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ECONOMIC DEGLOBALIZATION – FROM HYPOTHESIS TO REALITY

Cătălin Postelnicu, Vasile Dinu, Dan-Cristian Dabija

Introduction

Benefits of globalization in the economy of the country is a contentious issue not only in general public but also among academics and professionals of the world economy and international trade, management and marketing, who hold important positions in European or international financial institutions [4]. So far, in most cases, deglobalization has been regarded as a process of diminishing economic interdependence and integration between states [16]. Consequently, the term is widely used to describe several historical periods, when the flows of foreign direct investment (FDI) and the capacity of international trade were declining due to the consequences of regional or global economic crises.

By definition, deglobalization is conceptually set in contrast to the process of globalization, thus failing to admit the multiple connotations of the latter concept. Beginning with the 1980s of the last century, when the third great wave of globalization became a subject of concern, some economists and sociologists implied that they were questioning the positive stance of globalization, considering that it might not be as strong as it seemed and it would not have long-term incidence [20]. Discouraged by the incapacity of globalization to find solutions to some vital issues of the global economy (such as poverty, unemployment, decline and destructuring of entire economic sectors etc.), a series of researchers and practitioners felt compelled to witness the profound degradation of several historically constituted economic and social structures, which, until then, seemed to be unwavering. Accordingly, they swiftly proceeded to the definition and implementation of a new term which, for lack of other notions, was termed "deglobalization".

"Deglobalization" derives from "globalization" by adding the prefix "de" [16]. The notion permeated the economic discussions without ever having been given a sufficiently clear and commonly accepted definition apparently intended as an antonym. The current global economic evolutions have stated that the globalization process has lost the propelling force it had possessed before the current financial-economic crisis. Thus, periods of relative decline can also occur at times and they can be associated with a deglobalization tendency, specifically with a tendency to reposition the global economy on new coordinates of efficiency and competitiveness. Hence, periods of reversal may possibly lead to deglobalization tendencies with new rules of efficiency and competitiveness.

This situation represents to a certain extent an option for survival and not necessarily a plea for revisiting the age of economic protectionism, specific to many decades of the last century. Such periods in which the process of globalization decreased in intensity, have been known since the second half of the 19th century. They became more numerous throughout the 20th century, especially as a follow-up of the outbreak of the two world wars which immensely destabilized the global economy. They were accompanied by the Great Depression of the 1929–1933s, whose echo died out many years later, but whose effects are persisting nowadays in one form or another [16]. The process of globalisation is closely linked to ideas of neoliberalism, laissez-faire economy, free market and it is not the result of regulated state policy [3].

1. Measuring Deglobalization

Indeed, one of the constant issues of economic theory and practice refers to the method of measuring the deglobalization phenomenon. Similar to globalization, a set of indices can be taken into account in order to reveal the

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facets of the phenomenon of deglobalization. Contemporary economic research [16] postulates that the process of deglobalization can be best highlighted by watching at least three main economic flows, such as:

- Dynamics of imports and exports of goods and services at a global or regional level, as an expression of international commerce.
- Dynamics of expats' money remittance.
- Inflows and outflows brought by foreign direct and portfolio investments.

Monitoring these three macroeconomic components alone does not give a clear enough picture of the globalization process. The analysis must rest on additional information, such as of changes in technology transfer, evolution of tariffs and non-tariff barriers to trade, restrictions imposed by some states on the free movement of labour, elaboration of administrative acts meant to encourage the purchase and consumption of local goods, subsidies offered to protect the agricultural sector etc. [6]. Many of these leverages are activated especially during periods of economic crisis. In this regard, conclusive evidence follows from the reaction of highly developed countries (Japan, USA, Germany, France, UK etc.) to the negative effects of the economic-financial crisis between 2008 and 2010. These have contributed in different ways to some drawback in the process of globalization. This may be connected with stagnation or even recession in some economies (currently observed in some states of the European Union (EU), and also in other regions of the global economy). Still, it would be wrong to attribute these changes only to economic crises. Other events, such as natural and economic disasters, major armed conflicts, etc., can contribute to this development.

Some researchers [11], [14], [30] point out in recent studies that within the last 10–20 years, deglobalization phenomena have in fact surfaced more intensively at a global level. At least the last wave of globalization shows atypical tendencies when compared to the former ones [24]. The existence of such a process was confirmed in 2013, when the Swiss Economic Institute (SEI, Zürich, Switzerland) published the so-called Index of Globalization [25]. Basically, this index covers a wider range of issues, including not only the economic but also the social, political and cultural globalization. The index highlights the globalization level of a national economy, taking into consideration the fore mentioned main economic flows, as well as the macroeconomic policy instruments fostered by governments.

Even if the phenomenon of globalization is very difficult to capture in numbers and tables [4], some authors point out that the globalization index is based on 25 variables [21], for 1970–2011 and calculated for 207 countries [23]. This allows for indirect observation of the deglobalization process at certain periods of time. While the social dimension reflects the extent of dissemination of information and ideas, the political one refers to the level of political cooperation between states, but undoubtedly the most important dimension remains the economic one, as it helps in estimating some of the consequences of the economic phenomena on the global market [12].

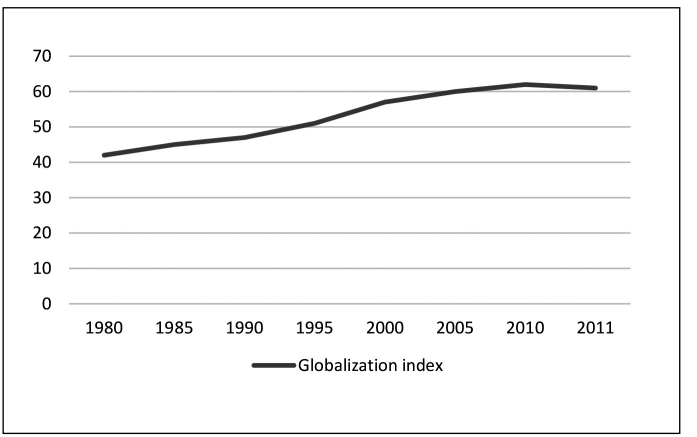
The necessary data for the index are available up to 2011. The analysis focuses on the consequences of the most recent economic-financial crisis on the slowdown of the globalization process. In our opinion, such a process could be considered a start for deglobalization. Still, its effects would be short-term. The relative slowdown of the globalization process was mainly experienced by the developed states, e.g. members of OECD. For these countries it was lately reported that the integration process into the world economy had been stagnating. It is very interesting that at the top of the most globalized states, Singapore has achieved the highest score, for a while, and then came second to Ireland [24]. They were closely followed by Belgium and the Netherlands [21]. Other economically developed states further distance themselves from the top – 10, such as: Canada – position 12, Switzerland – 11, Italia – 22, Germany – 26, and the USA barely 32, on a scale from 1 to 100 [21]. We gradually notice that many developed countries lost their high valuation according to the globalization index eventually recovered after 2010. Developing countries tend to keep the lower positions of the index, weakly anticipating any possibility for major upgrading on the index.

The positions taken by these countries reflect the synergic influence, a conglomerate of all dimensions, without making a clear distinction between them. The synergistic effects of these dimensions are shown in figure 1, which indicates the evolution of the economic globalization index during 1980–2011. Researchers from the SEI state that the globalization process has

been visibly slowed down all over the world as a consequence of the current economic-financial crisis, as compared to the pre-crisis period [25]. Still we don't have to forget that globalization is partially determined by historical context of a country and other specific country conditions [3].

As figure 1 indicates, the globalization index highlights a slight decrease of the pace of economic globalization after 2007. And this is considered to be a trend towards deglobalization. Walden Bello is among those who have noticed the emergence of the economic deglobalization process starting in 2004 [1]. He mentions the so-called "deconstruction", later termed "deglobalization" in a pluralist world [1]. In his opinion, deglobalization describes the means used by developing states in order to promote their local interests, at the cost of the ones endorsed by the supporters of globalization. The deglobalization process is not necessarily connected to the effects created by the economic or financial crises, but it may also be due to other causes (sharp drop in global demand, natural disasters, armed conflicts etc.). In support of his claims, Bello notices the aftershock caused by the Great Depression of 1929–1933 or the Asian financial crisis of 1997 [1]. We think that the current economic depression as a consequence of the financial crisis of 2007 and 2008 confirms his conceptions.

Fig. 1: Evolution of the economic globalization index during 1980–2011, at global level



Source: [21]

The author underlines that "…the progress of global capitalism is marked not only by the short-term business cycles, but also by the long-term ones, especially by the super-cycles mentioned by Kondratiev a long time ago" [1]. Within such long waves, spreading over 50–60 years, several periods of crisis can distort the globalization process, but also generate factors favourable for globalization. The cyclic character of globalization and deglobalization has also been observed by other researchers [11], over a long period of time. There are interactions with the global circuit of values, as to the size of trade, capital movement, balance of external payments and international technology transfer. Thus, the deglobalization process is opposed to the process of increasing integration of markets and production, which does not only mean less global economy, but also more genuine cooperation between states. This should be based on financial and technological agreements, to secure economic competitiveness of all countries. In the long run, such unbalanced developments can generate intemperate enrichment of some nations, respectively the impoverishment of some others [1].

Hence, deglobalization also means creating leeway so that each country can develop its own economic strategy in accordance with its cultural and social values, its economic necessities and possibilities of sustainable development

[13]. Human resources like intellectual capital and material resources have to be taken into account. Deglobalization does not necessarily express the manifestation of a destructive strategy dictated by the prolonged crisis faced by global capitalism, as much as it expresses the descending phase of the Kondratiev (K-Wave) Long Wave Cycle [19]. The ascending phase of this cycle began in the 1950s of the last century, and 30 years later it reached a peak-point when the exploitation of obsolete technologies came to an end. This also explains the sequence of several economic crises that have weakened the strength of globalization. Breaking the cycle means finding true alternatives to the current global system, with credible and accepted outcomes by all participants to the international trade in commodities and services.

Bello in fact proposes the idea of a new global economy, although its chances are vague. The deglobalization process is still in its initial phase. It will not end up in autarchy but in new national sovereignty. Deglobalization thus becomes an effort of "reconstruction" which does not involve a withdrawal from the international economy, but its "reorientation", capable of removing the deficiencies of globalized production, all the more so as the many facets of the actual system are fragile and unsustainable [1].

Globalization has for some time become an inevitable phenomenon in the history of humanity. The last decades have been characterized by an enhancement of this phenomenon, due to unprecedented progress in technology, communications, science, transportation, biotechnologies, informatics, material production etc. The current stage of development of the world economy and the evolution of contemporary capitalism transform deglobalization into a myth and not into an actual reality intended to impose itself as a driving force in the near future. Of course, globalization has brought forth advantages and disadvantages. It has allowed the cheapening of many products, it has vastly broadened markets and especially access to them, it has facilitated dissemination of new technologies, thus favouring economic growth [15]. Critics of globalization argue that it has led to the growth of unemployment, it has created multiple environmental problems, it has hugely complicated financial relations which sometimes degenerated into severe crises etc. This situation has led to the necessity of a different kind of globalization, from which all participants in the international division of labour can benefit. Still, the globalization process could not be stopped, because the global economy itself is in full process of transformation. Consequently, globalization does not represent a simple economic event, but a large-scale phenomenon.

Drucker has signalled the fact that in order to be successful in a competitive global market, knowing one's costs is not enough. Every company should be able to determine the costs of the entire economic chain of production which, in most cases, covers a large number of companies spread worldwide [8]. Destructuring such a network already formed through globalization is only a utopian, unattainable and totally ineffective goal. Currently, production, management and distribution are organized in networks. Multinational firms have the capacity to work and act now in real time on a global scale. Certainly, not every economic activity necessarily presents a global feature. Many activities keep their local or regional features. However, the major strategic activities are currently included in a globalized, interconnected, interdependent system, so that whatever happens in the morning in a large North American bank on Wall Street is felt in a very short time in Tokyo, Frankfurt and London. The sophisticated information system based on global communication networks enables very fast responses to any signal coming from any economic or financial "corner" of the world [9]. From this perspective, we think that the effort to create an entirely free global market, as imagined by Bello, is an illusion, a utopia, an unattainable goal in the near future.

The Dutch economist van Bergeijk starts [27] from the observation that, during the last years marked by the recent economic-crisis, international trade has undergone a real collapse, comparable to the one recorded during the Great Depression of the 1930s of the last century. To a certain extent, the researcher overemphasises the international trade aspects during the two periods, as well as the completely different causes that determined its break-down. Still, van Bergeijk broadly demonstrates that the globalization process mainly caused by the international trade flows can be summarized in two major causes: social and economic risks and uncertainties caused by the crisis. The author warns of the danger of protectionism revival that seems to be "waiting by the corner".

Therefore, van Bergeijk interprets the decline of international trade to be a clear indication of the deglobalization process of the global economy.

Hillebrand approaches this issue more pragmatically [10], considering that the deglobalization process has started to manifest itself from the period 1913–1950 when, due to the two world wars, the international division of labour was seriously affected, concomitantly with the sometimes excessive assertion of global protectionism [10]. He analysis in detail the long-term effect that deglobalization would have on the developed countries, members of OECD. In order to do this, he creates two scenarios: the one of "deglobalization", understood as a process of reducing the economic interdependence between states (including integration), the other of "globalization" itself. Finally, Hillebrand reaches the conclusion that the GDP per capita in 2035 could be by 23% smaller in case of "deglobalization" than by continuing economic "globalization" [10]. Concomitantly, the number of people globally living in extreme poverty will increase.

Hence, not only the rich, developed states and the less advanced ones will suffer from deglobalization, but also the society as a whole. The influences and impact would have different proportions. For example, applying the globalization scenario on the USA would raise GDP per capita to 66,150 dollars/year by 2035, whilst applying the deglobalization scenario would raise GDP per capita only to 60,290/ year. Hence, a difference of -8.9%. In absolute amount, the total GDP of the USA would rise to 24,287 billion dollars if the globalization scenario were applied, as compared to 19,794 billion dollars in case of deglobalization [10]. The situation would look even worse for the EU. Here the difference between the two GDPs would be even more pronounced, amounting to -21.3%, or $31,270 per capita in annual average, in case of the globalization scenario, and only $24,600 in case of the deglobalization one [10].

These data confirm that globalization works in tandem with economic development, in contrast to deglobalization which impedes it. More serious is the fact that deglobalization generates instability between states due to weakening the ties of economic interdependence, enhancing the prospect of unwanted economic or trade conflicts. Thus, deglobalization contributes to the reduction of trade and capital flows, negatively affecting economic development. Under the condition of deglobalization (synergistic effects of various uncontrollable factors, drastic reduction of technology transfer, raw materials and innovations, less dependence on foreign capital) states impair their own future due to a decrease of labour productivity. This is the main factor of economic growth and poverty reduction. Autarchic development has therefore become anachronistic at the present stage of development of the global economy, possible only for restricted geographical areas, with very small, isolated states.

2. Is Deglobalization a Long-Term Phenomenon?

Careful observation of the evolution of international trade and foreign direct investments (FDI) can help to find out whether deglobalization is a permanent or only a temporary process. The issue of money remittances from expats working abroad is a different question. During the last 20–30 years, a series of major changes have marked the evolution of international trade. This allows us to say that we are confronted with a new stage of development of the global economy, namely deglobalization.

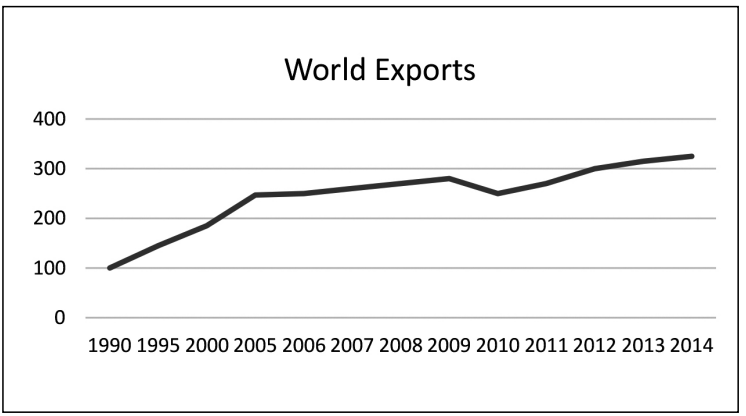
The World Trade Organization (WTO) Report for 2013 enables us to assess the main tendencies in recent world trade, but also several possible scenarios of future evolution [28], [29]. The WTO analysis emphasizes that international trade in commodities and services has experienced notable changes with respect to geographical dispersion, structure and number of agents. These trades have been and are still influenced by a series of major factors such as demography, FDI, technologies involved in the production process, energy sources and the necessity to preserve exploitable natural resources, sustainability of consumption, transportation costs, production of modern means of communication, trade agreements between states. Subsequently, the integrationist pressure has enhanced intensity at rates far beyond global GDP. For example, between 1980 and 2011, the international trade in commodities increased at a rate of over 7% per year, up to a value of 18 trillion US dollars at the end of the period. Trade services, of about 4 trillion US dollars by the end of 2011,

have to be added to this value. In real terms (by removing the influence of the inflation rate and the variation of exchange rates), the international commodity trade rose, between 1980 and 2011, on an almost four times higher level and two times faster than production [29]. Simultaneously, new participants have emerged on the global market scene, such as several developing countries, emerging countries (Central European states and from the former Soviet influence block), as well as rapidly industrializing economies (China, India, Brazil, the Russian Federation, etc.). In 1980, developing economies accounted for 34% of the world merchandise exports, by 2011 they reached a share of 47% [29]. China, India, Brazil, Mexico, etc., particularly are outstanding among them.

The spread of modern technology, export specialization and increasing factor mobility accompany a vast amplification of trade between "South-South" and "North-South". In recent years, many states have been able to better exploit comparative advantages, especially as a natural consequence of the globalization process [16]. The increase of production has played a decisive role for economic growth, although the connection between this and the demographic factor has become more complicated in certain geographical areas. We estimate that in this situation we can no longer speak of a "collapse" of international trade, or of a clear deglobalization tendency due to the decline in international trade between 2008 and 2009.

All data submitted by WTO have indisputably proven the opposite. Figure 2 indicates that the capacity of world commodity export has followed an upward trend between 1990 and 2012, with a slight decline between 2008 and 2009 caused by the financial and economic crisis. The same conclusion can be drawn from the growth rates of GDP, the global imports and exports (table 1).

Fig. 2: Dynamics of world commodity exports 1990–2011 (1990 = 100)



Source: [26]

2009 indeed proved to be the most unfortunate year, not only for the gross world product (GWP), but also for the international commodity trade, measured by exports and imports. Although 2010 indicated the prospect of a fast recovery, 2011 was strongly affected by the sovereign debt crisis in Europe and contractions in the supply of goods caused by certain natural disasters (earthquakes, floods, etc.) or social unrest in some Arab countries (Libya, Tunisia, Egypt).

Tab. 1: Gross domestic product (GDP) and export – global import of goods (annual increase / decrease in %)

	GDP			Export			Import		
	2009	2010	2011	2009	2010	2011	2009	2010	2011
Global	-2.6	3.8	2.4	-12	13.8	5.0	-12.9	13.7	4.9

Source: World Trade Organization, World Trade Report 2012, p. 20.

Tab. 2: Growth rates of GDP and commodity trade recorded by developed countries as compared to developing countries

	GDP			Export			Import		
	2009	2010	2011	2009	2010	2011	2009	2010	2011
Developed states	-4.1	2.9	1.5	-15.1	13.0	4.7	-14.4	10.9	2.8
Developing states	2.2	7.2	5.7	-7.4	14.9	5.4	-10.5	18.1	7.9

Source: World Trade Organization, World Trade Report 2012, p. 20.

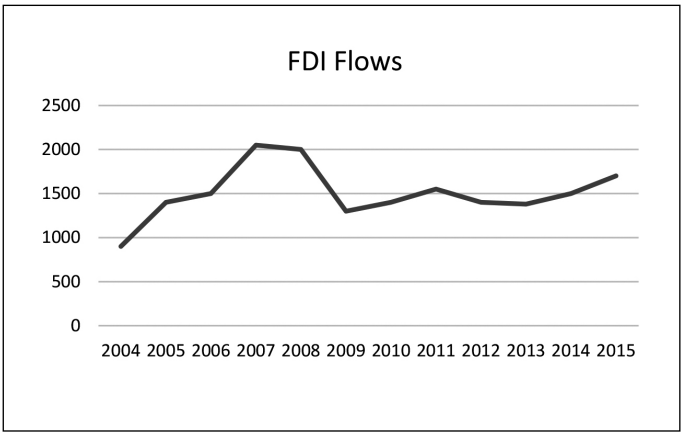
It is a remarkable fact that the developing economies have been less affected by the adverse consequences of the recent economic and financial crisis, as compared to the developed countries (table 2).

The most important emerging economies with strong economic potential such as China, India, Brazil, the South African Republic, the Russian Federation, Mexico and others, have had an important role in this development. The five largest exporters in 2011 were China with 1.9 trillion US dollars or 10.4% of world exports, the U.S.A. (1.48 trillion US dollars), Germany (1.47 trillion US dollars), Japan (833 billion US dollars), the Netherlands (660 billion US dollars). EU-27 was ranked on top of exporters by 2.13 trillion US dollars in 2011 [28]. Within the next years, we expect that they will be the main promoters of world trade in commodities.

As to the capital flows caused by FDI, they were clearly less present when compared to the previous years, reaching a total of 1.35 trillion US dollars in 2012. The severe reduction (by approximately 18%) was in sharp contrast with the evolution of GDP and international trade which recorded global increases [26]. This decrease reflects the deficiencies of the global economy and the uncertainties caused by the recent crisis, which determined the investors to become more cautious. The report presented by UNCTAD states that the recovery of confidence in the business environment will take longer than economists have expected. Though macroeconomic conditions improved, FDI might record a considerable leap, reaching 1.6 trillion US dollars in 2014 and 1.8 trillion US dollars in 2015 [26] despite several risks. This demonstrates the weakness of the global financial system, the possible deterioration of the macroeconomic situation in some geographical areas, as well as the slow recovery of investors' confidence. As shown by the data analysis included in figure 3, there was a drop in FDI after their spectacular increase from 2004 to mid-2007, due to the economic-financial crisis. After 2009 a slowing rate of decline can be observed, the FDI volume recording several oscillations due to the slow revival of the global economy.

The top positions of the largest investing economies are still occupied by the same developed countries, to which several emerging countries have been added. Thus, the top places were represented in 2012 by the USA (329 billion US dollars), Japan (123), China (84), the United Kingdom (71), Germany (67), Canada (54), the Russian Federation (51), Switzerland (44), France (37), Sweden (33), South Korea (33), Italy (30), and so on [26]. These economies will maintain the positive trend until and after 2015, the world stock of capital investments continuing to rise from 14.706 billion US dollars, the value during the 2005–2007 pre-crisis period, to 22.593 billion US dollars in 2012 [26].

Fig. 3: **The global FDI flows during 2004–2012 and their projection for the years 2014–2015 (US billion dollars)**



Source: [26]

Though some fluctuations occurred over time, FDI flows will continue their upswing in the following period, the idea of deglobalization remaining still an illusion from this point of view. Of course, both the emitting and the receiving countries will become more selective towards the incorporation of these investments with respect to different economic goals. In addition, we should not overlook the fact that the risk of protectionism in the investment field has not altogether disappeared, especially in what certain strategic sectors are concerned (high-tech industries, innovation, energy, etc.).

Conclusions

Globalization has reached a stage of development where the fragmentation of production and the international dispersion of economic activities have reached unimaginable shares in the not too distant past. At present, almost 60% of the global trade consists of intermediate goods and services that are incorporated into various stages of material production. This has led to the creation of a highly complex network that was included into what we may call "the global value chain". Nowadays, this global value chain has become the main feature of the world economy. Globally, about 28% of the total exports correspond to the added value that was first imported, and then incorporated into products and services to be exported again [26].

Fragmentation of production has reached such high levels in some industries (automobile, electronics, chemistry, IT, etc.), that these productive chains can no longer be interrupted, without seriously impairing costs and economic efficiency on a whole. Each country aims at taking a position as favourable as possible in this global production chain, and strives not to isolate itself. To speak under such circumstances about the necessity of deglobalization means to condemn an economy *"ab initio"* to underdevelopment, backwardness, and eventually to a drop-out from the map of the civilized world. Deglobalization presented as a new possible version of the international division of labour, only means the annihilation of the synergistic effects created by globalization through investments and trade. Ultimately, the relevance of these two major vectors of development cannot be evidenced by deglobalization, but by international economic integration.

Under certain circumstances, the cyclic nature of economy could eventually affect all players on the market. This, on the other hand, could entitle us to read it as a positive outcome of deglobalization. The current economic crisis is global, without offering global solutions. On the contrary, each nation looks for its own solutions. Consequently, the global crisis is practically understood more as the sum-total of several local crises. When speaking of "local solutions to a global crisis", we are also dealing with a tendency towards deglobalization.

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Abstract

ECONOMIC DEGLOBALIZATION – FROM HYPOTHESIS TO REALITY

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Lately, a new term is used in international economic literature, namely "de-globalization" which has already sparked off numerous debates. As expected, some economists were quick to adopt it unhesitatingly, but others have labelled it as "absurd", "superficial", "simple", "anachronistic" and even "counterproductive". In fact, there are two diverging processes opposed to each other, both worth mentioning. First – globalization – with its multiple meanings and definitions, and the second – deglobalization – which is just beginning to find a place within the confines of concepts used in international economics literature. The issue is not to treat them only as antonyms, but rather to demonstrate the causal relation between them. We consider trying to measure deglobalization as an important step in determining the true meaning of such a phenomenon, or if it is real. Also, would be interesting to find out if deglobalization is really a long lasting trend, or just a short term turn in the evolution of the world economy. Using the "globalization index" and its components as a tool in this direction could be one of the potential solutions in defining the meaning of the new and complex changes which tends to shape the international economic relations and, after all, the international business environment. Although it is admitted not being a perfect tool, it could be a starting point in studying such a vast change. Therefore, the motivation of this article is to contribute to theoretical debates that bear on this new term, given that, as in the case of globalization itself, economists have not yet reached a consensus on the definition.

Key Words: *Globalization, deglobalization, international trade, foreign direct investment (FDI), economic integration.*

JEL Classification: *F14, F23, F6, F21.*

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RANKING OF PRIORITIES AMONG THE BALTIC CAPITAL CITIES FOR THE DEVELOPMENT OF SUSTAINABLE CONSTRUCTION

Marius Lazauskas, Edmundas Kazimieras Zavadskas, Jonas Šaparauskas

Introduction

The financial crisis that commenced in 2007 and peaked in 2008, destabilised the real estate market. Changes in credit policy deprived property owners of their ability to settle accounts with banks [13], [2], [11], [21], [1]. The construction sector was not the only one that fell victim to the economic downturn as it took its toll on other industries as well [13].

Construction is among the most significant sectors that impact on the level of national economics [29]. Likewise, the prevailing international and national situation caused fluctuations in the field of constructions; consequently, the latest period of crisis in the construction industry not only affected Western economics but also spread to the Baltic states, including Lithuania. The end of 2013 – the beginning of 2014 saw the start of the recovery of the Lithuanian construction sector. Just like many other countries of the world, Lithuania implements numerous projects constructing buildings and complexes of the new type of quality, this way improving the condition of buildings nationwide. Qualitative and quantitative urban development takes place in historic city centres, residential areas, unused territories or currently dilapidated public areas that could be revived for the benefit of residents or other stakeholders.

Aiming to resolve issues related to the crisis of the real estate sector as well as attempting to stabilise the situation in the region, actors of Baltic construction sectors revisited their business priorities and objectives. It is only natural that Lithuania, Latvia and Estonia have distinctive construction sector traditions of their own that reflect different aspects pertaining to economics, market, legal framework, technologic and technical solutions, culture, psychology, etc. Generally speaking, however, the success of the construction sector is determined by legal regulation as well as institutional and political strategies of a country [12].

Stabilisation of such economic and financial processes of the Baltic region as enterprise bankruptcy, unemployment rate, growing numbers of bad loans, falling wages and prices of real estate urged actors of the real estate market to assess their way forward.

Tight cooperation between the Baltic states on the level of governments as well as joint activities of separate actors of the construction market necessitate the assessment of the largest cities of Lithuania, Latvia and Estonia from the point of view of potential construction sector markets that should be mostly considered for effective development of construction projects. Investigation into the construction sector potential of three Baltic state capital cities (Vilnius, Riga and Tallinn) would facilitate an expedient targeting of capital and investments of construction market actors in order to create the greatest added value of national economics, residents and the development of sustainable environment.

A large number of fields, which impact on the development of a sustainable city, belongs to the construction industry, including new property development, adaptation of old buildings to contemporary needs, construction of roads and engineering networks, and integration of renewable energy technologies in buildings. In the assessment of urban development, the construction field must encompass architectural, environmental, social and economic aspects to ensure the result that will be suitable for current and future generations of residents. A complex model is required for modelling of a contemporary city, on the basis of which it would be possible to analyse urban development and the future

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sustainable development planning using modern technologies and strategic decisions.

Looking at a number of alternatives that are described using distinctive criteria, it is rational to use multi-attribute assessment methods. MOORA (Multi-Objective Optimisation by Ratio Analysis) and MULTIMOORA (MOORA plus Full Multiplicative Form) methods are used to address this particular problem related to the assessment of priorities among cities of Vilnius, Riga and Tallinn in terms of the development of sustainable construction ideas.

Tab. 1: SWOT analysis of the Baltic states

SWOT	Description
Strengths	Macroeconomic stability; Continuous economic growth; Geographically advantageous position, focused on the transit in the western direction; Focus on western markets; High level of education; Access to the Baltic Sea.
Weaknesses	Low level of practical skills among young people; Insufficient social guarantees; Energy dependence and the insufficiency of local energy; Insufficient management of renewable energy resources; Insufficient investments into the advancement of technologies.
Opportunities	EU membership and the Common Market; Increasing cooperation with countries of the Baltic Sea Region; Continuous economic growth attracts foreign investments; Investments into the advancement of technologies; Immigrant labour.
Threats	Energy dependence; Growing competition in industrial sectors; Dependence on EU markets; Aging population; Brain drain; Drain of labour force.

Source: own

1. Relevance of Issues Particular to the Baltic States

Sustainable development is among the key concerns of the contemporary world. Possibly, the greatest part of issues related to the process of sustainable development is associated with social needs of residents and their attitude toward the surrounding environment as well as nature [5]. The community, businesses, public institutions and governmental authorities are joining forces to find ways and promote the economic development as well as environmental and social well-being in the attempt to satisfy natural needs of people [20]. Therefore, cooperation between business representatives and the public sector is essential in order to implement the most effective solutions. All parties of a construction project development aim to achieve their own objectives. This is the reason why entities operating in the Baltic Sea Region and offering constriction services and products are concerned with investments into the most effective markets.

Aiming to assess attractiveness of a certain object, all entities of the public and private sectors seek to determine its strengths, weaknesses, opportunities and threats, i.e. to carry out the SWOT analysis. The Baltic states have many similarities; thus, general essential SWOT parameters can be defined (Tab. 1).

Subsequent to the assessment of general attributes of strengths, weaknesses,

opportunities and strengths, a conclusion can be made that all countries face similar issues in social, industrial, strategic and other fields; consequently, similar problem solving methods can be used to support these markets. The objective of the formulated problem is to determine, which of the analysed capital cities is the most attractive in terms of investments into fields of the construction industry and in which of them the investment process would ensure the greatest added value through sustainable development.

2. Designing the System of Criteria

Effective development of construction projects must be based on confidence regarding the successful completion of a project and realisation of set objectives that are as close to the sustainable development policy as possible. As potential markets for the implementation of construction objectives, cities are made of numerous descriptive criteria. Three alternatives have been assessed in this particular case: Vilnius, Riga and Tallinn. These three capital cities are described using criteria, such as density of population, the number of public transport routes, average wage of working population, the Global City Competitiveness Index, the price for purchase or rent of residential or office space, health care index, etc. Authors of this article identified there main groups of criteria (economic, social and environmental), which are used in this article to assess effectiveness of a city (Tab. 2).

Tab. 2: Criteria of sustainable urban construction – Part 1

No.	Name of criterion	Description of a criterion and the direction for assessment
Economic		
x_1	GDP growth, %; [9]	Unemployment rate and GDP (gross domestic product) are closely related criteria: the more workers are available, the more services and products may be produced by the economy. GDP – the monetary value of all finished products and services produced within a certain period, which indicates the size of the national economy. Direction – maximisation (aimed at economic growth).
x_2	Foreign investments into national economics, million/EUR; [24]	Criterion, which estimates investments that reached the national economy from foreign investors. The criterion defines the entire economy of a country; however, considering that the largest cities create the greatest added value, the greatest part of these investments goes into funds of large cities. Direction – maximisation (aimed at attraction of investments and economic growth).
x_3	Number of individual apartment transactions, units; [23]	Criterion that indicates the number of individual apartment transactions in 2014. Direction – maximisation (aimed at circulation of residential real estate in the market).
x_4	Number of investment transactions, units; [24]	Criterion estimating the number of investment transaction in the period 2010–2013. Direction – maximisation (aimed at attracting domestic and external capital).
Social		
x_5	Unemployment rate, %; [9]	Unemployment rate is the ratio expressed as a percentage of people able and willing to work but without a suitable job and the entire working-age population, i.e. labour force. The unemployment rate indicates the percentage of the unemployed from the standpoint of the entire labour force. The situation with the unemployment rate of 4–5 per cent is regarded as full employment by economists. Direction – minimisation (aimed at reduction of the number of the unemployed and creation of a sufficient number of jobs).
x_6	Price to Income Ratio, cont. [22]	Criterion that defines the ratio of income receive by residents and prices for available real estate as well as possibilities of residents to buy real estate. The comparison is made between median real estate market prices and median household income. Direction – minimisation (aimed at increasing the purchasing power of interested buyers).
x_7	Basket of Goods and Services, const. [22]	Assessment of the basket of necessary goods and services. This basket covers food, living expenses, transportation and medical services, etc. Direction – minimisation (aimed at reducing the gap between the purchasing power of residents and the Basket of Goods and Services).
x_8	Safety Index, cont. [22]	Criterion that defines satisfaction of residents with safety of their environment, protection from mental, physical and natural factors. Direction – maximisation (aimed at completely safe physical and mental environment).

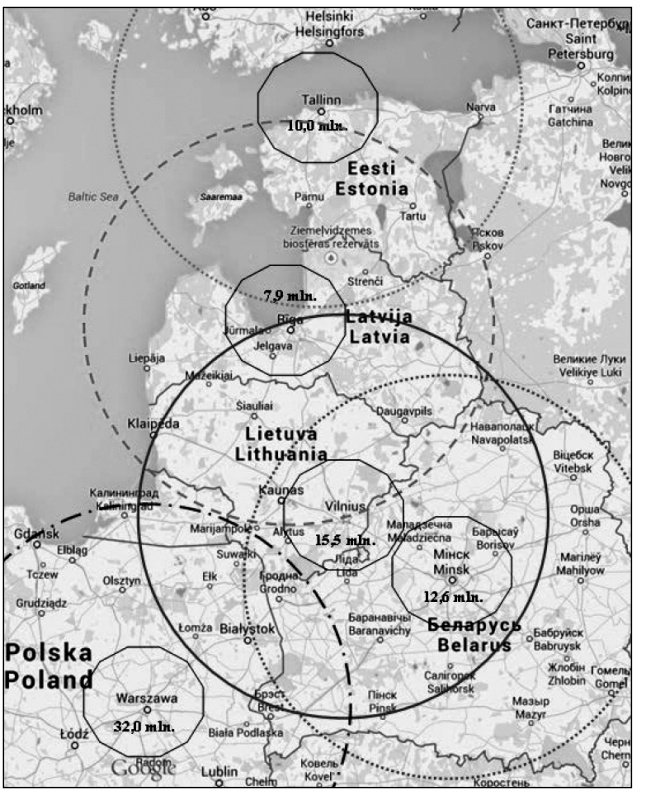
Source: own and [9], [22], [23], [24], [31].

