and satisfying the current needs in the area of environmental protection and nature conservation. Such encouraging facts are accompanied by obstacles due to the lack of available resources to finance such activities.

Relation to the EU: On 1 May 2004, Slovenia became a member of the European Union. The year before, the accession to the EU was supported at a referendum by 89.64% of voters. On 21 December 2007, Slovenia entered the Schengen area. On 1 January 2007, it further deepened its ties with other EU Member States by adopting as the 13th state the single European currency. In the first half of 2008,

Slovenia presided over the Council of the European Union. Today, Slovenia participates in community programmes in various areas that are primarily focused on social and economic progress and their interconnection. It contributes a part of its gross domestic product (GDP) to the common EU budget and in return it receives financial support, among other things for the development of agriculture and the countryside, for sustainable growth and for economic, social and more balanced development of regions within the framework of the European cohesion policy.

Governmental definition of sustainable development

In 2005, the Government adopted Slovenia's Development Strategy by 2013, which meets the standards of sustainable development strategy. Sustainable development has thus become an integral part of the selected development model in Slovenia. The National Council for Sustainable Development (NCSD) was involved in the preparation of the NSDS. The NCSD organised five thematic discussions, including one with regional and local representatives. Inter-ministerial coordination was established during the preparation of the NSDS. Moreover, the NCSD fosters cross-sectoral coordination. According to the Government decision of 14 June 2007, the NCSD is chaired by the Minister of the Government Office for Growth and co-chaired by the Minister of Environment and Spatial Planning and by the Minister of Local Government and Regional Policy. It is composed of 34 members, comprising 9 representatives of Government offices and 25 representatives of civil society. The renewed EU Strategy for Sustainable Development (EU SDS) that was adopted in June 2006 foresees that Member States report bi-annually on how they address the priorities of the EU SDS. Slovenia published its first national report on implementing the EU SDS in the summer of 2007.

Institutional position of sustainable development: The lead ministry/institution in the SD strategy process is the Government Office for Growth. The implementation of the NSDS is monitored in the form of a Development Report that is prepared annually by the Institute of Macroeconomic Analysis and Development and adopted by the Government of the Republic of Slovenia as guidelines for the formulation of national economic and development policy. It is an independent professional service of the Government of the RS in the area of economic and social policy, development strategy and policy, national-economic balances and other tools for analysis and prognosis, and international cooperation and inclusion into economic integrations. The Director of the Office is directly accountable to the Prime Minister.

Definition of sustainable development in the national strategy: Slovenia's Development Strategy includes four dimensions: economic, environmental, social and cultural issues. In accordance with Slovenia's Development Strategy, the principle of sustainability in the economic and social domains primarily concerns the achievement of a sustained increase in the capacity for economic growth, human development and improved welfare. Among other things this presupposes cross-generational sustainability of social insurance and public finance systems, the creation of conditions for sustained population growth and the prevention of developmental isolation of certain social groups or regions of the country [18, p. 19]. In the area of spatial development, the principle of sustainability translates into such an organisation of the economy, infrastructure, land settlement and way of living within the capacity limitations of the environment, space and natural resources that the spatial and settlement-related needs of the population are effectively satisfied [18, p. 19].

Monitoring the strategy for sustainable development: The Development report, which is prepared by the Institute of Macroeconomic Analysis and Development, is a document in which the realisation of the Slovenia's Development Strategy is presented once a year. The report is divided into two parts. The first part comprises a concise overview of Slovenia's Development Strategy realisation in the area of five developmental priorities: a competitive economy and faster economic growth, an effective generation, two-way flow and application of the knowledge needed for economic development and quality jobs, an efficient and less costly state, a modern social state with higher employment and Integration of measures to achieve sustainable development. The second part of the report provides a detailed presentation of the progress by the

development indicators of Slovenia. The key development indicators are joined in three areas: well-being, balance and moderation, and intergenerational cooperation. Each field is described through environmental, economic and social aspects.

