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Quantitative and Qualitative Analysis of X-efficiency in the Croatian Market

Ozren Rafajac¹, Marinko Skare²

ABSTRACT

This article aims to explain the idea of X-efficiency, which indicates the difference between potential and actual output. If any business subject produces below its own potentials, it can be considered X-inefficient. To determine whether X-inefficiency in Croatian companies exists, how large it is in its volume and why it appears, in 2014, empirical research was conducted. Since only 22% of interviewed companies use all their available resources and given that the mean capacity utilization rate is only 70% and the mean resource utilization rate is 68%, our study results suggest that among business subjects in the Republic of Croatia, X-inefficiency exists to a large extent. Qualitative analysis shows that X-inefficiency appears mostly because of the competitive pressure. Other reasons include legal and administrative problems, the existence of inertness and a lack of motivation, the decision to work "less for more", inadequate demand, economic crisis, the decision to save resources for future use, seasonal demand, incompetence of the government, corruption, and the risk of debt collection as well as local organizational problems.

KEY WORDS: X-efficiency, social efficiency, market failures, transitional economies

JEL Classification: D61, G14, P2, P0

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Introduction

According to Leibenstein's theory of X-efficiency, if a business subject is producing the maximum size of output it can produce, then it can be considered X-efficient (Leibenstein, 1978). X-inefficiency occurs when X-efficiency is not accomplished. The theory of X-efficiency is based upon several elementary postulates such as imperfect markets, incomplete work contracts/production functions, an effort as a discretionary variable, selective rationality and inert areas (Leibenstein, 1978). Within neo-liberal theory, in a perfectly com-

petitive market, X-inefficiency would not exist because if any company is less efficient than the rest of their competitors, it would not generate enough profit to stay in business in the long run. However, a perfectly competitive market is only an imaginary and unrealistic idea. In all other market forms in which we usually participate, such as oligopoly and monopoly, there is almost always some degree of X-inefficiency. This does not mean that optimal decisions cannot be made but only highlights the fact that sub-optimal decisions are possible. By accepting this possibility, the XE theory provides a theoretical background for discussion on some interesting questions: Do business subjects always minimize their costs, and do they always maximize their profits? How efficiently do they use their resources? How does the size of a company

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affect its X-efficiency? What are the main causes of X-inefficiency? How does one become X-efficient? Although the problem of the efficient use of resources should be the focus of economists, in conventional economics, the phenomenon of X-efficiency has been unfairly neglected, understated and considered as less important. This is particularly true for transitional economies where, until now, despite its importance in the explanation of economic reality, very little research about X-efficiency has been conducted.

The main justification for the implementation of this research arises from the fact that in the Republic of Croatia, numerous resources (human and material) are still not optimally utilized. In the last 20 years, since a process of transition from public to private ownership began, many companies in transitional countries have been faced with a problem of non-allocative efficiency. Unfortunately, local scientists have shown little interest in this subject. Their unfamiliarity with the idea of X-efficiency is fairly evident from the related research studies and the literature that is mostly focused solely on themes of economic growth and competition that not even remotely consider the factors such as effort, inertia, interpersonal interactions and agent-principal relationship. Consequently, these theoretical and empirical studies are not able to provide a complete picture of the growth and development process in CEE economies. Selective rationality, principal-agent relations, effort choice, inert areas and effort entropy are all factors closely associated with the growth of businesses and thus with the national growth in general. In former socialist countries (now transitional such as Croatia), the capital-labor relationship was based on public and not on private ownership, which in turn dictated the individual, household and firm behavior. Without an understanding that motivation is a transitional variable that might depend on many specific factors (i.e., type of leadership, culture, legal framework) and might depend on whether an individual is an owner or only an employee of a company (because they do not necessarily share the same interests), the role of the firms and entrepreneurship in the economic development of CEE countries cannot be clearly defined. Consequently, the fact that some of the CEE countries have converged more rapidly with EU countries than with others also cannot be explained.

In conventional microeconomic theory, there is no distinction between individual agents (companies with one employee) and organized groups of agents (medium or large enterprises). Although many advocates of free markets suggest that small and medium enterprises are more efficient than large ones, these people usually do not have any supportive evidence for their claims. In addition, even if they do and their results are confirmed, a counter argument could be that bigger agents (large market players) have larger quantities of resources they can “keep and save” for investment and economic use in the future. By emphasizing that many of our resources are not optimally used and that motivation should not be a constant but a variable depending on many types of pressures that individuals feel during economics activities, Leibenstein’s theoretical approach offers a far more realistic explanation of economic behavior than conventional microeconomic and growth theory. The purpose of our study is to show how the X-efficiency theory can be applied for better understanding of economic growth and development of transitional countries (such as Croatia) and to explain how a high degree of X-inefficiency can represent a main cause of slow economic convergence toward EU countries. Accordingly, we have set two main objectives:

- (1) To measure the level of X-efficiency in the Croatian economy; and
- (2) To identify X-inefficiency as the principal growth constraint factor in Croatia.

To accomplish these tasks, this paper compares the achieved level of overall growth and development with quantitative levels and with qualitative causes of X-inefficiency in Croatian firms. Fundamentally, this study responds to a call for a new economic approach for largely indebted transitional countries, such as Croatia, in the light of Leibenstein’s theory, which has stressed the role of entrepreneurship in the development process. We expect that the findings presented in this paper will help policy makers and economists in transitional countries to expand their knowledge about the behavior and reasoning of economic subjects. However, the presented results are only preliminary findings that should be extended and confirmed by further studies on the role of entrepreneurship in the development of transitional economies. All this

will in turn increase the awareness of policy makers and economic practitioners about the fact that transition is a process that is far more beyond price and trade liberalization, property protection, or a new fiscal and monetary system. Rather, it involves a switch in the mental behavior of all economic agents (individuals, households, firms and governments). Our results suggest that in the Croatian economy, such a transition has not yet occurred, which means that the transition to market economics is far from complete and that it has not ended with the official accession to the EU.

The paper comprises five parts. The first section represents the introduction that emphasizes an importance of the X-efficiency theory for the process of the economic growth and development. Section two offers a review of the relevant literature on economic transition for Croatia and Leibenstein's theory in general, whereas the research sample and methodology are presented in section three. Section four presents the empirical results of the investigation, while section five offers a conclusion about the implications and limitations of the conducted research as well as recommendations for future work in the field of X-efficiency theory in transitional economies.

Conceptual framework

According to Dean and Perlman (1998), Harvey Leibenstein can be considered a pioneer in experimental and behavioral economics. Although his theory of X-efficiency was established back in 1966, it went fairly unnoticed in mainstream economics. Within his XE theory, he assumed that markets are imperfect because of monopolistic power and asymmetric information. Although they can determine the number of work hours and assignments that must be completed, work contracts can never completely define the behavior of workers, just as different qualitative variations of the same draft or product are possible in production functions (Leibenstein, 1978). That implies that the worker's effort is a discretionary variable and not a constantly given value. In the X-efficiency approach, the term effort includes both physical and mental aspects, and thus, it is viewed as the outcome of an individual's response to motivations provided by his or her own psyche and/or by the external environment. Since the basic unit under analysis in this theory is an individual (not a household or a company as in neo-

liberal theory) and since it suggests that maximization is to be observed, but not assumed, XE theory is closer to the real-life circumstances than any other theory of economic behavior. In life practice, individuals choose how rational they want to be in different situations, which means that they demonstrate a selective rationality that is based on the concept of pressure. Leibenstein (1978) stated, "Individuals often make trade-offs between how they would like to behave without any constraints and how they should behave concerning constraints they are facing" (p. 22). Thus, the basic element of rational behavior is concern about the constraints we face.