Tab. 2: Criteria of sustainable urban construction – Part 2

No.	Name of criterion	Description of a criterion and the direction for assessment
Environmental		
x_9	Urban area, sq. km; [31]	Describes the size of a city, including the central part and suburbs that fall within the jurisdiction of the city municipality. Direction – maximisation (aimed at covering the greatest possible urban area with sustainability principles).
x_{10}	Area of buildings in the urban area, %; [31]	Defines the part of urban territory, which is occupied by buildings. The criterion assess the potential for construction of new buildings or other structures. Direction – minimisation (assessing reserves of potential for a wider development).
x_{11}	Office and production space, Thousands sq. m; [23]	Criterion that describes the area of buildings used for office space, production, storage and other industrial purposes. Direction – minimisation (assessing the development potential of larger construction businesses).
x_{12}	Air pollution, $\mu g/m^3$ [22]	Criterion that defines urban air pollution. Air pollution is determined by way of assessing the concentration of substances such as carbon dioxide, ozone, nitrogen dioxide, sulfur dioxide and other gasses in air. Direction – minimisation (aimed at clean environment).

Source: own and [9], [22], [23], [24], [31].

Fig. 1: Distribution of residents at a distance of 300 km



Source: [10]

The listed criteria comprise a calculation system, which is described as a multi-criteria problem. Research literature suggests numerous algorithms that could be used to solve such problems, e.g. MOORA, MULTIMOORA, TOPSIS, VIKOR, ELECTRE, PROMETHEE, ARAS, COPRAS, SAW and other methods that are widely used around the globe.

Urban environments interact with numerous stakeholders [15]. Vilnius, Riga and Tallinn as well as their surrounding territories are no exception as their residents feel the impact of large cities (Fig. 1). The interacting environment of these cities is closely linked with state authorities, business entities, religious communities, investors, residents and foreign tourists.

Nature and civilisation dwell in close interaction with each other, which must be maintained considering interests of all stakeholders [30]. Aiming to satisfy needs of a number of stakeholder groups, certain calculation methods have to be used in order to assess the input of each group into decision-making. Aiming to assess effectiveness of a city while interacting with private investors and striving for a coherent balance among principles, assessment criteria listed in Tab. 2 are used to solve this problem, i.e. complex implementation of a construction project [18]:

- Expansion of green spaces and biodiversity;
- Compactness and variety of urban public spaces;
- Development of the public transport system;
- Determining environmental quality and a healthy city;
- The use of renewable energy sources;
- Waste sorting and promotion of waste-sorting culture;
- Promotion of social life and interaction;
- Regulating activities of business entities on the basis of sustainable development principles;
- Education on sustainable development;
- International cooperation of cities;
- Adherence to above-named strategies.

3. The Problem Solving Process

This problem has been designed following the assessment of three alternatives, which are described with the help of certain criteria. To solve this multi-criteria problem, MOORA and MULTIMOORA have been used.

While determining maximising and minimising directions of criteria for MOORA and MULTIMOORA alternatives, the authors of the article assessed these directions in relation to interests of private investors and residents, i.e. aiming for general principles of sustainable development: promotion of business, satisfaction of needs of the public and humans, and saving nature and resources.

3.1 Problem Solving with the Help of MOORA Method

MOORA method (Multi-Objective Optimization On the basis of Ratio Analysis) was first introduced in 2006, by researchers Brauers and Zavadskas [6], [19]. MOORA method has been used in various research areas, e.g. engineering [27], [26], [14], economics [25], [3], [28], management [4], environmental protection [16], [17] and production [8].

MOORA method is comprised of two parts [6] that control each other:

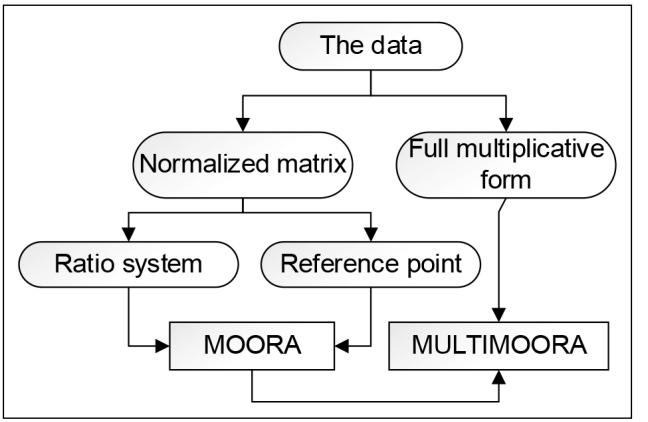
- the Ratio System; and
- the Reference Point.

According to [8], MOORA method can be easily understood and implemented. Calculation principles and results using MOORA method are provided in Tab. 3.

3.2 Problem Solving with the Help of MULTIMOORA Method

MULTIMOORA is the method designed on the basis of MOORA by adding one more multiplicative form [7]. The schematic expression of the method is provided in Fig. 2.

Fig. 2: **MULTIMOORA decision algorithm**



Source: [7]

MOORA method was supplemented with full multiplicative form, which comprises minimisation and maximisation of the multiplicative utility function. On the basis of data provided in Tab. 3, MULTIMOORA calculations are made. The overall utility of the *i*-th alternative can be expressed as a value that has no measure:

$$U_i' = \frac{A_i}{B_i}, \quad (1)$$

where $A_i = \prod_{j=1}^{g} x_{ij}$. $i = 1.2$ ....m denotes the product of objectives of the *i*-th alternative to be maximized with g = 1.....n as the number of objectives to be maximized.

And $B_i = \prod_{j=g+1}^{n} x_{ij}$ denotes the product of objectives of the *i*-th alternative to be minimized with n – g as the number of objectives (indicators) to be minimized.

3.3 Assessment of Results

Summary of results received using MOORA and MULTIMOORA calculation methods (Tab. 4) demonstrated that considering the currently prevailing conditions in the Baltic states and aiming to develop sustainable construction in the region, the most attractive investment zone is the city of Vilnius (Lithuania), i.e. alternative a_1.

Tab. 4: **Calculation results**

	MULTIMOORA			The sum of rank	Final rank
	MOORA		U_i		
	RS	RP			
a_1	1	1	1	3	***1***
a_2	3	3	3	9	***3***
a_3	2	2	2	6	***2***

Source: own

Tab. 3: MOORA and MULTIMOORA decision algorithm

MULTIMOORA	MOORA	Stage 1		Alternatives and their weights: Vilnius	Riga	Tallinn	Data normalisation	Assessment directions	$x_{ij} = \frac{x_{ij}}{\sqrt{\sum_{j=1}^{m} x_{ij}^2}}$;		
				a_1	a_2	a_3			a_1	a_2	a_3
		Criteria	x_1	3.1	2.4	1.6		*max*	0.732	0.567	0.378
			x_2	158	127	100		*max*	0.699	0.562	0.442
			x_3	795	772	608		*max*	0.629	0.611	0.481
			x_4	357	204	576		*max*	0.504	0.288	0.814
			x_5	11	10.8	7.6		*min*	0.640	0.628	0.442
			x_6	13.45	13.32	11.87		*min*	0.602	0.596	0.531
			x_7	54.64	58.64	65.91		*min*	0.527	0.565	0.635
			x_8	70.82	61.49	70.43		*max*	0.604	0.524	0.600
			x_9	402	307	159		*max*	0.758	0.579	0.300
			x_{10}	20.2	38.8	14.2		*min*	0.439	0.844	0.309
			x_{11}	404	580	681		*min*	0.365	0.611	0.702
			x_{12}	26.45	48.21	16.59		*min*	0.461	0.839	0.289
		Stage 2		The Ratio System (RS): $y_j^* = \sum_{i=1}^{i=6} x_{ij^*} - \sum_{i=g+1}^{i=6} x_{ij^*}$					0.893	-0.953	0.107
				The rank of the ratio system:					1	3	2
		Stage 3		The Reference Point (RP): $\min_{(j)} \{\max_{(i)} \lvert r_i \div x_{ij^*} \rvert\}$					0.198	0.551	0.337
				The rank of the reference point:					1	3	2
		Stage 4		The overall utility of the *i*-th alternative U_i:					1158.396	43.390	294.718
				The rank of overall utility of the *i*-th alternative					1	3	2

Source: own

Conclusions

Each true-life situation, which requires decision-making, requires to carefully consider the available information. The objective of this article was to assess the potential of construction development in the Baltic states – Lithuania, Latvia and Estonia – and rank these capital cities in terms of their attractiveness. Certainly, criteria that define the alternatives could be supplemented with other criteria that are important for decision-making groups.

As mentioned before, the assessment has been carried out to promote private investments following the principles of sustainable development, to ensure the union between private business objectives, regulation by state authorities and satisfaction of interests of urban residents. A number of descriptive criteria – comprising a multi-criteria problem, which has been assessed using weightless MOORA and MULTIMOORA methods – have been used to describe the alternatives. Following the assessment of criteria systems, the conclusion was made that considering the market trends and the ideology of sustainable development, the zone of the city of Vilnius (Lithuania) is the most attractive for investments as well as the development of construction business.

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Abstract

RANKING OF PRIORITIES AMONG THE BALTIC CAPITAL CITIES FOR THE DEVELOPMENT OF SUSTAINABLE CONSTRUCTION

Marius Lazauskas, Edmundas Kazimieras Zavadskas, Jonas Šaparauskas

Crisis of the real estate sector resulted in disadvantageous conditions for legal entities operating in the field of construction and implementation of new property development projects. As a result, many such entities started investigating their options to offer construction services and products to more economically attractive foreign markets. This necessitates the need to assess the effectiveness of investments into new markets, considering the current developmental trends of the construction sector, which are related to implementation of sustainable construction projects. Close cooperation of Baltic States at the national level and joint activities of several construction market participants predetermine the necessity to assess biggest cities of Lithuania, Latvia, and Estonia being the potential market of construction sector to be selected as a target segment of efficient development of construction needs.These are the reasons behind the creation of a typical calculation model, which could be adapted for an effective and uncomplicated assessment of investment rationale in new markets while ensuring the adherence to principles of sustainable development. Assessment of potential capabilities of a construction sector of three Baltic capitals (Vilnius, Riga, Tallinn) could provide the opportunity to direct capital and investments of construction market participants in the wore efficient way and create the highest added value for the economy, residents and development of sustainable environments. Identification of project implementation area is a key factor in determining directions of the activity performed by private investors, performed in order to assess the opportunity of efficient realisation of construction project proposed for implementation with particular environment. A multiple-criteria task is formulated, which aims to determine the rank of priorities among cities of the Baltic states; and multi-criteria methods MOORA and MULTIMOORA are used for decision-making.

Key Words: *Real estate, construction market, decision-making, MOORA, MULTIMOORA.*

JEL Classification: *CO2, R4, L62, L92.*

DOI: *10.15240/tul/001/2015-2-002*

QUANTIFYING CORRUPTION AT A SUBNATIONAL LEVEL

Veronika Linhartová, Jolana Volejníková

Introduction

Corruption and its potential reduction is a constant topic not only of economic or social science research, but also an issue that plagues governments and citizens alike. This phenomenon is more or less immanent in every social system, regardless of the size and sophistication of the country or culture of the nation. Despite the fact that corruption is not a new phenomenon and a number of foreign and domestic authors have been dealing with this subject for several years, there are still many questions that remain unanswered. The very definition of the term corruption is not yet clear, and different authors define corruption with greater or smaller differences. For more detail, see e.g. [6], [9], [29], [20]. Even the question of whether and how corruption can affect the economic level of a country has never been answered by any literature without controversy. One may thus encounter the view that corruption is "sand in the wheels" of the economy, which impedes economic transactions, as it reduces the security of property rights and contributes to inefficient allocation of resources [23], [28], [24], [17], [13]. On the other hand, there are authors who believe that corruption is precisely what "greases the wheels" of the economy, because it allows individuals to avoid administrative and bureaucratic delays [12], [14], [15], [1], [16]. It can be said, however, that with the existence of adequate legislation, the argument about corruption as "greasing the wheels of the economy" is totally unacceptable.

The issue of quantifying the degree of corruption also raises fierce debate. Considering the fact that bribery and other forms of corruption are illegal in most countries, the people involved make every effort to carefully conceal their actions and revealing corruption is often almost impossible. Even so, there are currently a number of exact procedures that attempt to quantify the level of corruption in a country. Among the best known current indicators of corruption is one example, the CPI (Corruption Perception Index), published annually by Transparency International and the Control of Corruption of the World Bank [27]. A common feature of all currently existing indices of corruption, however, is the fact that all without exception quantify the level of corruption in a country and are therefore not applicable for quantification of corruption at a sub-national level. The authors of this paper argue that the socio-economic development in a country is not homogeneous, and that it can be assumed that a difference exists in the extent of corruption in different regions within the same country. Under this assumption, more corrupt sub-national regions are detrimental to the national evaluation of corruption in a country as a whole. The fact that the distribution of corruption in a country is not homogenous was confirmed by authors [2] and [5] in their studies of Italian regions. The level of corruption in the sub national breakdown as reported by these authors was very diverse and its analysis can help explain the differences in the different economic performance of the regions. It can be noted, however, that the study of the Italian authors is unique and finding another study on the quantification of regional levels of corruption, or its impact on the region, is virtually impossible. From this it is clear that the issue of quantifying corruption and its consequences at the regional level is a topic that deserves more attention. There are several reasons to consider these issues. Perhaps the strongest is that if corruption is indeed one of the variables that are degrading the performance of economies, the elimination of corruption in certain regions may just be the key to removing regional economic disparities and thereby increasing the economic performance of the country. Analysing regional corruption may also lead to the creation of direct regional anti-corruption

initiatives that can bring about reductions in the national level of corruption. In general terms, a sub-national resolution in terms of the degree of corruption could bring a new dimension to traditional theories of regional disparities.

The main objective of this article is formulated in the context of the above considerations. It contains a design for a method of quantifying the extent of corruption at the level of regional cohesion. The proposed method is then verified and applied to individual regions of the Member States and candidate States of the European Union. Using the proposed method it is possible to evaluate the current state of corruption in the evaluated regions, to mutually compare the regions, to determine the degree of deviation from the "surface" level of national corruption and simultaneously determine the degree of variability in the extent of corruption within the country.

The text of this article presents the proposed method of quantifying the regional level of corruption verified using Kendall's coefficient of concordance for further use. Verification of the proposed method is carried out at a national and regional level. Methods at the national level are verified by comparing the evaluation of the newly proposed method to the evaluation of existing corruption indices. This will determine the level of agreement between the already established indices and the newly proposed method. The methods are verified at the regional level using police statistics on recorded corruption offences. After the method is verified, the level of corruption in the various regions is calculated. Special attention is paid to quantifying the extent of corruption in the regions of the Czech Republic. Calculating the level of corruption in the Czech regions will identify those regions which are more affected by corruption than others and would thus worsen the national evaluation of the Czech Republic within the standard published indices of corruption.

1. Proposal for a Method of Quantifying the Extent of Corruption at a Sub-National Level

Due to the absence of any method for determining corruption in a more or less affected sub-national region, the next section will present a method for quantifying corruption at a sub-national level. The design of this method is based on the construction of the European Quality of Government Index developed by the European Commission together with The Quality of Government Institute. Corruption is understood here in accordance with the definition of Nye, who describes corruption as "*behaviour that deviates from the formal duties of a public role because of private-regarding wealth or status gains"* [20]. This definition focuses on the abuse of public power, and somewhat ignores corruption in the private sector, which of course also exists. Most existing studies, however, have focused on corruption in the public sector, as the consequences of misuse of public power impact the broad mass of taxpayers and the country as such.

1.1 The European Quality of Government Index

The European Quality of Government Index (EQI) was created to quantify the quality of public administration at a regional level. The index so far been developed twice; in 2010 and 2013. 27 EU Member States were included in the EQI in 2010. In 2013, 28 EU Member States are included as well as the Candidate States Turkey and Serbia; in total 30 countries. The European Commission plans to construct EQI regularly every three years.

In addition to the national evaluation of the quality of governance, the resulting EQI also takes note of the evaluation of regional administration using regional data which the European Commission has drawn up for the needs of constructing the EQI. The EQI thus consists of two main parts:

The first part of the EQI takes into account the national government level, which is represented by the Worldwide Governance Indicators (WGI) of the World Bank. Of the six pillars of the quality of governance, the European Commission chose four for the construction of the EQI: Voice and Accountability (GM1), Government Effectiveness (GM3), Rule of Law (GM5) Control of Corruption (GM6) [4], [26], [11].

The second part of the EQI, which takes into account the regional level of governance, was compiled by the European Commission on the basis of a unique regional survey, conducted for the sole purpose of creating a Regional indicator of government quality, which would take into account regional aspects in the final construction of the EQI.

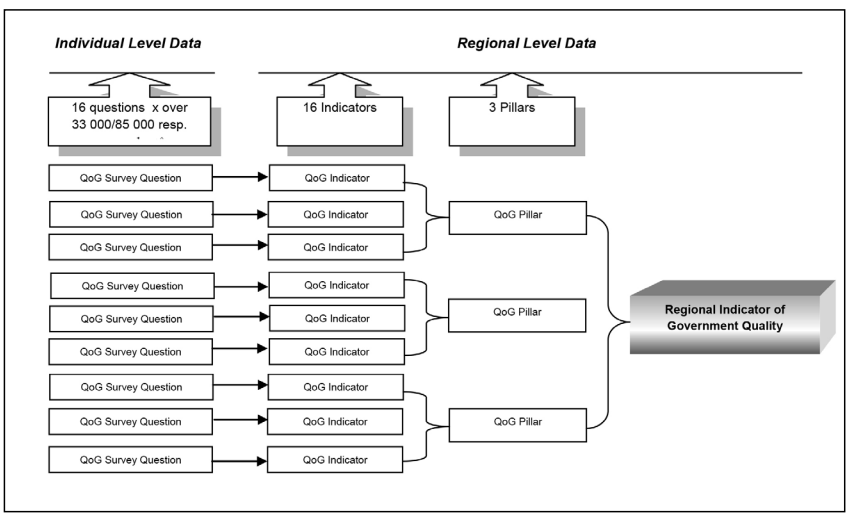
This unique research registered in the first construction of the EQI was executed in 172 NUTS II regions in 18 countries of the Eu-

ropean Union in 2010 (from the remaining 9 countries of the European Union only data at the national level was included). The research includes altogether 181 regional units. Data was obtained by means of surveying more than 33,000 inhabitants. The all-European regional research was conducted from 15th December 2009 to 1st February 2010 by means of telephone interviews with respondents older than 18 years and in the local language.

In the second construction of EQI, it was executed in 206 NUTS regions in 24 countries of the European Union in 2013 (from the remaining 7 countries of the European Union only data at the national level was included). The research includes altogether 213 regional units. Data was obtained by means of research of more than 85,000 inhabitants.

The resulting regional quality of administration indicator reflects the actual experience of respondents with the use of individual public services, thus the quality of governance in the region is evaluated as it is perceived by its inhabitants; i.e., the recipients of public administration. The Regional indicator of government quality is composed of 16 separate indicators relating to the quality of administration in a particular region. These 16 indicators were developed based on 16 questions (The list of questions is available at http://www.qog.pol.gu.se/data/datadownloads/qogeuregionaldata/.) developed in accordance with the pillars arising from the methodology of the WGI: Voice and Accountability, Government Effectiveness, Rule of Law and Control of Corruption. In order to capture the most important sub-national differences, questions were focused on three public services that are often funded or administered at sub-national levels. Each of the four pillars mentioned thus involves issues relating to education, health care and law enforcement in the region. With a focus on these three services, respondents were asked to assess these public services with regard to the three fundamental concepts of quality administration - quality, impartiality and corruption. These three concepts are the pillars of the resulting regional indicator of quality government. Data is aggregated three times using a simple average. First is the creation of the average values of responses to the questions. This will create 16 indicators for each region. Then these 16 values are aggregated into three defined pillars - quality, impartiality and corruption. Finally, these three pillars are aggregated into a single numerical Regional quality of administration indicator. A simple diagram of the formation of the Regional indicator of government quality is shown in Figure 1.

Fig. 1: Approach to creating a Regional Indicator of Government Quality



Source: own work according to [3]

Thus in its final form, the resulting EU Quality of Government Index enriches the national evaluation of quality of administration created by the World Bank (WGI) on a regional scale (Regional indicator of government quality).

The final form of the construction of the EQI is as follows:

$$EQI_{regionXincountryY} = WGI_{countryY} + \\ + (R_{qogregionXincountryY} - CR_{qogcountryY}), \quad (1)$$

where $EQI_{regionXincountryY}$ is the final European Quality of Government Index in the region of a given country,

$WGI_{countryY}$ is the national average of the above four *Worldwide Governance Indicators* for each country,

$R_{qogregionXincountryY}$ is the score from a regional survey; thus the *Regional indicator of government quality*,

$CR_{qogcountryY}$ is the regional survey of all regions in the country weighted by the proportion of the population of each region to the national population of the country.

The EQI has so far been calculated twice; once in 2010 and in 2013. Member States of the EU-28, Turkey and Serbia, were included in the calculation.

1.2 Proposal for a Regional Index of Corruption

It is apparent that the resulting EQI, as it was compiled by the European Commission together with The Quality of Government Institute, provides the opportunity to pursue a quantification of corruption at a sub-national level, which had not previously been practically possible. The primary modifications of the already created EQI can create a modified index, which, of all the components of quality government, takes into account only corruption; it therefore takes into account only the indicator Control of Corruption in the national evaluation and the indicator Pillars of Corruption in the regional evaluation. Based on this modified methodology of the EQI composition, the modified method of calculating EQI can then be applied only for the purpose of quantifying corruption in the cohesion regions.

The resulting Regional Index of Corruption (RIC) is then calculated based on the formula:

$$RIC_{regionXincountryY} = CC_{countryY} + \\ + (PC_{qogregionXincountryY} - CPC_{qogcountryY}), \quad (2)$$

where $RIC_{regionXincountryY}$ is the resulting *Regional Index of Corruption* for each region of a given country,

$CC_{countryY}$ is the national indicator value of *Control Of Corruption (GM6)* from the Worldwide Governance Indicators,

$PC_{qogregionXincountryY}$ is the score from a regional survey focused on corruption, thus *Pillar of Corruption*,

$CPC_{qogcountryY}$ is the value for the Pillar of Corruption from the regional survey of all regions in a country weighted by the proportion of the population in each region on the national population of the country.

Composite indicators often evoke a number of questions relating to their composition and weighting of the individual indicators entering into a composite indicator. There were created tens of aggregated indicators at the time when composite indicators reached a rapid expansion. Most of them, unfortunately, were not built on correct statistical basis [25]. Because of these errors composite indicators failed to meet expectations, which were inserted into them, sparking concerns among their users and negatively affected trust in composite indicators in general. The credibility of these indicators is mainly related to the accuracy of data, based on which they are constructed and the methodology by which they are constructed. Number of composite indicators is constructed by reputable international institution. Such indicators can get known and respected easier and earlier. However, although composite indicators are designed very carefully and statistical requirements have been met, their acceptation is always dependent on bargaining and how they are accepted by experts and public. Acceptation of aggregated indicators mostly depends on how they meet the original goal, i.e. whether measure what they should and the subsequent acceptance of their users. Gaining legitimacy and trust of users is a gradual process.

In the case of constructing indicator EQI was by the European Commission used an equal weighting of entering variables. With respect to author´s proposed RIC is a modification of EQI, authors of the article do not consider important further weighting of variables entering into RIC.

2. Applying the Proposed Regional Index of Corruption

The Regional Index of Corruption (hereinafter RIC) is applied and tested first at the national

level, then at the level of the cohesion regions. From the resulting values, the individual regions can be mutually compared and regions can be identified which are more or less affected by corruption. Table 1 shows the resulting ranking of countries in the newly created RIC for the years 2010 and 2013. Countries in the segmented EQI 2013 are included; thus there are a total of 30 countries. The higher the value of the RIC, the better is the evaluation of the country's RIC. In the evaluation of the RIC between 2010 and 2013, it was found that the new Member States and candidate States of the European Union are at the very bottom of the list of countries evaluated. Conversely, the Nordic countries were evaluated as the least affected by corruption.

Tab. 1: Regional Index of Corruption for 2010 and 2013

NUTS I	RIC 2010	Ranking	NUTS I	RIC 2013	Ranking
DK	1.811919	1	DK	1.841393	1
FI	1.740486	2	SE	1.559288	2
SE	1.516722	3	FI	1.555572	3
NL	1.438868	4	LU	1.493145	4
LU	1.261475	5	NL	1.479409	5
AT	1.142543	6	DE	0.932501	6
IE	0.948732	7	UK	0.779821	7
DE	0.917613	8	BE	0.749709	8
UK	0.830591	9	IE	0.726454	9
FR	0.488344	10	FR	0.703595	10
BE	0.415918	11	AT	0.609217	11
CY	0.322032	12	PT	0.168304	12
ES	0.157165	13	ES	0.131936	13
MT	0.083101	14	EE	-0.0212	14
PT	0.029269	15	SI	-0.05617	15
SI	-0.07815	16	CY	-0.07266	16
EE	-0.12856	17	MT	-0.1372	17
LV	-0.67118	18	PL	-0.56423	18
LT	-0.70428	19	HU	-0.76712	19
HU	-0.71697	20	CZ	-0.7947	20
PL	-0.76271	21	SK	-0.85981	21
SK	-0.81496	22	LT	-0.86415	22
CZ	-0.85541	23	LV	-0.92744	23
IT	-0.87991	24	IT	-1.05754	24
GR	-1.06275	25	TR	-1.08985	25
TR	-1.08395	26	HR	-1.14626	26
HR	-1.23592	27	GR	-1.38318	27
RO	-1.37328	28	RO	-1.39001	28
RS	-1.55004	29	BG	-1.43259	29
BG	-1.55089	30	RS	-1.46287	30

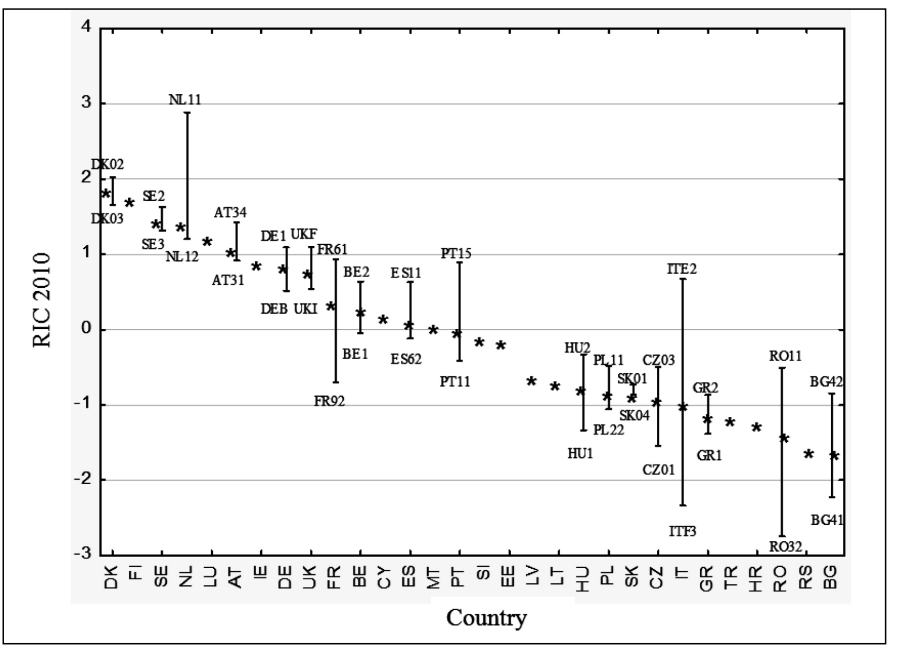
Source: Author's own work

By using Statistica 12, graphic models were created of the variability of RIC values in individual countries for the years 2010 and 2013. The box plots use the method of min-max comparison and show the range of RIC values marking the best and the worst of the regions evaluated in the country. On the x-axis are plotted the countries evaluated; on the y-axis are the resulting values of the RIC in a given year. The range of values is complemented by the final value of the RIC of the country, which is represented by an asterisk. Figure 2 shows the range of RIC values for 2010 in the thirty countries evaluated. Definitely the greatest variability in the assessment of corruption is to be found in the Italian regions. Italian respondents answered questions regarding the impact of corruption on their area with great differences, and perceived corruption very differently depending on which region they live. The most corrupt Italian region, based on the results of the RIC from 2010, is the Campania region (ITF3), while the best ratings were achieved in the Umbria region (ITE2). A high variability was also observed in Romania, France and the Netherlands. Rating corruption at the national level can be particularly misleading for these countries. In the Czech Republic, a middle variability of RIC values was recorded. The top rated region is Jihozápad (Southwest) (CZ03) with a value of -0.9346 and the worst rating is the capital city of Prague (CZ01) with a value of -1.9878.

In the evaluation of RIC in 2010, the NUTS II regions which placed best were the Dutch region of Groningen (NL11) with a value of 2.8867. The best ratings in 2010 were achieved generally by Dutch, Danish, Finnish and Swedish regions. In contrast, at the other end of the ranking were Romanian, Italian and Bulgarian regions.

Definitely the worst ranking among the NUTS II regions was the Romanian region of Bucharest (RO32) with a value of -2.7491.

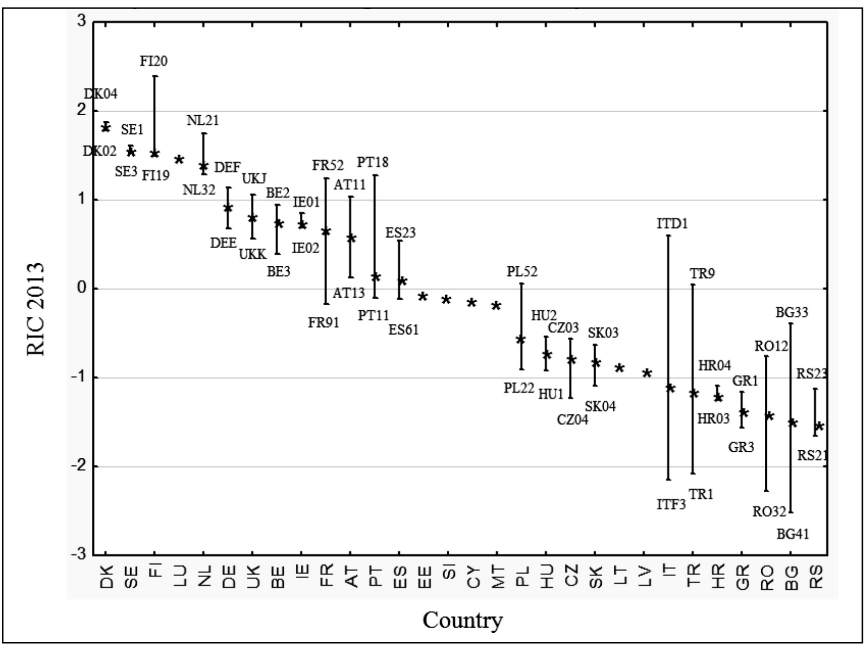
Fig. 2: Box Graph of Values for the Regional Index of Corruption for 2010



Source: Author's own work

Figure 3 shows the range of values of RIC for 2013. In 2013, the region with the lowest level of corruption was the Finnish region of Aland (FI20) with a value of 2.3932. On the other hand, the most corrupt region of the European Union was the Bulgarian region of Yugozapaden (BG41) with a value of -2.5237. A high variability of data in 2013 was found again in Italy, as well as Bulgaria, Turkey and Romania. In these countries, the inhabitants of regions had different opinions on the impact of corruption in their area and the corruption assessment may not reflect the current situation in some regions. In contrast, in Danish, Swedish, Irish and Croatian regions only very small deviations, were detected in the values of RIC of 2013 and evaluation of the national level of corruption relevantly reflects the evaluation of the regions. Within the Czech Republic, in 2013 the best region evaluated in terms of corruption was Jihozápad (Southwest) (CZ03) with a value of -0.5694 and the most corrupt region was Severozápad (Northwest) (CZ04) with a value of -1.2304.

Fig. 3: Box Graph of Values for the Regional Index of Corruption for 2013



Source: Author's own work

The resulting RIC values demonstrate that some European Union countries show a very high degree of variability in the regional level of corruption. This confirms the assumption that existing indices evaluating the national level of corruption can ultimately overestimate the regions more affected by corruption and underestimate the less corrupt. Definitely the greatest variability of the data evaluated in both years was demonstrated in the Italian regions. In Italy, as one of the smaller countries, several studies on corruption have been conducted in various Italian regions. The authors [2] and [5] in their studies agree that the variability of the degree of corruption in the Italian regions is very high and in this country there are regions with very high levels of corruption, but also regions with much lower levels of corruption. By applying the proposed Regional Corruption Index (RIC), not only were the conclusions of the authors confirmed regarding the Italian regions, but this conclusion is demonstrated in the majority of countries surveyed.

2.1 Verifying the Proposed Method

The proposed method of quantifying the degree of corruption at the regional level is subsequently verified at national and regional level. Kendall's coefficient of concordance can be used for mathematical verification of the conformity of the assessment methods for the proposed RIC and existing indexes. This is a non-parametric method of mathematical statistics which is primarily used to assess the conformity of individual evaluators. The value of the coefficient varies between 0 (no agreement) and 1 (complete agreement) [10].

2.1.1 Verifying Method at the National Level

In order to compare evaluations at the national level, two presently existing indices are selected which measure the degree of corruption in the country. These are indices that focus exclusively on quantifying the national level of corruption. The selected corruption indicators are the Corruption Perceptions Index (CPI) of Transparency International and the Control of Corruption (CC) of the World Bank [11], [27]. Given that data from the Regional government quality indicator, which was used for the construction of the RIC, has been collected among respondents since 2009 and the data of the World Bank to evaluate the situation at the national level was drawn upon in 2008, it is appropriate, in assessing conformity of the ratings, to take into account not only data for 2010. To compare the resulting values of RIC for 2010, a time range of existing indices were selected for the years 2008–2010, which take into account the entire time period during which the data was collected for the RIC. To verify the agreement of the assessment of RIC for 2013, the time range 2011 to 2013 was chosen.

Table 2 presents the resulting calculation of Kendall's coefficient of concordance ranking countries according to the RIC in 2010 and the CPI and CC from 2008 to 2010 and to the RIC 2013 and the CPI and the CPI and CC from 2011 to 2013 as evaluated by the program Statistica 12. Kendall's coefficient of concordance assessing the order of the selected indices reaches around 98%. The RIC itself with each of the chosen indices for each year corellates in all cases at least at a level of 95%.

High values of the coefficients of concordance in both years indicate that the proposed RIC ranks countries in terms of their corruption very similarly to the currently used indices of corruption. These conclusions of Kendall's coefficient of concordance verify the possibility of using the RIC.