Link to the EU Strategy for Sustainable Development: With the accession to the EU, Slovenia faced different development frameworks for the realisation of Slovenian national development. Slovenia had to find a way to realise its national goals in a sustainable way by considering the EU rules, policies and strategies. In accordance thereof, it prepared Slovenia's Development Strategy. The Slovenia's Development Strategy (SDS) is an umbrella strategic document, which determines the developmental vision and priorities of Slovenia's development. The main point of the Slovenia's Development Strategy (SDS) is prosperity of its citizens. Despite this, it needs to be emphasized that the key objective of Slovenia's Development Strategy for 2013 is economic growth and employment rate and four of the five SDS development priorities would contribute to achieving this objective, while the revised EU strategy emphasises the structural economic changes, which are necessary for a more sustainable production and more sustainable consumption patterns. Concerning the content, this strategy brings together the fundamental starting points and principles of sustainable development, it defines the objectives and tasks in seven key areas: climate changes and pure energy, sustainable transport, sustainable consumption, preservation and management of natural resources, public health, social inclusion, demography and migrations, and poverty in the world.

Key sustainable development indicators and the achieved of progress

In November 2010, a set of key national sustainable development indicators was published by the Statistical Office of the Republic of Slovenia under an international project with financial support from Eurostat. The selection of the indicators tried to achieve the maximum compatibility with structural indicators developed by the EU to monitor the Lisbon Strategy (see Table 2).

Table 2: Key indicators of sustainable development and their trends

Areas		Indicators	
WELFARE	QUALITY OF NATURAL RESOURCES	Air quality	Negative
		Drinking water quality	Negative
		Organic farming	Positive
	ECONOMIC GROWTH	GDP, Household income	Negative
		Registered unemployment rate	Negative
	SAFETY	Access to social protection	Positive
		Access to education	Positive
		Access to health care	Positive
		Crime	Positive
BALANCE AND MODESTY	NATURAL RESOURCES	Energy consumption,	Negative
		Water consumption from public water supply	Positive
		Municipal and food waste generation	Negative/ positive
		Passenger transport	Negative
	RESEARCH AND DEVELOPMENT	Expenditure on development	POSITIVE
	POPULATION, GENDER EQUALITY AND POVERTY	Total increase of population;	Negative
		Earnings of men and women,	Negative/ Positive
		At-risk-of-poverty rate	
INTERGENERATIONAL COOPERATION	INTENSITY OF USE OF NATURAL RESOURCES	Energy intensity	Negative
		Greenhouse gas emissions	Negative
		Consumption of mineral fertilizers in agriculture	Negative
		Intensity of tree harvesting	
	GOVERNMENT DEBT	Government debt	Negative
	CARE FOR ALL GENERATIONS	The age dependency	Negative
		Childcare	Positive
		Care for the elderly	Positive

Legend: The dark gray colour shows the environmental determinant, the light gray denotes the economic determinant, and the medium gray colour shows the social determinant.

Source: [12]

Welfare

Quality of natural resources: Slovenia is a moderately polluted European state. Obvious issues are the pollution of surface water resources. The first big problem is the pollution of surface water resources. Drinking water in Slovenia is not very good – suffering microbiological pollution with the exception of NE Slovenia, where drinking water is also polluted with pesticides and nitrates due to intensive farming. Consumption of water from the public waterworks is also increasing. The second big problem is air pollution. The biggest sources of pollution are the energy and transport sectors. The cause for the latter is especially (too) slow restructuring of the Slovenian economy and non-sustainable consumer patterns, which

largely contribute to an increased use of the final energy and of personal vehicle transport. The growth of organic and integrated farming practically halted in 2008. In 2008, Slovenian farms included in standards for sustainable (organic and integrated) farming cultivated almost 18% of total UAA, of which one third was cultivated using organic methods and two thirds using integrated methods. The total areas increased in 2008, too; however, growth was modest: in integrated farming by 1.3% and in organic farming, which is one of the most efficient methods of sustainable agricultural use of natural resources, by 1.8%. The share of organically farmed area in the total UAA thus rose from 5.9% to 6.1%. Although the share in Slovenia in 2007 was higher than the EU-15 average, it was much lower than in two neighbouring countries (Slovenia 5.9%, EU-15 4.7%; Italy 9.0%, Austria 11.7%, Hungary 2.5%).The consumption of NPP fertilisers decreased again in 2008; 10.4% less NPP fertilisers were used in agricultural production than in 2007 and 30.8% less than in 2000. Consumption of nitrogen decreased most (by 15.4%), followed by phosphorus with 6.4% and potassium with 3.9%. Measured per hectare of utilised agricultural area (UAA), total consumption of NPP fertilisers amounted to 104.9 kg, which is 9.3% less than in the previous year and the least in the whole analysed period since 1995. According to the latest comparable data for 2007, consumption of NPP fertilisers in Slovenia was higher than the EU-27 and EU-15 averages as well as in higher than the level in the three neighbouring EU Member States (Slovenia 115.6 kg/ha, EU-27 103.9 kg/ha, EU-15 106.1 kg/ha, Italy 95.2 kg/ha, Austria 48.6 kg/ha, Hungary 93.6 kg/ha). In 2008, sales of pesticides increased. The total quantity of active ingredients of pesticides sold in Slovenia, which, however, was not only used in agriculture, decreased after 2004 but then increased by 5.4% in 2008. The environmental burden of livestock production in Slovenia is slightly higher than the EU average, while the average milk yield per animal is lower and decreased further in 2008.