The specific level of X-efficiency within an enterprise may be affected by many internal and external constraints. The boundary between external and internal is, admittedly, vague. External constraints are those that are part of the (external) environment within which a business subject operates and include the structure of regulations, the structure of the market, the structure of property rights, and the ownership form. Internal constraints include personality traits, work norms, (internal) motivational factors and transaction costs. Since it acknowledges the possibility of both maximizing and non-maximizing behavior and thus acknowledges the possibility that economic agents are not always equally persistent in the maximizing of their profit/utility or in the minimizing of their costs, which conventional neoclassical economics ignore, one would expect that Leibenstein's theory would have a significant impact on mainstream economic theory. Unfortunately, this was not the case.

It is important to stress that X-inefficiency is not the only type of inefficiency in economic practice. The X-efficiency considers only the outputs produced with the given inputs and disregards whether existing inputs that are being used are the best to use, which relates to the allocative efficiency. For example, a company that hires a surgeon to wash dishes can be X-efficient, although his relocation to the position of healing those who are ill would be far more efficient for the society in general (Leibenstein, 1978). Discussion on allocative and non-allocative efficiency was first begun by Leibenstein (1966) when he argued, "Micro-economic theory focuses itself on allocative efficiency to the exclusion of other types of efficiencies that, in fact, are much more significant in many instances than

the allocative efficiency” (p. 392). Accordingly, Leibenstein (1966) observed non-allocative efficiency as an extremely important aspect in the growth process and suggested, “Minimizing of X-inefficiency can be accomplished by a higher level of competitive pressure and by specific motivational factors that improve the level of effort or motivated action” (p. 412). Still, his ideas did not pass without opposition. One of them was Stigler (1976), who said, “The increase of output which is the result of increased effort is not increase in efficiency, but a change in the input” (p. 213).

Although it has not received the attention it deserves in conventional economic circles, the theory of X-efficiency has not stopped being the subject of interesting discussions since it first appeared. The above statement is confirmed by the fact that since the late 1960s until the year 2002, more than 80 articles were published in which their authors tried to analyze X-efficiency (Frantz, 1982, 2004). According to Frantz (2007), the term X-efficiency is one of the most quoted according to The Social Science Citation Index, and it had its citation peak in the period between 1981 and 1985. The results of various conducted research were quite interesting. By analyzing the relationships between public monopolistic and public duopolistic enterprises in the field of electric power production in 49 cities in the USA, Primeaux and Nelson (1980) reached a conclusion that the degree of competition has no effect on the level of capacity utilization. Contrary to that, Sjöström and Weitzman (1996) have found that there exists a well-defined sense in which competition is a surprisingly powerful force for efficiency. An empirical study conducted by Altunbas, Evans and Molyneux (2001) have found little evidence to suggest that privately owned banks are more efficient than their mutual and public-sector counterparts. Similar studies that tried to determine a connection between X-efficiency and the form of ownership are those done by Majumdar (1998) and Button and Weyman-Jones (1992). According to Fung (2006), initial differences in X-efficiency among bank holding companies can, between them, create permanent differences in steady-state productivity. Bogetoft, Färe and Obel (2006) discuss how to measure allocative efficiency without presuming technical efficiency, which is relevant when it is easier to introduce reallocations than improvements in technical efficiency. Moreover, X-efficiency

was analyzed in relation to the level of wages or salary, and in that case, Altman (2006) has demonstrated how, contrary to standard theory, which claims that higher salaries decrease the search for work, implementing X-efficiency in a model leads to the state of things where higher salaries increase the search for work.

In the last decade, XE theory has been applied in several additional studies. After comparing the cost and profit efficiency level and the managerial behavior of banks in nine Central and Eastern European countries (the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Slovakia and Slovenia), in the period 1995-2002, Rossi, Schwaiger and Winkler (2008) came to the conclusion that the low level of efficiency recorded in the CEEC banks could be partially ascribed to uncontrolled external factors that are beyond the control of management. Hai-bo and He-zhong (2009) discuss the main factors influencing Chinese port X-efficiency and propose that reforming the staff incentive system and company ownership system are the main factors that could improve the X-efficiency in Chinese ports. By analyzing technical efficiency in Nigerian farming Omonona, Egbetokun and Akanbi (2010) find that the farmers’ average technical efficiency is 87% and suggest that farmers should be encouraged to join cooperative business models. By studying the impact of Information and Communication Technology (ICT) on labor productivity growth between 1995 and 2005, Ceccobelli, Gitto and Mancuso (2012) find that ICT technologies positively contribute to the generation of convergence clubs in the evolution of labor productivity. Fienhage (2014) applies XE theory in the Supply Chain Management and claims that XE theory can contribute to the sourcing strategy, the supplier strategy and the contracting decision of purchasers by giving practical suggestions to the purchasers.

While the literature about competitiveness and development issues in transitional economies is quite large, the issue of non-allocative efficiency has been almost completely forgotten. From Chikán (2008), who has tried to provide a framework for connecting macro and micro level research on competitiveness, to Lovrinčević, Mikulić and Rajh (2008), who have paid attention to the measuring of national competitiveness. Although researchers have paid attention to measuring the competitiveness of the manufacturing

sector in relation to other Central, East and Southeast European economies (Gligorov & Vidovic, 2004), FDI and competitiveness link (Sohinger & Horvatin, 2005), export competitiveness for manufacturing companies (Stojčić, Bečić, & Vojnić, 2012), innovation activities impact on competitiveness (Stojcic, Hashi, & Telhaj, 2011), external deficit and exchange rate influence on competitiveness (Vujčić & Presečan, 1999), corporate governance development importance for boosting competitiveness (Ljubojević & Novičić, 2007), differences in foreign and domestic product competitiveness (Leko-Šimić, 2001), major competitiveness element determinants (Tica, Cenani, & Bilas, 2004) and labor force competitiveness in Croatia (Bejaković and Lowther, 2004), very little research on X-efficiency in transitional countries has actually been conducted. As far as the authors know, in the last two decades, only two non-allocative efficiency research studies in the Republic of Croatia have been conducted. After measuring efficiency in the seventeen Croatian customs service houses, Benazić (2012) found that only five of them were working efficiently and that the main reason of inefficiency was in an inadequate organizational structure of the Croatian customs administration. Another attempt was measuring the efficiency and productivity of the Croatian banking sector in the period 2000-2004, and in that case, Primorac and Troskot (2005) found that many banks in that period operated with a negative profit. Given that most of the banks observed in that period changed considerably, the authors concluded that statistical analysis for a banking sector as turbulent as the Croatian is has proved useless.

Although all previously mentioned research studies have made contributions in proving the X-efficiency theory, it can be noted that these studies have not yet fully clarified why companies do not use all available resources X-efficiently. Analysis of the responses to the questions of why business subjects do not use all available resources and how to optimize capacity utilization rates should provide better insight into the qualitative dimension of X-inefficiency.

Methodology and data

To empirically ascertain whether X-inefficiency in Croatian companies exists, and if it exists, how large it is, and why it appears, we conducted an empirical

survey between May and December 2014 on a randomly chosen sample of business subjects in Croatia. Research was conducted in the form of a web questionnaire, which has allowed managers to anonymously answer our questions. Such methodology was used in order to collect as many relevant answers as possible. The invitation to participate in the survey was sent to 5000 email addresses of business entities operating in the Republic of Croatia. All participants were asked to forward this invitation to their business partners. In addition, a call for participation in the research was set up on the Internet and on social networks.

Due to policy restrictions on the disclosure of business indicators, some managers did not participate in the survey, and of those who did, one segment did not want to disclose anything regarding their business performance. This led to a total of 375 business subjects who responded to the questionnaire (initial sample), while only 150 of them responded to all the questions. To achieve the highest possible level of statistical significance, the research sample is limited to those 150 (N) business subjects who fully completed our questionnaire.

Originally, the questionnaire comprised 22 questions divided into five different sections. This paper presents the results of the most significant questions from the first, second and fourth section. The first part describes the research sample and includes questions about industry, activity, ownership and the size of the companies. The second part addresses the capacity and resource utilization, along with the main reasons why some of the available resources were not engaged and with the main strategies that ensure optimal utilization of production/service capacities. The fourth section explored competitiveness through questions about the percentage of sales in different markets and the relevance of different factors that have provided business success to the examined business subjects. These answers were used to analyze X-inefficiency in the Croatian market.