Tab. 2: Kendall's Coefficients of Concordance for Regional Index of Corruption 2010 and 2013 – Part 1

Variable	Kendall´s coefficient for RIC 2010				Kendall´s coefficient for RIC 2013			
	(no. of variables–30, no. of indices-7)				*(no. of variables–30, no. of indices-6)*			
	Avg. value r = 0.97501				Avg. value r = 0.98355			
	Average (ranking)	**Total (ranking)**	**Average**	**Deviation**	**Average (ranking)**	**Total (ranking)**	**Average**	**Deviation**
AT	6.85714	48.0000	6.85714	0.89974	10.33333	62.0000	10.16667	1.602082
BE	10.28571	72.0000	10.28571	0.48795	8.08333	48.5000	8.00000	0.632456
BG	28.71429	201.0000	28.57143	1.13389	28.58333	171.5000	28.50000	0.836660
CY	13.57143	95.0000	13.42857	1.39728	13.66667	82.0000	13.66667	1.861899
CZ	20.50000	143.5000	20.42857	1.51186	21.25000	127.5000	21.00000	1.095445
DE	7.35714	51.5000	7.28571	0.95119	6.00000	36.0000	6.00000	
DK	1.14286	8.0000	1.00000		1.16667	7.0000	1.00000	
EE	14.71429	103.0000	14.57143	2.22539	13.33333	80.0000	13.33333	1.032796
ES	13.85714	97.0000	13.85714	0.89974	13.66667	82.0000	13.66667	1.211060
FI	2.42857	17.0000	2.28571	0.75593	2.41667	14.5000	2.16667	0.983192

Source: Author's own work

Tab. 2: Kendall's Coefficients of Concordance for Regional Index of Corruption 2010 and 2013 – Part 2

Variable	Kendall´s coefficient for RIC 2010 (no. of variables–30, no. of indices-7) Avg. value r = 0.97501				Kendall´s coefficient for RIC 2013 (no. of variables–30, no. of indices-6) Avg. value r = 0.98355			
	Average (ranking)	Total (ranking)	Average	Deviation	Average (ranking)	Total (ranking)	Average	Deviation
FR	10.71429	75.0000	10.71429	0.48795	10.00000	60.0000	10.00000	0.632456
GR	26.07143	182.5000	25.85714	2.03540	28.33333	170.0000	28.33333	1.366260
HR	26.42857	185.0000	26.42857	0.78679	25.08333	150.5000	24.83333	1.329160
HU	19.28571	135.0000	19.28571	1.11269	19.50000	117.0000	19.50000	0.547723
IE	6.85714	48.0000	6.71429	0.75593	9.33333	56.0000	9.16667	0.408248
IT	23.85714	167.0000	23.85714	1.57359	25.41667	152.5000	25.33333	1.211060
LT	21.78571	152.5000	21.57143	2.99205	19.91667	119.5000	19.83333	1.940790
LU	5,00000	35.0000	5.00000		4.66667	28.0000	4.66667	0.516398
LV	21.78571	152.5000	21.57143	1.90238	22.41667	134.5000	22.16667	0.983192
MT	16.00000	112.0000	16.00000	1.41421	17.16667	103.0000	17.16667	1.329160
NL	3.92857	27.5000	3.85714	0.37796	4.33333	26.0000	4.33333	0.516398
PL	19.71429	138.000	19.57143	2.22539	17.33333	104.0000	17.33333	1.211060
PT	14.57143	102.0000	14.57143	1.81265	14.00000	84.0000	14.00000	1.673320
RO	28.14286	197.0000	28.00000	0.81649	27.41667	164.5000	27.33333	1.211060
RS	29.64286	207.5000	29.57143	0.53452	29.41667	176.5000	29.33333	0.816497
SE	2.50000	17.5000	2.42857	0.78680	2.41667	14.5000	2.33333	0.516398
SI	14.28571	100.0000	14.14286	2.11570	16.08333	96.5000	16.00000	0.894427
SK	21.64286	151.5000	21.42857	1.13389	23.33333	140.0000	23.16667	1.722401
TR	24.42857	171.0000	24.28571	1.25357	23.08333	138.5000	22.83333	1.722401
UK	8.92857	62.5000	8.85714	0.37796	7.25000	43.5000	7.16667	0.408248

Source: Author's own work

2.1.2 Verifying the Proposed Methods at the Regional Level

At present, virtually the only possible way to verify the proposed method at the regional level is to compare RIC with statistics of corruption offences in the regions of the Czech Republic. According to official statistics of the Ministry of the Interior and the of the Czech National Police, however, only recorded cases of corruption can be traced, whose number is based on the activity of the state bodies. The strategy of the government in the fight against corruption for the period 2013–2014 indicates that corruption in the Czech Republic has a high degree of latency and only a few cases have been uncovered [18]. According to the Government Programme for Combating Corruption of the Czech Republic, only one percent of corruption offences have been uncovered [19]. The actual number of these crimes that have occurred in recent years is likely to be much higher [21]. For the purposes of distinguishing the regions on the basis of corruption, without the need for a precise quantification, this tool is usable.

In order to verify the Regional Corruption Index, the following corruption offences are used, related to corruption in public administration, which is defined by the Criminal

Code: accepting bribes (§ 331), bribery (§ 332) and indirect bribery (§ 333), abuse of power of officials (§ 329), obstruction of official duties of a person by negligence (§ 330). Given that the most risky area is currently regarded to be the redistribution of public funds through procurement and auction sales, the analysis also includes the offences of manipulation of public procurement and public tenders (§ 257) and actions against public auctions (§ 258).

The following Table 3 shows the results of Kendall's coefficient of concordance for the RIC of 2010 and the evaluation of the regions on the basis of crimes recorded in 2008–2010. The value of Kendall's coefficient in all the years in question has a value of at least about 74%, which indicates a statistically significant concordance between the assessment of the regions based on the RIC in 2010 and rated based on police statistics. Verification of conformity conclusions of RIC for 2013 and statistics of corruption offences recorded in the years 2011 to 2013 is shown in Table 4. The evaluation of RIC from 2013 coincides with police statistics of this period by at least 40%.

Verification of data at the regional level is not as clear as with national data; however, the assessment of the regions on the basis of corruption offences and under the proposed Regional Corruption Index (RIC) has also been shown to coincide. The observed values of the assessed coefficients of concordance rank the regions based on the evaluation of police statistics and the proposed RIC confirms the predicted use of this index as a tool for defining more and less corrupt areas at the regional level.

Tab. 3: Kendall's Coefficients of Concordance for the Regional Index of Corruption 2010 and corruption crimes in 2008–2010

Variable	Corruption Crimes 2008				Corruption Crimes 2009				Corruption Crimes 2010			
	(no. of variables–8 no. of indices-2)				*(no. of variables–8, no. of indices-2)*				*(no. of variables–8, no. of indices-2)*			
	Avg. value r = 0.73810				Avg. value r = 0.85714				Avg. value r = 0.76190			
	Average (ranking)	Total (ranking)	Average	Deviation	Average (ranking)	Total (ranking)	Average	Deviation	Average (ranking)	Total (ranking)	Average	Deviation
Prague	1.00	2.00	1.00		1.00	2.00	1.00		1.00	2.00	1.00	
Severozápad	2.00	5.00	2.00	0.70711	3.00	6.00	3.00		2.00	5.00	2.00	0.70711
Střední Čechy	4.00	9.00	4.00	0.70711	4.00	9.00	4.00	0.70711	4.00	8.00	4.00	
Jihovýchod	2.00	5.00	2.00	0.70711	2.00	4.00	2.00		3.00	7.00	3.00	2.12132
Severovýchod	5.00	11.00	5.00	2.12132	5.00	11.00	5.00	2.12132	6.00	13.00	6.00	0.70711
MorSlez	6.00	13.00	6.00	2.12132	5.00	11.00	5.00	0.70711	4.00	8.00	4.00	1.41421
Jihozápad	7.00	15.00	7.00	0.70711	8.00	16.00	8.00		7.00	15.00	7.00	0.70711
Střední Morava	6.00	12.00	6.00		6.00	13.00	6.00	0.70711	7.00	14.00	7.00	1.414211

Source: Author's own work

3. Quantifying the Degree of Corruption in the Regions of the Czech Republic

The development of RIC values for 2010 and 2013 for the regions of the Czech Republic in Table 5 show particularly evident significantly worse ratings for the regions Severozápad and Moravskoslezsko between these periods. Conclusions of the RIC may support the conclusions of many organisations that deal with this issue, such. For example, according to the non-profit organisation Oživení, Moravskoslezsko is one of the worst regions evaluated, both in terms of transparency of public procurement, and in terms of the risk of conflict of interest. According to research by the Industry and Transport Association, whose aim was to highlight the main issues of the business environment, companies and business owners consider corruption to be serious and a complication to their business activities mainly in the Severozápad region [22].

Tab. 4: Kendall's Coefficients of Concordance for the Regional Index of Corruption 2013 and corruption crimes in 2011-2013

Variable	Corruption Crimes 2011				Corruption Crimes 2012				Corruption Crimes 2013			
	(no. of variables–8 no. of indices-2)				*(no. of variables–8, no. of indices-2)*				*(no. of variables–8, no. of indices-2)*			
	Avg. value r = 0.40476				Avg. value r = 0.71429				Avg. value r = 0.64286			
	Average (ranking)	Total (ranking)	Average	Deviation	Average (ranking)	Total (ranking)	Average	Deviation	Average (ranking)	Total (ranking)	Average	Deviation
Prague	2.00	4.00	2.00	1.41421	2.00	4.00	2.00	1.41421	2.00	4.00	2.00	1.41421
Severozápad	2.00	4.00	2.00	1.41421	1.00	3.00	1.00	0.70711	1.00	3.00	1.00	0.70711
Střední Čechy	3.00	6.00	3.00	1.41421	3.00	7.00	3.00	0.70711	3.00	7.00	3.00	0.70711
Jihovýchod	5.00	10.00	5.00	1.41421	5.00	10.00	5.00	1.41421	5.00	10.00	5.00	1.41421
Severovýchod	7.00	14.00	7.00		6.00	13.00	6.00	0.70711	6.00	13.00	6.00	0.70711
MorSlez	4.00	8.00	4.00	2.82843	3.00	7.00	3.00	2.12132	3.00	7.00	3.00	2.12132
Jihozápad	6.00	13.00	6.00	2.12132	8.00	16.00	8.00		7.00	15.00	7.00	0.70711
Střední Morava	6.00	13.00	6.00	2.12132	6.00	12.00	6.00	1.41421	6.00	13.00	6.00	2.12132

Source: Author's own work

Also, the suspension of financial flows from EU funds to the ROP Severozápad because of a suspicion of corruption, which occurred in 2011, highlights the increased risk in this region. Greater improvements, however, were made in the Prague and Jihozápad regions. Since 2010, Prague has been one of the two regions to establish a regional anti-corruption strategy. It also seeks to fight against conflict of interest by means of regularly updated codes of conduct for councillors and officials. The Jihomoravsko region is the second region in the Czech Republic which created its own anti-corruption strategy, in 2011. Also in the evaluation of the transparency of public tenders of the non-profit organisation Oživení, the Jihovýchod region ranked second to Prague and in the assessment of the issue of conflict of interest even overtook Prague and was rated as the best region struggling with this issue.

From the assessment of the Czech Republic within the RIC in 2010, it is clear that the value of the index at the national level is considerably worsened by the Prague region. Also, the Jihovýchod and Severozápad regions reached a value lower than the Czech Republic as a whole. These three regions are ranked in the overall scale below the national assessment and can be expected to impair the national assessment of corruption in the Czech Republic as a whole. In the RIC evaluation from 2013, the Prague cohesion region is still below the national values of the RIC, although it has significantly improved its score, as has the Severozápad region and now the Moravskoslezsko region. In the monitored period 2010–2013, these regions were identified as regions affected by corruption more than other regions in the Czech Republic. It can therefore be assumed that the reduction of corruption in these regions would improve the assessment of the Czech Republic as a whole in the context of existing indices at the national level of corruption.

Tab. 5: Regional Index of Corruption for 2010 and 2013 in the regions of the CR

	NUTS	RIC 2010	NUTS	RIC 2013
	Czech Republic	-0.8554	Czech Republic	-0.7947
1	Prague	-1.5486	Severozápad	-1.2304
2	Jihovýchod	-0.9193	MorSlez.	-1.1510
3	Severozápad	-0.8958	Prague	-1.0085
4	Stř. Čechy	-0.8588	Stř. Čechy	-0.7340
5	MorSlez.	-0.7876	Stř. Morava	-0.6699
6	Stř. Morava	-0.7296	Jihovýchod	-0.5734
7	Severovýchod	-0.6218	Severovýchod	-0.5715
8	Jihozápad	-0.4954	Jihozápad	-0.5694

Source: Author's own work

Conclusion

In the text of this paper, the Regional Corruption Index, RIC, was proposed which, based on data from the World Bank and the European Commission, allows the level of corruption at the level of cohesion regions to be quantified. The proposed index uses extensive surveys of knowledgeable institutions which deal with corruption in the long term and takes into account not only regional assessments of respondents living in a certain region, but also the national assessment of experts. It is an index that at present enriches the existing expert assessment with the views of the population in the cohesion regions, who are the users of public goods and services in the region.

With the use of a Regional Corruption Index, RIC, the regional level of corruption of all Member States of the European Union and some candidate countries was also calculated. The resulting RIC value demonstrated that some European Union countries show a very high degree of variability at the regional level of corruption. This confirms the assumption that existing indices evaluating the national level of corruption can ultimately overestimate regions more affected by corruption and vice versa underestimate those less corrupt. Among the Member States with a very high variability of corruption within the cohesion regions are Italy, Romania and Bulgaria. Also in the Czech Republic, different corrupt activity was confirmed within individual cohesion regions. The region most affected by corruption according to the RIC of 2010 was the Prague cohesion region; according to the evaluation of the RIC of 2013 it was the Severozápad region. Both these indices showed the region least affected by corruption to be the Jihozápad region.

The authors of this paper believe that the new methodology for quantifying corruption at the sub-national level has the potential for broad theoretical and practical applications. Besides theoretical, scientific-research analysis leading to the definition of deviations in the regional level of corruption from the level of corruption at the national level, applying the RIC could allow the mutual comparison of individual sub-national levels of a country in terms of the degree of corruption and become a new tool for identifying the variability and intensity of corruption in a given area. Practically, it would help define problem areas of a given region and facilitate direct identification of anti-corruption initiatives. In this context, it is interesting that according to the last Anti-Corruption Report published by the European Commission, the Czech Republic, in drawing money from EU funds for the period 2007–2013, was rated the worst in the entire European Union. One of the key problems of drawing resources from European funds is particularly corruption. European funds so often, paradoxically, do not help remove undesirable regional disparities, but the distribution of those resources has been proven to increase opportunities for corruption, which brings additional negative economic consequences to the region, which may result in disparities within the country increasing [3].

At the current level of knowledge, the ability to quantify the extent of corruption at a sub-national level fills a gap that, within the general issue of corruption still exists, both in the Czech Republic and worldwide. Exposing corruption in today's globalised environment is becoming more complex and it is an issue even for countries that generally achieve relatively good results. It is therefore necessary to continue charting corruption and prevent its further expansion. The present article only opens another direction of scientific research in this field. It can be assumed that extending the time scale will allow the Regional Corruption Index, RIC, further research in this area, especially with regard to the need for a practical application of the proposed methodology at the level of authentic regions.

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Abstract

QUANTIFYING CORRUPTION AT A SUBNATIONAL LEVEL

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Regarding the fact that bribery and other methods of corruption are illegal in most countries, their participants try to hide them very carefully and uncovering corruption is often almost impossible. Despite that a high number of specific procedures exist nowadays. A common feature of these methods is however that they focus on the corruption rate at the level of countries. Quantification of the corruption rate in smaller regional areas is still a considerably unexplored territory not only in the Czech Republic but also all over the world. Also the definition of the potential impacts of corruption or their precise quantification is an area that was investigated only in general level of state. Detailed analysis of corruption still lacks regional dimension. Subnational distinction of a territory in terms of the corruption rate could provide a completely new extension of theories of reasons and consequences of regional disparities. There are several reasons why to focus on this issue. Perhaps the strongest reason is that if corruption is one of the variables that have an effect of reducing economic performance, the elimination of corruption in certain regions may be the key to the elimination of regional economic disparities and thus increase the economic performance of the state.

The main goal of the presented article is formulated in this connection. It consists of a proposal of a methodology for quantifying the corruption rate in individual regions of the Czech Republic. It will be possible to mutually compare individual regions and at the same time define the rate of deviation of a region from "surface" corruption rate in a country. Definition of these regional disparities in corruption will be a benefit mainly for anti-corruption policies of a country.

Key Words: *Corruption, region, regional disparities, Transparency International, Corruption Perception Index.*

JEL Classification: *D73, H11.*

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FACTORS DETERMINING THE CORPORATE CAPITAL STRUCTURE IN THE CZECH REPUBLIC FROM THE PERSPECTIVE OF BUSINESS ENTITIES

Lenka Strýčková

Introduction

The corporate capital structure is construed as the relationship between the debt and equity sources, which companies use to finance their business. Since the early fifties of the last century, the relationship between a company´s debt and equity has been dealt with by various theories of capital structure. However, the validity of various corporate capital structure theories is not universal, and sometimes, a claim of one theory may be in direct conflict with the claims of other capital structure theories. Particular theories differ from each other in two basic levels: firstly, there are different ways of determining the factors that affect the capital structure, and secondly, assessing the optimal capital structure is based on various criteria.

Each business company is unique; its access to sources of funding differs, the business activities are carried out in different economic environment and each company may have different objectives. When selecting sources of financing, a company is influenced in its decision by factors that are determined within the enterprise, such as strategies, goals and mission, the ownership structure, risk attitude, business sector and the position on the given market, the uniqueness of the products offered and the growth potential, firm age, economic results of the company, etc. A company´s selection of sources of financing is also determined by the external environment, which consists of the degree of economic development of the country, the political environment, the level of capital market development, the monetary policy of the country, the level of interest and tax rates, the state support of the entrepreneurship, the legislation in force, the level of competition in the particular sector, the degree of information asymmetry and other factors.

The specific form of corporate capital structure is therefore a complex process dependent on the large number of different determinants and selected financial strategies, and thus depends on the decisions of individual firms. The aim of this paper is to capture the process of selection of particular sources of financing and to identify the most important factors determining the capital structure of companies in the Czech Republic from the perspective of these business entities on the basis of empirical inquiry. To determine the most significant factors, statistical methods and procedures were applied: descriptive statistics, the analysis of responses as ordinal variables, the analysis of responses as cardinal variables, and the factor analysis.

1. Determinants of the Capital Structure

„*There is no universal theory of capital structure, and no reason to expect one.*“ [18] This statement of S.C. Myers suggests that research on the corporate capital structure has so far brought no universally valid theory, because the nature of the problem makes it in substance impossible.

This, however, does not mean that no research into this area has been made. There are many different theories of capital structure, but these are conditional theories, applicable only under certain conditions. In general, theories of capital structure can be divided into static and dynamic ones. The basic static theories of corporate capital structure include the theory of optimal capital structure, based on Miller and Modigliani´s theory of the impact of taxes and costs of financial distress, and trade-off theory of capital structure. The most widespread and most respected theory of corporate capital structure is considered to be the theory of optimal capital structure, which is

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based on the assumption that the use of debt in corporate financing leads to the reduction of average cost of total capital; but it happens only up to a certain level of debt: when exceeded, the average cost of capital starts rising again. Trade-off theory involves investigation into the costs of financial distress that can eliminate the positive effects of the tax shield.

Dynamic theories, unlike the static ones, do not seek an optimal capital structure, but provide a certain preferential hierarchy of financial resources of a company. According to the pecking order theory, firms use internal equity (profit) first for financing of their activities, then debt sources and, as a last resort external equity (share issues).

Most of the still valid theories of capital structure were formed in the Anglo-Saxon world, and therefore the conclusions of these theories cannot be unreservedly applied in the Czech environment. Czech expert literature on the corporate capital structure thus usually takes over the conclusions of foreign publications.

1.1 Theoretical Background

Krauseová [15] analyzed the capital structure of Czech companies in dependence on the external environment, relating mainly to the historical development since 1989 and the European recession period. In her empirical study she also analyzed the effects of property turnover, profitability, growth, size, and profit volatility on the debt levels according to particular business sectors. She emphasizes conservative attitude of companies' towards debt and predominant accumulation of equity. She also points at low use of bonds as a source of financing. She expects that within the corporate capital structure there will be an increase in the proportion of debt sources.

One of the first experts in the Czech environment who addressed the topic of corporate finance and capital structure were the Neumaiers [19]. The Neumaiers´ theory confirms the compromise theory and in special cases is based on F. Modigliani and K.H. Miller´s theory.

Synek [24] states that the total size of the corporate capital depends on many factors; and he emphasizes the following ones: a company size, degree of mechanization, automation and robotics, the rate of capital turnover and sales organization.

Kislingerová [13] sees as the most important factors affecting corporate decisions about the level of debt the following: the size and stability of business profits, business position on the market (so-called "operating leverage"), stability or volatility of revenues, capital structure of the company (portfolio of assets), financial independence of the company (financial freedom), and the stability of the distribution of profit.

Landa and Martinovičová [16] provided the analysis of the current state and changes in capital structure depending on the industrial sectors in the years 2007 to 2009, with regard to the economic crisis. In the monitored sectors they confirmed the correctness of the generally presented findings concerning the predominance of the cost of equity over the cost of debt. They also confirmed assumption of greater use of bank loans by economically underperforming businesses (and vice versa).

Hrdý [10] states that determinants represent the cause producing results in the form of the theory of optimization of the capital structure, whereby the particular capital structure theories are always based on various determinants. The author also points to corporate financial managers´ insufficient knowledge of theoretical approaches to the corporate capital structure optimization and the related incomprehension of the zero debt as a sign of prosperity and a good name, and failing to take advantage of the tax shield effect.

Bauer [4] examines the correlation of indebtedness on the company size, industry, profitability, liquidity of assets, growth opportunities, tax rates, tax shield and volatility in his study. He states that the determinants of capital structure of Czech business companies listed on the stock exchange correspond with the companies from the group of countries G7. In accordance with generally accepted theoretical assumptions he found for example a negative correlation of corporate indebtedness with profitability and non-debt tax shield, and a positive correlation of indebtedness of Czech companies and the company size.

Prášilová [22] has investigated whether certain determinants, namely the proportion of fixed assets, retained earnings, interest rate, return on assets, firm size, the share of tangible assets and firm age have an impact on the corporate capital structure, and observed the degree of this influence. The result of the analysis is finding that the total corporate indebtedness is positively correlated with the

firm age and the amount of retained earnings; the negative correlation is represented by return on assets and company size. Her conclusions are in accordance with the results of recent surveys, which recognize the partial effects of both main theoretical approaches, the trade-off theory and the pecking order theory, on the financial decision-making of companies.

Foreign, Anglo-Saxon literature, for example Baker [3] identifies the following factors affecting the corporate capital structure: liquidity of assets, company size, growth opportunities, profitability, volatility, business sector, the impact of taxes, credit rating, the situation on the debt market, the situation in the capital market and the macroeconomic conditions.

1.2 The Impact of Industrial Sector

Firms operating in the same industrial sector tend to have similar external conditions for their business activities. Therefore, it is also possible to find a correlation between the business sector and the capital structure of companies – as shown, for example, by Bradley, Jarrell and Kim [6].

At the same time, the average indebtedness may be a factor that influences the indebtedness of a particular company: Chevalier [11] found that individual companies compare their own debt ratios with industry averages and directly (by setting a target debt levels) or indirectly adjust their own financial policy to these averages.

Talberg et al. [25] dealt with the debt within a particular industrial sector and discovered the differences within individual industries. These inter-sectoral differences in capital structure he explains by the different level of risk within industries. In accordance with the theory of financial distress, the company with higher risk levels should get less indebted.

According to various studies, the industrial sector factor may be represented by other variables as well, such as by the stage of technology development, regulation, or type of assets in the sector. For example, Almazan and Molina [1] argue that differences in technology lead to different capital structures.

1.3 Tax Factors

In the classical tax system higher corporate debt and hence higher interest paid result in reducing the tax burden on a company, although the empirical evidence for this statement is not easy to find, since higher taxes are correlated with higher productivity.

Graham [8] indicates that companies with higher marginal tax rate get into debt more often, which is consistent with the trade-off theory of capital structure. In contrast, Bradley, Jarrell and Kim [6] found a positive correlation between non-debt tax shield and the debt, which is in conflict with the primary assumptions of the debt tax shield. As a possible explanation of this phenomenon they indicate that non-debt tax shield can be simply a representative of tangible assets.

Bessler, Drobetz and Kazemieh [5] have reported that tax effects on corporate debt can be measured by various variables, which include the highest statutory tax rate, the ratio of net operating losses and assets, depreciation expense ratio and the ratio of tax-deductible loans to assets.

1.4 Company Size

The effect of company size on indebtedness is ambiguous. On the one hand, Titman and Wessels [26] argue that large firms tend to be more diversified and that's why they fail less often. The costs of financial distress are also usually larger in small companies. In other words, in accordance with the trade-off theory there is a positive correlation between a company size and the probability of its bankruptcy, so there is a positive correlation between the company size and indebtedness.

On the other hand, the size of a company may be representative for information asymmetry between corporate and capital markets professionals. Pecking order theory in this context assumes a negative relationship between indebtedness and a company size, because large companies have a higher capacity to equity financing.

Company size is usually measured by the volume of property via sales or the number of employees.

1.5 Business Profitability

The profitability of a company is measured by various indicators, primarily by means of return on assets (ROA) or return on equity (ROE), possibly with return on investment (ROI) [14].

High return on equity is a result of low indebtedness. [7] This argument is economically grounded in the pecking order theory hypothesis, where firms prefer financing

through retained earnings to debt financing. Although profitable companies could increase their indebtedness in order to take advantage of the tax shield, empirical studies usually do not confirm this. Negative impact of indebtedness on the business profitability is a major argument against the validity of the trade-off theory.

1.6 Growth Opportunities

Trade-off theory assumes that firms with higher investment opportunities are less indebted, because they avoid the tendency to under-investment and replacement of external equity capital for reasons other than the interests of the owners (shareholders) and creditors of the company. [5] This statement is supported by M.C. Jensen´s theory of free cash-flow [12].

In contrast, the conclusions of the pecking order theory are not entirely clear in terms of the growth opportunities. Simplified, it is possible to state that this theory assumes a positive correlation between indebtedness and the growth opportunities of companies. The indebtedness grows if investment exceeds the level of retained earnings, and falls when investment is lower. Assuming a fixed profitability there can be expected higher indebtedness of firms with higher investment opportunities. However, if the theory takes into account current and future financial costs, the conclusions of this theory are opposite (firms with higher investment opportunities are less indebted) [5].

1.7 Conditions on the Financial and Capital Markets

Antoniou [2] reports significant differences in the formation of the capital structure between capital market-oriented countries and countries oriented on the debt financing through banks. These factors include differences in legislative terms of particular countries, financial structure, accounting and tax systems, business management etc.

On the capital market, the market value of a company is determined by the share price; the rate of return required by investors in individual securities quantifies the risk associated with business activities. What is more, the stock market may be regarded as a reliable indicator of economic development [20]. Allocation function lies in the moving funds from surplus entities to deficit entities through various money market instruments, which also leads to the redistribution of risk between economic entities. Other features include the provision of financial markets liquidity and reducing transaction costs [21].

Unless at least one of the two basic functions on the capital market is met, the markets will probably have some deficiency, such as distrust of investors or issuers of securities, or a lack of market liquidity. Other reasons for malfunctions or inefficiencies of the capital market in economy may be a limited size of the economy or a historically very strong position of the banking sector. Great Britain and the United States are countries historically oriented on the capital market; countries with economies oriented on the banking sector include continental European countries (France, Germany, etc.) and Japan. The Czech Republic traditionally belongs to the group of economies dependent on the banking sector.

Trade-off theory indicates a positive correlation between the level of expected inflation and the level of corporate indebtedness of firms that take expected inflation into account for correct timing of debt [5].

Henderson, Jegadeesh, and Weisbach [9] have documented that firms fall into debt more often if interest rates are low. They have also monitored interest rates abroad, and if external interest rates are lower, they incur debts abroad.

2. Methodology

For processing of this study, the method of analysis of expert domestic and foreign publications and scientific papers was used first. On its basis theoretical background was elaborated by the means of synthesis of the obtained knowledge. The study also includes results of the empirical investigation that was conducted in several phases.

The first phase involved determination of the population and the representative sample. All economically active companies in the Czech Republic served as the population of investigation. The database of companies and institutions Creditinfo Albertina GOLD, which contains an overview of all registered business entities in the Czech Republic, including the basic economic results of the companies listed in the Business Journal, was used as the source of data on the subjects. The population was represented by all business companies; sampling was conducted in 14 industry sectors according to CZ-NACE, while within each sector

100 companies were randomly selected (using a random number generator). The sample therefore consisted of 1,400 companies.

The next phase included the formation of an electronic questionnaire, which was sent out via e-mail to financial and economic departments or management of 1,400 companies. The number of returned questionnaires was only 48; however, it can be regarded as a set of a great magnitude. The questionnaire included questions aimed to determine the actual factors that have an impact on what kind of sources of financing are used by companies. In the other words, to find out whether the final company's capital structure was the result of the company´s own decision or other internal factors, or rather the result of external factors that the company itself was not able to influence. Unlike a number of economic studies conducted in the sphere of the corporate capital structure, which rely on ex-post publicly available economic data, this survey was focused rather on the factors that ex-ante affect the final capital structure.

Evaluation of the data was done by the means of descriptive statistics methods. Ordinal variables are variables that can in a given interval take a finite number of values, and can be sorted according to the qualitative point of view. Cardinal numeric variables are variables whose values are important numbers that can be sorted in increasing or decreasing scales, and can theoretically take any value from the interval variable definition. It is not always possible to decide clearly whether it is a cardinal or ordinal variable, therefore both analyzes were performed. The entire work is carried out with the level of significance of $\alpha = 0.05$.

To determine the most outstanding internal and external determinants of the capital structure, the factor analysis method was used. This is a statistical method of grouping of data, that are highly correlated, and a consecutive reduction of the number of original variables to a smaller number of factors [17]. Owing to the method name "factor" analysis, which aims to determine the resulting "factors", in this study the term "determinants of capital structure" is further used for the "factors that affect the capital structure of the company", since it is a "variable" entering the factor analysis. Factor analysis of external determinants originally included nine variables (determinants); the internal determinant analysis included 11 variables. The term "factor" is the output from the factor analysis, which is formed by reduction and summarization of "variables" – determinants. Based on the factor analysis of internal and external determinants three external and three internal factors were determined, while each factor is made up of multiple variables listed in the questionnaire. R software was used for the processing of the factor analysis [23].

Tab. 1: Distribution of respondents according to the legal form of business

Legal form of business	Number of respondents	Percentage
Joint-stock company	8	16.7%
Limited liability company	39	81.3%
Other (state enterprise)	1	2.1%
Total	48	100.0%

Source: own

3. Research Results

The questionnaire survey was focused on the internal and external determinants of the corporate capital structure. The respondents also answered questions concerning the legal forms of business, prevailing business sector and the company size.

3.1 Evaluation of the Questionnaire Survey – Descriptive Statistics

Table 1 summarizes the distribution of respondents according to the legal form of business.

Tab. 2: Distribution of respondents according to the prevailing business sector

Prevailing business sector	Number of respondents	Percentage
F – Construction	9	18.8%
D – Electricity, gas, steam and air conditioning	8	16.7%
G – Wholesale and retail trade; repair of motor vehicles and motorcycles	6	12.5%
A – Agriculture, fishery, and forestry	5	10.4%
B – Mining and quarrying	5	10.4%
C – Manufacturing	5	10.4%
N – Administrative and support service activities	3	6.3%
E – Water supply; sewerage, waste management and remediation activities	2	4.2%
H – Transportation and storage	1	2.1%
I – Accommodation and food service activities	1	2.1%
J – Information and communication	1	2.1%
L – Real estate activities	1	2.1%
M – Administrative and support service activities	1	2.1%
Total	48	100.0%

Source: own

Tab. 3: Distribution of respondents according to company size (measured by the number of employees)

Number of employees (company size)	Number of respondents	Percentage
0–9 employees (micro-sized enterprise)	12	25.0%
10–49 employees (small-sized enterprise)	21	43.8%
50–249 employees (medium-sized enterprise)	10	20.8%
250 and more employees (large-sized enterprise)	5	10.4%
Total	48	100.0%

Source: own

The legal form of a limited liability company was represented statistically with the most significant frequency. It can also be stated that the legal form of the "other" occurred minimally (once) and it was in the case of the state enterprise.

Table 2 summarizes the distribution of the respondents according to the prevailing business sector of an enterprise.

Respondents with a predominant business activity F are represented statistically more significantly than respondents with a predominant activity E, H, I, J, L and M ($p\text{-value}_{max} \leq 0.0348$). Respondents with a predominant business activity D are represented statistically more significantly than respondents with a predominant activity H, I, J, L and M (p-value max≤0.0196). There was not identified statistically significant difference in the frequency of other business sectors ($p\text{-value}_{min} \leq 0.0578$).

Table 3 presents the distribution of respondents by size (measured by the number of employees).

3.2 The Evaluation of External Determinants of Capital Structure

The respondents had a choice of nine external determinants of the capital structure of their company, while the evaluation scale from 1 to 5 has been used (note: 1 = most important, 5 = no effect).

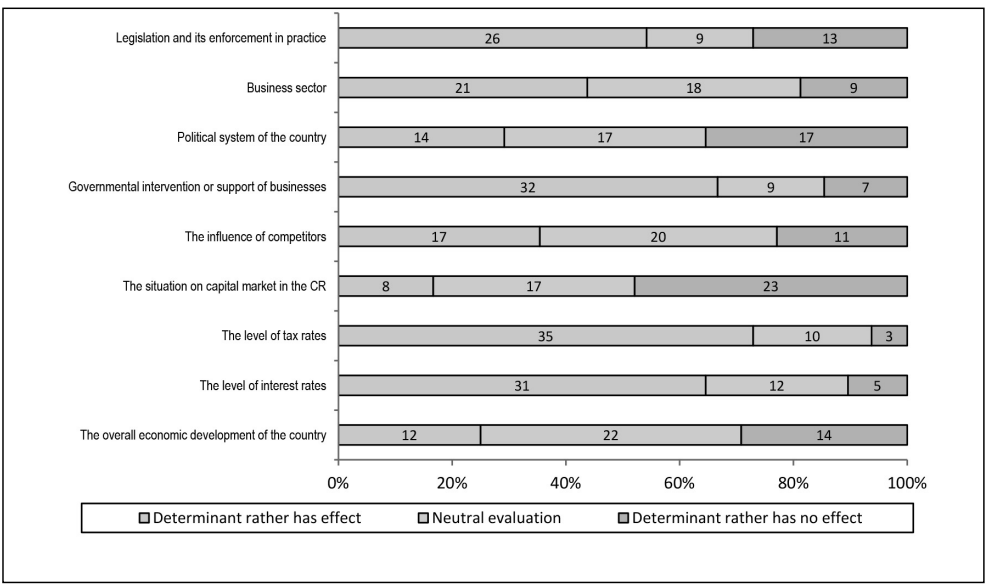
3.2.1 Analysis of Responses as Ordinal Variables

As already mentioned, the ordinal variables are variables that can – in a given interval – take finite number of values, and they can be sorted from a qualitative point of view.

Given the small number of data and fragmentation of responses, the aggregation of responses is performed as follows: ratings 1 and 2 are aggregated into: "the determinant rather has effect", rating 3: "neutral evaluation", and ratings 4 and 5: "the determinant rather has no effect" – see Figure 1.

After aggregation of responses it can be stated that the determinants "legislation and its enforcement in practice", "government intervention or support of businesses", "the

Fig. 1: The importance of external determinants: the structure of responses (after aggregation of responses)



Source: own

level of tax rates in the Czech Republic" and "the level of interest rates in the Czech Republic" have been identified as rather important by the respondents. For these variables, the answer „the determinant rather has effect" occurs significantly more frequently than the other two ($p\text{-value}_{max} \leq 0.037$). If we compared only the answers that lean toward any extreme view (we did not take into account the answers "neutral evaluation"), the determinant of "business sector" would be added to the group of variables with effect.

Determinant "the situation on the capital market in the Czech Republic" has the highest quotient of answers "determinant rather has no effect." This is represented statistically more significantly than the answer "determinant rather has effect" ($p\text{-value} \leq 0.007$).

3.2.2 Analysis of Responses as Cardinal Variables

It is not always possible to conclusively determine whether a variable is of ordinal or cardinal character, therefore an analysis of the responses as cardinal variables was carried out as well.

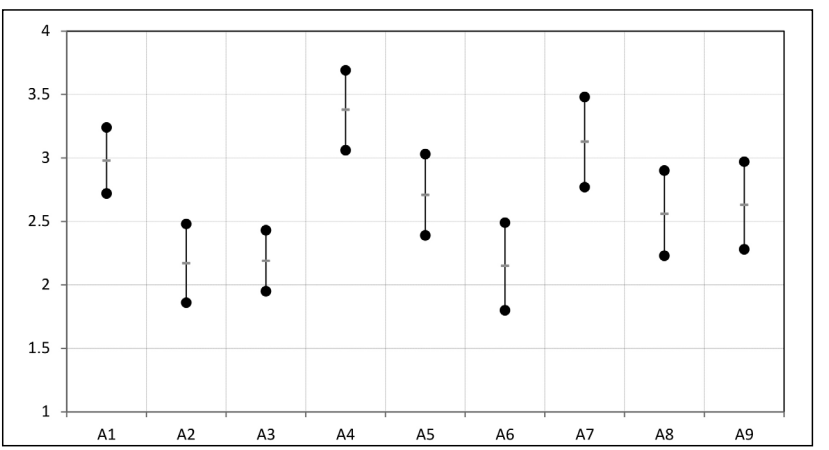
Cardinal variables are variables whose values are classified as numbers; it is possible to sort them in increasing or decreasing series and they can theoretically take any value from the definition interval of the variable. The basic descriptive statistics is performed first within the analysis to calculate the basic parameters of location and dispersion (Tab. 4 and Fig. 2).