Economic growth: Slovenia's economic growth since 1997 has been dynamic and continuously approaching the OECD average, measured by gross domestic product (GDP) per capita. The high growth was a reflection of a favourable business environment and important structural reforms, which served as the foundation for the entry to the European Union (EU) in 2004. Economic policies helped maintain the economic growth without creating big imbalances. The global crisis affected Slovenia the most through international exchange, as foreign demand, especially German, experienced a severe drop. The contraction of GDP that started in the final quarter of 2008 accelerated in 2009. Affected by the global crisis, Slovenia's GDP dropped by 0.8% year-on-year in the last quarter of 2008 and by as much as 7.8% in 2009. Competitiveness of the Slovenian economy is diminishing; it declined on the scale of competitiveness in the period from 2008 to 2010 by 14 places, therefore faster convergence with the EU is needed but this is only possible with structural changes. Sustainable development in Slovenia has not been reached yet.

Safety: After independence, Slovenia experienced a shock and a high rate of unemployment. The conditions started improving only at the end of the 1990s, when the rate of unemployment started dropping and all other living standard indicators started showing positive growth as well. Two years ago, the quality of life indicators for Slovenia started dropping very fast due to the global financial and economic crisis. The employment rate dropped in 2009 due to declining economic activity, yet remained above the EU average. In the first three quarters of 2009, it averaged 67.5% (i.e. 1.3 p.p. below the level of 2008). Until 2003, the employment rate had hovered around 63%, which was slightly above the EU average, but in 2004 it recorded a significant jump and even exceeded the average of the old EU Member States (EU-15). It was continually increasing as long as until 2008. In 2009, the number of people in employment decreased in most market activities.

Social-protection expenditure in Slovenia increased somewhat in real terms in 2007, while it fell again as a share of GDP, mainly as a result of rapid GDP growth. Slovenia allocated EUR 7,381 m or 21.4% of GDP to social protection in 2007, which is 1.3 p.p. less than a year before and 4.8 p.p. below the EU average. The 2007 reduction resulted from GDP growing faster than social-protection expenditure, which increased by close to 5% in nominal

terms and by a solid 1% in real terms. In terms of share of GDP, health expenditure in Slovenia in 2007 fell below the EU average; health expenditure per capita also shows that Slovenia lagged behind the advanced European economies. In 2007 (the latest internationally comparable figure), health expenditure as a share of Slovenia's GDP decreased to 7.8% (8.3% in 2006), while it rose again in 2008, to 8.1%, which has been approximately the average level in the EU for several years. Unemployment rose while employment declined, which pushed Slovenia further away from the realisation of the target of reaching a 70% employment rate by 2013. Wage growth in 2009 was lower than in previous years and the number of recipients of various social benefits increased significantly as a result of higher unemployment. Consequently, the level of social disadvantage in Slovenia has been increasing, while the government has at the same time been decreasing the share of public financial expenditure in GDP connected with social development and social security. This is still below the EU average and amounts to 28% of GDP; we intend to allocate 15% of GDP for social security, which is also below the EU average. The social-protection system experienced no systemic changes in 2009, but the situation again confirmed that the pension, health care and long-term care systems were in a pressing need for changes to improve their efficiency and to ensure sustainability of the public finances. If you are unemployed and live in Slovenia, the probability of living under the poverty threshold is almost 40%. This means your monthly income is less than 545 euros. If you live in a household without active working members and have children, the probability of living under the poverty threshold is almost 60%. Over the past three years (2007-2009), the share of the population with a tertiary education ranged between 22% and 23%, thus considerably widening the gap to the EU average. According to the Labour Force Survey (LFS), the share of the population with a tertiary education aged 25-64 totalled 22.5% in the second quarter of 2009, which is 0.6 p.p. more than the year before, yet still lower than in 2007 when it was the highest to date. On this indicator, Slovenia lags behind the majority of economically more developed countries. In 2000-2009, this share rose by 6.7 p.p. but Slovenia nevertheless failed to notably reduce its gap to the EU average (it lagged by 3.1 p.p. in 2000 and by 2.5 p.p. in 2009). Due to the stagnation between 2007 and 2009, the gap behind the European average grew from 0.5 p.p. in 2007 to 2.5 p.p. in 2009.