With respect to their industry, the sample included 18% manufacturing companies, 14% in commerce and motor vehicles services, 12% in construction, 11.3% in diversified service activities, 8.7% in agriculture, fishing and forestry, 5.3% in transport and warehousing, 5.3% in information and communications, and 4.7% in accommodation and food service industry, while the

shares of companies in other industries were allocated in lower percentages. The research sample comprised 18% production companies, 50.7% service companies and 31.3% who perform both, production and service activities. In the research sample, there were 74% companies that had hired up to 49 employees, 13.3% that had hired between 50 and 199 employees and 12.7% that had hired 200 or more employees. As far as the ownership was concerned, 92% were privately owned, 5.3% were publicly owned, and 2.7% had mixed or public-private ownership.

According to the data of the Croatian Financial Agency and the Croatian Chamber of Commerce in Croatia, in 2014, there were 104 116 micro, small and medium-sized enterprises (99.7% of total registered enterprises) operating, which had a share of 53% of total revenues, 68.4% of employment and 48.5% in Croatian exports (Alpeza et al., 2016). Given that this research sample includes 87.3% micro, small and medium-sized companies, it represents a relatively good (but not ideal) representation of the selected population.

Measuring of X-efficiency is not always a simple task. Given that the differences in estimates between actual and potential outputs (in both financial (market) and natural (physical) measuring units) can vary significantly, analysis is directed toward the closest possible measures, and these are the capacity utilization rate and the utilization rate of overall available resources, as both can be equally well used to indicate the level of X-inefficiency. As far as the interpretation of collected results is concerned, it must be noted that all collected answers are only subjective evaluations of the respondents, who often seek to present their business capabilities as better than they are to give a better impression about themselves or about their own company. Given the size of the sample and the scope of the analysis that followed, this investigation should be regarded as a preliminary attempt to recognize elementary tendencies that occur within socio-economic market relationships in Croatia. Finally, it is important that analysis of any socio-economic environment, because of the natural, climatic, social, political, formally legal and cultural differences, always represents a specific case that cannot instantly be projected onto other socio-economic environments.

Empirical results

The analysis of data concerning the utilization of production and service capacities (which indicates the difference between actual and potential output) showed that of 150 (N) collected answers, only 12.7% of examinees stated that their potential output is the same as their actual output, which means they were X-efficient. In answering the question about the utilization of all available resources, only 11.3% of examinees stated that they use all available resources, while in the next question, which was about qualitative aspects of X-efficiency, only 22% of respondents stated the same thing. With these three results on our mind, it is possible to conclude that in the Croatian market in 2014, at least 78% of companies were X-inefficient, which means they produced outputs that were lower than their potential outputs. This information directly confirms that in the Croatian market, X-inefficiency is present in a very large number of companies.

Since the start of the transition, the Croatian economy has experienced large issues with low economic competitiveness (see figure 1). Figure 1 shows the trend in global competitiveness for the Croatian Economy since year 2006. It can be observed that Croatian economy's global competitiveness performance on the competitiveness scale is moving about the mean value (1-7 best). A large drop in the economy's competitiveness was registered at the beginning of the global financial crisis in 2008, with the competitiveness index value significantly below values registered in 2006. The ethical behavior of firms and efficacy of corporate boards in Croatia during the 2006-2013 period is of interest to us since it is strongly connected with the X-efficiency theory explored in this study (see figure 2). The data in figure 2 show that the ethical behavior of the firms and corporate board efficacy are both significantly below the mean value for countries in the report (mean value for ethical behavior = 4.2; mean value for corporate board efficacy = 4.5).

Figure 3 exhibits transition indicator progress since 1989, with scale index = 1 meaning little or no change from planned economy to 4+ = standard market economy performance. During 1989-2012, significant progress (transition) on the macroeconomic environment in Croatia was achieved. Currently, the macroeconomic environment of the Croatian economy (price liberalization, trade and forex system, and

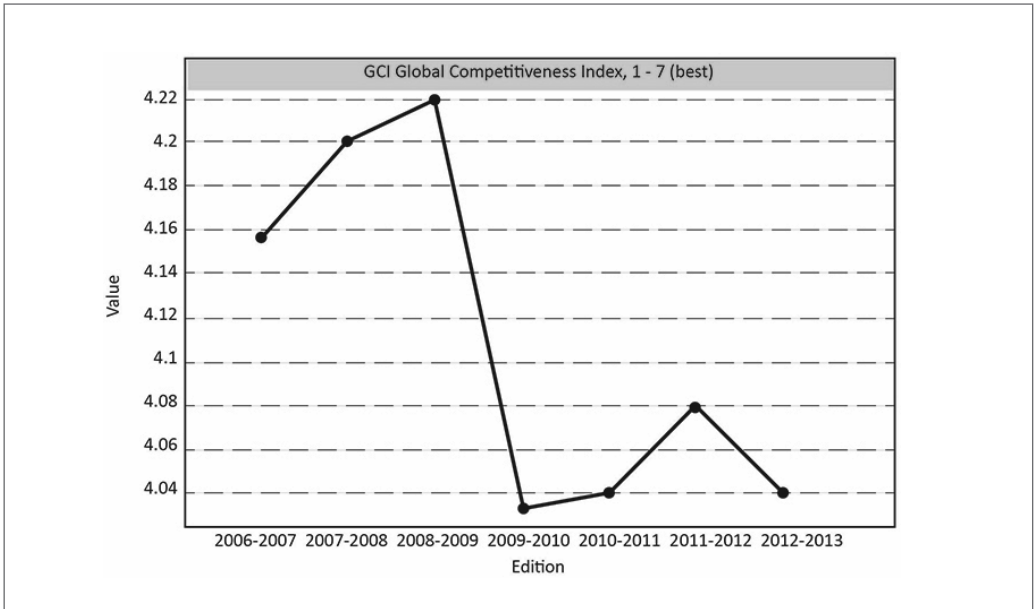


Figure 1. GCI Global Competitiveness Index Croatia, 2006-2013

Source: Adapted from "The Global Competitiveness Report 2013–2014.Full Data Edition" by K. Schwab (Ed.). (2013). Published by The World Economic Forum, Geneva Retrieved from http://www3.weforum.org/docs/WEF_GlobalCompetitivenessReport_2013-14.pdf

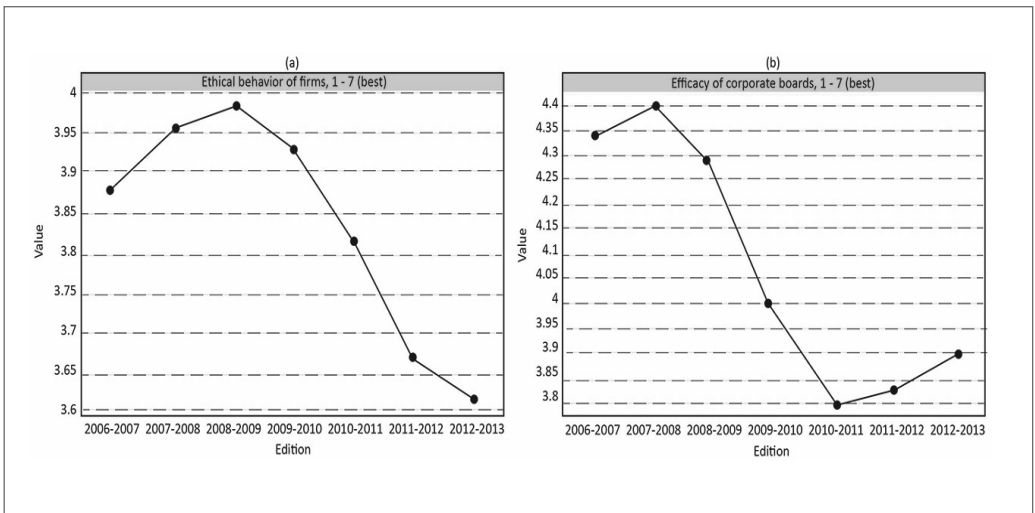


Figure 2. GCI Ethical behavior of firms (a) and corporate board efficacy (b) in Croatia, 2006- 2013