Tab. 4: The importance of external determinants: the analysis of responses as cardinal variables

External determinants	$\bar{x}$	$\bar{x} - t\frac{s}{\sqrt{n}}$	$\bar{x} + t\frac{s}{\sqrt{n}}$	Median	Standard deviation
A1: the overall economic development of the country	2.98	2.72	3.24	3	0.934
A2: the level of interest rates in the CR	2.17	1.86	2.48	2	1.098
A3: the level of tax rates in the CR	2.19	1.95	2.43	2	0.842
A4: the situation on the capital market in the CR	3.38	3.06	3.69	3	1.104
A5: the influence of competitors	2.71	2.39	3.03	3	1.129
A6: government intervention or support of businesses	2.15	1.80	2.49	2	1.220
A7: political system of the country	3.13	2.77	3.48	3	1.265
A8: business sector	2.56	2.23	2.90	3	1.183
A9: legislation and its enforcement in practice	2.63	2.28	2.97	2	1.231

Source: own

Fig. 2: The importance of external determinants: graphical evaluation of responses as cardinal variables



Source: own

A statistically significant difference in the mean values of individual variables can be identified with "A2: the level of interest rates in the Czech Republic", "A3: the level of tax rates in the Czech Republic" and "A6: government intervention or support of businesses" (rather significant influence) on the one hand and "A1: the overall economic development of the country", "A4: the situation on the capital market in the Czech Republic" and "A7: the political system of the country" (rather insignificant impact) on the other hand (95% confidence intervals for the mean values do not overlap). The difference in mean values of evaluation in other cases cannot be considered statistically significant (95% confidence intervals for the mean values overlap).

3.2.3 Factor Analysis Assessing the Impact of External Determinants

Factor analysis was performed in the three steps (Tab. 5), within which variables and determinants were reduced. Attributes with a correlation coefficient of less than ± 0.5 were discarded. The aim was to reduce the variables and the extracted factors to a so-called optimal level, i.e. to the number of factors that had the greatest influence on the resulting capital structure.

Tab. 5: The importance of external determinants: the factor analysis of the impact of external determinants

		Step 1	Step 2	Step 3
Cronbach's alpha		0.826	0.820	0.749
95% confidence interval		(0.754;0.899)	(0.744;0.896)	(0.637;0.860)
Kaiser-Meyer-Olkin measure		0.722	0.737	0.613
Bartlett's test of sphericity	Chi-square	163.48	162.7	115.5
	Degrees of freedom	36	28	15
	The significance level	0.0	0.0	0.0
The number of variables entering the factor analysis		9	8	6
The number of factors		5	4	3
The number of variables in the factors		8	6	6
Cumulative percentage of variability		0.746	0.698	0.712

Source: own

Cronbach's alpha is met in all the steps by exceeding the value of 0.7. The confidence interval represents the interval in which the random variable falls within a pre-selected probability 1-α. The condition to attain the Kaiser-Meyer-Olkinova rate, i.e. value higher than 0.6, is valid in all steps. Bartlett's test of sphericity was met in all steps.

In step 2 the variable "government intervention or support of businesses" was released, since it has statistically significant ties in the factor where are no other variables.

Tab. 6: The importance of external determinants: results of factor analysis – the identification of the important factors

	F1	F2	F3
A1: overall economic development of the country	0.686	0.151	0.367
A2: the level of interest rates in the CR	-0.004	-0.17	0.653
A3: the level of tax rates in the CR	0.427	0.094	0.762
A4: the situation on the capital market in the CR	0.284	0.545	0.275
A5: the influence of competitors	0.196	0.970	-0.123
A7: political system of the country	0.867	0.490	-0.0051

Source: own

Tab. 7: **The importance of external determinants: results of factor analysis – variability of the factors**

	F1	F2	F3
Characteristic value	1.524	1.51	1.236
Percentage of variability	0.254	0.252	0.206
Cumulative percentage of variability	0.254	0.506	0.712

Source: own

In step 3 the variable "business sector" was released, since it has statistically significant ties in the factor where are no other variables. Variable "legislation and its enforcement in practice" was released as well, because it has no statistically significant ties in any factor.

Further reduction in the next step would not be beneficial; so no more variables were released and the three factors were identified.

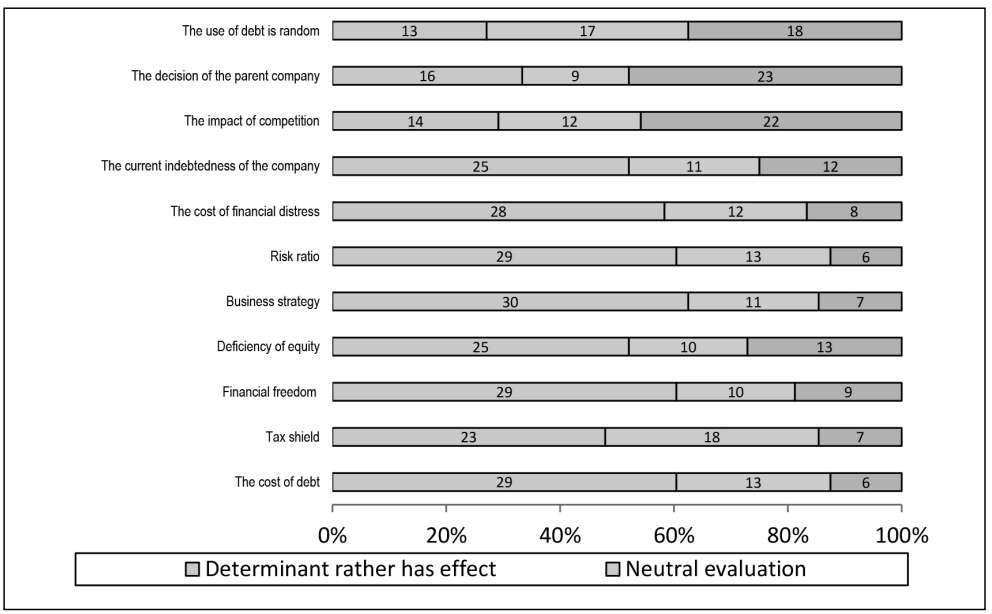
By means of the factor analysis of external determinants of capital structure the three factors were derived (Tab. 6). Each of these factors is composed by two variables (indicated by colouring).

Factor 1 includes "*overall economic development of the country*" and "*political system of the country*". Thus it was in common entitled as **the economic and political development of the country**.

Factor 2 consists of "*the situation on the capital market in the Czech Republic*" and "*the influence of competitors* ", together called **the market environment of the country**.

Factor 3 is given by the variables "*the level of interest rates in the Czech Republic*" and "*the level of tax rates in the Czech Republic*", together entitled as **the level of tax and interest rates**.

Fig. 3: **The importance of internal determinants: the structure of responses (after aggregation of responses)**



Source: own

As shown in Table 7, the cumulative variability is 71.2%, of which factor 1 "the economic and political development of the country" represents 25.4%, factor 2 "the market environment of the country" represents 25.2% and factor 3 "the level of tax and interest rates" represents 20.6%. It is therefore evident, that the factors "the industrial and economic development of the country" and "the market environment of the country" are seen by respondents as the most important external determinants of the capital structure of their companies. The most important determinants thus include the legislative conditions, law enforcement, administration, but also factors such as the overall development of the national economy, a stage of economic cycle, or preferences of the governing political parties. Respondents anticipate quite considerable influence also to determinant "the level of tax and interest rates", which is entirely logical in relation to obtaining debt financial sources and using the effect of tax shield.

3.3 The Evaluation of Internal Determinants of Capital Structure

In context of questioning related to the internal determinants, the respondents had a choice of 11 variant variables, while the evaluation scale from 1 to 5 has been used (note: 1 = most important, 5 = no effect).

3.3.1 Analysis of Responses as Ordinal Variables

Due to the low number of data and fragmentation of answers, the same assessment as the aggregation of external determinants was made to evaluate responses concerning internal determinants as ordinal variables.

On the basis of evaluation of aggregated responses (Fig. 3) it can be stated that the influence of internal determinants is perceived by the respondents as more important. This can be deduced from the fact that seven determinants are represented statistically the most significantly with the highest number of evaluations "determinant rather has effect." This concerns determinants: "current indebtedness of the company", "the cost of financial distress", "risk ratio", "business strategy", "deficiency of equity", "financial freedom", and "the cost of debt" ($p\text{-value}_{max} \leq 0.0196$).

Tab. 8: The importance of internal determinants: analysis of the responses as cardinal variables

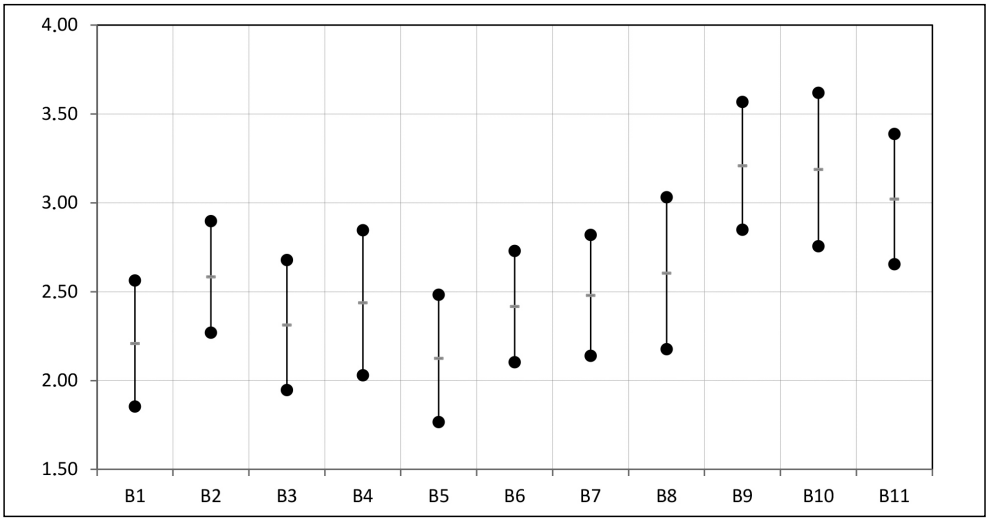
Internal determinants	$\bar{x}$	$\bar{x} - t\frac{s}{\sqrt{n}}$	$\bar{x} + t\frac{s}{\sqrt{n}}$	Median	Standard Deviation
B1: the costs of debt	2.21	1.85	2.56	2	1.254
B2: tax shield	2.58	2.27	2.90	3	1.108
B3: financial freedom	2.31	1.95	2.68	2	1.291
B4: deficiency of equity	2.44	2.03	2.85	2	1.443
B5: business strategy	2.13	1.77	2.48	2	1.265
B6: risk ratio	2.42	2.10	2.73	2	1.108
B7: the cost of financial distress	2.48	2.14	2.82	2	1.203
B8: the current indebtedness of the company	2.60	2.18	3.03	2	1.512
B9: the impact of competition	3.21	2.85	3.57	3	1.271
B10: the decision of the parent company	3.19	2.76	3.62	3	1.525
B11: use of debt is random	3.02	2.65	3.39	3	1.296

Source: own

3.3.2 Analysis of Responses as Cardinal Variables

Table 8 and the chart in Figure 4 below summarize the evaluation of responses to questions concerning internal determinants as cardinal variables.

Fig. 4: **The importance of internal determinants: graphical evaluation of responses as cardinal variables**



Source: own

The analysis revealed a statistically significant difference in the mean values of determinants "B9: the impact of competition" and "B10: the decision of the parent company" (rather small effect) and factors "B1: the cost of debt", "B3: financial freedom", "B5: business strategy" and "B6: risk ratio" (rather large effect). Further differences were revealed in the mean values of determinants: "B11: the use of debt is random, according to the actual needs of the company" (rather small effect), "B1: the cost of debt" and "B5: business strategy" (rather large effect).

The difference in the evaluation of mean values of other occurrences cannot be considered as statistically significant (95% confidence intervals for the mean values overlap).

Tab. 9: **The importance of internal determinants: the factor analysis of the impact of internal determinants**

		Step 1	Step 2	Step 2a
Cronbach's alpha		0.782	0.802	0.802
95% confidence interval		(0.694;0.870)	(0.716;0.889)	(0.716;0.889)
Kaiser-Meyer-Olkin measure		0.679	0.683	0.683
Bartlett's test of sphericity	Chi-square	256.4	192.4	192.4
	Degrees of freedom	60	36	36
	The significance level	0.0	0.0	0,0
The number of variables entering the factor analysis		11	9	9
The number of factors		5	4	3
The number of variables in the factors		9	9	9
Cumulative percentage of variability		0.747	0.699	0.651

Source: own

3.3.3 Factor Analysis Assessing the Impact of Internal Determinants

Factor analysis of internal determinants of capital structure was performed in two steps (Tab. 9) with the aim to reduce number of variables and number of extracted factors to optimal levels. After the step 2, there was further reduction in the number of factors from 4 to 3, since the factor F4 explains only 9% of the variance.

Cronbach's alpha is met in all steps (exceeds the value of 0.7). The confidence interval represents the interval in which the random variable falls within a pre-selected probability 1-α. The condition to achieve the Kaiser-Meyer-Olkin rate, i.e. value higher than 0.6, is valid in all steps. Bartlett's test of sphericity was met in all steps.

In step 2, the variables „use of debt is random, depends on the current needs of the company" and "financial freedom" were released, since they have statistically significant ties in factors where are no other variables.

In step 2a, the reduction of the numbers of factors was performed to F1, F2 and F3. Factor F4 explains only 9% of the variance (the number of variables remained the same, and therefore assumptions KMA and Cronbach's alpha as well), while further reduction would not have been beneficial. On the basis of internal determinants analysis, three factors can be identified as the most significant again.

Tab. 10: The importance of internal factors: results of the factor analysis – identification of important factors

	F1	F2	F3
B1: the cost of debt	0.212	0.950	0.096
B2: tax shield	0.049	0.758	0.232
B4: deficiency of equity	0.096	0.144	0.584
B5: business strategy	0.769	0.315	0.129
B6: risk ratio	0.696	0.424	0.256
B7: the cost of financial distress	0.414	0.202	0.588
B8: the current indebtedness of the company	-0.036	0.085	0.993
B9: the impact of competition	0.771	-0.060	-0.023
B10: the decision of the parent company	0.547	0.042	0.087

Source: own

By means of internal determinants factor analysis of capital structure three most significant factors were obtained (Tab. 10). Individual factors are composed of a different number of variables.

Factor 1 includes the determinants "*business strategy*", "*risk ratio*", "*the impact of competition*" and "*the decision of the parent company*", and thus was generally labelled as the **corporate philosophy**.

Factor 2 consists of the "*the cost of debt*" and "*tax shield*", collectively called the **cost of capital**.

Factor 3 is given by the variables "*deficiency of equity*", "*the cost of financial distress*" and "*the current indebtedness of the company*" with the general term **financial health and corporate indebtedness**.

Tab. 11: The importance internal determinants: results of factor analysis – variability of the factors

	F1	F2	F3
Characteristic value	2.200	1.831	1.826
Percentage of variability	0.244	0.203	0.203
Cumulative percentage of variability	0.244	0.448	0.651

Source: own

As shown in Table 11, the cumulative percentage of variability is 65.1%, of which factor 1 "the corporate philosophy" consists of 24.4%, factor 2 "the cost of capital" 20.3% and factor 3 "financial health and corporate indebtedness" 20.3%. The first factor named as "the corporate philosophy" has the largest share within the cumulative variability. All internal determinants included in this factor are closely related to the company decisions and its attitudes to risk, to the management of the company ("the decision of the parent company") and at the same time to the perception of the capital structure of competitive companies. The second factor "the cost of capital" is closely related to external environment, because it emphasizes the dependency of companies' decision-making on the cost of capital (given from the outside) and their attitude to the debt with respect to the financial benefits of tax shield. The third factor "financial health and corporate indebtedness" clearly indicates that companies monitor the debt ratio of their companies, and on the basis of these data they make decisions concerning changes in corporate indebtedness of these companies. This factor rather indicates the need of debt use due to lack of own equity, unlike the second factor, which indicates the use of debt rather for reasons of economic advantages for the business.

Conclusions

The aim of this study was to reveal the background of processes and influences that have the most significant effect on the corporate debt ratio from the perspective of these businesses. A questionnaire survey was therefore focused on issues relating to the capital structure of a company – whether the capital structure of the companies results from their own financial decisions, or it is rather just a consequence of various external or internal factors. Empirical investigation was carried out using electronic questioning; descriptive statistics and factor analysis were used as evaluation methods. Although the number of returned questionnaires was not high, it can be considered sufficient for identification of the most important factors from the perspectives of business entities, and the objective of this survey has been achieved. Considering the structure of the respondents, it is not possible to generalize the validity of the expressed conclusions and apply them to all businesses in the Czech Republic, but rather on small and medium-sized enterprises active in the production and processing sectors with the legal form of limited liability company.

In context of questioning related to external determinants of the corporate capital structure, the respondents had a choice of nine variables, of which as the most significant determinants were identified: "the level of tax rates in the Czech Republic", "the level of interest rates in the Czech Republic", "government intervention or support of businesses", and "legislation and its enforcement in practice". By means of the factor analysis, three so-called factors were formulated as summary variables created by the reduction and summarization of individual variables – selected determinants. The first factor "economic and political development of the country" includes "the overall economic development of the country" and "the political system of the country". The second factor "market environment of the country" is composed of "the situation on the capital market in the Czech Republic" and "the influence of competitors." The third factor "the levels of tax and interest rates" has been formulated on the basis of the variables "level of interest rates in the Czech Republic" and "the level of tax rates in the Czech Republic".

The effect of internal determinants of capital structure was perceived by the respondents as more important. This can be inferred from the fact that seven of the eleven factors are represented statistically the most significantly with highest number of evaluation "determinant rather has effect". Those factors were: "the current indebtedness of the company", "the costs of financial distress", "risk ratio", "business strategy", "deficiency of own equity", "financial freedom" and " the costs of debt". Factor analysis subsequently revealed three aggregate factors. The first factor "the corporate philosophy" includes the determinants of "business strategy", "risk ratio", "the impact of competition" and "the decision of the parent company". The second internal factor called "the cost of capital" is based on the mutual effects of "the costs of debt" and "tax shield". The third factor "financial health and corporate indebtedness" was revealed using the variables "deficiency of equity", "the cost of financial distress", and "the current indebtedness of the company".

The answer to the essential question of this article, whether the final capital structure

of a company is the result of its own decision-making, or rather a result of various external factors, thus tends rather to the predominance of the internal factors.

Based on the results of performed analysis it maybe stated, inter alia, that the survey results are consistent even with the pecking order theory, according to which companies consider internal equity as primary source of financing, and only in case of its deficiency consider using debt. At the same time, the survey results correspond with the trade-off theory of capital structure which is based on the compromise choice between the advantage of debt financing (interest tax shield) and the costs of financial distress (rising cost of capital).

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Abstract

FACTORS DETERMINING THE CORPORATE CAPITAL STRUCTURE IN THE CZECH REPUBLIC FROM THE PERSPECTIVE OF BUSINESS ENTITIES

Lenka Strýčková

The specific corporate capital structure is fundamentally a complex process dependent on a large variety of determinants; and the chosen financial strategy therefore depends on the particular decisions of individual firms. The aim of this contribution is to capture the most important determinants of the corporate capital structure from the perspective of entrepreneurs on the basis of an empirical inquiry. Although the number of respondents was limited, inquiry results still can be considered as relevant to formulate conclusions for small and medium-sized enterprises operating in the manufacturing and processing sectors with the legal form of the limited liability company. To identify the most important factors affecting corporate decisions concerning the sources of financing, the statistical methods and procedures were used for the research evaluation. With the help of factor analysis, the three key external factors, brought in by the entrepreneurs, were derived: the economic and political development of the country, the market environment of the country, and the levels of tax and interest rates. The effect of internal factors determining the corporate capital structure was perceived by respondents as more important. The inquiry revealed that the most important internal factors were supposed to be: the corporate philosophy, the cost of the capital, and the financial health and indebtedness of a business. The answer to the essential question of this article, whether the final capital structure of a company is the result of its own decision-making, or rather a result of various external factors, thus tends rather to the predominance of the internal factors.

Key Words: *Capital structure, debt, equity, determinants, factors, company.*

JEL Classification: *G32.*

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METHOD FOR SELECTING EXPERT GROUPS AND DETERMINING THE IMPORTANCE OF EXPERTS' JUDGMENTS FOR THE PURPOSE OF MANAGERIAL DECISION-MAKING TASKS IN HEALTH SYSTEM

Ilya Ivlev, Peter Kneppo, Miroslav Barták

Introduction

Current trends in scientific and technological advances are bringing a significant improvements in health care as a result of creation new tools tool to support decision making process for decision-makers (DM) [8], [11], [12], [23], [27]. The experts group approach is used in health sector both clinical [28], [31] and nonclinical [5], [24], [29], [30], [32] decision-making. The goal of this paper is to develop, test and analyse a methodology for determining the qualitative and quantitative composition of an expert group and its application on example of the health technology decision making in the Czech Republic. Health providers face the problem of trying to make decisions in situations where there is insufficient information and also where there is an overload of (often contradictory) information [13]. Regulatory and reimbursement authorities face uncertain choices when considering the adoption of health-care technologies [4]. As the largest share of healthcare expenditure is paid from public sources, the efficient decisions are not only purely technical and financial problem but may be seen as an issue of public interest in the broader terms. This type of decision-making methodology may have a very wide potential also outside the sector of healthcare [14], [16]. Unfortunately the decision-making in the healthcare (and many other part of public sectors) in terms of large investment the Czech Republic is relatively often the object of serious economics as well as legal concerns. To seek for evidence-based methodology that has a potential for evidence-based decision-making is very vital as an opposite to the decision-making influenced by partial individual and group interests.

Many of the most effective models used to find experts are mainly based on the language models [17], [33]. One of the problems with models based on language model frameworks is that they can take into account textual similarities between the query topics and documents [1], [20], [26]. The paper [2] provides two experts finding search strategies modelled to incorporate different types of evidence extracted from the data. The advantage of the modern approaches is machine learning techniques [18], [34] or discriminative probabilistic models [7] a possibility of aggregation of a large number of heterogeneous information. In addition to that, there are the following problems and difficulties: it is difficult to express qualitative information on experts in the quantitative form because information about the candidates varies with time; the experience of a candidate is always varying through time. [8]

In candidate-centric probability estimation approaches for academic expert finding [1], the assessment of an expert is made using generative probabilistic models. In query independent methods [25], knowledge of the expert candidates is presented as a mixture of language models. The person-centric [26] approach is increasingly being used. This paper [19] is based on textual similarities, the author's profile information and the author's citation patterns to try to find academic experts. The methods of Condorcet Fuse [19], Markov chain models [6] and multi-criteria decision-making methods 10] are recognised as representing the most relevant works [3]. The multisensory Data Fusion approach using Dempster-Shafer theory of Evidence together with Shannon's Entropy [20] was used for academic experts finding.

Experts finding is a difficult task because the experts and their skills and knowledge are rare, expensive, constantly changing and varying in depth. When addressing difficult multidisciplinary problems, a combination of knowledge from several experts is often required, especially from experts in various fields. Our method proposal is based on the research of experts' weighting factor determining that reflects the overall competence of the experts when problem solving.

1. Examination of Experts

An examination needs to be performed to determine the weight-coefficients of importance introduced by each criterion of choice. Depending on the scale of the problem, the examination is organised either by a DM in person or by an expert group appointed by the DM. Decisions about the number and competence of experts are made with regard to the scope of the task, the veracity of the evaluations of experts' characteristics and the available resources.

The following tasks need to be solved while creating the expert team: 1) understand the task to be solved by the experts; 2) determine fields of activity linked to the task; 3) decide what share in the team shall be allocated to experts representing each field of activity; 4) determine the number of experts in the team and draft a list thereof; 5) analyse experts' qualifications and edit the draft list of experts; 6) obtain the experts' agreement to work on the team; and 7) finalise the list of experts. Depending on the chosen form of determining experts' preferences, the main requirements of the experts are as follows: 1) competence (reliability and validity of decisions, awareness and reproducible assessment and argumentativeness replies); 2) impartiality; 3) creativity; 4) conformism; 5) team spirit (dependent on quaternary type); 6) relation to the examination; 7) degree of participation in the solving problem; and 8) communication skills (dependent on quaternary type) (Fig. 1).

The experts' characteristics, as listed above, give a comprehensive picture of the qualities that influence the examination results most strongly [20] (properties that are written on a black background are taken into account in our model).

2. Quantity List for the Expert Group

To determine the sufficient number of experts, we needed to find a number H, so that the inequality $W > H$ is true, where W is the dispersive Kendall's coefficient of concordance (coefficient of concordance of experts' opinions. Constant H is selected from the relationship $PW > H = \alpha$ and is fully defined by the level of significance α. It is irrational to select a low level of significance because its decrease results in an increase of H, which, consequently, increases the contingency of the error of the second type [13].

Thereby, we shall determine the necessary quantity of experts that guarantees, at a fixed level of significance, the given critical value of dispersive coefficient of concordance. For reasons of simplification, we shall consider the following relationship true:

$$P\left(W > H\right) \approx P\left[\left(\frac{\chi^2_{n-1}}{n-1}\right) > Hm\right] = \alpha. \quad (1)$$

As $\lim_{n\to\infty} \frac{\chi^2_{n-1}}{n-1} = 1$ (n = quantity of parameters), the level of significance of a criterion is determined by the product H^*m (m = number of experts), which, even with a small number of experts, can make α sufficiently small.

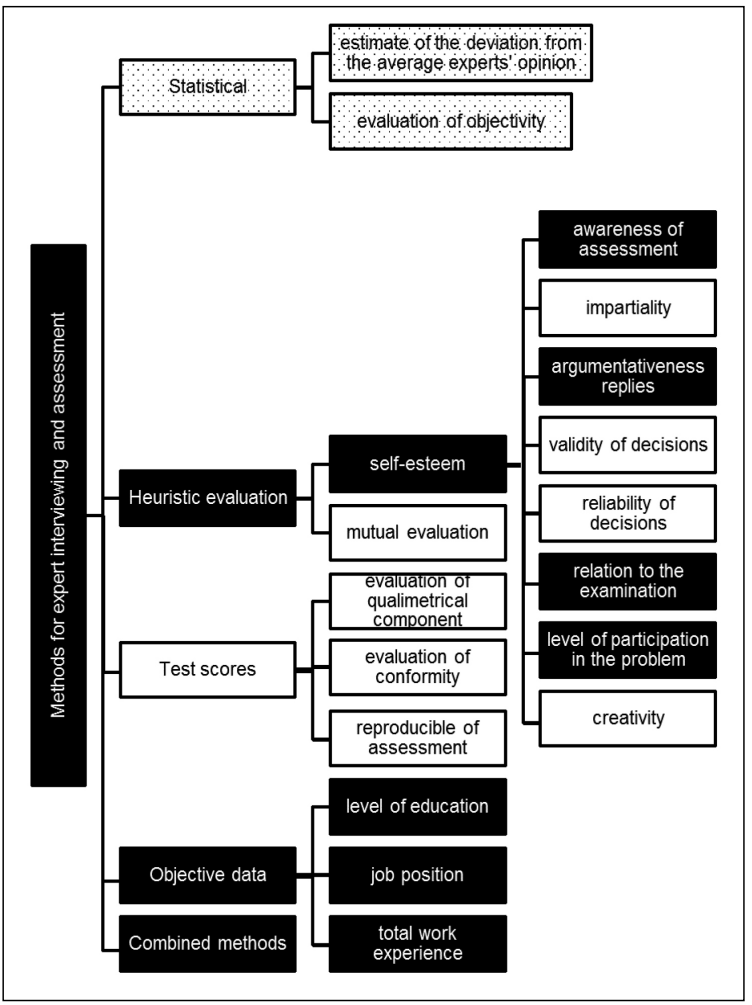
The survey of experts included recording, in an informative and quantitative form, the experts' opinions about a given problem. The main modes used to survey experts include questionnaires and interviews, discussions and brainstorming. The Delphi method could be used for consensus-building by using a series of questionnaires delivered using multiple iterations [19], [20].

3. Processing of Experts' Evaluations

Processing is needed to obtain generalised data and new information that is concealed in the experts' evaluations. If group evaluations of objects prove doubtful when compared with calculated statistics, it is necessary to determine the reasons for the failed examination. The most typical reasons for failed examinations include the following:

1. Drawbacks in the selection of the expert group: experts' goals did not correspond with the goal of the research (conflict of interests), unsound examination.

Fig. 1: Expert properties and methods of assessment



Source: own

2. A conflict of opinion exists. In order to discover different points of view, the experts need to be grouped according to how close their evaluations are. If such grouping proves successful, statistical processing has to be performed for each group separately.
3. Mistakes in the text of the questionnaire, e.g., ambiguous interpretation of questions or use of specific words.
4. Introduction into the questionnaire byway objects. Insufficient conformity of experts' evaluations does not allow for the group evaluations of all objects to be considered as reliable. If this situation occurs, those evaluations will need to be excluded and the results reprocessed.

Depending on the goals of the expert evaluation, the following main tasks are required to process the survey results: 1) determine experts' competences and generalised evaluations of objects, 2) rank the objects, 3) determine conformity in the experts' opinions,

and 4) determine the relationships among the ranged objects. The following section will describe the individual points relevant to the task we are solving.

3.1 Evaluation of Expert Competence in the Generalised Evaluation of Objects

The first prerequisite to ensure reliability of the examination results is to invite experts who are interested in the results of the examination. Concurrently, the goals of experts have to correspond with the goal of the examination, in general.

It is clear that in present-day conditions, formal indicators of experts (job title, science degree, work experience, number of publications, etc.) can be used only as secondary criteria in identifying experts' total competence that reflects their overall professional skills and qualities. When using the self-evaluation method, the expert provides information about the fields he or she is most competent in [22]. It follows that to evaluate experts' competences; several main methods could be used: self-evaluation, evaluation of a colleague's competence, testing of the experts, and the evaluation of them by the organizers of the examination based on previous examinations. The methods listed above belong to so-called external methods with respect to the conducted examination. However, the method of self-evaluation of competence rates the degree of the expert's self-confidence rather than their real competence. Similarly, during the evaluation method, other people's competence and the group's awareness about each other's abilities play a role. As can be seen, each method has its drawbacks. Other methods of evaluation of experts' competences use posterior data, or the results from the evaluation of objects. Here, experts' competences are evaluated by the degree of conformity of their evaluations to the group evaluation of objects [22]. The essence of this approach lies in the fact that experts who have expressed contradictory opinions receive low grades of competence, and consequently, their evaluations play a less important role when determining the group evaluation. When an expert's evaluation is close to the group's evaluation, the competence of this expert is treated as higher [21] and this fact could be used as a way of experts' competence determining. It should be noted, that grope opinion of experts with close overall competence level would have higher conformity [27].

3.1.1 Evaluation Based on Objective and Subjective Parameter Assessment

To prevent the results of the self-evaluation method from being a mere reflection of an expert's self-confidence, it is possible to use approaches [9] that provide an objective constituent of knowledge about the expert's competence (Tab. 1).

It is advisable to determine an index of relative self-evaluation by an expert based on the degree of their participation in elaborating the problem as a complex coefficient, which expresses the relationship between the expert and the examination, their participation and their interest. For each question or group of questions on which expert's competence should be evaluated, there is a corresponding scale called the "relative self-evaluation of expert" in the table of expert evaluations.

To prevent the grades in the scale from influencing the self-evaluation, the relative self-evaluation of expert scale contains a list of expert competence properties without any grades.

With this approach, the expert has to underline the properties that, in his or her opinion, determine the level of his or her personal competence. The grades [9] are added by the working group while analysing the collected questionnaires (Tab. 1).

3.1.2 Evaluation of Expert Awareness and His or Her Relevance of Knowledge

Another way (Tab. 2) to determine an expert's weighting factor is via the index of familiarity with the task. It is calculated on the basis of an expert's evaluation of their own familiarity with the problem and indication of typical sources of arguments to support their opinions (index of argumentation, results from summing up the grades in the reference table, index of familiarity with the problem and results from the expert's self-evaluation expressed on a 10-grade scale and multiplied by 0.1 with the purpose of bringing the value to one). In general, the relative self-evaluation of expert index is designed to make the expert perform a self-evaluation of his or her own competence on the given question.

Tab. 1: Questionnaire for evaluation of expert's competence

Objective evaluation								Subjective evaluation	
w_1		w_2		w_3		w_4		w_5	
Job position	Grades	Education	Grades	Total work experience (years)	Grades	Work experience in the problem area	Grades	Level of participation in the problem	Grades
Head of organisation	1.0	Ph.D.	1.0	>10	1.0	>10	1.0	Expert specialises in the given issue	1.0
Deputy head	0.8	Higher education (master)	0.8	10-5	0.8	10-5	0.8	Expert participates in practical work on solving the issue, but the issue does not belong to the expert's indicated specialisation	0.8
Head of department	0.6	Higher education (bachelor)	0.6	<5	0.6	<5	0.6	The issue belongs to the expert's specialisation	0.6
Deputy head of department	0.4	less	0	0	0	0	0	The issue does not belong to the expert's specialisation	0.3

Source: [9]

Tab. 2: Reference table of indices of argumentation ($w_{6,j}$)

$w_{6,j}$	Sources of arguments	Level of source's influence on the expert's opinion				
		Indicators and their weights	I read often and regularly	I read often, but not regularly	I read seldom	I do not read at all
			100%	75%	20%	0%
$w_{6,1}$	Summarising papers by local authors		0.250	0.187	0.050	0
$w_{6,2}$	Summarising papers by foreign authors		0.250	0.187	0.050	0
$w_{6,3}$	Patent information		0.250	0.187	0.050	0
$w_{6,4}$	Companies' reports (catalogues, brochures, recommendations, etc.)		0.250	0.187	0.050	0

Source: own

$$W_6 = \frac{1}{4}\sum_{j=1}^{4} W_{6,j} \quad (2)$$

Practical research on expert polls show that although self-evaluation methods are not sufficient as the sole criterion for determining expert competence, their application provides a more well-founded selection and evaluation of the experts [9]. To solve the problem of setting the weight coefficients of experts and, thus, determining the probability of obtaining reliable evaluations, we propose to create a comprehensive method based on the approach that combines various competence evaluation methodologies: a self-evaluation of experts about their own competence on the problem; an introduction of grades for objective data and an appreciation of the index of argumentation. Thereby, the competence index of an expert can be treated as a probability of the expert's giving a reliable evaluation, where $0 \leq W_e \leq 1$.

4. Results and Discussion

4.1 Determining the Quality of the Expert Group

The methodology was used for the selection of experts for the propose of rational selection of large medical equipment such as, computed tomography (CT), mammographic digital X-ray systems (MAM), magnetic resonance imaging (MRI), radiographic/fluoroscopic systems (general purpose) (RFS), ultrasonic scanning systems (cardiac) (USC) and ultrasonic scanning systems (general purpose) (USG). The list of most health care facilities or departments in the Czech Republic where CT, MAM, MRI, RFS, USC and USG are located was formed. Potential experts were asked to answer the web-based questionnaire. The purpose of experts groups' creation was presented in each questionnaire. Candidates for the experts were managers (heads of departments, heads of clinics, etc.) and employees (physicians, biomedical engineers, radiological assistants, senior technicians, etc.) from the departments of radiology, imaging methods, radio diagnostics, interventional radiology, departments of cardiology and the Institute of radiology and the other departments in hospitals of all levels of organisation and all regions of the Czech Republic. The selection of experts was conducted with 872 employees from 422 health facilities in the Czech Republic (Tab. 3).

The method of selecting the most knowledgeable experts for the task of selecting and procuring medical equipment for hospitals is based on 1) the expert's overall work experience, 2) experience in solving tasks, 3) level of education and scientific record, 4) interest in solving the particular task, 5) current position and 6) awareness of how to solve the task. This study also considered the

Tab. 3: The participants of the survey

The task	The number of health care facilities' staffed potential experts	The number of questionnaires sent	The number of responses
Selection of MRI	34	60	19 (31.7%)
Selection of mammographic digital X-ray systems	68	125	18 (14.4%)
Selection of USC	101	190	22 (11.6%)
Selection of CT	89	162	15 (9.3%)
Selection of USG	116	116	9 (7.0%)
Selection of RFS	14	219	13 (6.0%)
Total	422	872	96 (11.0%)

Source: own calculations

7) relevance of the expert's knowledge and 8) the overall self-evaluation concerning their total competence in solving the task.