Expenditure on educational institutions per student measured in EUR PPS1 in Slovenia exceeds the EU average, and recorded further growth in 2006 (latest available data).Total public expenditure on education as a share of GDP2 is relatively high. In 2007 (latest domestic data), it accounted for 5.19% of GDP, while in 2006 (latest international data) Slovenia exceeded the EU average by 0.63 p.p. The ratio of students to teaching staff in Slovenia is improving, yet the gap behind other European countries is still considerable. In 2007 (academic year 2006/2007), for which the latest international data are available, the ratio of students to teaching staff was 21.0 in Slovenia, lagging notably behind the average of the 19 EU countries (that are also members of the OECD) where this ratio was 16.0. In that year, Slovenia lagged significantly behind the economically most developed Northern European countries, such as Sweden, Norway and Iceland, where the ratio is the lowest, and was only better than Greece. The average number of years of schooling of the adult population recorded no increase in 2008 and continues to lag behind the most developed countries.

Balance and modesty

Natural resources: Overuse of natural resources and creation of different forms of load on the environment and space is typical of Slovenia, as the Slovenian market applies the environmental policy only partially. Despite certain positive shifts in terms of decreasing some environmental pressures and the improvement of the quality of some of the ingredients of the environment, the data for Slovenia from the viewpoint of environmental pressure are unfavourable or non-sustainable. In 2008, environmental pressures increased most notably in transport. This was also reflected in a deterioration of the energy intensity of Slovenia's economy in 2008, which is nevertheless much higher than the EU average, despite the improvement in 2006 and 2007. Significant growth in greenhouse-gas emissions, which has also mainly resulted from increased traffic in recent years, continued in 2008. However, energy consumption

per unit of value added in manufacturing continued to decline, most notably in precisely those industries that are most burdensome for the environment. The share of the use of renewable energy sources increased in 2008, and also in 2009 (according to our estimate), after declining for several years. In 2009, pressures on the environment diminished, amid the decline in economic activity, and there was also progress in policies supporting electricity generation from renewable sources and efficient energy use. Waste management also improved slightly, according to the most recent data (for 2008), but a decisive move towards more sustainable development has yet to be made, particularly in the field of municipal waste.

Research and development: After a one-year decline, gross domestic expenditure on R&D expressed as a percentage of GDP increased in 2008. Gross domestic expenditure on R&D (GERD) as a share of GDP rose by 0.21 p.p. over the preceding year to 1.66%, also owing to the higher number of reporting units in the Slovenian business sector in 2008. In real terms, GERD increased by 16.6%, reaching EUR 616.9 m in 2008. Slovenia's gap behind the European average narrowed to 0.24 p.p. in 2008, the lowest value so far. Slovenia thus overtook some of the countries that ranked higher in 2007 (Luxembourg, the Netherlands and the Czech Republic), maintaining its position as the highest-ranking new Member State. In terms of number of patent applications filed at the European Patent Office (EPO), Slovenia is narrowing the otherwise significant gap to the European average. According to available data, Slovenian applicants in 2008 filed 63.7 patent applications per million inhabitants, compared with 131.1 across the EU. Slovenia ranks 14th among the EU countries and exceeds almost all new Member States (with the exception of Malta and Cyprus) and some Southern European countries (Spain, Portugal and Greece). The other new Member States have reduced the gap in this area much more slowly and are far behind the EU average.