Source: Adapted from "The Global Competitiveness Report 2013–2014.Full Data Edition" by K. Schwab (Ed.). (2013). Published by The World Economic Forum, Geneva Retrieved from http://www3.weforum.org/docs/WEF_GlobalCompetitivenessReport_2013-14.pdf

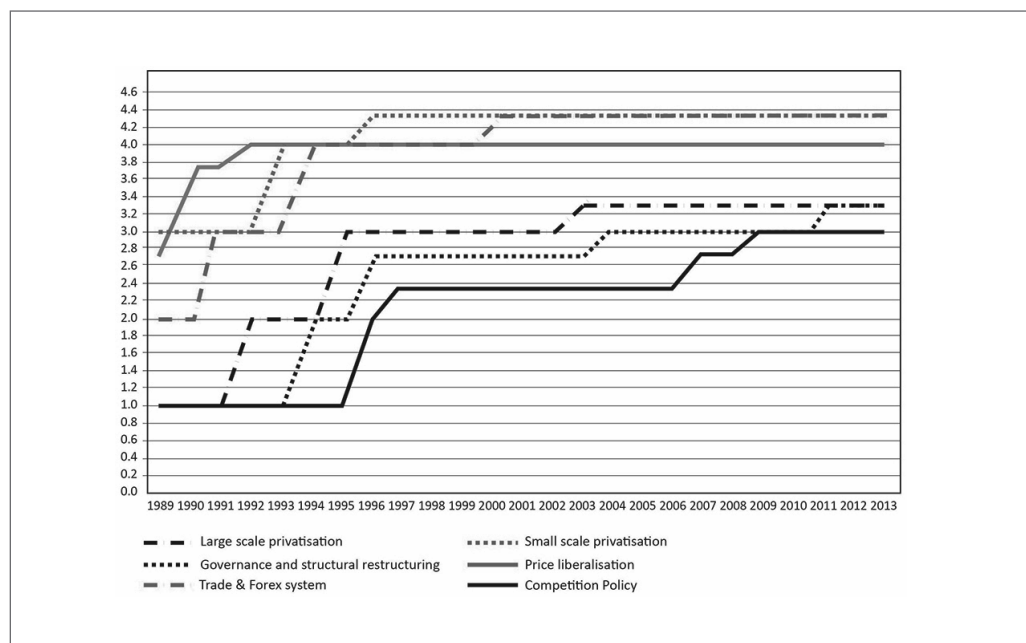


Figure 3. Transition progress (transition indicators) dynamics in Croatia, 2006-2013

Source: Adapted from "Transition Report 2012. Integration Across Borders" by European Bank for Reconstruction and Development. (2012). Retrieved from <http://www.ebrd.com/downloads/research/transition/tr12.pdf>

small-scale privatization) resembles the one present in western market economies. Steady but not quite strong progress (transition) has been achieved in governance and enterprise restructuring, large-scale privatization and competition policy. Looking at these indicators rather closely, one can find reasonable evidence of the X-inefficiency presence within the Croatian economy. In fact, both figures 2 and 3 clearly support such a hypothesis. However, the issue and level of X-inefficiency within the Croatian economy only in part shares a common denominator with the X-inefficiency phenomena in the western market economies. While in western market economies, X-inefficiency is a consequence of asymmetric information, incomplete production function and labor markets, discretionary efforts, rationality as a continuum and as psychological phenomenon and the existence of inert area (Hosseini, 2013), in a transitional economy such as Croatia, X-inefficiency appears as an ex-

PLICIT consequence of poor SME development policy fostered by the policy makers.

After the War of 1991-1995, entrepreneurs who were trying to start a business were forced to pay an average interest rate on domestic bank credits of approximately 18-23%. They could take out a foreign bank loan, but even in that case, they needed a domestic bank's guarantees that they were forced to pay approximately 12% plus LIBOR, which was the same as borrowing from a domestic bank. Since policy makers at that time (up until now) had no SMS development policy or any other constructive development plan, people started to rush into their businesses with the lowest starting business costs (travel agencies, groceries shops, consulting firms, apartments and room renting, small wellness firms, and small vine and oil production firms, etc.). Thus, a massive de-industrialization process occurred (see table 1). Consequently, enterprise reform suffered, allocative efficiency dropped and with inefficient al-

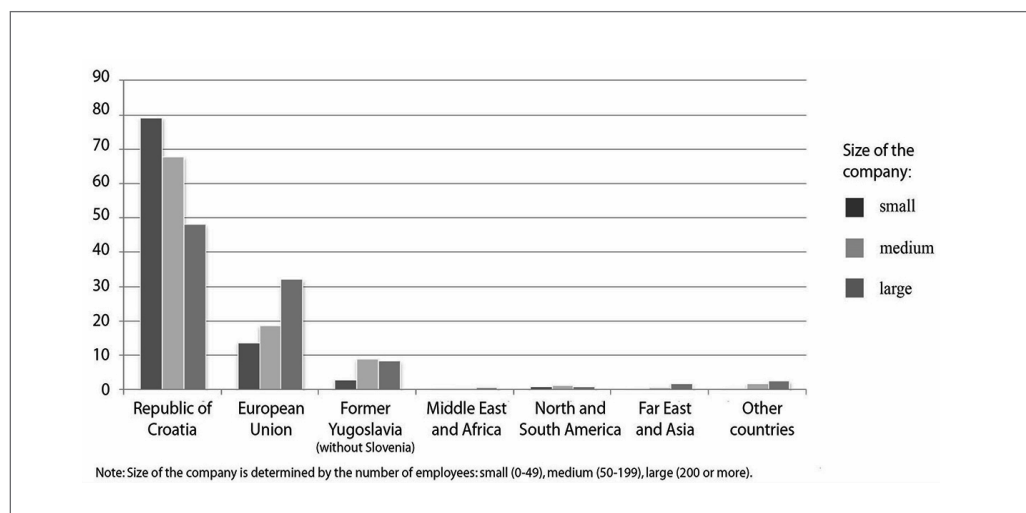
Table 1. Structural and Institutional Change Indicators for Croatia, 2004-2010