The data obtained from the questionnaire of experts did not follow a normal (Shapiro-Wilk test) distribution ($p < 0.001$) ("Source of argumentation" [$p = 0.029$] and "Self-ranking" [$p = 0.003$]). An analysis of the results revealed (Mann-Whitney U-test) that there was no reason to reject the null hypothesis that the inter-group values of the compared (total rating w_{TR} and self-rating w_{SR}) characteristics were homogeneous ($p = 0.285$). A medium-strength positive correlation (Spearman's rank correlation) was found between the two measures ($r = 0.550$, $p < 0.001$) (Fig. 5).

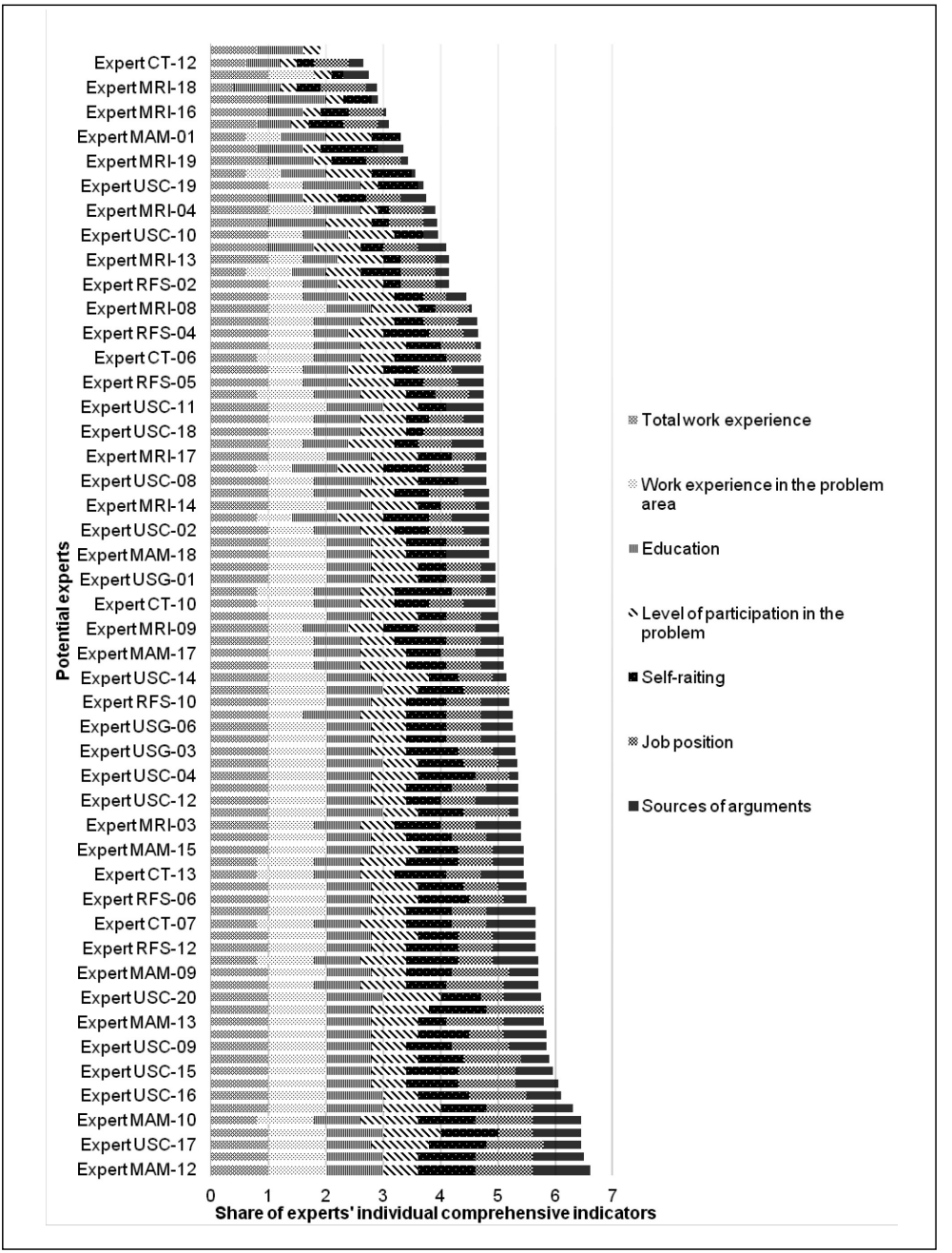
Examinations of the correlations between the components that determine the total weight of the experts were performed. The correlations between "Work experience in the problem area" and "Education" (r = 0.268; p = 0.01) and "Work experience in the problem area" and "Job position" (r = 0.342; p = 0.001) suggest that solving the task of selecting large medical equipment participating potential experts with higher level of education and higher operating positions. The task of selecting large medical equipment is categorised as a managerial task should be solved by the most experienced professionals filling a managerial role.

The moderate correlation between "*Work experience in the problem area*" and "Sources of arguments" ($r = 0.394$, $p < 0.001$) and the weak correlation between "Work experience in the problem area" and "*Level of participation in the problem*" ($r = 0.239$, $p < 0.022$), as well as "Sources of arguments" and "Job position" ($r = 0.231$, $p = 0.027$), indicate that higher levels of expert experience equate to higher levels of participation in solving the task, higher levels of theoretical preparation and higher levels of overall competence.

The w_{SR} index was obtained as a result of experts' self-rankings on a scale from zero (*I am NOT competent in addressing the issue of selection*) to 10 (*I am competent in addressing the issue of selection*). The w_{SR} most closely correlated with "Work experience in the problem area" ($r = 0.519$, $p < 0.001$), that is, 52% of the general weighting factor consists of the experts' «Work experience in the problem area». The next parameters most closely correlated to the w_{SR} were the experts' levels of argumentativeness (theoretical preparation, source of arguments and awareness) ($r = 0.440$, $p < 0.001$), "Job position" ($r = 0.319$, $p = 0.002$) and "Education" ($r = 0.280$, $p = 0.007$). The presence of the above correlations indicates that the index of experts' self-rankings is dependent on "Work experience in the problem area", "Sources of arguments", "Job position" and "Education". A statistically significant association was not detected between w_{ST} and the experts' total work experience ($p = 0.089$) or w_{SR} and level of experts' participation in the problem solving task of selecting medical equipment ($p = 0.200$).

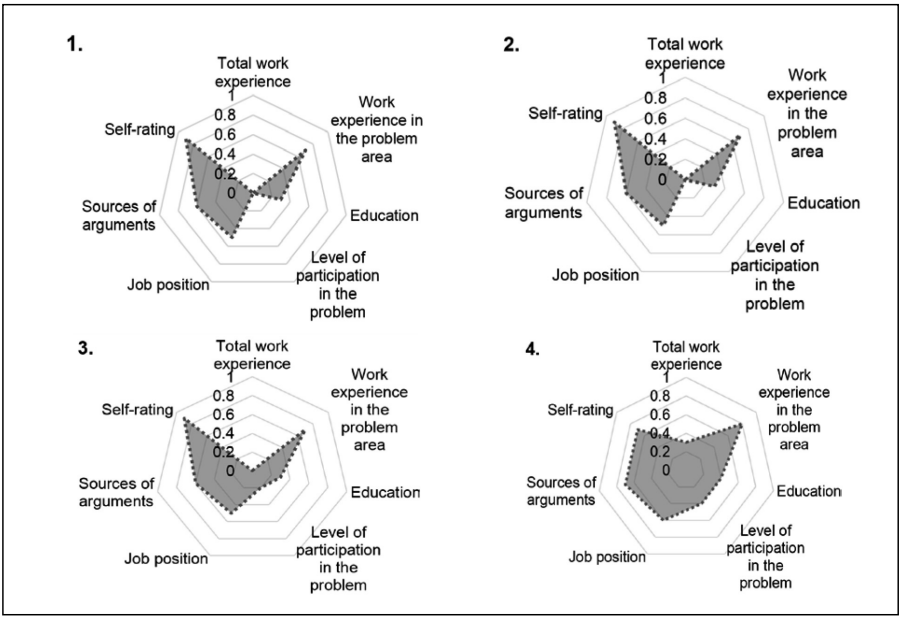
Fig. 2 shows that the least sensitive (less varying, depending on the expert) indicators were "Total work experience", "Education", "Work experience in the problem area" and "Level of participation in the problem". These results are indicative of the fact that specialists with a high level of education and high-quality positions, whose work was related to the problem of selection, were pre-selected as experts.

Fig. 2: **The list of experts in order by their comprehensive assessment of competence (values obtained from the evaluation of experts on the objective and subjective criteria and evaluation of their own opinions about their own competence)**



Source: own calculations

Fig. 3: **The equity structure of the total weight 1 – $W_e^{(1)}$, 2 – $W_e^{(2)}$, 3 – $W_e^{(3)}$ and 4 – $W_e^{(4)}$**



Source: own calculations

4.2 The Overall Weight of Experts' Competence

Four different calculation models (Fig. 3) for the total competence weighting factor were investigated to determine the final model for calculating the total weight of competence of each expert.

In the first method:

$$W_e^{(1)} = \frac{1}{2}\left(w_{ST} + w_{TR}\right), \tag{3}$$

where

$$w_{TR} = \frac{1}{n}\sum_{i=1}^{n} w_i, \tag{4}$$

the weight of each of the coefficients (w_{ST} and w_{TR} [formula 4]) are considered equal, i.e., the contribution of each of the coefficients to the total weight $W_e^{(1)}$ is the same (as in $W_e^{(2)}$ and $W_e^{(3)}$) (Fig. 5). Since the arithmetic mean is not a robust statistic (is subject to strong influence of large deviations), $W_e^{(1)}$ increasingly relies on the uncertainty of w_{ST} (Fig. 6-B).

The second method of calculation

$$W_e^{(2)} = \sqrt{w_{ST}^2 + w_{TR}^2}, \tag{5}$$

is an adaptation of the calculation of the A-type uncertainty measurement in a calibration, where the input values are correlated, as in this case (r = 0.55, p < 0.001) (Fig. 5). The w_{TR} is viewed as uncertainty in the assessment of competence obtained on the basis of objective and subjective parameters. The w_{ST} is viewed as the uncertainty contributed by other unaccounted factors. The experts' weighting factors obtained by this method were very accurate reproductions of the estimate $W_e^{(1)}$ (r = 0.998, p < 0.001) (Fig. 6-B, Fig. 6-C) and faithfully reproduced the estimates for w_{ST} and w_{TR}.

In the third model,

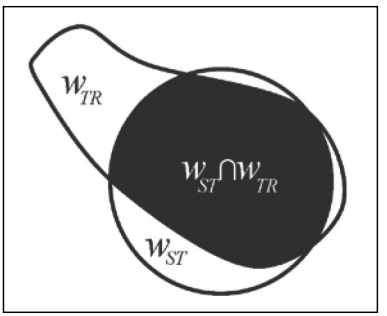
$$W_e^{(3)} = w_{ST} \times w_{TR}, \quad (6)$$

the single estimates w_{ST} and w_{TR} were viewed as the probability (formula 7) of the simultaneous occurrence of two independent events.

$$P(AB) = P(A) \times P(B). \quad (7)$$

Hence, the general probability $W_e^{(3)}$ was regarded as the value contained in the region of overlap of probabilities w_{ST} and w_{TR} (Fig. 4).

Fig. 4: The overlap of probabilities w_{ST} and w_{TR}



Source: own

With the use of the product, both variables w_{ST} and w_{TR} were endowed with the property of equal importance (equivalent in the same manner as in $W_e^{(1)}$ and $W_e^{(2)}$).

A very strong correlation was found between the weighting factors $W_e^{(1)}$ - $W_e^{(2)}$ (r = 0.998, p < 0.001) and $W_e^{(1)}$ - $W_e^{(3)}$ (r = 0.998, p < 0.001). From the figure (Fig. 6-A, Fig. 6-B, Fig. 6-C), it seems that the nature of the curve $W_e^{(k)}$ corresponded more to w_{ST} and less with w_{TR} (Fig. 5). When using multiplication during the $W_e^{(3)}$ calculations, the slope of the curve changes (Fig. 6-D).

The slope of the curve changes, because of the fact (due to the multiplication) that experts with larger w_{ST} and w_{TR} get more weight $W_e^{(3)}$ and experts with lower values of w_{ST} and w_{TR} get less weight $W_e^{(3)}$, in the context of this task is no longer justified. This is considered artificial expert dilution and is leading to a loss of proportional relationships between them.

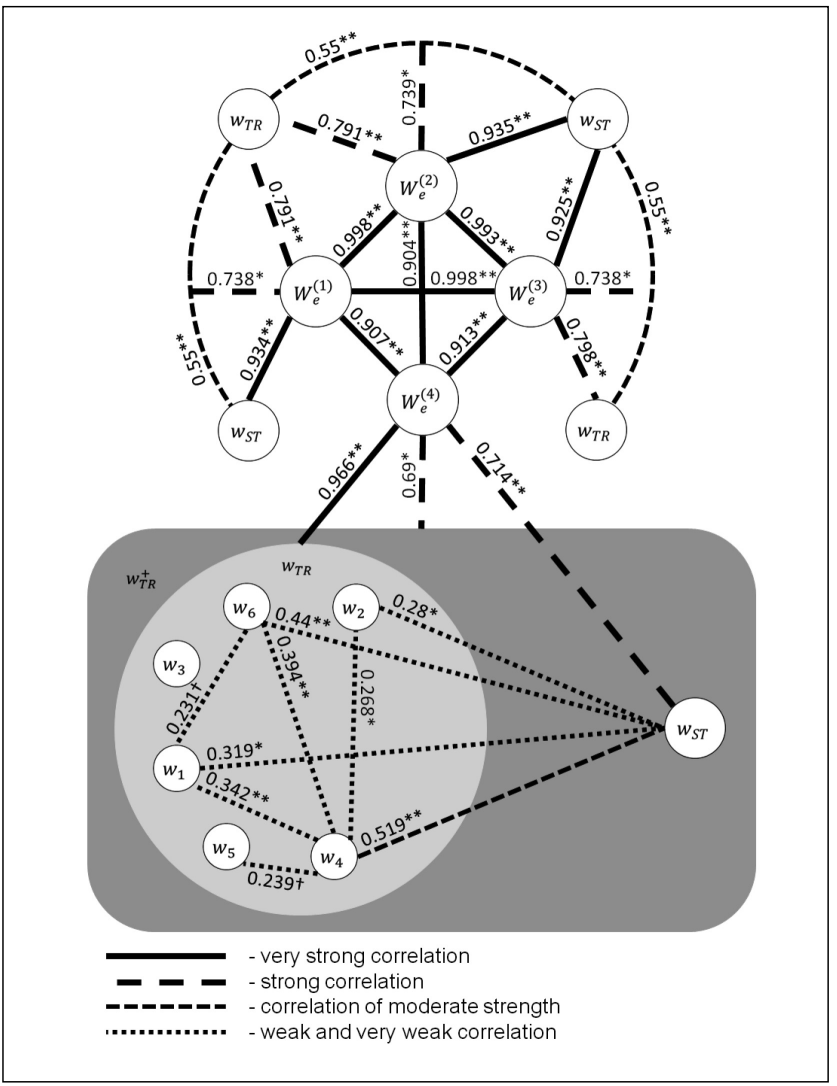
The fourth approach to the definition of W_e is fundamentally different:

$$W_e^{(4)} = w_{TR}^{+} = \frac{1}{n+1}\left(\sum_{i=1}^{n} w_i + w_{ST}\right). \quad (8)$$

The w_{ST} here was part of $W_e^{(4)}$, along with other components (w_i). The estimate $W_e^{(4)}$ corresponded more to w_{TR} (r = 0.966, p < 0.001) and less to w_{ST} (r = 0.714, p < 0.001) (Fig. 5), which was contradictory to $W_e^{(1)}$, $W_e^{(2)}$ and $W_e^{(3)}$. Thus, this was also true when the w_{ST} became a subsidiary corrective measure of $W_e^{(4)}$. The shape of the curve $W_e^{(4)}$ (Fig. 6-A) was more consistent with the comprehensive assessment w_{TR}, which was calculated on the basis of objective and subjective information.

The use of the model $W_e^{(4)}$ eliminated violations of proportionality extreme values, and considerably reduced the effect of uncertainty w_{ST}. This effect is desirable because the importance attached to w_{ST} is unjustified. The w_{ST} depends too much on experts' own psychological states and their understanding of the grading scale. The model for calculating $W_e^{(4)}$ is the most suitable for the determination of experts' general competences. The estimate $W_e^{(4)}$, for obvious reasons, less effectively reproduced (r = 0.690, p < 0.01) the union of following weight functions, w_{ST} and w_{TR}, than the estimates obtained by other methods ($W_e^{(1)}$, $W_e^{(2)}$ and $W_e^{(3)}$). (Fig. 5).

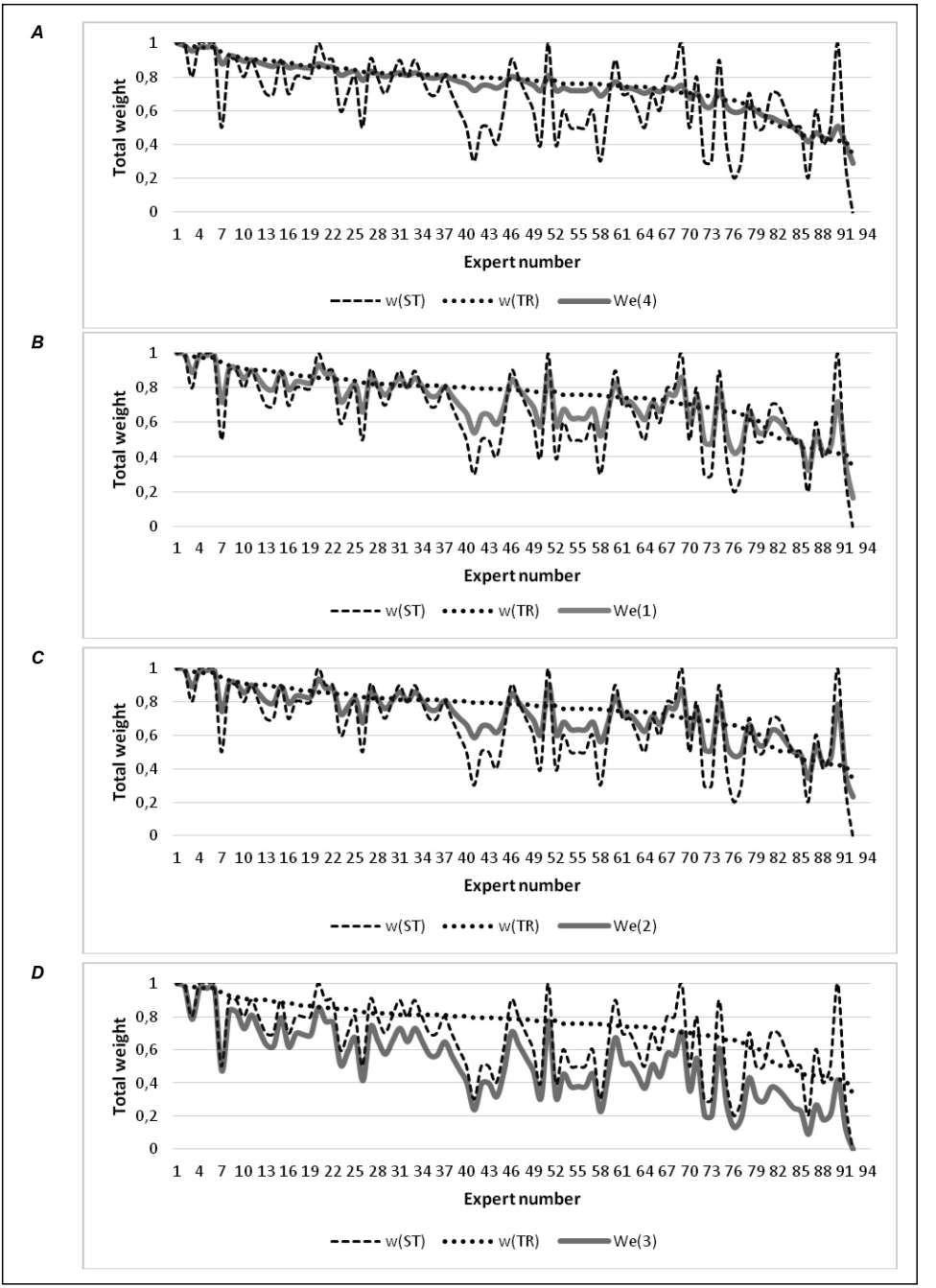
Fig. 5: **The correlation between the estimates 1) obtained by the self-assessment w_{ST} and 2) obtained on the basis of objective and subjective data w_{TR}**



Source: own calculations

† - $p \leq 0.05$; * - $p \leq 0.01$; ** - $p \leq 0.001$

Fig. 6: Comparison of the curves w_{ST} and w_{TR} with $A - W_e^{(4)}$, $B - W_e^{(1)}$, $C - W_e^{(2)}$ and $D - W_e^{(3)}$



Source: own calculations

The greatest difficulties in establishing an expert group include the following: 1) the complexity of taking into account the diverse properties of the expert, 2) the integration of humans' psycho-physiological characteristics (a tendency to take risks, a tendency to formalise and subconscious preference for various numbers), 3) the complexity of describing of the study area and 4) accounting for all components.

Conclusions

This paper developed, tested and analysed a method for determining the qualitative and quantitative composition of an expert group. As a result of the application procedure, each potential expert was evaluated on eight complex-valued criteria based on objective and subjective data. After the evaluation, each expert was given their own weighting factor regarding the importance of their judgments. The most important expert properties that might be considered for determination of their general weight included the following: 1) professional competence (reliability and validity of the decisions rendered), 2) impartiality, 3) objectivity, 4) concern in participating in the examination, 5) ability to operate on a scale of relations and a scale of probability, and 6) ability to take into account the large number of gradation scales. Another important factor is the reproducibility of the results, which can be assessed by numerous questionnaires. Thus, the accuracy of judgment of correctly formed expert groups is sufficiently large, and the error does not exceed 5–10%. This method can be used in the formation of an expert group for virtually any application. This approach to the decision-making processes in the health sector may be understood as a contribution to the evidence based health policy with respect both to the nonclinical as well as clinical decisions. This methodology may be a partial contribution in some fields of scientific and technological forecasting, managerial decision making, quality assessment and operational research both in public and private sector.

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Abstract

METHOD FOR SELECTING EXPERT GROUPS AND DETERMINING THE IMPORTANCE OF EXPERTS' JUDGMENTS FOR THE PURPOSE OF MANAGERIAL DECISION-MAKING TASKS IN HEALTH SYSTEM

Ilya Ivlev, Peter Kneppo, Miroslav Barták

This work aims to develop a methodology for determining the qualitative composition of an expert group and the weighting factor regarding the importance of expert's judgments for the purpose of participating in decision-making. It is based on the expert's overall work experience, experience in solving tasks, level of education and scientific record, interest in solving the particular task, current position and awareness of how to solve the task. This study also considered the relevance of the expert's knowledge and the overall self-evaluation concerning their total competence in solving the task. For the purpose of validating the methodology, 96 potential experts (physicians, biomedical engineers, radiological assistants, medical physicists, etc.) from 72 health facilities in the Czech Republic were interviewed through a web-based questionnaire. The calculation model that was selected was able to eliminate errors in estimating the proportionality of extreme values and reduces the impact of uncertainty in the experts' overall self-evaluations concerning their total competence. A statistically significant correlation was found between the complex weighting factor and the following characteristics: the expert's experience in dealing with similar tasks ($r = 0.512$, $p < 0.001$), the expert's theoretical background (awareness) and the relevance of the expert's knowledge ($r = 0.440$, $p < 0.001$), the expert's current position ($r = 0.319$, $p = 0.002$) and the level of his or her education and scientific record ($r = 0.280$, $p = 0.007$). The developed methodology may be especially useful in scientific and technological forecasting, medical and managerial decision-making, quality assessment and operational research.

Key Words: *Group decision making; expert; expert selection criteria; medical equipment; self-assessment; weighting factor.*

JEL Classification: *C44, D81, I11.*

DOI: *10.15240/tul/001/2015-2-005*

THE POSITION OF MANAGEMENT OF CZECH JOINT-STOCK COMPANIES ON DIVIDEND POLICY

František Sejkora, Pavel Duspiva

Introduction

The concept of distributing economic results belongs unequivocally among the basic financial decisions of management. Dividend payout to shareholders can be considered to be dividing profits while fulfilling legal conditions. For many shareholders, the payment of dividends is an important part of their investment decisions. Dividend policy can be defined as determining the method which provides the basis for whether profits will be withheld, shared or used for other purposes. Financial management must implement dividend policy in accordance with other financial decisions, i.e., primarily with investment (how and in to which activities to invest resources) and financial (what sources to use to finance their activities) decisions. From the perspective of financial theory, dividend policy is usually considered against the backdrop of the company's original goal, which is – according to current financial economics – maximizing the firm's market value. In 1961, economists [27] published a theoretical article with the title: "Dividend Policy, Growth and the Valuation of Shares," which is still one of the most discussed controversies in financial theory. The authors of this article submitted scientific evidence about the fact that a shareholder or potential investor is irrelevant to the company's dividend policy, because this does not influence firm value. In other words, receiving dividends or withholding and reinvesting company profit is considered mutually interchangeable. According to this theory, if the profit is reinvested, the firm's market value increases to the level that the investor would receive in the case of sale of shares plus the equivalent amount of unpaid dividends. Their article was a genuine breakthrough, because, at that point, most economists believed that the appropriate dividend policy would influence the firm's market value. According to the authors, the one determinant which does influence the firm's market value is the firm's investment options, therefore, not the dividend amount. The company should accept only projects with positive net present value when accepting such projects leads to maximizing the firm's market value. This theory is founded on the presumption of the existence of a perfect capital market; according to critics of the theory, this does not exist, because the world is full of market imperfections. Another premise is the existence of absolute certainty when decision-making concerning economic entities and the rational behavior of all participants of the financial market in the case that everyone has access to the same informational content and zero transaction costs. Despite these relatively strong and unrealistic preliminary requirements, it emerges from the authors' work that the dividend does not raise firm value by itself, but only implicitly through the market's imperfections.

A significant reason why companies pay dividends is the existence of the principal-agent theory. To a certain degree, dividend payout can reduce conflicts that can arise on account of the differing interests of individual parties during the administration and management of the company.

Asymmetrical information is one cause of the market mechanism's failure. The actual market does not evaluate known and certain values, but evaluates the prospective trend of a company's current and future yields. When it is assumed that managers have more timely information about the company's actual value and potential, dividend payments carry information about the company's future profitability.

Another significant characteristic that influences individual companies' dividend policy is taxes. More or less, different countries have different tax systems, which categorize capital and dividend yields into frequently differing tax

groups; for example, there may be high rates of implemented tax dependent on the investor's income.

The firm life-cycle theory of dividends explains how companies adapt payout ratio dependent on their own development when, on one hand, the costs drop for acquiring borrowed capital, and, on the other hand, agency costs are incurred. According to [25], the condition of uncertainty makes dividend decision-making a behavioral question, when an increase in profit is transferred to the dividend only when a firm is certain that it will not have to revise its decision in the future.

The large number of articles appearing (primarily in international literature) is evidence that the problem of dividend policy has not yet been satisfactorily resolved. For the most part, current empirical studies are founded on data that have come out of maturely developed countries. Recently, gaps have been filled in the form of studies founded on data from developing countries. Studies show the existence of significant differences in dividend policy implemented in companies – not only on the market overall, but also within individual sectors. There are only a few papers devoted to dividend policy in professional Czech literature [13], [33], which come from the first half of the last decade.

From theoretical and empirical studies, it is apparent that the significance of dividend policy as a tool for maximizing the shareholders' wealth is not clear-cut for individual companies. If we take into consideration that each company determines its dividend policy as a function of the market imperfection it faces, this conclusion is not surprising.

The goal of this article is to identify factors that have a fundamental influence on dividend payout and to further determine and evaluate the position of management on dividend theories. This goal is current as set within the conditions of Czech joint-stock companies, because deeper studies in this area are not available for recent years. Nevertheless, the greater majority of joint-stock companies currently pay dividends and dividend policy has become a part of their financial policy that is impossible to overlook.

1. The Reasons Why Companies Pay Dividends

Various theories have been developed to explain the reasons why companies pay dividends. According to critics of the thesis about dividend irrelevancy, these authors' [27] model is too abstract and unusable in the real financial world. Looking from the perspective of their potential impact on dividend irrelevance, the authors distinguish three large market imperfections: (1) principal-agency, (2) information asymmetry and (3) taxes [24]. In addition, empirical studies claim that company characteristics such as the phase in a company's life cycle, ownership structure, the number of shareholders and firm size all play a fundamental role in dividend payout. Not least when considering dividend determination, is the behavioral question.

1.1 Market Imperfections

The division of management from company ownership leads to agency conflict; this can result in situations where the shareholders' and management's interests do not coincide, and they can even end up working against each other. Management's members centralize the daily managerial agency in their hands, but they are not the investors. This managerial agency requires decision-making, which is regularly supported by the use of quantitative methods [9]. Naturally, this leads to conflict that, on one hand, admits the possibility of the investment's direct devaluation and concern about the ineffective use of entrusted financial resources as well as the possibility of opportunistic behavior on the part of management or minimizing risk when conducting business [18]. To a certain degree, dividend payout can actually reduce this type of managerial conflict. Dividend payout changes the ratio of owned capital and borrowed capital as well as the decrease of financial resources. As a result, the company must take care of necessary financial resources for investment on the financial market. The financial market represents not only an important source for financing enterprises, but also the main supervisory institution overseeing the management's behavior ([10], [17]).

In companies, agency conflict also occurs between the majority and minority shareholders. The authors of [34] state that problems of agency related to significant joint-stock interest are more difficult to supervise than problems of agency which occur in relation to delegating management's decision-making powers. The authors of [22] present two models for a company's minority shareholder dividend policy, which are modified and empirically

tested in various forms. In the first, minority shareholders use their power and request dividend payout because of limited potential for personal reward on the part of the majority shareholders. Empirical studies by these authors [16] support this hypothesis. The second model presumes the dividend is a substitute mechanism for relieving conflict between minority and majority shareholders. Majority shareholders are motivated to pay dividends primarily in countries with low safeguards for minority shareholders with the goal of creating a good company reputation and, therefore, ensuring better access to sources for financing the company. Empirical studies by these authors [19] support this hypothesis.

Finally, the third agency problem concerns the conflict between the firm alone and third parties, primarily concerning company creditors. The authors of [31] present a number of ways for shareholders to expropriate wealth from creditors. One of the most common ways is insufficient investments where shareholders prioritize dividend distribution at the expense of investments in new projects, which leads to increasing risk from the perspective of the creditors. The authors of [5] followed up on this idea in article [22] and consider the dividend to be a substitute mechanism for relieving conflict between shareholders and creditors. In their empirical research involving 35 countries around the world, the authors of [7] come to the conclusion that creditors have a greater influence on dividend politics than shareholders.

The work with information is among the factors that decide about the quality of business activities-therefore it is the resource of inimitable competitive advantages [29]. Another market imperfection is the existence of information asymmetry between shareholders and management. According to the conclusion of the authors of [27] the dividend alone does not increase firm value. Information about expected future profits, which the dividend yields, increases firm value. If the signaling theory is correct, investors can then deduce information about the company's future profitability by changes in dividend policy.

Part of the signaling theory is the assumption of information asymmetry between managers and investors in access to information about company prospects. It is possible to overcome this asymmetry with the help of dividend signaling. In order for this signal to be credible, it must carry costs with it, which limits less successful companies from false signaling using dividends. These costs are generally understood to be higher tax rates [20], though they can be also transaction costs [4] or costs coming from sub-investment [28]. All three models agree on the conclusion that more profitable companies pay higher dividends as well as that higher dividends are linked to higher stock prices.

The extensive empirical research that has been previously conducted does not give clear-cut support for the signaling theory. Evidence that a relationship between dividends and stock price exists was confirmed by the majority of empirical research that has been conducted (e.g. [1], [26]). Nonetheless, empirical evidence about whether dividends carry information concerning the firm's future profitability are not so clear-cut. Empirical studies confirming that dividends carry information concerning future profitability are [14] and [32], for example. Conversely, the relationship between dividends and future profit was not confirmed, for example, in this study [2].

For many investors, investment into shares is an important part of their decision-making processes. For situations with at least two alternative solutions, it is possible to successfully apply the methods of multiple-criteria decision analysis [15]. Various tax burdens for dividends and capital yields create different groups of investors interested in various corporate dividend policies. If capital yields are taxed with a lower rate than dividend yields, then investors with higher profits will prefer capital yields. On the other hand, the market has investors with lower or no tax from direct dividends, which are, in relation to the clientele effect, unequivocally for stocks with high dividends. If there is a change in their preferred company's dividend policy, then investors can sell that company's shares, or the company can attract a group of different investors, which can result in this influencing the price of shares.

Empirical verification of this theory is conducted with the help of a drop in the stock price on the ex-dividend date. The authors of [11] were the first to empirically confirm the clientele effect theory. In conclusion, the authors found that investors from the group with higher tax burdens should prefer companies with lower dividend yields and the reverse. In researching the tax effect for the drop of prices on the ex-dividend

date, empirical studies primarily use changes in tax systems. For example, the authors of [21] corroborated the tax clientele effect, though the tax effect was not upheld in the study by these authors [35], for example.

1.2 Other Reasons for Dividend Payout

We can add managerial preference to the list of other reasons why a firm pays dividends. In their research, the author of [25] performed a range of interviews with company managers on their firm's dividend policy. The author alleges that, when there is uncertainty, dividend decision-making becomes a behavioral question. One of the most important conclusions was that companies have a set long-term payout ratio. Therefore, joint-stock company management will not implement change in the dividend policy if they are not able to ensure a stable dividend level for the given time interval in the future. Management considers frequent changes in dividend policy to be a negative signal for investors in the form of future economic uncertainty for the company. These conclusions are supported by many empirical studies. The authors of [3] (1997 page of 1032) state: "Lintner's model of dividends remains the best description of the dividend setting process available." The authors of [23] state that over the course of the last 80 years, the number of companies that apply this model of corporate dividend politics has been increasing.

Another key factor is the theory of the firm life cycle. The firm life cycle theory assumes that dividend payout is dependent on the company's developmental phase, where financial indicators such as profitability, size, investment opportunities and capital structure change over time. After reaching a certain life cycle phase, the company is not capable of finding appropriate investment resources for its generated cash flow, and, therefore, distributing financial resources to investors in the form of dividends appears to be the most convenient strategy. This dividend theory explains how companies adjust payout ratio in dependence with their development when, on one hand, costs for obtaining borrowed capital decrease and, on the other hand, agency costs appear [6]. The authors of [12] assert that large, established companies with high profits and slow growth are more willing to pay dividends. The authors of [8] cite the ratio of undivided profit to owned capital as an indicator of life cycle phase.

2. Research Goal and Methods

The research concept arose from existent findings for the problematic being investigated. The basic research goal was to establish factors that influence management concerning dividend policy in the investigated sectors and the stance of respondents as to whether dividend policy can influence firm value. The following research questions and hypotheses were established for this purpose:

Research question: What factors influence management when making decisions concerning dividend payout?

Hypothesis H1: Dividend payout influences market imperfections, which results in influencing firm value.

The following sub-hypothesis were defined to verify their validity:

H1a: Dividend policy influences firm value.

H1b: Dividend policy influences investment and financial decision-making.

H1c: Dividend policy decreases information asymmetry between management and shareholders.

H1d: Dividend policy decreases agency costs between management and shareholders.

H1e: Dividend policy reflects the shareholders requirements.

Regarding the fact that the necessary condition for dividend payout is profit, research was aimed at the sector "Production and Distribution of Electricity, Gas and Water," which is most interesting among Czech joint-stock companies from the perspective of profitability and frequency of dividend payout. For the reasons of quantitative research, a two-part questionnaire was created. The first part of the questionnaire provided the answer to the research question and contained 20 factors that influence dividend policy in the chosen sector. The choice of factors arose from both theoretical findings on dividend theories as well as empirical examination. Other than this, the respondent had the option to fill in factors not included in the list. This option remained without response. Individual factors were evaluated with the help of a four-point scale of importance where 0 = none, 1 = low, 2 = medium, 3 = high concerning the importance of the given factor.

For testing the importance of individual factors, the t-test was used; a two-sided hypothesis was tested as to whether the middle value of the factor's importance equals an average of 1.5.

The second part of the questionnaire verified the group of five sub-hypotheses which were corroborating the main hypothesis of whether dividend policy can influence firm value. The respondents' individual positions were evaluated with the help of a 1 to 5 scale where the value of 5 represented strong agreement, 4 = agreement, 3 = without opinion, 2 = disagreement, and 1 = strong disagreement.