Population: Regarding sustained population growth, the period since 2005 has been characterised by a growing number of inhabitants, particularly due to increasing net migration, with the fertility rate also increasing since 2004. Life expectancy continues to rise. After brief stagnation in the early period of transition, life expectancy in Slovenia has been constantly increasing since 1994. In 2008, life expectancy for men was 75.4 years and for women 82.3 years. Infant mortality in Slovenia has been falling for a number of years. In 2008, the infant mortality rate was 2.8 infants per 1,000 live births, which was the same as a year previously. On this indicator, Slovenia was fourth among EU Member States in 2007, behind Luxembourg, Sweden and Finland.

Poverty and gender inequality: In 2008, the risk of poverty slightly increased in Slovenia, yet it remained low compared with other countries, as did income inequality. The at-risk-of poverty rate was 12.3% in 2008, 0.8 p.p. higher than in 2007 (11.5%). Despite a slight increase, the at-risk-of-poverty rate still shows that inequality in Slovenia is fairly low. Even compared with EU countries, Slovenia maintains a low at-risk-of-poverty rate, since lower figures were recorded in only three countries: the Czech Republic (9%), Slovakia and the Netherlands (11%), whereas Austria, Hungary and Sweden have the same rate as Slovenia. Inequality of income in Slovenia is also low according to some other indicators of inequality of income distribution. In 2008, the Gini coefficient for Slovenia was 23.4%, whereas the quintile-share ratio (quintile coefficient) was 3.4, ranking Slovenia among those countries with the lowest level of income inequality in the EU-27.

Intergenerational cooperation

Intensity of use of natural resources: After several years of strong growth, the output of emission-intensive industries in Slovenia declined by 2.4% in 2008 and by as much as 18.6% in 2009. The total output of emission-intensive industries in Slovenia, i.e. sectors with the highest emission intensity (into air, water, earth) per unit of output, has been growing faster than the output of other manufacturing industries in the whole period since 1999. Energy intensity in Slovenia is relatively high and is improving too slowly relative to other EU countries; in 2008, it even increased somewhat. In 2008, Slovenia consumed 258.5 toe (tonnes of oil equivalent) of primary energy to produce EUR 1 million of GDP (in constant prices and exchange rates of 2000); the EU as a whole consumed 169.4 toe in 2007 (compared with 253.3 toe consumed in Slovenia that year). Slovenia thus spent approximately 50% more energy per

unit of GDP than the EU average. Slovenia's high energy intensity is partly related to a high share of energy-intensive manufacturing industries in its economy as well as the lower general level of its economic development. The share of the use of renewable energy sources (RES) in Slovenia fluctuates depending on hydro-energy use; in 2008, it increased mainly due to favourable hydrological conditions. According to SORS data for 2008, the share of RES accounted for 11.3% of total energy consumption in Slovenia, while in the EU in 2007 this share was 7.8%, according to Eurostat. In Slovenia, the greatest contribution to the use of RES comes from biomass and hydro-energy, while in the EU, growth is dictated by alternative sources. The increase of the share of RES in electricity consumption was, along with favourable hydrological conditions, also impacted by lower economic activity. Forest area also expanded in 2008, but the increase was the lowest in the past decade. Total tree removal increased in 2008; due to significant damage caused by wind, the share of removal for sanitation purposes increased. The intensity of tree felling slightly improved in 2008; however, it still lagged way behind levels targeted in forestry-management plans. In the period 1995-2006, the production of roundwood in Slovenia increased faster than in the EU and in some comparable Member States (in Slovenia by 70%, in the EU-27 by 27%, in the EU-15 by 22%, in Austria by 33%). However, the structure of production of raw-wood categories in Slovenia is not very favourable.

Government debt: General government debt stood at 35.9% of GDP at the end of 2009. In 2009, gross external-debt growth came to a rapid slowdown as private-sector debt contracted. The share of long-term debt increased. Slovenia's gross external debt rose 0.9 bn to EUR 40.1 bn at the end of 2009, a massive slowdown given the increases of EUR 10.7 bn in 2007 and just under EUR 5 bn in 2008, which were underpinned by strong borrowing by domestic commercial banks.

Care for all generations: The age-dependency ratio increased further in Slovenia in 2009. The old-age-dependency ratio rose by a further 0.5 of an index point in 2009, while the total age-dependency ratio increased for the fifth consecutive year.