	2004	2005	2006	2007	2008	2009	2010
Enterprises							
Privatization revenues (cumulative, in percentage of GDP)	14.6	14.7	15.7	16.7	17.0	17.4	na
Private sector share in GDP (in percentage)	65.0	65.0	65.0	70.0	70.0	70.0	70.0
Private sector share in employment (in percentage)	66.0	68.0	68.0	70.0	70.0	70.0	na
Budgetary subsidies and current transfers (in percentage of GDP)	2.3	2.3	2291.7	2.4	2,376.2	2,424.5	na
Share of industry in total employment (in percentage)	21.7	20.5	21.0	21.6	21.7	18.8	na
Change in labor productivity in industry (in percentage)	2.5	8.8	-1.0	2.6	0.8	7.2	na
Investment/GDP (in percentage)	26.0	26.3	28.1	28.9	30.7	26.7	na
EBRD index of small-scale privatization	4.3	4.3	4.3	4.3	4.3	4.3	4.3
EBRD index of large-scale privatization	3.3	3.3	3.3	3.3	3.3	3.3	3.3
EBRD index of enterprise reform	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Markets and trade							
Share of administered prices in CPI (in percentage)	0.0	0.0	0.0	0.0	0.0	na	na
Number of goods with administered prices in EBRD-15 basket	0.0	0.0	0.0	0.0	0.0	na	na
Share of trade with non-transition countries (in percentage)	71.3	68.5	68.3	65.2	64.7	na	na
Share of trade in GDP (in percentage)	60.9	61.5	64.6	64.9	59.6	50.1	69.2
Tariff revenues (in percentage of imports)	1.6	1.5	1.3	1.2	1.3	1.6	na
EBRD index of price liberalization	4.0	4.0	4.0	4.0	4.0	4.0	4.0
EBRD index of forex and trade liberalization	4.3	4.3	4.3	4.3	4.3	4.3	4.3
EBRD index of competition policy	2.3	2.3	2.3	2.7	2.7	3.0	3.0
Financial sector							
Number of banks (foreign-owned)	37(15)	34(13)	33(15)	33(16)	33(16)	32(15)	na
Asset share of state-owned banks (in percentage)	3.1	3.4	4.2	4.7	4.4	4.1	na
Asset share of foreign-owned banks (in percentage)	91.3	91.3	90.8	90.4	90.8	91.0	na
Non-performing loans (in percentage of total loans)	7.5	6.2	5.2	4.8	4.8	7.8	na
Domestic credit to private sector (in percentage of GDP)	51.8	56.4	64.0	67.1	68.1	69.6	na
Domestic credit to households (in percentage of GDP)	30.4	34.0	38.2	41.4	37.1	36.9	na
Of which mortgage lending (in percentage of GDP)	10.1	12.0	14.7	16.4	15.3	15.9	na
Stock market capitalization (in percentage of GDP)	25.2	30.5	56.5	104.7	40.4	39.2	na
Stock trading volume (in percentage of market capitalization)	6.0	6.7	8.7	8.6	7.4	5.6	na
Eurobond issuance (in percentage of GDP)	3.8	0.0	0.8	1.3	0.0	4.9	na
EBRD index of banking sector reform	4.0	4.0	4.0	4.0	4.0	4.0	4.0
EBRD index of reform of non-bank financial institutions	2.7	2.7	3.0	3.0	3.0	3.0	3.0
Infrastructure							
Fixed-line (mobile) penetration rate (per 100 inhabitants)	424(63.7)	424(82.2)	413(99.1)	417(113.7)	419(134.0)	na	na
Internet users (per 100 inhabitants)	30.9	33.1	38.0	44.8	50.8	na	na
Railway labor productivity (1989-100)	92.7	107.0	125.3	141.7	145.4	na	na
Residential electricity tariffs (USc kWh)	9.1	9.4	10.0	10.9	12.4	na	na
Average collection rate, electricity (in percentage)	69	98	100	100	100	100	na
GDP per unit of energy use (PPP in US dollars per kgoe)	6.2	6.6	na	na	na	na	na
EBRD index of infrastructure reform	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Electric power	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Railways	2.7	2.7	2.7	2.7	2.7	2.7	2.7
Roads	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Telecommunication	3.3	3.3	3.7	3.7	4.0	4.0	4.0
Water and wastewater	3.3	3.3	3.3	3.3	3.3	3.3	3.3

Source: Adapted from "Transition Report 2012. Integration Across Borders" by European Bank for Reconstruction and Development. (2012). Retrieved from <http://www.ebrd.com/downloads/research/transition/tr12.pdf>

Table 2. The mean values in total sales of Croatian companies in selected countries

	N	Minimum	Maximum	Mean	Std. Deviation
Republic of Croatia	150	0	100	73.75	34.842
European Union	150	0	100	16.77	27.255
Former Yugoslavia countries (without Slovenia)	150	0	60	4.53	8.981
Middle East and Africa	150	0	40	0.54	3.531
North and South America	150	0	35	1.00	4.410
Far East and Asia	150	0	30	0.43	2.757
Other	150	0	20	0.97	3.472

**Figure 4.** Percentage of sales in selected countries by the size of the company

location of resources within Croatian economy, inefficiency within Croatian firms surfaced. Therefore, X-inefficiency within Croatian firms represents a main obstacle to actual and future economic growth. Macroeconomic efficiency means nothing if X-inefficiency within firms is present.

The high X-inefficiency level within Croatian firms is an explicit cause of their low competitiveness in foreign markets, forcing firms to sell commodities on the domestic market, which is limited and has low consumption power (see table 2 and figure 4).

Given that all others are selling all their products and services only on the national market, only 32%

of all interviewed businesses could be considered as exporters. Data analysis has shown that there is no significant correlation between the capacity utilization and exporting activities. With few exceptions, only medium-sized and large companies have enough strength to export their products and services (see figure 4). Further analysis shows that production oriented companies are exporting more to the European Union and to the former Yugoslavian countries (except Slovenia) than service and mixed oriented companies as well as that the general exporting power of Croatian companies is quite low for other markets other than the EU market (see figure 5).

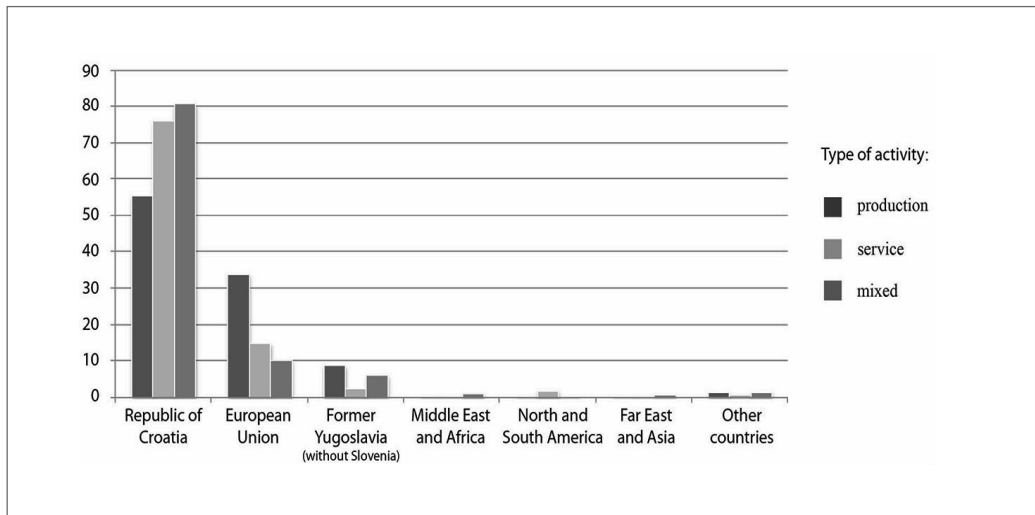


Figure 5. Percentage of sales in selected countries by the type of activity

Quantitative dimension of X-inefficiency in Croatian firms

The simplest way to observe the existence of X-inefficiency within a given company is to observe the utilization of production and service capacities (see table 3). Whereas some companies can have maximum utilization of manufacturing and/or service capacities and some resources will remain unused (i.e., intellectual capital, fields, buildings, financial capital, etc.), an additional measure that can be used in addressing problems of X-inefficiency is the one that observes the utilization of overall available resources. Within the research sample of 150 business subjects, the mean utilization of production and service capacities was 70%, while the mean utilization of overall available resources was 68.1%.

If X-efficiency is analyzed according to the size of the company, it is possible to conclude that among smaller companies (0-49 of employees), the utilization of available capacities and resources is lower than within larger companies (50 or more employees). In other words, there is a statistically significant difference in the utilization of productive/service capacities related to the size of the company ($t=2.994$, $df=148$, $p=0.003$). Organizations that employ up to 49 workers ($\bar{x} = 66.92$, $\sigma_x = 22.528$) have

smaller capacity utilization rates than those with 50 or more workers ($\bar{x} = 78.92$, $\sigma_x = 18.371$). The same is true with the utilization of overall resources, where there can also be found a statistically significant difference in the utilization of all available resources, which is related to the size of the company ($t=2.123$, $df=148$, $p=0.035$). Organizations that employ up to 49 workers ($\bar{x} = 65.80$, $\sigma_x = 21.226$) use a lower percentage of available resources than those with 50 or more workers ($\bar{x} = 74.51$, $\sigma_x = 24.244$). The gathered data lead to an unexpected conclusion, i.e., X-inefficiency is more frequent in small companies than in large companies.