The validity of the sub-hypotheses was determined according to the number of answers obtained. The Wilcoxon signed-rank test was used to verify the significance of individual assertions; in this, a two-sided (or a one-sided) hypothesis was tested for whether the middle value of the median equals 3 (or is larger or smaller than 3).

The starting point for establishing the scope of the basic sample group suitable for research was the Amadeus database. In the Czech Republic, there are 225 companies active in this sector out of an overall number of 25,237 joint-stock companies. Of these, the largest number of companies are producers and distributors of electricity, gas, steam and hot water (around 2/3); the remainder are concerned with water manufacture and treatment. With regards to the assumption that dividend decision-making is primarily implemented by larger companies and those with a definite history, the basic group was further reduced to exclude companies with a yearly turn-over of under 30 million CZK and companies founded after 2008. The final scope of the basic sample which fulfilled the defined requirements was 159 joint-stock companies active in the investigated field.

The survey took place from November 2013 to January 2014. The questionnaires were distributed to the selected businesses via electronic mail and students from the University of Pardubice. The questionnaire was created for workers in financial management – specifically, members of the executive board, who are assumed to have comprehensive knowledge and an overview of the company. In light of the number of contacted respondents, the authors attempted to ensure a sufficient representative sample. It is possible to estimate the necessary minimal sample size using the following relationship:

$$n \geq \frac{t_{\alpha}^2 * p * (1-p)}{d^2} \quad (1)$$

where:

t_{α} is the coefficient of reliability for the selected reliability α,

p is the estimate of the relative frequency of surveyed criteria in the basic sample,

d is the required permissible error,

If we require 90% reliability with a permissible error of 11%, then the minimum number of surveyed respondents is the following:

$$n \geq \frac{1.645^2 * 0.16}{0.11^2} = 35.78 \quad (2)$$

The minimum number of surveyed respondents for determining representation of selection should be 36.

From the perspective of probable statistics, the sample group was established by non-random selection. With respect to the fact that the basic sample is not extensive, all 159 companies were contacted using the questionnaire.

Of the total 159 companies contacted, 44 questionnaires were returned. Two of the returned questionnaires were not entered into the statistical evaluation, because they were not completely filled out. The overall return rate was 26.42%. The representation of companies engaged in production and treatment of water was 45% of the sample and the rest, i.e., 55%, were producers and distributors of electricity, gas, steam and hot water. On the basis of the above information, we can consider the sample group to be representative.

3. Research Results

Table 1 provides the answers to the research question concerning which factors influence management when making decisions about dividend payout. The table illustrates the order of individual factors from most significant to least significant, including descriptive characteristics of the statistics (statistically significant differences are in bold type).

From the data in the table, it is clear that management considers a wide range of factors when devising dividend policy. That indicates that dividend policy among the investigated companies differs, and there is no one factor

Tab. 1: The factors influencing management when making decisions about dividend payout

Factor	Level of Importance (%)				Average	t-test
	None	Low	Medium	High		
	0	1	2	3		
F5 Existing shareholder requirements	4.76%	0.00%	35.71%	59.52%	**2.5**	**8.75**
F11 Limiting liquidity (access to funds)	9.52%	21.43%	45.24%	23.80%	**1.95**	**2.97**
F1 The amount of actual profit	9.52%	21.43%	45.24%	23.81%	**1.83**	**2.38**
F7 Maintaining the target state of debt	0.00%	40.48%	47.62%	11.9%	**1.71**	**2.38**
F6 The stability of profit	4.76%	35.71%	52.38%	7.14%	1.62	2.06
F14 The expected amount of future profit	7.14%	42.86%	45.24%	4.76%	1.48	-0.22
F12 The actual influence of financial leverage	9.52%	40.47%	50.00%	0.00%	1.4	-0.93
F8 The expected degree of the productivity of activities	7.14%	47.62%	45.24%	0.00%	1.38	-1.24
F13 Investment opportunities (access to profitable projects)	9.52%	52.38%	30.95%	7.14%	1.36	-1.22
F4 Costs for acquiring new sources of financing	9.52%	54.76%	30.95%	4.76%	1.31	-1.73
F2 Access to alternative sources of capital	14.28%	45.24%	40.47%	0.00%	**1.26**	**-2.2**
F9 Influence firm value (shares)	9.52%	64.29%	26.19%	0.00%	**1.17**	**-3.72**
F19 Contractual limitations (e. g., from credit contracts)	40.48%	33.33%	14.28%	11.90%	**0.98**	**-3.31**
F3 The future state of the economy (macroeconomic indicators)	19.05%	16.67%	14.29%	0.00%	**0.95**	**-6.09**
F17 Maintain the payout ratio	23.81%	66.67%	9.52%	0.00%	**0.86**	**-7.36**
F16 Send out a positive signal to investors (creditors)	30.95%	54.76%	11.90%	2.38%	**0.86**	**-5.8**
F10 Legislative measures	28.57%	64.28%	7.14%	0.00%	**0.78**	**-8.19**
F18 Maintain the history of dividend payout	35.71%	57.14%	7.14%	0.00%	**0.71**	**-8.54**
F15 Dividend policy in accordance with the competition	45.24%	42.86%	11.9%	0.00%	**0.67**	**-7.86**
F20 Avoid a warning signal for investors in the form of lowering the dividend	47.62%	52.38%	0.00%	0.00%	**0.52**	**-12.51**

Source: own

that is unimportant for management. From the perspective of statistical significance, it is possible to divide the given factors in to three groups: i) important, statistically significant factors, ii) average factors for which no statistical importance was demonstrated and iii) factors of below-average importance for which statistical significance was demonstrated.

From the total of 20 factors investigated, respondents specified **the following factors as most significant**: *F5 – Existing shareholder requirements, F11 – Limiting liquidity, F1 – The amount of actual profit* and *F7 – Maintaining the target state of debt.* All these factors are statistically significant at a rate of 0.05 significance.

The most significant factor is *F5 – Existing shareholder requirements*, which 95.23% of managers put down as medium to high in importance among the given factors. The course of privatization in the Czech Republic led to the emergence of concentrated ownership, where shareholders more easily force management to act in the shareholder's interests, including

dividend payout at a corresponding rate. *F1 – The amount of actual profit* is another important factor. Profit represents the criteria for management's success at assessing entrusted economic sources, and profit is the basic prerequisite for management's decision concerning dividend payout. For this reason are important accounting records because the resulting financial statements and reports help plan and make decisions [30]. According to the respondents, other significant factors assessed that influence decision-making concerning dividends are *F11 – Limiting liquidity (access to funds)* and *F7 – Maintaining the target state of debt*. In accounting, profit is reported using the accrual concept, which does not indicate the company's ability to generate money with its activities. From the perspective of the corporate financial balance sheet, funds are important, because then the enterprise is capable of fulfilling their commitments, including the ability to pay dividends. The state of debt indicates the reality that a business uses external sources for financing its activities, i. e., debt. The basic problem of a company's financial management is the choice of the correct sources for financing their activities – finding the optimal relationship between owned capital and borrowed capital.

The next group of factors listed by the respondents are those of **average importance, but statistically insignificant**. The most significant factors in this group are *F6 The stability of profit* and *F14 The expected amount of future profit*. This is possible to interpret to mean that managers do not consider dividend decision-making to be a behavioral question in the style of Lintner's model, but make decisions operationally according to the actual situation and primarily according to shareholder requirements. This is confirmed by factors *F18 Maintain the history of dividend payout* and *F17 Maintain payout rate*, which are, from the perspective of importance, below-average and statistically significant.

Other factors of average importance but statistically insignificant are *F12 The actual influence of financial leverage*, *F8 The expected degree of the productivity of activities*, *F13 Investment opportunities (access to profitable projects)* and *F14 Costs for acquiring new sources of financing*. It is possible to include these factors under financial decision-making concerning investments, when the optimal chosen combination of factors is able to raise company profit, which is able to be subsequently distributed to shareholders in the form of dividends.

The remaining ten factors are of **below-average importance and statistically significant**. This group includes the factor *F2 Access to alternative sources of capital*. Its low level of importance indicates that obtaining sources for financing is clearly not difficult for managers. Low debt and company profitability provide potential creditors with a suitable, low risk investment opportunity. Factor *F19 Contractual limitations* is given a below-average rating, but the importance of this factor within the conditions of the investigated field was confirmed as a part of the survey. Two respondents stated that their current credit contracts contain clauses forbidding dividend payout.

Tables 2–6 below verify the validity of hypothesis H1. Five sub-hypothesis were defined for its verification. The first sub-hypothesis determined whether dividend policy influences firm value. The question of whether or how dividend policy influences firm value has been following academic workers and managers for decades. The authors of [27] proved that, under a perfect market, firm value does not depend on dividend policy. The wording of the questions and relative frequency of answers expressing the position of respondents on dividend policy and firm value are listed in Table 2 below.

The most explicit agreement was given by the respondents to the statement that *dividend policy should attempt to maximize firm value for shareholders* and *dividend policy is the main factor that influences a firm's market value* with 83.3% and 66.67% of respondents respectively expressing slight or strong agreement. Only 54.76% of respondents agreed somewhat or strongly with the statement that *a change in the dividend influences firm value*. All of the statements are statistically significant.

A summary overview of the number of answers for the three statements concerning dividend policy and firm value provides support for sub-hypothesis H1a – that dividend policy does influence firm value. This conclusion is therefore in conflict with the theory of dividend neutrality from source [27].

The second sub-hypothesis, H1b, investigated the significance of dividend policy on investment and financial decision-making. The wording of the questions and the relative

Tab. 2: The relative frequency of answers to the question testing hypothesis H1a

1.	2.	3.	4.	5.
Statement from the questionnaire to which the respondents reacted	**Relative frequency of answers supporting the statement (%)**	**Relative frequency of answers, „I don't know" (%)**	**Relative frequency of answers in conflict with the statement (%)**	**Median**
H1 *Dividend policy should attempt to maximize firm value for shareholders*	I strongly agree 47.62	16.67	I strongly disagree 0.00	4
	I somewhat agree 35.71		I somewhat disagree 0.00	
	agreement **83.33**		disagreement **0.00**	
H2 *Dividend policy is the main factor which influences a firm's market value*	I strongly agree 19.05	28.57	I strongly disagree 0.0	4
	I somewhat agree 47.62		I somewhat disagree 4.76	
	agreement **66.67**		disagreement **4.76**	
H3 *A change in the dividend influences firm value*	I strongly agree 11.90	28.57	I strongly disagree 0.0	4
	I somewhat agree 42.86		I somewhat disagree 16.67	
	agreement **54.76**		disagreement **16.67**	

Source: own

Tab. 3: The relative frequency of answers to the questions testing hypothesis H1b

1.	2.	3.	4.	5.
Statement from the questionnaire to which the respondents reacted	**Relative frequency of answers supporting the statement (%)**	**Relative frequency of answers, „I don't know" (%)**	**Relative frequency of answers in conflict with the statement (%)**	**Median**
F1 *Dividends are paid after using all other investment alternatives*	I strongly agree 19.05	30.95	I strongly disagree 0.00	4
	I somewhat agree 50.00		I somewhat disagree 0.00	
	agreement **69.05**		disagreement **0.00**	
F2 *Investment, financial, and dividend decisions are interrelated*	I strongly agree 47.62	19.05	I strongly disagree 0.00	4
	I somewhat agree 33.33		I somewhat disagree 0.00	
	agreement **80.95**		disagreement **0.00**	
F3 *Financing investments with undivided profits is cheaper than external financing*	I strongly agree 33.33	19.05	I strongly disagree 0.00	4
	I somewhat agree 47.61		I somewhat disagree 0.00	
	agreement **80.94**		disagreement **0.00**	
F4 *Dividends represent a flexible tool for optimizing capital structure*	I strongly agree 23.81	47.62	I strongly disagree 0.0	3
	I somewhat agree 19.05		I somewhat disagree 9.52	
	agreement **42.85**		disagreement **9.52**	
F5 *Financing with the help of retained earnings rather than externally is subject to less control by external creditors*	I strongly agree 28.57	47.61	I strongly disagree 0.00	3
	I somewhat agree 4.76		I somewhat disagree 19.05	
	agreement **33.32**		disagreement **19.05**	
F6 *Dividend policy influences capital costs*	I strongly agree 14.28	47.62	I strongly disagree 0.00	3.5
	I somewhat agree 38.09		I somewhat disagree 0.00	
	agreement **52.37**		disagreement **0.00**	

Source: own

frequency of answers expressing the position of respondents to investment and financial decision-making are shown in Table 3.

Appropriately established corporate investment and financial strategy can increase firm value. Within investment decision-making, this means the choice of effective investment alternatives; from the perspective of financial decision-making, this means optimizing the company's capital structure. The benefit of this strategy lies in raising company profit, which can be subsequently distributed to shareholders in the form of dividends. This set dividend policy is the result of investment and financial decisions. Of the respondents, 80.95% agreed with the statement that *investment, financial and dividend decisions are interrelated*; this statement is statistically significant.

On the other hand, the relationship between dividend policy, investments and capital structure can be the reverse. This situation arises in the case of residual dividend policy, where dividends are paid only when all investments have been carried out and the company still has residual funds available. The statement that *dividends are paid after implementing all other investments* had a strong or slight agreement rate of 69.05% among managers and is statistically significant.

In relation to investment decision-making, there is residual policy, which renders "more flexible" dividends more attractive. According to the pecking order theory, this is because management prioritized undivided profit over issuing shares or bonds during financing because of high flotation costs. Undivided profit can be the only source of financing in the case of restriction of access to sources on the financial market. The statement that financing investments with undivided profit is cheaper than external financing is statistically significant and gained a strong or slight agreement rate of 80.9% from respondents.

Moreover, management yields greater control to the side of investors when using external financing. The statement that *financing with the help of retained earnings rather than externally is subject to less control by external creditors* had a strong or slight agreement rate of 33.3% of respondents. This conclusion can relate to the fact that, in the case of a dominant shareholder, this shareholder watches over the management to make sure there will be no ineffective spending of financial resources. It is necessary to add that, for this statement, a large amount of respondents did not have an opinion, which is statistically significant.

Dividend payout means a change in the structure of financial sources. Unpaid dividends strengthen owned capital at the expense of borrowed capital and the reverse. With the correct choice of composition of owned and borrowed capital, management sets the balance between risk and yield with the goal of maximizing the enterprise's value. The statement that *dividends represent a flexible tool for optimizing capital structure* had a rate of 42.85% of respondents having slight or strong agreement.

Raising the rate of external sources in relation to internal sources raises the firm's risk level from the creditors' perspective; thereby, the willingness of creditors to lend to the company will decrease and borrowing costs will be higher. On the other hand, not paying dividends and thereby strengthening owned capital creates better conditions for capital acquisition costs. The statement that *dividend policy influences capital costs* had strong or slight agreement from 52.37% of respondents. On the basis of the number of answers supporting the individual statement, it is possible to confirm the given hypothesis H1b.

The third sub-hypothesis, H1c, concerns the theory of signaling. According to this theory, dividends are a signaling mechanism by which companies can lower information asymmetry between management and shareholders. By means of changes in dividend policy, investors can deduce information about future company performance. The respondents' opinions on the significance of dividends as a means of information transfer between managers and shareholders is shown in Table 4 below.

Tab. 4: The relative frequency of answers to the questions testing hypothesis H1c

1.	2.	3.	4.	5.
Statement from the questionnaire to which the respondents reacted	**Relative frequency of answers supporting the statement (%)**	**Relative frequency of answers, „I don't know" (%)**	**Relative frequency of answers in conflict with the statement (%)**	**Median**
S1 *The dividend represents one of the main tools investors use to evaluate corporate performance*	I strongly agree 23.80	26.19	I strongly disagree 0.00	4
	I somewhat agree 40.48		I somewhat disagree 9.52	
	agreement **64.28**		disagreement **9.52**	
S2 *Dividends represent unused financial resources for profitable projects*	I strongly agree 16.67	30.95	I strongly disagree 19.04	3
	I somewhat agree 21.52		I somewhat disagree 11.90	
	agreement **38.19**		disagreement **30.94**	
S3 *A decrease (increase) in the dividend signals deterioration (improvement) of future profits*	I strongly agree 0.00	45.23	I strongly disagree 0.00	3
	I somewhat agree 28.57		I somewhat disagree 26.21	
	agreement **28.57**		disagreement **26.21**	
S4 *The company should communicate reasons for changes in dividend amount with investors*	I strongly agree 35.71	21.43	I strongly disagree 0.00	4
	I somewhat agree 28.57		I somewhat disagree 14.29	
	agreement **64.28**		disagreement **14.29**	
S5 *If there are other tools for imparting market information, then the dividend does not represent an important signal*	I strongly agree 0.00	52.38	I strongly disagree 0.00	3
	I somewhat agree 40.48		I somewhat disagree 7.14	
	agreement **40.48**		disagreement **7.14**	
S6 *When determining corporate strategy, other firms' dividend policy trends are taken into consideration*	I strongly agree 0.00	69.04	I strongly disagree 4.77	3
	I somewhat agree 9.52		I somewhat disagree 16.67	
	agreement **9.52**		disagreement **21.44**	

Source: own

From the data in the table, it can be said that of the statements expressing support for the dividend mechanism's importance, the most supported statements were that *the dividend represents one of the main tools investors use to evaluate corporate performance*, which gained 64.28% agreement, and the statement that *the company should communicate reasons for changes in dividend amount with investors*, which was supported by 64.28% of respondents. The importance of dividends is also supported by the statement that *if there are other tools for imparting market information, then the dividend does not represent an important signal,* which was not endorsed by only 7.14% of the respondents.

The thesis that dividend change indicates a change in future profits was not proved for the companies studied. The statement that *a decrease (increase) in the dividend signals deterioration (improvement) of future profits* showed agreement of 28.57% and no opinion on the given problematic for 45.23% of respondents; this statement is without statistical repercussions. This conclusion corresponds to the support for statement S5 that when reasons for dividend change are shared, then the dividend need not indicate change in company performance. Managers can react to an investment opportunity by lowering or not paying the dividend and the reverse. Related to this is the statement that *dividends represent unused financial resources for profitable projects*, which gained a mere 38.19% of agreement from the respondents and is without statistical repercussion.

The statement that *when determining corporate strategy, other firms' dividend policy trends are taken into consideration* has a disagreement rate of 21.44% of respondents; this disagreement is statistically significant. This viewpoint also corresponds with factor F15 *Dividend policy in accordance with the*

competition listed in question four – respondents consider this of low importance when deciding dividend payout.

On the basis of the number of answers expressing the respondents' position on individual questions, it is not possible to confirm the given hypothesis H1c.

The fourth sub-hypothesis, H1d, investigated the respondents' opinions as to whether dividends can serve as a tool for limiting agency problems between shareholders (investors) and managers. The problem occurs when managers act in their own interests and do not take the shareholders' interests into sufficient consideration. The wording of the questions and relative frequency of answers expressing the respondents' positions on the importance of dividends as a tool for reducing the agency problem between shareholders and management are listed in Table 5 below.

Tab. 5: The relative frequency of answers to the questions testing hypothesis H1d

1.	2.	3.	4.	5.
Statement from the questionnaire to which the respondents reacted	**Relative frequency of answers supporting the statement (%)**	**Relative frequency of answers, „I don't know" (%)**	**Relative frequency of answers in conflict with the statement (%)**	**Median**
N1 *The dividend serves as a tool to make managers act in the shareholders' interest*	I strongly agree 2.38	45.24	I strongly disagree 2.38	3
	I somewhat agree 40.24		I somewhat disagree 9.52	
	agreement **42.62**		disagreement **11.9**	
N2 *Raising the dividend lowers the shareholders' need to supervise management*	I strongly agree 0.00	21.43	I strongly disagree 19.05	2
	I somewhat agree 14.28		I somewhat disagree 45.24	
	agreement **14.28**		disagreement **64.29**	
N3 *The dividend forces businesses to look for external sources of financing, which raises the level of control shareholders and creditors have over management*	I strongly agree 0.00	54.76	I strongly disagree 7.14	3
	I somewhat agree 7.14		I somewhat disagree 30.95	
	agreement **7.14**		disagreement **38.09**	

Source: own

The predominantly high level of disagreement with individual statements does not support the importance of dividends for resolving agency problems between shareholders and management. Respondents registered the most explicit disagreement to the statement that *raising the dividend lowers the shareholders' need to supervise management;* 64.29% of respondents disagreed with this to a greater or lesser degree. The statement that *the dividend forces businesses to look for external sources of financing, which raises the level of control shareholders and creditors have over management* showed disagreement of 38% of respondents and is statistically significant. The respondents listed only agreement with the first statement that *the dividend serves as a tool to make managers act in the shareholders' interest.* This agreement could be caused by a combination of misunderstanding the questions and the fact that respondents consider *F5 Existing shareholder requirements* to be the most important factor in dividend policy. In addition to the higher level of disagreement, respondents often responded to individual statements with "I don't know, without opinion." These respondents' positions indicate either unfamiliarity with the given problem or that other tools are used in resolving conflict between management and shareholders.

On the basis of the number of answers expressing respondents' positions on individual questions, it is not possible to confirm the given hypothesis, H1d.

The fifth sub-hypothesis, H1e, investigated the respondents' opinions on how ownership structure can influence corporate dividend policy and thereby indirectly influence firm value as well. In the case that ownership is in the hands of one individual, such individuals usually manage the firm by themselves or select and supervise management and provide

individual decisions autonomously with the goal of maximizing their own wealth. However, companies are characterized by various forms of part-ownership, in which there are multiple owners. Individual shareholders can have various reasons for distributing dividends or a goal concerning dividend amount or retaining profit for reinvestment. The wording of the questions and the relative frequency of answers expressing the respondents' positions on shareholder importance in dividend policy are listed in Table 6 below.

Tab. 6: The relative frequency of answers to the questions testing hypothesis H1e

1.	2.	3.	4.	5.
Statement from the questionnaire to which the respondents reacted	**Relative frequency of answers supporting the statement (%)**	**Relative frequency of answers, „I don't know" (%)**	**Relative frequency of answers in conflict with the statement (%)**	**Median**
A1 *Shareholder requirements are an important factor in decision-making concerning dividend policy*	I strongly agree 66.67	4.76	I strongly disagree 0.00	5
	I somewhat agree 28.57		I somewhat disagree 0.00	
	agreement **95.24**		disagreement **0.00**	
A2 *Shareholders prefer a cash dividend rather than a higher, unpredictable capital profit*	I strongly agree 38.07	28.57	I strongly disagree 0.00	4
	I somewhat agree 21.43		I somewhat disagree 11.91	
	agreement **59.52**		disagreement **11.91**	
A3 *The company creates dividend policy on the basis of the main shareholders' requirements*	I strongly agree 85.71	4.76	I strongly disagree 0.00	5
	I somewhat agree 9.52		I somewhat disagree 0.00	
	agreement **95.23**		disagreement **0.00**	
A4 *Shareholders prefer stable dividends*	I strongly agree 21.43	19.04	I strongly disagree 7.14	4
	I somewhat agree 30.95		I somewhat disagree 21.43	
	agreement **52.38**		disagreement **28.57**	
A5 *Tax incidence for shareholders is an important factor when decision-making concerning dividend policy*	I strongly agree 19.05	16.67	I strongly disagree 0.00	4
	I somewhat agree 52.38		I somewhat disagree 11.90	
	agreement **71.43**		disagreement **11.90**	
A6 *Majority and minority shareholders have differing dividend preferences*	I strongly agree 30.95	35.71	I strongly disagree 7.14	3
	I somewhat agree 14.29		I somewhat disagree **11.90**	
	agreement **45.24**		disagreement 19.04	
A7 *Internal and external shareholders have differing dividend preferences*	I strongly agree 11.90	40.47	I strongly disagree 7.14	3
	I somewhat agree 23.81		I somewhat disagree 16.67	
	agreement **35.71**		disagreement **23.81**	

Source: own

Respondents gave the most explicit agreement to the statements that s*hareholder requirements are an important factor in decision-making concerning dividend policy* and *the company creates dividend policy on the basis of the main shareholders' requirements*; 95% of respondents agreed with these statements, which is statistically significant. These overall positions of agreement are consistent with the conclusions of the research question in which respondents listed the most important factor when making decisions as *F5 Existing shareholder requirements*.

In the Czech Republic, the system of taxing dividends is founded on the classic system, which consists of the separation of taxed

profits and dividends – without their being mutually interrelated in any way. Dividend taxation is performed by withholding tax at a rate of 15%. The statement that *tax incidence for shareholders is an important factor when decision-making concerning dividend policy* indicated agreement by 71.4% of respondents and is statistically significant. In relation to the affirmative statement A2 and low state of debt of the observed businesses, freeing dividends from tax could result in raising the number of companies with dividend payout.

The statement that *shareholders prefer a cash dividend rather than a higher, unpredictable capital profit* received agreement from 59.5% of respondents. A similarly significant level of agreement was shown by the statement that *shareholders prefer stable dividends*. It is possible to interpret this position as the fact that shareholders do not trust managers to invest undivided profit reasonably or that they have doubts about management abusing financial resources.

The statements A6 and A7 commented on the differences in dividend preferences between majority and minority shareholders and between internal and external shareholders. In both cases, the affirmative position was predominant among respondents, but, in the case of the statement that *internal and external shareholders have differing dividend preferences,* this agreement was statistically insignificant.

From the number of answers supporting the statements, it is possible to confirm hypothesis H1e. This is in accordance with the conclusions of the research question concerning which factors influence management when making decisions about dividend payout, for which the most important factor was listed as *F5 Existing shareholder requirements*.

Conclusion

One of the key areas of corporate financial management is decision-making concerning the distribution of economic results. The dividend can be considered to be one option for distributing economic results while fulfilling legal conditions. For many shareholders, dividend payout is an important part of their decision-making concerning investments.

The goal of this article was to identify factors that influence management in the investigated sector when making decisions about dividend payout. The respondents had twenty factors to choose from. The survey made it clear that the most important factors for management are the following: (1) the requirements of existing shareholders, (2) access to funds, (3) the actual amount of profit and (4) maintaining the target state of debt. All these factors were of above-average importance and statistically significant on the basis of the t-test. There were another six indicators with average importance, however, none of them showed statistical significance at a significance of $\alpha = 0.05$. Managers considered the remaining factors to be of below-average importance.

Especially in academic circles, the most commonly accepted theory is the theory of dividend neutrality, which says that firm value is entirely independent of its dividend policy. According to critics of this theory, the prerequisites considered are too abstract and unusable in the real financial world. Therefore, another goal of this article was to determine the respondents' position on whether and how dividend policy influences firm value. With this in mind, the hypothesis that dividend payout influences market imperfections, which result in influencing firm value was formulated. The answer to this hypothesis was achieved by formulating five sub-hypotheses.

Research results supported the validity of the base hypothesis. However, hypotheses H1c and H1d do not provide support for dividends in favor of lowering information asymmetry and agency costs between management and shareholders. This conclusion can be caused by the respondents' insufficient theoretical knowledge of the given problematic. Another cause can be ownership structure, when the firms investigated are characterized by high ownership concentration, i.e., when the companies are governed by one or two significant shareholders. An important shareholder is able to protect other shareholders from management implementing their own interests. In these cases, it is possible to expect that there will be no information asymmetry between the shareholders and the management, resulting in no agency conflict or its consequent costs. Knowledge of the most important factors for dividend payout enables existing shareholders and potential investors to make decisions more objectively. Businessmen with stocks and financial advisers can also use the research results practically for appropriately

timing clients' investments to receive dividend yields.

From the research conducted, it is clear that shareholder requirements are the most important factor when shaping dividend policy for the investigated companies. To this end, this primary research was expanded into secondary research. Seven regressive models were composed to identify and define the strength of individual factors for dividend payout among individual types of shareholders. Likewise, the results of this research will be published subsequently.

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Abstract

THE POSITION OF MANAGEMENT OF CZECH JOINT-STOCK COMPANIES ON DIVIDEND POLICY

František Sejkora, Pavel Duspiva

The concept of distributing economic results belongs unequivocally among management's basic financial decisions. Dividend payout to shareholders can be considered to be the distribution of economic results while fulfilling legal conditions. The goal of this article is to identify factors that have a fundamental influence on dividend payout and to further determine and evaluate the position of management on dividend theories. This problematic is current for the conditions of Czech joint-stock companies, because deeper studies in this area are not available for recent years. Nevertheless, currently, the greater majority of joint-stock companies now regularly pay dividends, and dividend policy has become a part of their financial policy that is impossible to overlook. With regards to the fact that profit is the necessary condition for dividend payout, research was aimed at the sector, "Production and Distribution of Electricity, Gas and Water," which is most interesting among Czech joint-stock companies from the perspective of profitability and frequency of dividend payout. For the reasons of quantitative research, a two-part questionnaire was created for workers in financial management – specifically, members of the executive board, who are assumed to have comprehensive knowledge and an overview of the company. The survey showed that the most important factors for management when making decisions concerning dividend payout are the following: the requirements of existing shareholders, access to funds, the actual amount of profit and maintaining the target state of debt. Further results confirmed that dividend policy does influence firm value. However, dividends are not supported as a tool for lowering information asymmetry and agency costs between management and shareholders. This conclusion can be caused by ownership structure when the firms investigated are characterized by high concentration of ownership; then, one shareholder is able to better protect the other shareholders against the implementation of management's interests.

Key Words: *Dividend policy, factors, value of the company, management, shareholders.*

JEL Classification: *G35.*

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AN EXPLORATORY STUDY OF A COMPARISON BETWEEN THE UK AND CZECH REPUBLIC OF THE FINANCIAL MODELS USED IN THE APPRAISAL OF ICT AND NON-ICT CAPITAL PROJECTS

Josef Hynek, Václav Janeček, Frank Lefley

Introduction

The importance of the financial appraisal of information technology projects is well stated in the IT, information management, and financial literature [17]. Too often, optimistic forecasted savings/benefits and underestimation of costs, together with the under-valuation of the capital cost of ICT projects have resulted in disastrous failures. ICT projects, like all other capital projects, must achieve a positive financial return. This paper examines the financial models used by both Czech Republic and UK organisations in the appraisal of ICT and non-ICT capital projects. Czech Republic and UK organisations were chosen, as the UK has been a free market economy for many years and the Czech Republic has been in a process of transformation from a state-owned to a free market economy over the past twenty years and is therefore, in some respects, an emerging market. In fact, the main purpose of the Czech government reforms introduced in Czechoslovakia since 1990 and the Czech Republic since 1993 has been the transformation of a centrally planned economy into a market economy. The questions that arise are, (i) Are the financial models used by the two countries the same? (ii) Is there a difference in the use of financial models between ICT and non-ICT projects? and (iii) Is there a difference in the level of *importance* placed on the various financial models used? An issue that has also been raised in the literature (see, for example, [16]) is that of the determination of the discount rate used in discounted cashflow (DCF) calculations. We also explore this issue in this paper.

1. Literature Review

While each financial model aims at assessing the acceptability of a project, each looks at acceptability from a different perspective, and consequently some models are not merely substitutes for others. Acceptability can be viewed from a 'value' perspective, in which case the net present value (NPV) is the most appropriate model to use. Both the internal rate of return (IRR) and accounting rate of return (ARR) are more a measure of performance and reward criteria, while the payback period (PB) aims to measure project liquidity. The perceived weaknesses of some of these models have resulted in the development of 'modified' models, such as the modified internal rate of return (MIRR), the profitability index (PI), and the discounted payback period (DPB).

1.1 Payback Period (PB)

The PB model indicates how quickly the cost of an investment is recovered, but does not measure its profitability. It has long been recognised in the literature that this model is an inadequate measure of an investments worth as it is a cash concept, which is designed to answer the single question of how soon the original cash outlay will be recovered, it ignores the cashflows after the payback period [9], [24]. There is strong academic argument against the PB, for example, Pike [36, pp. 309] states, 'academic writers have almost unanimously condemned the use of the payback period as misleading and worthless in reaching investment decisions' Narayanan [34, pp. 309] states, 'the payback criterion continues to be

widely used in industry, although there is little support for it among the academicians'; and Fisher and Nof [11, pp. 138] argue that the PB is a 'quick-and-dirty rule'. The two most serious disadvantages of the PB model of financial appraisal are (i) it does not take any regard of returns after the payback period and, (ii) it ignores the timing of the returns.

1.2 The Discounted Payback Model (DPB)

In order to overcome the timing of the returns issue of the conventional PB model, a discounted PB model was developed Rappaport [38]. In effect, the DPB is, but, a truncated version of the NPV – looking only at the discounted cashflows up to the payback period, and for this reason, it is not a measure of profitability but simply, like the standard PB model, a measure of liquidity [31], [25]. However, it does take into account a company's cost of capital.

1.3 The Accounting Rate of Return (ARR)

The ARR model attempts to equate the financial data of a capital project with the accrual concept of conventional accounting. It is an attempt to measure the profit and the capital cost on the same basis as that adopted in preparing the financial accounts of the organisation. The ARR expresses the average return on the investment as a percentage of that investment. The figure for *investment* may be either the initial capital cost of the project (initial capital model, or return on original investment) or, based on the assumption that the cost of the project will reduce to zero or a predetermined residual/scrap value over the life of the project by way of depreciation, one half of the capital cost (average capital model, or return on average investment). The ARR does not take fully into account the fact that *profits* may vary year by year and, therefore, show an uneven pattern; it ignores the time value of the flow of funds, and is not suitable for comparing projects with different life spans. Kee and Bublitz [22] argue that an attraction of the ARR is its simplicity and articulation with accrual accounting measures, by which managers are frequently evaluated. Kelly and Tippett [23] argue that since the ARR is based on *book values* it is easy to compute and readily understandable by its users. Some academics report that the use of the ARR is in decline [27], while others show that it is a popular model in appraising IT projects [2].

1.4 The Net Present Value (NPV)

The literature repeatedly states that the NPV is the 'correct' investment appraisal model when looking to aim at maximising shareholder value, see for example Samuels et. al. [41] and Brealey & Myers [6]. The NPV of a project is the sum of all the net discounted cashflows during the life of the project less the present value of the capital cost of the project. A positive NPV indicates that if the project is accepted then the organisation's wealth will increase by this NPV. If the NPV is negative then the result will be a reduction in an organisation's net worth, while a zero NPV will result in no change.

1.5 The Profitability Index (PI)

Some academics suggest that a possible weakness of the NPV is that it does not distinguish between projects of high and low value capital cost and does not therefore measure how profitable a project is in relation to the capital invested. This is of particular importance when a company is restricted in its capital expenditure through, for example, a liquidity shortage. The PI may, to some extent, solve this problem [39]. The PI [also called the benefit/cost ratio and the present value index (PVI)] is a measure of *relative* profitability. It is calculated from the ratio between the net discounted benefits from a project and the capital investment (cost) required to achieve those benefits (hence the term benefit/cost ratio).

1.6 The Internal Rate of Return (IRR)

The IRR model (that is also referred to as the actuarial, the marginal efficiency of capital, and the yield model) uses the same net cashflows as the NPV model but expresses the result as a percentage yield. Provided this percentage yield is greater than the organisation's cost of finance/hurdle rate, then the project is said to be acceptable from a financial point of view. The IRR for a project is therefore the discount rate, which reduces the stream of net returns from with the project to a present value of zero. The IRR is more a measure of 'return' rather than an economic indicator of any increase in shareholder value, although even as a measure of return it has its critics. The IRR seems to have very little academic support. Hendricks [20, pp. 20] states: 'Using the IRR technique

can result in incorrect rankings of mutually exclusive projects or multiple rates of return. The NPV technique avoids the multiple rate of return problem and gives correct rankings of mutually exclusive projects. NPV also provides unambiguous, optimal project selection when capital rationing exists. Thus the use of NPV, as opposed to IRR, will enable a firm to make capital budgeting decisions that maximize the present value of its expected cash flows.'

1.7 The Modified Internal Rate of Return (MIRR)

In order to overcome some of the deficiencies of the IRR, a modification to the standard IRR was introduced by Baldwin [1], see also Lin [29] who was possibly the first to use the term: modified internal rate of return – MIRR). Earlier work by Solomon [44] had, however, laid the foundation for Baldwin's 'modification' when Solomon set out to devise a way to solve the problem of multiple internal rate of returns – a problem prone to the standard IRR when the cashflows from a project have more than one sign change: which is well recognised in the US from what is known as the Descartes' rule [29]. Such projects are said to be 'non-conventional', while, according to Beaves [4], a 'conventional' project is one where the sequence of cashflows has only a single sign change from negative to positive. Lefley [26] proves a link between the MIRR and the NPV.