Conclusion

Membership in the environmentally aware EU brings to Slovenia the need for and commitment to a systematic integration of environmental principles into the economy, and a method organization of daily life. Slovenia has adopted the EU acquis at a formal level, but it goes wrong on specific movements, which are usually painful. Slovenia never adopted its strategy for sustainable development. The field of sustainable development in Slovenia is a part of Slovenia's Development Strategy. Slovenia Development Strategy is based on the assumption that the main developmental lag of Slovenia behind the average of the extended EU is still in the area of economic development. It focuses on economic and social conditions and to a lesser degree on the segments of the environment. Under the sustainable development policies priorities the focus is mostly on the reduction of pressure on the environment. It is a matter of a development model of pollution control, which represents the initial phase of a more environmentally adapted economic and regional development [9, pp. 63-75]. Since the strategic documents are already designed not to include the comprehensive, economically, socially and environmentally balanced concept, the concept of balanced development in Slovenia is also not entirely realised. Since the date of Slovenia's accession to the EU, the European Commission has opened 61 procedures against Slovenia for violations in the areas of waste, air, chemicals and biocides, water, judgment of environmental impacts, nature conservation, climate change and more. Eight procedures for such violations are currently open. Since becoming an EU Member State, Slovenia has been convicted of violating environmental legislation three times. The Court of Justice convicted Slovenia for the first time in March 2009 for having disrespected the Directive on Environmental Responsibility. The Court of Justice in Luxembourg delivered the second judgment on 7 October 2010, for not having adopted in the determined period all the necessary measures as regards the issue of licenses for industrial plants in accordance with the Directive concerning integrated pollution prevention and control. In July 2010, the Ministry for the Environment and Spatial Planning was served through the State Attorney's Office

of the Republic of Slovenia by the Court of Justice of the EU the third lawsuit by the European Commission against Slovenia on account of alleged non-fulfilment of some of Slovenia's obligations from the Council Directive 1999/30/EC, relating to limit values of sulphur dioxide, nitrogen dioxide, particulate matter and lead in ambient air, as the daily values for annual and daily concentrations of PM10 in ambient air had been exceeded in Slovenia several years in a row.

All of the above points to two key challenges for Slovenia if it wants to achieve its sustainability objectives:

1. Slovenia's problem is that it does not have supervisory mechanisms to monitor and implement the environmental protection legislation. The most effective supervisory mechanism in Slovenia is currently the Court of Audit of the Republic of Slovenia. Other institutions are not doing their job, which is proven by EU lawsuits against Slovenia.
2. Slovenia's priorities are clear. It has to change the pattern of expansiveness with a quality model. However, that will not be enough. In order to be closer to the concept of sustainable development it has to change its mentality globally. The key question is how to achieve this. The change required is paradigmatic but the timing is not right.

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II Layout

PAPER TITLE IN ENGLISH (font size 18, bold, upper case)

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Tables should have single line for outside frame, and single line for inside lines

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Total length, including tables, figures, references, and notes should not exceed 15 pages.

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Entire book	Author, A. A. (Year). *Title of book.* Location: Publisher. *Electronic book:* Author, A. A. (Year). *Title of book.* Retrieved from http://www.xxxxxxx	Murray, R. (2005). *Writing for academic journals*. Maidenhead: Open University Press. Shotton, M. A. (1989). *Computer addiction?* A *study of computer dependency*. Retrieved from http://www.ebookstore.tandf.co.uk/html/index.asp
Book chapter	Author, A. A., & Author, B. B. (Year). Title of chapter or entry. In A. Editor, B. Editor, & C. Editor (Eds.), *Title of book* (pp. xxx-xxx). Location: Publisher.	Murphy, P. E., Laczniak, G. R., Bowie, N. E., & Klein, T. A. (2006). Ethical reasoning and marketing decisions. In P. E. Murphy & G. R. Laczniak (Eds.), *Marketing ethics: Cases and readings* (pp. 1-42). Upper Saddle River, NJ: Pearson Prentice Hall.
Journal article	Author, A. A., Author, B. B., & Author, C. C. (Year). Title of article. *Title of Periodical*, xx, pp-pp.	Yang, D. (2005). Culture matters to multinationals' intellectual property business. *Journal of World Business*, 40, 281–301.
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