The mean capacity utilization rate in the production industry is 71.5%; in the service industry, it is 74.3%, while in companies that conduct business in both industries, the capacity utilization rate is only 62.3%. The situation is somewhat different in regard to the second question about the utilization of overall profitably exploitable resources. The mean utilization rate of all profitably exploitable resources in the production industry is 67.9%; in the service industry, it is 71.2%, while for the companies that are simultaneously performing both activities, the mean value of resource utilization is 63.2%. These data are shown in figures 6 and 7.

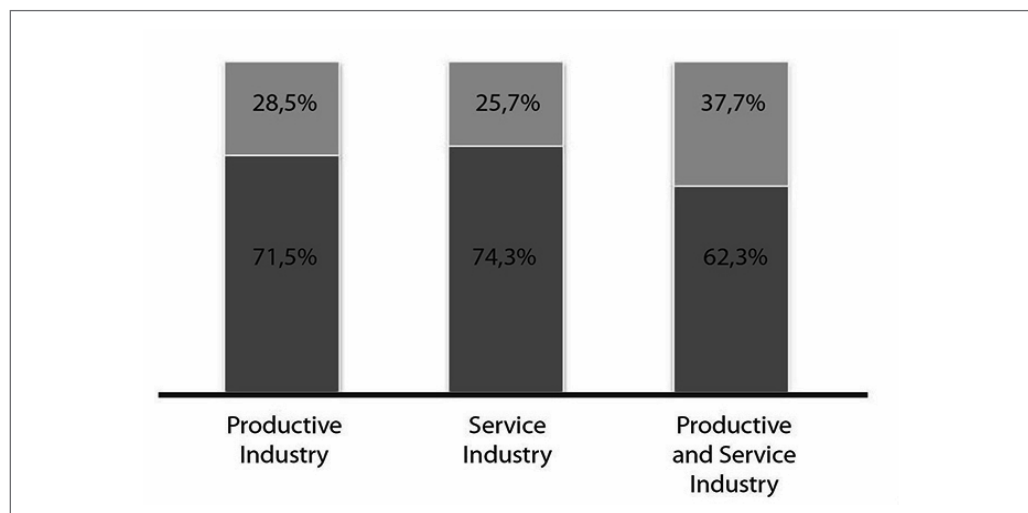


Figure 6. The mean utilization of production and service capacities by industry in percentage

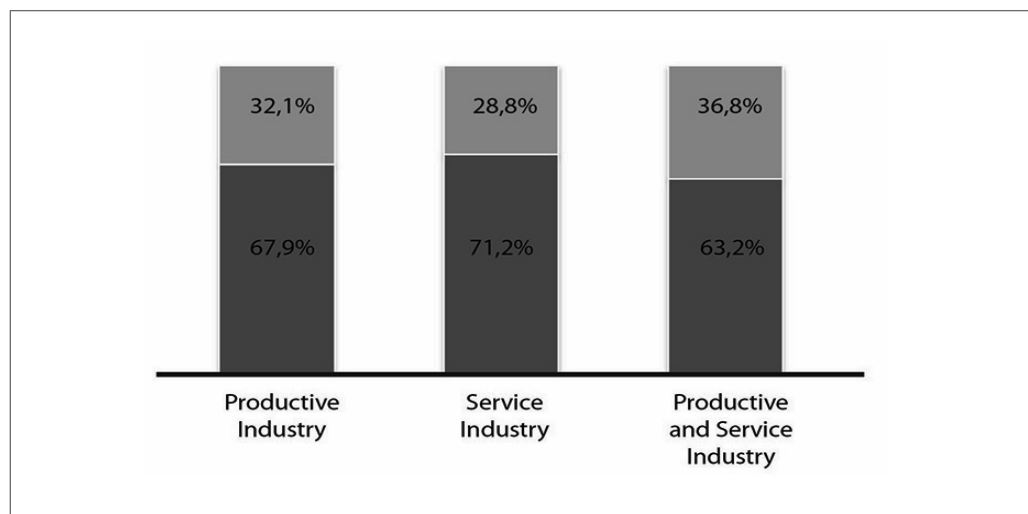


Figure 7. The mean utilization of overall profitable exploitable resources by industry in percentage

When actual and potential outputs are placed on the opposite sides of equation, the result is the social efficiency variable. The closer the relationship between actual and potential outputs is to the number 1, the higher the social efficiency of a given company becomes, and vice versa. Of course, the variable of social efficiency tells nothing about the activity

that is being performed. It represents only a numerical value, while the qualitative value is determined within broader social discussions on desirability and undesirability of those activities (for example, a hospital or tobacco plant). According to the gathered data, the social efficiency of the service companies (0.74) is higher than social efficiency of the

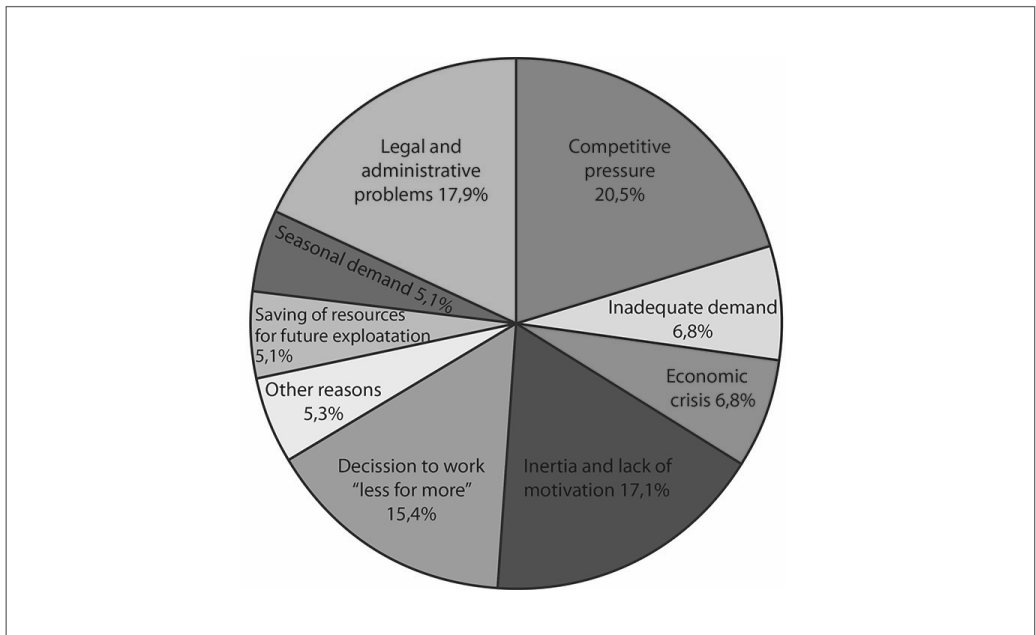


Figure 8. Specific reasons why companies do not use all of available resources

production (0.71) and mix-oriented (0.62) companies. Unfortunately, this study did not cover enough public and private-public companies to determine the differences in their social efficiency in relation to the privately owned companies. According to the empirical results, 17.3% of participants claim that there are no stronger competitors in their main market, while 74.7% of participants claim that there are only 5 or less competitors in their main market that are stronger than them. The conducted analysis suggests that there is no statistically significant correlation between capacity utilization and total number of competitors ($r = -0.066$, $p > 0.05$). However, there is a small but a statistically significant positive correlation between capacity utilization and market share ($r = 0.177$, $p < 0.05$). In addition, one-way variance analysis shows that there is a statistically significant difference in capacity utilization with respect to the type of activity ($F(2,147) = 4.62$, $p < 0.05$). Tukey's post hoc test shows that service ($\bar{x} = 74.33$) and mixed ($\bar{x} = 62.26$) activities differ.

Qualitative dimension of X-inefficiency in Croatian firms

The next part of the conducted research was aimed toward investigation of a qualitative dimension of the X-inefficiency. Examinees were offered six different answers and a free entry option to encompass all possible answers. While 33 respondents claimed that they use all available resources, 117 of them indicated the main reason why some of their resources were not fully engaged, and their answers are displayed in figure 8.