The literature supports the view that advanced technology projects, such as ICT, should be appraised by the more sophisticated DCF financial models, see for example, Pike [37] or Fotr et al. [12].

The determination of the discount rate used in DCF calculations is a contentious issue [16]. The financial/economic theory literature argues that the discount rate should be equal to the prevailing rate in the capital market for the same level of risk, while the management accounting literature supports a 'cost of capital' approach. There are those that advocate a risk-free discount rate [1], [40], [35], [43], [14], [30] and further evidence suggests that the discount rate is being increased to take account of project specific risk [10]. Sundem [45, pp. 320] argues that the NPV model may be 'increased greatly' ... 'by assigning projects to two or three risk classes and using a different discount rate for evaluating projects in each risk class.' Levy and Sarnat [28] are of the opinion that the discount rate should be based on the weighted average cost of capital (WACC), although they argue that some changes may be needed to cover project specific risk. Mao [32] on the other hand, argues that it is usual to use a firm's 'marginal investment rate' as the discount rate for the NPV calculation. Mao also argues that the adoption of the 'cost of capital' approach in the determination of a discount rate may also include an allowance for corporate risk but usually excludes project specific risk. Let us not forget one original concept (at least from the accounting literature) of the NPV which is to calculate the net present value of future cashflows after taking into account the 'time value of money', and that discount rates were in fact based on interest rates [21]. Merrett and Sykes [33] argue that in arriving at a DCF discount rate, it is necessary to establish a meaningful 'time value of money'. The determination of the discount rate is perhaps the most difficult and the most controversial topic in the whole theory of finance [15]. There is therefore no consensus on how the discount rate should be determined, leaving managers' to use whatever approach they feel appropriate, with varying degrees of success. We therefore explore the following factors which the literature suggests influences the determination of the discount rate; opportunity cost of capital, project specific risk, inflation (time value of money), organisational risk, and taxation.

2. Research Methodology

This exploratory research is based on a factual and attitudinal survey conducted simultaneously in both the Czech Republic and the UK. The advantages and disadvantages of this type of survey are well known, but it still provides a useful data collection tool [13]. In general, the survey document was designed to make it clear that it was an academic study and not a commercial / marketing exercise. Statistical analysis of the factual survey in connection with project financial models used is based on the z-test. The attitudinal part of the survey was centred on a series of statements with responses based on a four-point Likert-type scale. A two-tailed t-test is used for analysing the differences in means between the UK and Czech Republic respondents' views. A standard crosscheck analysis was undertaken to verify the compatibility, reliability and validity of the data. The object of the survey was the identification

of current practices in respect of the appraisal of both ICT and non-ICT projects and the opinions of senior executives on a number of important issues regarding such practices. This paper looks specifically at the financial models used to appraise ICT and non-ICT projects and what factors influence the determination of the discount rate in DCF calculations and is part of a much wider research study. More specifically, however, we tested the following hypotheses:

- H1: There is no significant difference in the usage or importance of the PB models between the two countries.
- H2: There is no significant difference in the usage or importance of the PB models between ICT and non-ICT projects.
- H3: There is no significant difference in the usage or importance of the ARR models between the two countries.
- H4: There is no significant difference in the usage or importance of the ARR models between ICT and non-ICT projects.
- H5: There is no significant difference in the usage or importance of the NPV models between the two countries.
- H6: There is no significant difference in the usage or importance of the NPV models between ICT and non-ICT projects.
- H7: There is no significant difference in the usage or importance of the IRR/MIRR models between the two countries.
- H8: There is no significant difference in the usage or importance of the IRR/MIRR models between ICT and non-ICT projects.
- H9: There is no significant difference in the factors used to arrive at a DCF discount rate between the two countries.
- H10: There is no significant difference in the factors used to arrive at a DCF discount rate between ICT and non-ICT projects.

This is the only survey to address simultaneously the appraisal issues concerning ICT and non-ICT projects in both the Czech Republic and the UK.

Our research is empirical, in that it reports on what is actually done, and uses exploratory descriptive analysis to interpret the findings. It is also pragmatic in that it is concerned 'with what works' and ties up with the utilitarian arguments that what matters is what has 'utility to the individual'. We argue that our conclusions are pragmatic and have value in practical application.

3. Research Results

3.1 Response and Sample Size

The survey was simultaneously conducted in the Czech Republic and the UK and was addressed to large companies, measured by turnover, within each of the two countries. We look specifically at the Czech Republic – an emerging free-market economy and the UK – a well-established free-market economy. The respondents were asked to answer certain questions 'in relation to the most recent ICT project that their organisation had evaluated with which they were familiar'. At the Czech Republic the respondents comprised of forty-six chief financial officers, twelve chief executive officers, thirteen IT/administration managers, and eight other managers from a range of areas of responsibility (two respondents did not state their area of responsibility). The respondents had worked an average of twelve years with their current employer.

The CZ survey resulted in a net sample of 625 of which eighty-one valid responses were received, giving a response rate of 13%. The UK survey resulted in a net sample of 470 of which seventy-one valid responses were received, giving a net response rate of 15.1%. These response rates were deemed acceptable when considering the current global economic recession and the strategic nature of the questionnaire. The responses are in line with, for example [7], who achieved a response rate of 16%, and Sandahl and Sjőgren [43] – group 'B' 16.5%. The number of usable responses were greater than that of Ward, et al. [47], who achieved a usable response of sixty, Ballantine and Stray [3], who achieved a usable response of fifty-six in the second stage of their research, Harris, et al. [19] who achieved a usable response from sixty-five companies and Berry [5], who received a usable response of thirty-nine.

We accept that non-response bias, as with all postal surveys, may present a problem if one is of the opinion, for example, that the non-respondents are those that do not appraise their capital projects in any robust manner and have deliberately chosen not to reveal such matters by not completing the questionnaire. We do not necessarily support this view, especially as the organisation classifications of the respondents' mirrors the target samples, but we do accept that the research results may have some limitations in terms of drawing general conclusions.

Tab. 1: CZ Financial models used in appraising the most recent ICT project

Model:	(n = 74)		Ranked				Ranking
	(a)	(b)	1st	2nd	3rd	4th	
Payback discounted + conventional*	66	63	37	20	6	0	2.7500
Payback (conventional / non-discounted figures) (PB)	48	46	27	14	5	0	2.1622
Net Present Value (NPV)	29	27	15	6	5	1	1.2027
Return on investment / Accounting rate of return (ROI/ARR)	24	22	13	4	4	1	0.9865
Discounted Payback (using discounted figures) (DPB)	18	17	10	6	1	0	0.8108
Internal Rate of Return + Modified Internal Rate of Return*	14	12	4	4	2	2	0.4595
Internal Rate of Return (IRR)	14	12	4	4	2	2	0.4595
Other	5	4	3	0	1	0	0.1892
Profitability Index (PI)	5	4	1	1	2	0	0.1486
Modified Internal Rate of Return (MIRR)	0	0	0	0	0	0	0

Note: Two respondents' did not give a ranking to the models they used. (n): (a) total number, (b) total number ranked. Seven respondents' used both the PB and DPB. Only one respondent used five financial models; this respondent's 5th rank (ROI/ARR) has been included in rank 4 for calculations purposes. 7 respondents did not answer the question. 42 (56.8% of the 74 respondents who answered this question) used one or more of the DCF models.
*The description refers to a combination of related models.

Source: own

3.2 Financial Appraisal Models Used

H1: There is no significant difference in the usage or importance of the PB models between the two countries.
H2: There is no significant difference in the usage or importance of the PB models between ICT and non-ICT projects.

The payback (including discounted payback) model of investment appraisal continues to be the most favoured by practitioner (see, tables 1 and 2), with fifty-nine (i.e. 66 less seven respondents who used both the PB and DPB) [79.7%, importance ranking 2.7500] of Czech Republic organisations and sixty-two [87.3%, importance ranking 2.6216] of UK organisations, using this method with respect to ICT projects. With respect to non-ICT projects (see, tables 3 and 4) the figures are, respectively, fifty-nine (i.e. 65 less six respondents who used both the PB and DPB) [CR -89.0%, importance ranking 2.7531] and sixty [UK -90.9%, importance ranking 2.4730]. There is no significant difference at the $p < 0.01$ level in usage or importance between the two countries.

It is interesting to note that the CZ makes less use of the DPB model than the UK. With respect to ICT projects the number of CZ organisation that use the DPB is eighteen (importance ranking 0.8108), while the UK organisations numbered thirty-seven (importance ranking 1.5270). For non-ICT projects the numbers were, respectively, CZ nineteen (importance ranking 0.8649) and UK thirty-six (importance ranking 1.4054).The figures show no significant difference between the use of DPB between the two types of projects, but there is a significant difference at the $p < 0.01$ level between the two countries usage with respect to both ICT (The z-score is -3.4474. The p-value is 0.00056) and non-ICT projects (The z-score is -3.4335. The p-value is 0.0006).

The CZ, however, makes greater use of the conventional PB (non-discounted) model than the UK. With respect to ICT projects the number of CZ organisation that use the DPB is forty-eight (importance ranking 2.1622),

Tab. 2: UK Financial models used in appraising the most recent ICT project

Model (in order of perceived importance)	(n = 71)	Ranked				Ranking
		1st	2nd	3rd	4th	
Payback discounted/conventional (no company used both)*	62	25	21	15	1	2.6216
Internal Rate of Return/ Modified Internal Rate of Return*	47	22	14	9	2	2.0270
Net Present Value (NPV)	50	18	17	11	4	2.0135
Internal Rate of Return (IRR)	40	20	12	7	1	1.7703
Discounted Payback (using discounted figures) (DPB)	37	14	12	10	1	1.5270
Payback (conventional/non-discounted figures) (PB)	25	11	9	5	0	1.0946
Return on investment / Accounting rate of return (ROI/ARR)	26	6	14	4	2	1.0270
Profitability Index (PI)	12	0	1	6	5	0.2703
Modified Internal Rate of Return (MIRR)	7	2	2	2	1	0.2568

*The description refers to a combination of related models. All respondents (71) reported on and ranked financial models in respect of ICT projects.

Source: own

while the UK organisations numbered twenty-five (importance ranking 1.0946). For non-ICT projects the numbers were, respectively, CZ forty-six (importance ranking 2.1486) and UK twenty-four (importance ranking 1.0676). The figures show no significant difference between the use of PB for each of the two types of projects, but there is a significant difference at the $p < 0.01$ level between the two countries usage with respect to both ICT (The z-score is 3.5701. The p-value is 0.00036) and non-ICT projects (The z-score is 3.1381. The p-value is 0.00168). There is also a difference in the importance ranking between the two countries with respect to ICT and non-ICT projects, with the CZ placing a greater level of importance on the PB than the UK.

H3: There is no significant difference in the usage or importance of the ARR models between the two countries.
H4: There is no significant difference in the usage or importance of the ARR models between ICT and non-ICT projects.

With respect to ICT projects, twenty-four (ranking 0.9865) CZ organisations use the ROI/ARR and twenty-six (ranking 1.0270) UK organisations. Eighteen (ranking 0.7297) CZ and twenty-two (ranking 0.8514) UK organisations use the ROI/ARR, with respect to non-ICT projects. There is no significant difference at the $p < 0.01$ level in these figures.

H5: There is no significant difference in the usage or importance of the NPV models between the two countries.
H6: There is no significant difference in the usage or importance of the NPV models between ICT and non-ICT projects.

The NPV was used by twenty-nine (ranked by twenty-seven; ranking 1.2027) CZ organisations with respect of ICT projects and twenty-five (ranked by twenty-three; ranking 1.0135) in respect of non-ICT projects. With regard to UK organisations, the figures are fifty (ranking 2.0135) for ICT projects and forty-five (ranking 1.8514) with respect to non-ICT projects. The figures show no significant difference between the use of NPV between the two types of projects, but there is a significant difference at the $p < 0.01$ level between the two countries (UK-CZ ICT projects; the z-score is -3.7754 and the p-value is 0.00016, UK-CZ non-ICT projects; the z-score is -3.9959 and

Tab. 3: CZ Financial models used in appraising the most recent non-ICT project

Model: (in order of perceived importance)	(n = 73)		Ranked				Ranking
	(a)	(b)	1st	2nd	3rd	4th	
Payback discounted + conventional*	65	62	41	17	4	0	2.7531
Payback (conventional / non-discounted figures) (PB)	46	44	30	11	3	0	2.1486
Net Present Value (NPV)	25	23	12	6	4	1	1.0135
Discounted Payback (using discounted figures) (DPB)	19	18	11	6	1	0	0.8649
Internal Rate of Return + Modified Internal Rate of Return*	20	18	6	8	2	2	0.7297
Return on investment / Accounting rate of return (ROI/ARR)	18	16	10	3	2	1	0.7297
Internal Rate of Return (IRR)	17	16	4	8	2	2	0.6216
Other	5	4	4	0	0	0	0.2162
Profitability Index (PI)	5	4	2	0	2	0	0.1622
Modified Internal Rate of Return (MIRR)	3	2	2	0	0	0	0.1081

Note: Two respondents did not give a ranking to the models they used. (n): (a) total number, (b) total number ranked. Six respondents' used both the PB and DPB. Only one respondent used five financial models; this respondent's 5th rank (ROI/ARR) has been included in rank 4 for calculations purposes. 42 (57.5% of the 73 respondents who answered this question) used one or more of the DCF models.
*The description refers to a combination of related models.

Source: own

the p-value is 0), with the UK making greater use (and higher ranking) of the NPV than the CZ. However, the CZ organisations prefer the NPV to the IRR with such difference shown to be significant at the $p < 0.01$ level with respect to ICT projects (the z-score is 2.7158 and the p-value is 0.00652), but not shown to be significant with respect to non-ICT projects (the z-score is 1.4626 and the p-value is 0.1443, the result is *not* significant at $p < 0.10$).

The profitability index (PI), which may to some extent solve the perceived problem of the NPV regarding the profitability of a project in relation to capital invested [39], was used by five (ranked by four; ranking 0.1486) CZ organisations with respect of ICT projects and five (ranked by four; ranking 0.1622) in respect of non-ICT projects. With regard to UK organisations, the figures are twelve (ranking 0.2703) for ICT projects and eleven (ranking 0.2162) with respect to non-ICT projects. There is no significant difference at the $p < 0.01$ level in these figures.

H7: There is no significant difference in the usage or importance of the IRR/MIRR models between the two countries.
H8: There is no significant difference in the usage or importance of the IRR/MIRR models between ICT and non-ICT projects.

The IRR/MIRR was used by fourteen (ranked by twelve; ranking 0.4595) CZ organisations with respect of ICT projects and twenty (ranked by eighteen; ranking 0.7297) in respect of non-ICT projects. With regard to UK organisations, the figures are forty-seven (ranking 2.0270) for ICT projects and forty-four (ranking 1.9459) with respect to non-ICT projects. The figures show no significant difference between the use of IRR/MIRR between the two types of projects, but there is a significant difference at the $p < 0.01$ level between the two countries (UK-CZ ICT projects; the z-score is -4.6591 and the p-value is 0, UK-CZ non-ICT projects; the z-score is -4.6385 and the p-value is 0), with the UK making greater use (and higher ranking) of the IRR/MIRR than the CZ. It is interesting to note that with respect to the MIRR, no CZ

Tab. 4: UK Financial models used in appraising the most recent non-ICT project

Model (in order of perceived importance)	(n = 66)	Ranked				Ranking
		1st	2nd	3rd	4th	
Payback discounted/conventional (no company used both)*	60	22	21	15	2	2.4730
Internal Rate of Return/ Modified Internal Rate of Return*	44	23	11	9	1	1.9459
Net Present Value	45	17	15	11	2	1.8514
Internal Rate of Return	38	21	10	7	0	1.7297
Discounted Payback (using discounted figures)	36	11	12	11	2	1.4054
Payback (conventional/non-discounted figures)	24	11	9	4	0	1.0676
Return on investment / Accounting rate of return	22	4	13	3	2	0.8514
Profitability Index	11	0	0	5	6	0.2162
Modified Internal Rate of Return	6	2	1	2	1	0.2162
Other: If NPV is negative then take other factors into account	1	0	1	0	0	0.0405

Note: Sixty-six respondents reported on and ranked financial models in respect of non-ICT projects. Two organisations did not use any financial model but relied solely on corporate management judgement (strategic assessment).
*The description refers to a combination of related models.

Source: own

Tab. 5: Factors taken into account when determining the DCF discount rate

	UK		Czech Republic	
	ICT	non-ICT	ICT	Non-ICT
Factor	(n = 60)	(n = 56)	(n = 42)	(n = 42)
Opportunity cost of capital	48	41	14	14
Project-specific risk	21	18	15	17
Taxation	18	16	8	11
Inflation	16	16	26	29
Organisational risk	9	11	11	11
Other	2	1	6	4

Note: UK - ICT: Sixty (84.5%) organisation used one or more of the DCF models. Non-ICT: Fifty-six (78.8%) organisations used one or more of the DCF models. CZ – ICT: Forty-two (56.8% of the 74 respondents who answered the question on financial models) used one or more of the DCF models. Non-ICT: Forty-two (57.5% of the 73 respondents who answered the question on financial models) used one or more of the DCF models.

Source: own

organisation used this modified model to assess ICT projects, but three CZ organisations did use this model for non-ICT projects.

Five CZ organisations quoted 'other' financial appraisal approaches, including, non-discounted cashflows, size of cost savings, on time and on budget (post evaluation), and simplification of information flow.

3.3 Factors Influencing the Determination of DCF Discount Rates

H9: There is no significant difference in the factors used to arrive at a DCF discount rate between the two countries.
H10: There is no significant difference in the factors used to arrive at a DCF discount rate between ICT and non-ICT projects.

As the literature identifies conflicting views on how the discount rate used in the DCF models should be determined, we set out to investigate what factors in practice influenced this rate. We analysed the various factors between ICT and non-ICT projects and between CZ and UK organisations (see tab. 5). With respect to the UK, and for ICT projects, sixty (84.5%) organisations used one or more of the DCF models. With respect to non-ICT projects, the figure was fifty-six (78.8%). With respect to the CZ, and for ICT projects, forty-two (56.8% of the seventy-four respondents who answered the question on financial models) used one or more of the DCF models. With respect to non-ICT projects, the figure was forty-two (57.5% of the seventy-three respondents who answered the question on financial models). With respect to the UK, the most favoured factor was the 'opportunity cost of capital' used by forty-eight (80%) organisations with respect to ICT projects [forty-one (73.2%) for non-ICT projects]. This was followed by 'project specific risk' which was used by twenty-one (35%) organisations with respect to ICT projects [eighteen (32.1%) for non-ICT projects]. The most favoured factor among CZ organisations was 'inflation', i.e., time value of money, used by twenty-six (61.9%) organisations with respect to ICT projects [twenty-nine (69%) for non-ICT projects]. There is, however, a danger that the discount rate could include an allowance for inflation whilst it is ignored in the forecasted cashflows [8].This was followed by 'project specific risk', which was used by fifteen (35.7%) organisations with respect to ICT projects [seventeen (40.5%) for non-ICT projects.

While there was no significant difference in the factors, in either country, between ICT and non-ICT projects, there was a significant difference in some aspects between the two countries. The greater use of '*opportunity cost of capital'* by UK organisation was significantly different from the CZ at $p < 0.01$ (with respect to ICT projects the z-score is 4.751. The p-value is 0; with respect to non-ICT projects, the z-score is 3.9371. The p-value is 0). The greater use of '*inflation*' by CZ organisation was significantly different from the UK at $p < 0.01$ (with respect to ICT projects the z-score is -3.5589. The p-value is 0.0004; with respect to non-ICT projects, the z-score is -3.9791. The p-value is 0). With respect to the factor '*project specific risk',* there was no significant difference between the two countries at $p < 0.10$ (with respect to ICT projects the z-score is -0.0743. The p-value is 0.9442; with respect to non-ICT projects, the z-score is -0.852. The p-value is 0.3953). With respect to the factor '*taxation,* there was no significant difference between the two countries at $p < 0.10$ (with respect to ICT projects the z-score is 1.2492. The p-value is 0.2113; with respect to non-ICT projects, the z-score is 0.2611. The p-value is 0.7949).

3.4 Respondents' Opinions

Although the PB model is the most popular model in both the CZ and UK in respect of ICT and non-ICT project appraisals, it is interesting to note that there is a general opinion that this approach encourages a short-term view. A large number (see tab. 6) of both UK (mean 2.7606) and CZ (mean 2.6538) respondents agreed with the statement, '*The Payback model of financial appraisal encourages a short term view'*, with no significant difference ($t = 0.9525$) between the opinions of the respondents between the two countries. However, there is a significant difference at the $\alpha = 1\%$ level ($t = -5.0587$) between the opinions of the UK and CZ in respect of the following statement, '*The Payback model of financial appraisal is unsuitable for evaluating investments in ICT*'. It appears that the CZ, although heavily relying on the PB model, are of the opinion that it is *unsuitable* for evaluating ICT projects!

The difficulty experienced in cashflow determination with respect to ICT projects

Tab. 6: Statistical analysis of responses to opinion statements

Statement:	UK					CZ					t-values
	a	b	c	d	mean	a	b	c	d	mean	
(i) The Payback model of financial appraisal encourages a short term view	10	34	27	0	2.7606	6	42	27	3	2.6538	0.9525
(ii) The Payback model of financial appraisal is unsuitable for evaluating investments in ICT.	3	8	40	20	1.9155	11	26	38	4	2.5570	-5.0587*
(iii) Projected cashflows from ICT projects are more difficult to determine than those in respect of investments in non-ICT capital projects.	11	38	21	1	2.8310	14	44	15	4	2.8831	-0.4337
(iv) Many of the appraisal models available to assess capital projects are too theoretical and difficult to apply in the real world.	8	47	16	0	2.8873	16	42	17	1	2.9605	-0.6896
(v) A single practical (pragmatic) appraisal model that links together, finance, project-specific risk, and strategic issues would make the evaluation of ICT projects more meaningful.	17	53	1	0	3.2254	7	42	19	5	2.6986	5.1356*

Note: Level of agreement with each statement: a = 'strongly agree'; b = 'agree'; c = 'disagree'; and d = 'strongly disagree'.
*A significant difference at the α = 1% level (reject H0, that means are equal).

Source: own

is emphasised by the agreement to the following statement, '*Projected cashflows from ICT projects are more difficult to determine that those in respect of investments in non-ICT capital projects'*. There is no significant difference (t = -0.4337) between the opinions of the UK (mean 2.8310) and CZ (mean 2.8831) respondents. This is also shown to be the case with respect to the following statement, '*Many of the appraisal models available to assess capital projects are too theoretical and difficult to apply in the real world*'. Again, there is no significant difference (t = -0.6896) between the opinions of the UK (mean 2.8873) and CZ (mean 2.9605) respondents. The support for this statement may explain why there is such a high usage of the less-sophisticated PB model, even though the respondents believe it is *unsuitable* for appraising ICT projects.

The suggestion that a more pragmatic multi-aspect appraisal model may be more appropriate than the existing models is seen to have greater support among UK than CZ respondents. There is a significant difference at the α = 1% level (t = 5.1356) between the opinions of the UK (mean 3.2254) and CZ (mean 2.6986) respondents to the following statement, '*A single practical (pragmatic) appraisal model that links together, finance, project-specific risk, and strategic issues would make the evaluation of ICT projects more meaningful*'.

Conclusion

One of the important findings of this research is that any differences in the usage or level of importance of the financial appraisal models relate to the two countries rather than between ICT or non-ICT projects.

While there is no difference between the usage of the combined PB and DPB, our findings show that the CZ favours the conventional payback approach, while the UK favours the discounted payback approach. The high usage and importance of the payback model may indicate that the current volatile economic environment, with its high level of uncertainty, together with the reward structure of many companies, encourages a short-term business culture [18]. Another explanation may be that the payback model serves as a first approximate assessment of a projects worth and that more sophisticated models, such as NPV and IRR, are applied if the PB looks promising. This consideration needs further critical analysis.

An interesting observation is that, while

both the CZ and UK make extensive use of the payback model, they fully defend the view that this model influences a short-term mentality. The CZ, more so than the UK, also support the view that the payback is unsuitable for appraising ICT projects, yet they still use it to appraise such projects. This may suggest that the payback is not used as the main selection criteria, all be it an 'important' consideration, or that 'short-term' influences are very important to the appraisal team.

The CZ makes less use (and indicates lower rankings) of the DCF models than the UK, but the CZ does prefer the NPV to the IRR. Such difference was shown to be significant with respect to ICT projects. The greater preference for the NPV among CZ companies may reflect the 'rediscovery' by financial managers of the conventional DCF models and the 'persuasion' by academics of the correct approaches, such as NPV, through the Czech translation of such well-known western text books such as Brealey and Myers [6] during the Czech economy transformation after 1989.

The notion postulated in the literature that sophisticated projects, such as ICT, would be appraised using sophisticated models is not supported by this research. We support earlier literature over the concern of the limited use of DCF models in the appraisal of information technology projects and that more research is needed to ascertain why such models lack the importance they deserve. Is it that 'short-termism' is so embedded in present day business culture that DCF models will only play a supportive role to the less sophisticated payback model?

From our research findings, we support the view that the current financial models are appropriate to appraise both ICT and non-ICT projects and that the problems regarding the financial appraisal of ICT projects lies in the determination of the cashflows from such projects. It is in this area that future research should be directed.

As part of our research study, we set out to investigate what factors in practice influenced the determination of the discount rate used in DCF calculations. From our literature review, we were able to identify a number of important factors, which practitioners may take into account when determining their own organisation's discount rate. While there was no significant difference in the factors, in either country, between ICT and non-ICT projects, there was a significant difference in some aspects between the two countries. With respect to the UK, the 'opportunity cost of capital' was shown to be the most common factor used, while with respect to the CZ, the most common factor was 'inflation'. 'Project specific risk', was shown to be the second most influencing factor with respect to both countries. It appears that the CZ, being influence by inflationary factors, are adhering to the accounting text-book concept of the 'time value of money', while the UK are taking a more economic perspective. The UK, by using an opportunity cost of capital approach, may in fact be making it harder to achieve a positive NPV, and projects that are 'profitable' may be rejected. We would argue that any project that achieves a positive return above its 'true' cost of capital will enhance shareholder value. It may be that the CZ are adopting an approach, which is nearer to the true cost of capital than the UK. There is a serious need for clarification and simplification in the determination of the discount rate, especially if management, who are now considering investments in ICT, are to be convinced of the merits of DCF investment appraisal methods and are not left to rely on their own subjective judgement. It is equally essential that over exaggerated discount rates are not allowed to enter into the financial appraisal equation.

Future research should also look at testing the following hypotheses:

- H1: Organisations in emerging markets are more likely to use the NPV financial model than the IRR to appraise ICT projects.
- H2: Organisations in emerging markets are more likely to base their DCF discount rates on the time value of money.

This exploratory study will aid both practitioners and academics in a greater understanding of the financial appraisal of both ICT and non-ICT capital projects and the appraisal differences between CZ and UK organisations. Our future research suggestions should help to focus academics in a constructive and positive way.

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Abstract

AN EXPLORATORY STUDY OF A COMPARISON BETWEEN THE UK AND CZECH REPUBLIC OF THE FINANCIAL MODELS USED IN THE APPRAISAL OF ICT AND NON-ICT CAPITAL PROJECTS

Josef Hynek, Václav Janeček, Frank Lefley

Our research is aimed at identifying the current practices in respect of the financial appraisal of information communication technology and non-ICT projects. We look specifically at the UK – a well-established market economy – and the Czech Republic – an emerging market economy. Our research is based on a unique survey, which simultaneously examines the financial appraisal models used in the two types of projects, and addresses these issues from two diverse market economies. An important finding is that any differences in the financial models used relate to the two countries rather than between ICT or non-ICT projects. While both countries make extensive use of the payback model, they fully defend the view that this model influences a short-term mentality. The Czech Republic, more so than the UK, also support the view that the payback is unsuitable for appraising information communication technology projects, yet they still use it to appraise such projects. The Czech Republic places less importance on the discounted cashflow models than the UK, with the Czech Republic preferring the 'net present value' to the 'internal rate of return'. The UK, by using an 'opportunity cost of capital' approach in the determination of the 'discount rate', may be making it harder to achieve a positive net present value than the Czech Republic, who adopt an approach which is nearer to the true cost of capital. This exploratory study will aid both practitioners and academics in a greater understanding of the appraisal of capital assets and focus future research in a positive way.

Key Words: *Investment appraisal, information communication technology, ICT, emerging markets, DCF.*

JEL Classification: *D22, D24, D81.*

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THE ROLE OF MANAGEMENT DECISIONS IN EXPLAINING FIRM MARKET EXIT

Petra Došenović Bonča, Nina Ponikvar, Ksenja Pušnik, Maks Tajnikar

Introduction

In this paper we focus on the importance of including the decisions made by the firm's management in the factors that explain firm market exit. In so doing, we acknowledge both theoretical and empirical findings regarding the wide array of firm market exit determinants that include also the impact of the firm's managers and their decisions that may in many instances even be the decisive cause of the firm's market exit. Our research is based on the premise that the consequences of decisions of the firm's management are reflected directly in the firm's technical and cost efficiency levels. Namely, it is precisely the responsibility of managers to make decisions about the quantity of employed production inputs and such input combinations that minimise the long-run costs of production. We hypothesise that wrong decisions of managers regarding input-output combinations always result in inferior technical and/or cost efficiency and that both technical efficiency and cost efficiency are important firm market exit determinants. To test our hypotheses we identify the set of factors impacting firm market exit and focus on the impact of technical and cost efficiency.

Furthermore, we assume that in differing macroeconomic environments different decisions of the firm's management prove as decisive drivers of firm market exit. In our analysis we distinguish between decisions of managers that impact only the quantities of employed inputs in relation to produced quantities of outputs, i.e. decisions relevant for attaining the firm's technical efficiency, and decisions of managers about employed input combinations that impact the firm's level of cost efficiency. In making decisions from the first set managers are concerned only with the technical aspects of production, in making decisions from the second set the managers take into consideration both technical aspects of production and input prices. It is because of this distinction that we investigate separately technical efficiency and cost efficiency as determinants of firm market exit. This is also why we study whether the importance of decisions that are relevant for attaining technical efficiency and decisions that contribute to cost efficiency for firm market exit depend on the macroeconomic environment of the analysed firms. We do so because we hypothesise that the characteristics of the macroeconomic environment influence the impact of technical and cost efficiency on firm market exit. Such an analysis reveals which types of managerial decisions are relevant for firm market exit in differing macroeconomic environments.

In order to analyse the abovementioned issues, we develop an empirical model of firm market exit based on a neoclassical theory of the firm [40] and contributions of the existing body of literature in this field. We thus specify several non-nested microeconomic models of firm market exit. To differentiate between those factors that can be influenced by firm management and those factors that are considered non-discretionary, our categorisation of explanatory variables includes four groups, i.e. internal, external, demographic and environmental factors. The specifications of models differ in their selection of variables representing individual groups of factors and in the way these variables are measured. The internal factors group includes the above discussed decisions of managers that are the main focus of this paper and are proxied by technical and cost efficiency measures that are estimated using parametric stochastic frontier analysis. Models of firm market exit are estimated using a logistic regression for rare events [35], based on a panel of the population of Slovenian firms. To identify the

explanatory power of estimated models we use the classification test, the Bayesian information criterion and an artificial model nesting test. Microeconomic models of firm market exit are estimated for two periods in which Slovenian macroeconomic conditions differed significantly. The first period refers to years from 1995 to 2000 and the second to years from 2000 to 2005. Even though the selection of the two periods was partly influenced by data availability it was mostly determined by the key characteristics of the two studied periods. The 1995–2000 period represents the second phase of Slovenia's transition to a market economy when the transition process still imposed tight macroeconomic conditions. In this period neither liberalisation nor privatisation processes were completed but the economy had stabilised after initial transition shocks that included gaining political independence and emerging as an independent country. In the 1995–2000 period liberalisation and privatisation processes temporarily stopped. Concurrently the beginning of this first studied period marks the departure from the turbulent onset of transition when neither the macroeconomic conditions nor the legal environment enabled an objective identification of firm market exit factors [52]. Considering that the first studied period marks the completion of transition the second studied period from 2000 to 2005 represents the period when the Slovenian economy may be considered a consolidated market economy. Ownership structures and market institutions that formed in this period remained characteristic of the Slovenian economy for the entire first decade of the 21st century. At the same time the studied second time period completes before the start of overheating of the Slovenian economy that contributed to the great financial crisis in 2008. The selected two periods are thus different enough so that the impact of differing macroeconomic environments can be considered as relevant in explaining firm market exit. At the same time, the selected periods can be considered as "normal" so that the obtained results can be generalised and not influenced by specific economic conditions created by severe economic crises.

The paper contributes to the existing body of empirical firm market exit literature by estimating non-nested microeconomic models of the firm and selecting the ideal model specification by using the classification test, the Bayesian information criterion and an artificial model nesting test. Further, we introduce a new classification of firm market exit factors, i.e. internal, external, demographic and environmental factors. Among these factors the focus is on technical and cost efficiency measures that directly reflect the decisions made by the firm's management. As such, the paper contributes to the relatively small body of research investigating the impact of the decisions made by managers on firm market exit. An advantage of this paper is that the analysis of the impact of efficiency and other factors on firm market exit is based on the population of Slovenian firms regardless of their industry membership. In addition, the impact of market exit factors is investigated for two periods, allowing us to study differences in the impact of decisions made by managers in differing macroeconomic conditions. Moreover, our study is one of the few studies dealing with business failure and market exit issues in Slovenia.

1. Literature Review

There is a vast body of empirical literature investigating market exit factors that is based on various theories from economics, business sciences and entrepreneurship, which are relevant to understanding firm market exit. These relevant theories include the transaction cost theory [19], [61], the neoclassical theory of the firm [40], the theory of industrial organisation [5] and the dynamic growth theory consisting of Gibrat's Law [30], the passive learning theory [32], [33], the active learning theory [24], the life cycle theory [16], Schumpeter's theory of innovation [51] and the resource-based theory of the firm [42], [6].

In existing empirical studies different authors highlight and investigate diverse determinants of firm market exit. The most common determinant included in empirical research is the firm's financial operations. Foreman [26], for example, explains, when studying US local telecommunication, which firms fail within two years by considering certain financial ratios such as earnings per share, return on assets, retained earnings to assets, total debt proportion, and working capital to sales. Pompe and Bilderbeek [45] find that virtually every ratio category (profitability, activity, liquidity, and solvency ratios) has some predictive power with regard to bankruptcy. Certain ratios

perform similarly with different populations. Opler and Titman [39] find that a firm's capital structure must also be considered as a factor in the announcement of bankruptcy. Analysing German private and public corporations, Köke [36] finds that firms are more likely to fail when financial performance is generally poor. A positive effect of the leverage variable on the likelihood of exit was found by Fotopoulos and Louri [27].

A negative relationship between firm size and the likelihood of exit was found by Brüderl and Schüssler [12], Shleifer and Vishny [52], Dunne and Hughes [23], Audretch and Mahmood [4] and Köke [36]. The age of a firm is also considered one of the key firm exit determinants. The general consensus of empirical studies examining the impact of age on exit is that (after infancy) the likelihood of exit declines with age [13], [28], [60], [58], [38], [55]. Studies also show that firm survival is linked not only to a firm's size at the time of its establishment [43] but also to the growth achieved in the period closely following the firm's establishment [43], [36], [26], [14]. Empirical support can also be found for a negative relationship between market growth and firms' exit rates. However, there is also evidence to the contrary [56].

Since in this paper we focus on the decisions of managers regarding input-output combinations as a factor of firm market exit and assume that such decisions can be assessed by firm technical and cost efficiency, those empirical contributions that include firm efficiency and macroeconomic characteristics in the range of market exit factors are of particular interest to us.

An efficiency measure obtained by data envelopment analysis (DEA) was introduced as a quality of management measure in the model predicting the failure of banks. Their contributions marked the beginning of intense research efforts to link efficiency to bank failure. Several authors [7], [62], [44], [17], [34], [41], [46] confirm that technical efficiency significantly differs between non-successful and successful banks and that these differences are evident a few years prior to failure. Another group of authors employ either DEA or Stochastic Frontier Analysis (SFA) efficiency measures as regressor in the probability function of a bank market exit [7], [59]. Most studies confirm the positive impact of technical inefficiency on the probability of banks suffering a business failure. Wheelock and Wilson [59] arrived at the same conclusion for the link between cost efficiency and the business failure of US banks.