The most common reason that prevents business subjects from efficient use of their resources is the competitive pressure. In other words, 20.5% of respondents claim how excessive competition represents the main cause preventing them from full realization of their own potentials. Contrary to standard belief that competition makes us use and develop our capacities to the maximum, this research suggests that excessive competition disables us from maintaining our resource utilization at an optimal level. Although it may seem paradoxical in a short-term perspective, in

a long-term perspective, it is obvious: if competitors cooperate, their rewards are even greater. Businesses that are successful in finding a common language with their surroundings (e.g., competitors, clients and customers) can reduce their costs and invest these saved resources in some other activity (e.g., research and development) that will bring them a long-term advantage in their market. If they want to accomplish a higher degree of utilization of their own resources, economic growth and development, companies should cooperate with others to a far greater extent than what they currently do. The same can be said for individuals, remarking that their own feeling of self-sufficiency can be sustained only inside strong socio-economic bonds. However, these claims should be considered carefully. First, cooperation and collaboration are not simple or cheap. Second, too much cooperation can also lead to monopoly, which causes X-inefficiency in some conditions. Another probable explanation is that the resource just cannot be purchased by the firms that can make full use of it and gain profit. Thus, under the pressure of competition, this resource just remains unexploited.

The second most important cause of X-inefficiency within Croatian firms can be found in legal and administrative problems. Approximately 17.9% of business subjects claim that legal and administrative issues are the main cause that preventing them from efficient engagement of their resources. According to the World Bank Group (2014), whose score shows how far on average an economy is at a point in time from the best performance achieved by any economy in the ease of doing business, for 2014, Croatia was ranked 85th, with a score of 64.44, which is just slightly better than Bosnia and Herzegovina (60.24) and Serbia (63.46) but worse than Italy (68.19), Slovenia (69.84) and Hungary (66.82), all being its immediate neighbors. An economy's distance to the frontier is reflected on a scale from 0 to 100, where 0 represents the lowest performance and 100 the frontier. Although the same study predicts an improvement of 0.71 points for the year 2015, this is still much worse than in the most developed western economies, whose scores for 2014 were Austria (77.10), Germany (80.02), the United Kingdom (80.75) and the United States (81.96).

The third reason why business subjects do not manage to utilize all available resources in their companies

(documented in 17.1% of cases) is the personal inertia and lack of motivation. In the most general sense, the concept of inertia is used to indicate resistance or aversion to movement, change or action. Synonymous with inertia is inactivity. In psychology, sociology and economics, the term "inertia" is mainly used to describe a slow and inadequate adjustment of an individual to changes occurring in his or her own environment as well as the lack of desire to make a change or to respond to change. Socio-economic inertia becomes undesirable when the costs of changing are less than the benefits that can be achieved through it but when the change still is not occurring. Although cooperative behavior between economic agents can ensure significant mutual benefits (e.g., the reduction of costs), many contemporary companies and individuals do not cooperate to the extent they could. One of the main causes of such behavior lies in the fact that contemporary and mainstream economic science places a much greater emphasis on the benefits of competition than on the benefits of cooperation. Other reasons of such a state may include the lack of knowledge and personal inertia. We believe that through a wider discussion about the phenomenon of X-inefficiency, this would probably change.

The fourth most important cause of X-inefficiency is deliberate decisions by businesses to work "less for more". Since 15.4% of examinees claim that they are deliberately creating an artificial scarcity (in order to obtain higher profits), these results are extremely indicative in the wider social sense. Companies that are intentionally producing below their own qualitative and/or quantitative potentials may not be considered as socially useful companies. In neoclassical theory, the producers are considered to behave in that way only if they are in a monopolistic position or if they have an oligopolistic agreement with other producers. However, practice shows that producers, regardless of their number, always choose one price that serves as the lowest wage they will work for. The best examples of such behavior are workers organized in unions who determine the minimal price of their work. It is perfectly normal to assume that investors will behave in the same way (when they determine the lowest return rate of their investments), which leads to the conclusion that almost all who are doing any type of business wish to work as little as possible to achieve as

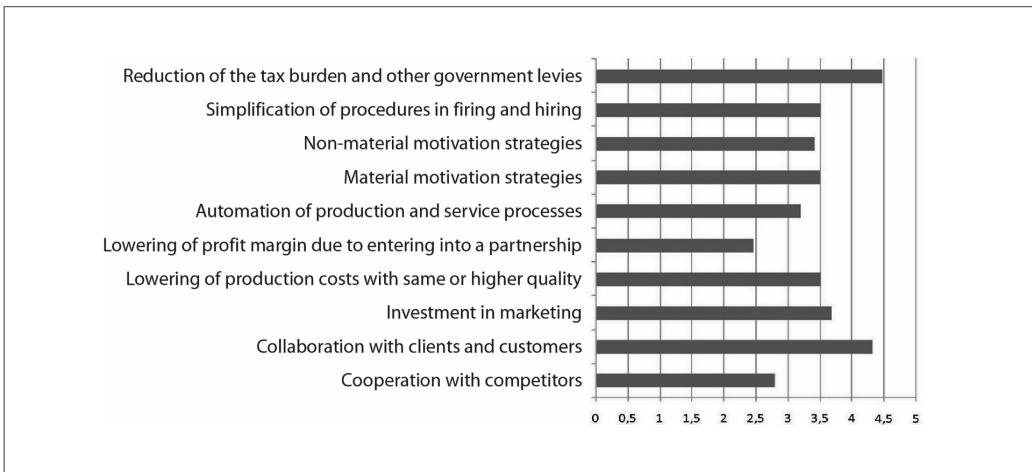


Figure 9. The mean strategic value of activities that could contribute to the optimal utilization of production/service capacities (1-5)

much as possible. Although there is nothing wrong in such reasoning –“more for less” is the basic maxim of socio-economic development – to be done properly, it requires a significant amount of knowledge, effort and organizational skills. Although they work more, workers generally accept less than investors for the same amount of work, and that type of allocation leads to an increase in inequality.

Further reasons for the occurrence of X-inefficiency in Croatian firms has been inadequate demand (8.6%) and economic crisis (6.8%), which can both cause a portion of disposable resources to remain unused. Although inadequate demand can be caused by incorrect predictions about future trends, in this case, it is probably closely connected with an economic crisis that can arise from a much broader range of factors, such as an inadequate economic paradigm, incompetence of the government, or corruption. Before the global financial crisis of 2008-2009, the Croatian economy was growing at a healthy 4-5% annually, with incomes doubling, while economic and social opportunities dramatically improved. According to the World Bank Group (2014), the prolonged crisis and inadequate policy changes were the main causes that have resulted in the country now entering its sixth year of recession, having lost over 12% of its output from the start of the global financial crisis. Although there is

some optimism about the prospect for growth in 2015, with exports projected to pick up in the Eurozone and private investments expected to increase, the structural reforms launched by the previous government have not yet stimulated job creation, productivity, and social cohesion. Whereas at the end of 2014, the unemployment rate was 17% with a youth unemployment rate of 40%, it is obvious that partial improvement measures cannot do much in the absence of a comprehensive development strategy. One of the main purposes of this study is to be helpful in that respect.

Another reason for the occurrence of X-inefficiency, documented in only 5.1% of cases, is the decision of business subjects to save their resources so that they can exploit them in the future. Such a small percentage of those who save their resources suggests that most companies that participated in the survey do not have the resources they could save.

Among other reasons for the X-inefficiency are seasonal demand (5.1%), incompetence of the government (1.7%), the risk of debt collection (1.7%) and local organizational problems (0.8%).

In the next question, respondents were asked to evaluate the importance of 10 different strategies that could contribute to the optimal utilization of production/service capacities in their firm. Within the observed sample of 150 answers and on a scale from 1

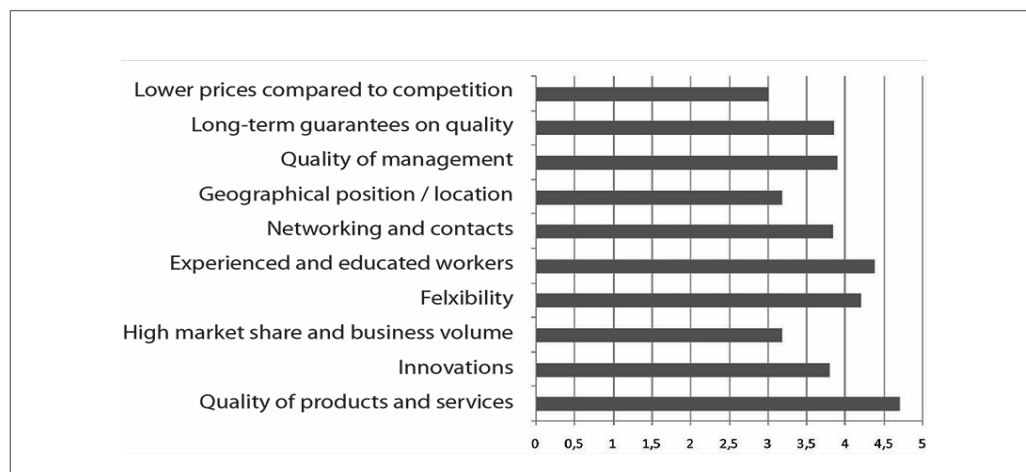


Figure 10. The mean strategic value of 10 factors that contribute to the success of a business organization (1-5)

(irrelevant) to 5 (highly important), the highest mean scores were given to the following strategies: reduction of the tax burden and other government levies (4.47), collaboration with clients/customers (4.31), investment in marketing (3.67), and simplification of administrative and legal procedures in hiring and firing (3.51). Middle-range scores were given to lowering of production costs with the same or higher quality of products/services (3.50), material motivation strategies (share of the profits, bonuses to salary, mobile, transportation) (3.49), and non-material motivation strategies (management by objectives, management style, organizational culture) (3.41). The lowest scores were given to automation of production and/or service processes (3.19), collaboration with competitors (2.79), and the lowering of profit margins due to entering a partnership (2.45).

Respondents in this survey think that reduction of the tax burden and other government levies represents the most important thing that could help them in the optimal utilization of their unused resources. While in the last two years the corporate tax has been reduced from 20% to 18%, the standard VAT in Croatia has been increased from 24% to 25% and is now among the highest rates in Europe. With such a big VAT that is significantly higher than those in its surrounding countries, Croatian products and ser-

vices remain quite expensive for end-users. Despite the fact that competitive pressure has been scored as the most important reason for X-inefficiency, most respondents do not see collaboration with competitors as a strategy that could contribute to the optimal utilization of their resources. This fact can be interpreted in several ways. First, respondents probably feel that it is not possible to establish collaboration with their direct competitors. Second, people are inclined to see the causes of their own problems outside of themselves. Since the improvement in collaboration with competitors requires changes in their own behavior and additional efforts, the reduction of the tax burden by government seems like a much easier solution. Third, collaborating with others may involve disclosing strategic information, and this is something that most managers are reluctant to do. The good news is that many companies recognize collaboration with clients/customers as an important strategy for the optimization of their capacity utilization. The analysis has shown that there is a small but statistically significant positive correlation between capacity utilization and application of the following strategies: automation of production and service processes ($r = 0.239$, $p < 0.05$), material motivation strategies ($r = 0.240$, $p < 0.05$) and nonmaterial motivation strategies ($r = 0.235$, $p < 0.05$).

To emphasize how even the smallest difference between two (in all other aspects the same) businesses (such as a pleasant working atmosphere) can make a decisive advantage in optimizing non-allocative efficiency, Leibenstein (1978) added a prefix X to his revolutionary theoretical concept. By following the trace of this interesting idea about the factor X, in the last question, respondents were asked to indicate an importance of 10 different factors in relation to their usefulness for the business success of their organizations. On the scale form 1 (irrelevant) to 5 (highly important), the highest mean scores were given to these factors: quality of products/services (4.70), experienced and educated workers (4.37), and flexibility (4.20). Middle range scores were given to high-quality management (3.89), long-term guarantees on quality (3.85), and networking and contacts (3.83). Interestingly, the lowest evaluated factors that provide success to interviewed businesses were innovations (3.80), a high market share and business volume (3.19), geographical position/location (3.19), and lower prices compared to the competition (3.01).

The conducted analysis clearly shows how over simplification can be quite dangerous. Complex problems cannot be comprehended with linear logic, but only with holistic and a systemic way of thinking. In real life, multiple equilibria are both possible and desirable. The consequence is that there are different strategies for achieving business success and many different reasons why companies do not use all their available resources.

Conclusion

The way in which a certain society uses its resources directly affects the quality of life of its members, but it also relates to the question of its long-term sustainability and survival. If a business organization operates X-inefficiently, it means that there must be some unexploited and low-cost opportunities (for increasing its inner productivity and hence for reducing its total costs) that are still not, but could be used in its development. Although the low competitiveness of Croatian firms has long been considered the main obstacle for stronger economic growth and development, the conducted empirical research suggests a quite different direction. It seems that competition is not always the best strategy in addressing socio-economic problems and that ease of doing business, accompanied with co-

operation and motivation, plays a much greater role in issues that relate to the economic development. Even in the most competitive environments, it is possible to identify business organizations that are producing outputs that are below their real potentials. Although these situations are an integral part of economic processes, they cannot be explained within the neo-liberal model of thinking. However, Leibenstein's theory offers a solid basis to explain such behavior.

The theory of X-efficiency provides a theoretical explanation of the fact that a conventional neoclassical economy ignores, which is that many available inputs are often not utilized as efficiently as they could be. This statement is confirmed by the results of empirical research conducted in the Croatian market where at least 78% of companies in 2014 were working below their full potential, which means they were doing their businesses with a certain degree of X-inefficiency. Since the mean utilization of production and service capacities within the observed sample is only 70% and the mean utilization of overall profitably exploitable resources is only 68.1%, the conducted analysis leads to the conclusion that X-inefficiency is a widespread phenomenon among companies in the Croatian market.

Empirical analysis suggests that the main reasons for X-inefficiency are competitive pressure (20.5%), legal and administrative problems (17.9%), inertia and lack of motivation (17.1%) and decision to work "less for more" (15.4%). Other reasons include inadequate demand (6.8%), economic crisis (6.8%), the decision to save resources for the future exploitation (5.1%), seasonal demand (5.1%), incompetence of the government (1.7%), corruption (1.7%), the risk of debt collection (1.7%) and local organizational problems (0.8%). If the empirical findings of this research are mapped to the entire society, it becomes clear that the Republic of Croatia needs a social policy in which the highest emphasis will be placed on quality, education and flexibility. If they want to achieve optimal utilization of available resources, our policy makers should create an efficient legal and practical framework that will motivate social individuals and companies to develop their full potentials. According to this research, automation of production and service activities and application of different (material and nonmaterial) motivation strategies are positively correlated with the high capacity utilization rate. Other important strategies that should

enable optimal utilization of resources are the reduction of the tax burden and government levies in strategic industries, encouraging collaboration with clients and customers, and investing in marketing and the simplification of administrative and legal procedures in hiring and firing. Finally, the educational sector should put more emphasis on teaching about different reasons why X-inefficiency may appear.

The main drawback of the presented research comprises the fact that the collected answers represent only the subjective claims of respondents, who usually tend to describe their positions better than they actually are. Another deficiency is a relatively small research sample, which is particularly true for the state-owned and mix-owned companies. Although they should provide an additional level of responsibility toward government and the public, managers in state-owned companies showed no particular interest to participate in our survey. The presented results suggest that there is a need for further research in this area. Given that in the public sector, there exist a substantial amount of resources that are not optimally utilized, future analysis of X-efficiency in the Republic of Croatia should be directed toward public and civil organizations as well as toward ordinary individuals, who often do not possess adequate knowledge about the optimization of their own economic behavior.

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