In the past few years, research into the impact of efficiency on market exit has also extended to non-banking sectors. Becchetti and Sierra [8] report a significant positive impact of the SFA technical efficiency of manufacturing firms in Italy in the 1989–1997 period on the probability of firm survival. Similar results, but based on DEA technical efficiency measures, were obtained by Tsionas and Papadogonas [56] for a sample of 3,404 manufacturing firms in Greece, Psillaki, Tsolas and Margaritas [47] for a sample of French firms in the textile and research industries and Pušnik and Tajnikar [49] for a sample of small firms in Slovenia. Cost efficiency as a variable in the market exit prediction model in non-financial sectors has to our knowledge only been used by Pušnik and Tajnikar [49], showing that both DEA and SFA technical and cost inefficiency measures hold predictive power concerning market exit.

For our research also existing empirical contributions investigating the role of the business environment in firm market exit are of particular relevance. Contributions that examine environmental characteristics as determinants of a firm's market exit show that the probability of a firm's market exit increases with the uncertainty of the legal and regulatory environment [22], [26], [10], instability of the macroeconomic environment [21], [3], [9], [10], unexpected macroeconomic developments [22], a low level of economic activity [37], globalisation and foreign direct investments [20], [31], [63] and is also impacted by the location of the firm [59], [49]. Research on the impact of the firm's industry membership on market exit yields mixed results. Cefis and Marsili [14] show that firms from high-tech industries have the greatest probability of survival. On the contrary, Phillips and Kirchhoff [43] do not find significant differences in firm survival rates between industries.

2. General Model of Firm Market Exit

Following theory and empirical evidence regarding firm market exit we assume that a general firm market exit model includes four groups of factors:

$$ME = f(IN, EX, DE, EN), \quad (1)$$

where *IN* denotes the group of internal market exit factors, *EX* the group of external market exit factors, *DE* the group of firms' demographic factors, while *EN* denotes environmental factors. Market exit (*ME*) describes liquidation of the firm due to a business failure, the deliberate termination of business activities or as a result of a merger, acquisition or takeover.

The group of internal factors includes those firm characteristics that affect firm costs through the employment of inputs and can be directly influenced by firm management. Namely, according to the microeconomic theory of the firm [40] finding a proper combination of inputs for the firm to achieve equilibrium is the task of the firm's management. It is thus management's role to select those techniques that enable the firm to maximise its technical efficiency and to take input prices into consideration when choosing such a combination of inputs that results in allocative and cost efficiency [25], [29]. To attain allocative and cost efficiency the firm's management varies the quantity of all inputs. These management decisions about input use thus shape the firm's long-run equilibrium at a minimal average cost. External factors define the firm's position in the market and primarily influence the firm's revenues. These factors impact the firm's market exit through market prices and output quantities sold. The achieved market prices and quantities sold depend on market competition. The firm's management can thus only affect them to a limited extent and has to make decisions within limitations imposed by the market. External factors therefore cannot directly and wholly reflect the quality of a firm's management as they are conditional on market characteristics. This is why they mostly impact revenues. Actually, they impact the firm's profitability considering that internal factors control for the firm's cost level. Demographic factors are those characteristics of a firm which have their origin in the past and are a result of past decisions of firm management and past market and environmental characteristics. Consequently, demographic factors can no longer be influenced by firm management and market characteristics at the time the firm's market exit is observed. Environmental factors reflect the firm's economic, legal, political, technological and social environments.

We test two main hypotheses to satisfy the aim of this paper. First, we hypothesise that a technically and/or cost inefficient firm is more likely to exit the market. Second, technical efficiency is hypothesised to have a different effect on firm market exit compared to cost efficiency in differing macroeconomic environments.

Besides efficiency and the macroeconomic environment, the specification of our model (eq. 1) also includes other market exit factors that have been proposed by the empirical studies mentioned above and are theoretically supported to a smaller or larger extent. This is why the four groups of factors in our model also include those factors that are not directly referred to in our research hypotheses, but are important for the model to encompass all relevant firm market exit factors.

3. Data and Methodology

The primary data source for our study is the database of firms' financial statements collected by the Agency of the Republic of Slovenia for Public Legal Records and Related Services, which covers the whole population of Slovenian firms for the 1995–2005 period. We narrowed the dataset by excluding firms for which an industry was not defined, firms with zero employees, firms with a negative value of equity or with zero sales revenues, and firms with zero assets or zero fixed assets. We further narrowed the datasets by excluding firms with missing values in our panel. We argue that, given the purpose of our analysis, such an approach to dealing with missing values is more appropriate than other more arbitrary methods such as imputation. Further, the disadvantages of this approach do not impact our results due to the large number of firms in our database.

We split the analysed period into two panel datasets that represent differing macroeconomic conditions. The first panel represents the 1995–2000 period characterised by tight macroeconomic conditions and the second panel is based on the 2000–2005 period of a consolidated market economy. The first panel comprises data on 16,121 firms and 80,605 observations and the second panel data on 17,405 firms and 87,520 observations. Firms in both panel datasets are divided into two mutually exclusive groups, i.e. exit and non-exit firms. In the observed period of six years, exit firms are those that were in business in the first five years of the analysed period and had closed their operations, thereby exiting the

market in the sixth year of the analysed period (2000 for the first panel and 2005 for the second panel). Non-exit firms are those that were in business for the whole six-year period. Both panels are unbalanced in favour of non-exit firms. Namely, in 2000 there were 2.48 percent of exit firms and in 2005 their share amounted to 2.19 percent. The use of unbalanced panels distinguishes our research from other studies adopting a balanced-sampling approach [8], [11].

For both analysed periods we proposed different empirical firm market exit specifications, all following the structure of the general model from equation 1. The empirical specifications thus follow the same classification of the market exit factors as the general model. Different specifications were used so that we could test our hypotheses. Namely, empirical specifications differ in the sets of internal and external factors but include the same demographic and environmental factors. More specifically, two different sets of internal factors and two different sets of external factors are included in the suggested empirical specifications. Empirical models that are created in this way from the general model of firm market exit stem from different theoretical frameworks. Due to the theoretically based variation in the sets of factors we have to consider the proposed models as non-nested models when selecting the most appropriate, i.e. ideal model for explaining firm market exit in Slovenia. We follow the model selection approach instead of the hypothesis testing approach. In the model selection approach, each competing model is evaluated by means of a numerical criterion: for a given sample observation, the procedure consists of selecting the model that optimises the chosen criterion. When using such an approach models with different specifications can be selected as the most appropriate for two different time periods.

The factors proposed by different theories as being relevant to market exit vary. In empirical research the most notable differences can be found in the selection of the array of external and internal factors. This is why for each of the two investigated periods our empirical specifications are obtained by keeping demographic and environmental factors unchanged, while testing two different sets of external factors and two different sets of internal factors. Further, the selection of a particular factor within individual sets of factors may differ between the two studied periods due to the model selection approach.

For both periods and all empirical specifications of the model, the dependent variable (*ME*) is defined in the same way as a binary variable with a value of 1 for exit firms and a value of 0 for non-exit firms.

The first set of internal factors includes long-term and short-term internal factors. Measures of technical and cost efficiency are regarded as long-term factors and asset turnover indices as short-term internal market exit factors. Asset turnover indices (*INATI*) included in the first set of internal factors are days sales outstanding (*INDSO*), days payables outstanding (*INDPO*), price of debt (*INDP*) and days inventory in stock (*INDIS*). Cost (*INCE*) and technical efficiency (*INTE*) measures are obtained by Stochastic Frontier Analysis using the number of employees and the value of fixed assets as inputs, the value of business revenues as an output measure and annual gross wages per employee and the sum of depreciation and costs of financing relative to the sum of fixed assets and inventory as factor prices [48].

In the second set of internal factors short-term internal factors remain unchanged, while labour productivity measured as the ratio between business revenues and the number of full-time equivalents (*INLP*), capacity utilisation as a ratio between business revenues and the value of fixed assets (*INCU*), the ratio between firm cost and its business revenues (*INCTR*), average monthly wage (*INW*) and price of capital approximated by the ratio between the sum of depreciation and cost of financing on one hand and total liabilities of the firm on the other hand (*INPC*) are included as long-term internal factors as an alternative to measures of technical and cost efficiency.

The first set of external factors also includes long-term and short-term factors. Long-term factors are represented by a set of dummy variables reflecting a firm's position in its industry and the industry's position in the whole economy. A set of dummies is obtained based on a comparison of the firm's and industry's wage and profit rates and a comparison of the industry's and economy's wage and profit rates. Such comparisons enable us to divide the analysed firms into 16 groups (*EXD16*) [see 54]. A firm's liquidity measured by the quick ratio (*EXQR*) is used as a short-term external factor.

The second set of external factors differs from the first one in the selection of the long-term external factors. The set of dummy variables is replaced by variables reflecting the firm's long-term market position that have an impact on the firm's generated revenues. These variables include return ratios (*EXRR*) (either return on equity (*EXROE*) or return on assets (*EXROA*)), and profitability ratios (*EXPR*) (either relative break-even point, defined as the ratio between firm's actual revenues and its revenues at the break-even point (*EXBEP*) or return on sales (*EXROS*)).

All empirical model specifications include the same demographic and environmental factors. Demographic factors are represented by the firm's financial leverage (*DEFL*) and firm size (*DESIZE*) measured either in terms of the value of revenues (*DESIZE1*) or with the value of a firm's fixed assets (*DESIZE2*). Environmental factors include industry (*ENNACE2*) and a firm's region (*ENREG*), included as two sets of dummy variables.

To eliminate the impact of annual changes in price levels and/or to control for industry membership, some of the independent variables are defined in terms of the deviation of the variable from the industry average, where industry is defined according to the 2-digit NACE classification of industries. Further, we estimate the 5-year trend of independent variables and use the trend regression coefficient values (see [2]) instead of annual values of independent variables to eliminate the collinearity between the values of selected variables in consequential years.

For both periods all empirical firm market exit models were assessed by the cross-sectional binominal logistic regression for rare events data of King and Zeng [35], which eliminates the impact of sample size and/or rare events on estimates of coefficients and the probability of firm exit. In choosing the ideal model specification for both of the investigated time periods we use second-degree empiricism, which represents a selection from among so-called non-nested models. The choice of alternative models was based upon a classification test, Akaike's [1] information criterion (AIC), Bayes' information criterion (BIC) [50], an artificial model nesting test, Vuong's [57] parametric distribution-free test for non-nested models and Clark's [18] non-parametric distribution-free test for non-nested models.

4. Results

Following the model selection approach using the above described criteria we selected the ideal model for explaining the market exit of firms in Slovenia. The model selection is shown in Figure 1, depicting that the ideal model to be used for analysing market exit is described by Alternative 2. The model under Alternative 2 includes technical and cost efficiency measures as long-term internal firm market exit factors and financial return and profitability ratios as long-term external firm market exit factors. The model with the financial return and profitability ratios as long-term external firm market exit factors was selected because it performs better than the model using the firm's relative position in its industry and the industry's position within the whole economy. Similarly, technical and cost efficiency measures are included because the comparison of alternative models that differ in the definition of long-term internal factors shows that the model with efficiency measures outperforms its counterpart including financial indicators. This result of the model selection process implies that the technical and cost efficiency measures are superior to the standard financial ratios that are widely used to capture the internal factors influencing firm market exit.

The ideal model under Alternative 2 includes technical and cost efficiency measures as long-term internal firm market exit factors and financial return and profitability ratios as long-term external firm market exit factors. This ideal model is used to study the market exit determinants for the case of firms in Slovenia in differing macroeconomic conditions. This means that we employ it to investigate firm market exit in the 1995–2000 and 2000–2005 periods. However, the empirical specifications of the ideal model for the two periods differ in the definition of some variables reflecting return and profitability. Namely, for the 1995–2000 period return is measured by the return on equity (*EXROE*) and profitability by the relative break-even point (*EXBEP*), while for the 2000–2005 period we use the return on assets (*EXROA*) and the return on sales (*EXROS*) as return and profitability measures. Further, size is measured differently in the two periods. In the first period size is defined in terms of the generated revenues (*DESIZE1*) and in the second period in terms of the value of fixed assets (*DESIZE2*). Accordingly, Equation 2

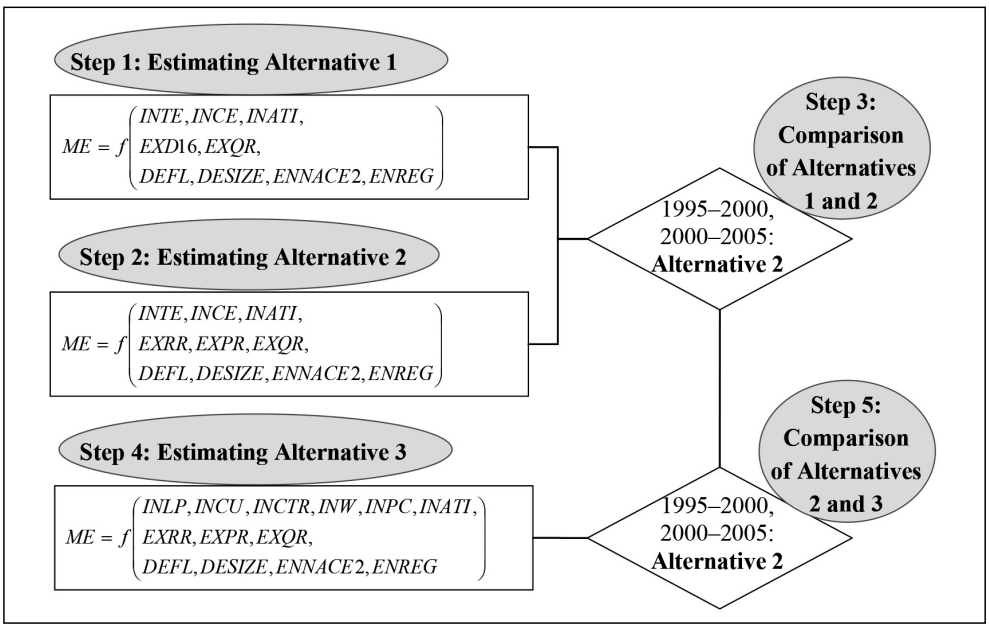
represents the empirical specification of the ideal model used for the analysis of firm market exit in Slovenia in the 1995–2000 period. Equation 3 shows the empirical specification of the ideal model for the 2000–2005 period.

$$ME = f\begin{pmatrix} INTE, INCE, INDSO, INDPO, INDP, INDIS, \\ EXROE, EXBEP, EXQR, \\ DEFL, DESIZE1, ENNACE2, ENREG \end{pmatrix} \quad (2)$$

$$ME = f\begin{pmatrix} INTE, INCE, INDSO, INDPO, INDP, INDIS, \\ EXROA, EXROS, EXQR, \\ DEFL, DESIZE2, ENNACE2, ENREG \end{pmatrix} \quad (3)$$

Table 1 on the next page shows the results obtained from the logistic regression of the empirical specifications of the ideal market exit models for both studied periods. The models are estimated first for the 1995–2000 period and then for the 2000–2005 period. The results are

Fig. 1: Selection of alternative non-nested models



Source: own

shown in three columns for each of the analysed periods. The first depicts the results of the logit regression, the second the estimates obtained by the logit regression for rare events, and the third the estimates of the logit regression for rare events based on the empirical specification obtained with the backward elimination procedure that improves the model by dealing with the issue of multicollinearity [15].

The econometric tests presented in Table 1 confirm the statistical significance of all of the proposed econometric specifications regardless of the applied regression form. However, according to the AIC and BIC tests for both of the analysed periods the results of the logistic regression for rare events based on the backward elimination procedure outperform the other models. Still, they confirm the robustness of the regression coefficients we obtained.

Tab. 1: Results of the market exit models of Slovenian firms

Dependent variable ME	1995–2000			2000–2005		
	Logit	Logit-rare events	Logit-rare events (backward elimination)	Logit	Logit-rare events	Logit-rare events (backward elimination)
INTE	-2.512	-2.469		-10.079[a]	-10.920[a]	-11.483[a]
INCE	-9.386[a]	-9.322[a]	-9.886[a]	0.190	-0.011	
INDSO	-0.001	0.001[c]		0.001	0.001	
INDPO	0.016[a]	0.015[a]	0.016[a]	0.010	0.009	
INDP	0.203	0.203	0.245[b]	0.052	-0.042	
INDIS	-0.016[b]	-0.014[c]	-0.015[c]	0.001	-0.004[a]	
EXQR	0.004	0.008[b]		0.007	0.005	0.012
EXROE	-11.343[a]	-11.790[a]	-11.372[a]			
EXROA				-2.778[a]	-2.709[a]	-2.806[a]
EXBEP	0.001	0.028[a]				
EXROS				-0.001	-0.001	
DEFL	-0.003	0.003[b]		-7.8E-06	-0.001[a]	
DESIZE1	-3.7E-11	1.2E-08				
DESIZE2				-2.2E-10	1.7E-08[c]	
ENNACE2 dummy set	yes	yes	yes	yes	yes	yes
ENREG dummy set	yes	yes	yes	yes	yes	yes
Constant	-3.297[a]	-3.284[a]	-3.651[a]	-3.753[a]	-3.728[a]	-3.894[a]
Log-likelihood	-1,742.95		-1,764.54	-1,696.16		-1,721.88
LR $\chi 2$	237.04		193.87	260.51		209.06
AIC	3,601.9		3,551.1	3,514.3		3,463.8
BIC	4,046.1		3,635.3	3,986.3		3,541.1
p-value	0.000		0.000	0.000		0.000
No. of observations	15,647			16,949		

Note: a, b and c denote significance at 0.1%, 1% and 5%, respectively

Source: own

Discussion and Conclusions

The results confirm our hypothesis that technically and/or cost inefficient firms are more likely to exit the market. Namely, for both of the analysed periods the technical and cost efficiency regression coefficients have the expected negative sign. This confirms our main hypothesis that technical and cost efficiency are a decisive market exit factor. Considering our argument that technical and cost efficiency reflect the decisions made by the firm's management, our results confirm that management is one of the key factors in explaining firm market exit. Even though a firm's

management plays many relevant roles within the firm, our research demonstrates that those management decisions that refer to input selection and their relative combinations are those which are most crucial for preventing a firm from failing and ensuring its survival.

The results also confirm our hypothesis that technical efficiency has a more significant influence on a firm's market exit compared to cost efficiency in a favourable macroeconomic environment, while cost efficiency has a more significant influence on a firm's market exit than technical efficiency in unfavourable macroeconomic conditions. It is evident from Table 1 that in the 1995–2000 period cost efficiency is a statistically significant firm market exit factor. This is not characteristic for technical efficiency in this period. Interestingly, the opposite holds true for the 2000–2005 period, when technically efficient firms were statistically significantly less likely to exit the market while cost efficiency did not have a significant impact. These results indicate that technical and cost efficiency reflect different internal market exit factors. Considering the definitions of cost and technical efficiency we could argue that in the first analysed period with tight macroeconomic conditions the market exit of Slovenian firms depended on either their allocative inefficiency or a combination of both their technical and allocative inefficiencies that are the two elements of cost efficiency. In this period, the market exit probability was thus impacted by management's decisions about the quantities and combinations of inputs relative to their prices. In the 2000–2005 period, i.e. the period of the consolidated market economy, the market exit probability depended mostly on the quantities of inputs employed and to a smaller degree on proper price-determined input combinations.

The latter results imply that during the period of the consolidated market economy those firms which exited the market were mostly technically inferior firms. Managers of such firms were able to influence the firm's cost level and allocate inputs according to relative input prices. However, they had limited influence on the technical efficiency due to obsolete techniques used in the firm's production. In the first period characterised by tight macroeconomic conditions managers also faced restrictions stemming from obsolete techniques. In addition, during this period management did not focus on properly allocating the inputs either because they were unable to do so or because incentives were not in place to stimulate such management decisions.

The conclusions have several important implications for both managers and policy makers. Results imply that in periods marked with unfavourable macroeconomic conditions managers make a serious mistake by ignoring input prices and delaying changes in the input mix in order to improve cost and price competitiveness through input substitution. In practice, input substitution is often associated with minor transaction costs. This implies that it can be achieved even if macroeconomic conditions are tight. In firms with technologies that limit input substitutability the managers unfortunately have hands tied making their firms more vulnerable, less adaptable and less capable of improving their competitiveness. In more stable macroeconomic circumstances, however, the most crucial changes that need to be implemented in firms are those that shift their production possibility frontier and not those that merely change the position of firms on the existing frontier. Implementing innovations and improving technical efficiency become key determinants of the firm's competitive position. Our research shows that in stable macroeconomic circumstances the survival of a firm that lags behind its competitors in this respect is put in jeopardy.

For policy makers our research is relevant because it shows that in times of unfavourable macroeconomic conditions interfering with relative input prices can have devastating consequences for many firms. Wrong or puzzling information about relative input prices created by price, monetary and income policies can mislead managers. Such interventions can create false information for managers and distort their decisions even to the extent that they result in firm failure. Economic policy should implement measures that lower the transaction costs associated with input substitution. Policies targeted at employment and labour market flexibility and measures aiming to support investment are of paramount importance in such circumstances. Policies aimed at encouraging innovation, however, should in such circumstances be expected to have smaller impacts because in unfavourable macroeconomic conditions managers often fail to identify the incentives and their effects. Such

measures are thus more appropriate for times with stable macroeconomic conditions.

This paper draws from the doctoral dissertation research of Ksenja Pušnik. It is written in memory of Ksenja, who lost her battle against cancer at the beginning of 2011.

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Abstract

THE ROLE OF MANAGEMENT DECISIONS IN EXPLAINING FIRM MARKET EXIT

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We study factors of firm market exit and focus on the role of the firm's management. We assume that the quality of decisions made by the firm's management can be assessed by the firm's technical and cost efficiency levels. We argue that the decisions of management are an important determinant of firm market exit and hypothesise that the characteristics of the macroeconomic environment influence the impact of technical and cost efficiency on firm market exit. This is why we study whether the importance of decisions that are relevant for attaining technical efficiency and decisions that contribute to cost efficiency for firm market exit depend on the macroeconomic environment of the analysed firms. Such an analysis reveals which types of managerial decisions are relevant for firm market exit in differing macroeconomic environments. We use a logistic regression for rare events to estimate non-nested microeconomic models of firm market exit in Slovenia for two periods characterised by differing macroeconomic conditions. The results confirm that firms in which decisions of management result in inferior efficiency are more likely to exit the market. Even though a firm's management plays many relevant roles within the firm, our research demonstrates that those management decisions that refer to input selection and their substitution are those which are most crucial for preventing a firm from failing and ensuring its survival. We also find that in differing macroeconomic environments different types of management decisions explain firm market exit. The results show that technical efficiency has a more significant influence on a firm's market exit compared to cost efficiency in a favourable macroeconomic environment, while cost efficiency has a more significant influence on a firm's market exit than technical efficiency in unfavourable macroeconomic conditions.

Key Words: *Market exit, management's decisions, non-nested microeconomic models, Slovenia.*

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DETERMINANTS OF BANK SOCIAL RESPONSIBILITY: CASE OF CROATIA

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Introduction

Recent financial turmoil, uncertain and unstable world and increasing public pressure have put financial sector and its responsibilities under great scrutiny. This has led to putting more emphasis on social responsibility of financial institutions, primarily banks, due to a powerful and influential position they have. Indeed, bank managers are becoming more concerned with social responsibility [72], resulting in a widespread adoption of social responsibility by the global banking community [64].

The considerable emphasis placed nowadays on the societal role of business is in accordance with the spreading belief that measures of company success must go beyond profit and should also relate to the needs of stakeholders and society at large [68]. Caroll [12] anticipated that the social aspect of company's responsibility in the 21st century will be more important than ever. Corporate social responsibility (CSR) is becoming the defining business issue of our time, affecting corporate profits and credibility, as well as personal security and sustainability of the global economy (see [18], cited in [12]). From a perspective of companies, social responsibility has become a powerful tool of gaining more favourable attitudes among their stakeholders [73], resulting in various benefits for companies themselves.

Business ethics and community support play an important role in various industries, including the banking sector [25]. This role is emphasized even more considering the fact that bank activities have significant and broad, not only economic, but also social implications. Social responsibility of banks and other financial institutions has already been recognised as necessary (e.g. [23], [10], [76], [81], [15]). The matter that arises is how the banking sector has and will continue to evolve in this respect. However, social responsibility of banks has been dominantly investigated in developed countries, with lack of research in less developed and transition countries. While CSR is relatively well established in Western Europe, USA and Australia [5], [69], limited understanding of CSR and only recent adoption of CSR practices characterise less developed countries. Although many authors point out on the importance of CSR research in developing country contexts ([5], [32], [58], [59]), there is a lack of empirical findings. This study extends research in Central and Eastern European (CEE) context, contributing to scarce literature on CSR in these countries (e.g. [42], [40], [47], [94]). It presents a break-through attempt to investigate determinants of CSR in Croatian banking industry.

In spite of relevance and timeliness of the issue, research in Croatia has been lagging behind recent literature on this topic, with the exception of only few notable studies. Some of them provide a conceptual framework of social responsibility (e.g. [89]), while most of the studies conducted focus on specific CSR issues (e.g. [50], [37], [24]). Some studies investigate social responsibility of companies from different industries ([90], [34], [94]), and social responsibility of the banking industry in particular has been somewhat addressed by Leko and Stojanovic [56], [57], Dujmovic, et al. [28] and Kundid and Rogosic [52], however there still exists a research gap. Therefore, the purpose of this paper is to assess social responsibility of Croatian banks, and moreover, to investigate its relation with selected factors in the banking industry.

This study links social responsibility to characteristic factors of individual banks and of the environment in which they operate, i.e. specific Croatian context. In particular, the emphasis is put on factors of bank size,

ownership status and financial performance at the individual level, linking social responsibility to individual bank characteristics, while at the industry level of Croatian banking sector we critically reflect on bank social responsibility by focusing on the structure of granted loans.

The approach taken differs from most previous studies because the research is conducted on both micro and macro level, which potentially offers a broader understanding of social responsibility in the banking industry. Our aim is to highlight holistic perspective of bank social responsibility in a particular CEE country. Research findings will provide additional understanding of what social responsibility in banking means, which factors does it relate to, and how it works in a specific environment.

This paper is structured as follows: to start with, the next part provides a brief literature review about the concept of social responsibility in the banking industry. Then, hypotheses are introduced, followed by research methodology after that. To follow, research findings are presented. Finally, the implications of our findings as well as practical standpoints are discussed, while the paper is concluded with a presentation of the limitations and some future research proposals.

1. Social Responsibility in the Banking Industry

CSR has never been more prominent on the corporate agenda than it is today ([85], cited in [41]). It has become a focal point of policy makers and the public, who demand that companies assume responsibility towards society, the environment, or the stakeholders in general [77]. Companies do have social responsibility and are not protected by limited liability from the consequences of their actions (see [38]). They have the responsibility for their impacts on society, comprising various environmental, social and economic obligations.

As far as it regards the banking industry, social responsibility practices have been embraced by the global banking community, evidenced by banks pouring millions of dollars into this purpose, signing international agreements that support socially responsible development [64] and increasingly reporting on their social responsibility. Banks are beginning to recognize that they do have a social responsibility to fulfil [6] and that only socially responsible banking is sustainable in the long run.

A number of factors have contributed to a more socially responsible orientation in banking. The increased economic and public pressure has forced banks to analyse their role in society and their contribution to obtaining more sustainable development [23]. In particular, the recent economic crisis and its social consequences have to some extent damaged consumer confidence and the level of trust in financial institutions. Demonstrating (and not only claiming) responsibility towards society is crucial for regaining trust, and banks are increasingly recognizing it. Furthermore, banks themselves are becoming increasingly aware of the risk associated with financing environmentally or socially sensitive projects. Therefore, in their lending activities they analyse how to fairly balance the risk and interests of various parties affected by their business.

A variety of industry trends and factors are also leading to intensifying the move toward socially responsible banking. The marketplace in which banks operate today demands new solutions and service offerings. Some of these can be delivered through socially responsible products, where recently much of the focus has been put on environmentally-oriented products. The pressure is put on major international banks to find new areas for growth. Other factors, such as consolidation and heightened competition in traditional markets, and technology innovations in banking products and processes, have been contributing as well.

Due to the nature of their activities and their size, bank social responsibility is expected to be more complex in comparison to other companies. A bank's responsibility extends to government, customers, shareholders, employees and the community [38]. Banks have a key role in government's aim of stewardship of the economy. As the most important financiers they uniquely perform functions of collecting deposits from wider public, granting loans, and running the payment system simultaneously. Additionally, they must take care of the ethical aspects of customer relationships, as people's assets are at stake [25]. Banks are answerable to their shareholders because they have invested their money in the business, are entitled to see it protected and rewarded by a fair return, and they also want to see their institution behaving in an ethically satisfactory

fashion. Banks depend on people to run their business and to reflect their ethical standards, who have to know what is expected of them. Finally, through their business activities banks invest in the well-being of the communities they serve and their everyday decisions have a long term impact on those communities [38].

The advantages and disadvantages of social responsibility in the banking industry have been argued at length in previous research. Numerous publications have shown that being socially responsible can benefit banks substantially [82]. However, as CSR is impossible to measure directly, it was largely measured and assessed through corporate social performance (CSP). CSP is a multidimensional construct that measures the extent to which firms are acting (or not acting) in a socially responsible manner [26] and therefore it is used as a means to assess CSR policies and practices [80]. Various CSP measures are used, from one-dimensional (e.g. environmental pollution, corporate philanthropy) to multidimensional measures, i.e. indices of various CSR indicators such as KLD index or Fortune ratings data, as well as questionnaire based surveys. Content analysis of corporate disclosures has been also used in a number of academic studies (e.g. [1], [97], [32], [65], [91]).

From banks' point of view, social responsibility in its comprehensive understanding is the way of creating long-term value. It enables banks to recognize business opportunities and to manage risk more efficiently. It improves their reputation and branding, by influencing trust and customer perceptions (e.g. [73], [66]). Awareness of responsibility towards society and environment guarantees compliance with government regulations. Finally, it offers vast potential to improve and develop banks' own services, e.g. in fast-growing areas of sustainable energy, cleaner production, biodiversity conservation and banking services to low-income and underserved groups [43].

2. Research Goal and Hypotheses

The aim of the research is to assess to what extent are Croatian banks socially responsible and to investigate several key factors that potentially relate to their social responsibility. In order to achieve the research goal, four hypotheses are proposed. First three hypotheses focus on determining the relation between bank social responsibility and its individual factors, in order to discover which banks are more likely to be socially responsible. In particular, we focus on factors of bank size, ownership status and financial performance. While factors of size and financial performance have already been set as important and investigated in previous research on social responsibility, we find the factor of ownership status interesting, taking into consideration specific ownership structure of Croatian banking sector. Fourth hypothesis strives towards testing the relation of social responsibility and the structure of granted loans in Croatian banking sector, at the industry level. The reasoning behind including the factor of the loan structure in the analysis is that it is potentially very indicative of industry's social (ir)responsibility, because some important conclusions can be drawn from the focus of bank lending activity.

Among various bank-level attributes that are likely to be related to its social responsibility, one of the key issues is firm size, identified as both vital and relatively unexamined [59], [97]. Majority of existing literature indicates a positive link between firm size and level of social responsibility (e.g. [87], [14], [67], [88], [54]), and only some refers specifically to the banking industry (e.g. [81], [65]).

In general, larger firms are associated with more resources found to positively affect their CSR commitment [96], [45]. They also tend to be more visible, implying facing more pressures and higher level of attention from the general public (see [92]), to participate in voluntary programmes (e.g. [7]) and make donations (e.g. [2]). Larger organisations may also have more advanced internal systems for dealing with the management of issues, leading to greater responsiveness to social issues as well ([8], cited in [92]). Because of numerous external and internal reasons, a positive relation between bank size and social responsibility is expected. The question arises whether this is also true in Croatian case. The point of view taken is that larger banks have more resources to train employees about social and environmental issues, to invest in assessment and technological solutions to minimize environmental impact and protect worker safety, and to implement relevant social and environmental management procedures. Larger banks have also more responsibility to behave responsibly due to their visibility

and brand image. They will disclose more information on social responsibility than smaller banks [39]. We adopt this view and based on it we present our first hypothesis:

H_1: *Bank size and social responsibility are positively related.*

Although numerous studies have recently been published examining determinants of CSR, a relatively small number of them consider ownership as an independent variable. Most of them examine relations between social responsibility and institutional ownership, managerial ownership, ownership structure dispersion or institutional investor types (e.g. [93], [16], [99], [36], [45], [59], [48]). However, very few take into consideration ownership status. In this regard Lee [55] focuses on public and private ownership status, while Qu [74] and Oh, et al. [69] introduce a variable of foreign ownership. Qu [74] assumes that the effect does exist, while research results of Oh et al. [69] indicate a significant, positive relationship between foreign ownership and CSR, suggesting that different owners may also have different orientations and preferences regarding the firm's CSR. This research gap calls for further research on the relationship between different status of ownership and firm's social responsibility.

In spite of the fact that existing literature indicates that foreign ownership is associated with sustainability [51] and with higher level of CSR, Oh et al. [69] clearly indicate that all foreign investors are not always in favour of CSR. However, we can agree with Hinson et al. [39] that international banks are expected to disclose more of their social responsibility information than local banks, due to their international presence and image, due to being subject to international conventions, as well as to regulations that make their disclosures more mandatory. This is further reinforced by the nature of their activities, or internationalization, which requires them to communicate such responsibilities to society [9].

In Croatia, almost 50% of banks in terms of their number are foreign-owned, and in terms of total banking industry assets, more than 90% is in foreign ownership. Croatian banks which are owned by large international bank groups are expected to disclose more of their socially responsible practices and in that respect to be more socially responsible than local banks. This is due not only to mentioned reasons, but also to a know-how they receive from their foreign parent companies, which already proved to be far more advanced in demonstrating their social responsibility than banks operating only on Croatian market. In this context we stipulate our second hypothesis as follows:

H_2: *Foreign-owned banks are characterized by higher levels of social responsibility in comparison to domestically owned banks.*

A major stream of research has resulted from efforts to understand the relationship between social performance and financial performance that exists for companies [3], resulting in positive (e.g. [96], [79], [94]), negative (e.g. [44], [46], [61]) and mixed evidence (e.g. [17], [16], [4]). Most of the studies of the banking industry document a positive link between these two constructs (e.g. [84], [42], [81], [65]).

The relationship between corporate social and financial performance remains one of the most attractive research topics [35]. That this collective research is large and important is evidenced in part by several major studies aimed at reviewing and analyzing the results of this accumulating research (e.g. [71], [62], [95], [70]). Besides the importance of empirical investigations of this relationship, Callan and Thomas [11] strongly emphasize its timeliness, because today, perhaps more than ever, firms are expected to dedicate resources to socially responsible activities.

Undoubtedly, a growing body of empirical evidence suggests that corporate social and financial performance are positively related. Despite a large and growing literature on CSR, there is very little evidence of firms actually sacrificing profits in the social interest [75]. And this is particularly true for the banking industry. In order to determine the existing social responsibility of Croatian banks, we test the following hypothesis by approximating financial performance with profitability:

H_3: *Bank profitability and social responsibility are positively related.*

Finally, a more complete understanding of bank social responsibility can be obtained by putting it into specific context. This is possible by taking into consideration characteristic

factors of Croatian banking industry, where we particularly focus on dedicated structure of granted loans. Specific structure of granted bank loans is reflected in a relatively high share of non-productive loans for final consumption in total granted loans for the most important institutional sector, i.e. households.

As Snoy [86] argued, ethical issues that financial intermediaries, especially commercial banks, in the international sphere face are *to whom does one lend* and *for what purpose does one lend*. Issues in Croatian banking sector, due to a high percentage share of foreign ownership, can be much associated with issues of international banking. In their international loans, banks frequently and legitimately aim at supporting national exports of equipments and engineering services. However, this does not exempt them from responsibility on the part of the borrowing country to import these goods and services, neither on the part of final consumers, i.e. bank customers to buy over-sized financial services poorly adapted to local conditions.

While most of the academic studies focus on other determinants of social responsibility such as profitability, size or ownership (e.g. [53]), there is a great lack of literature which would relate the structure of granted loans to social responsibility of a bank. The reason for this might be the fact that most of the studies on CSR in the banking industry were conducted in the most developed countries, whose banking systems do not face such issues. For example, banks in CEE countries are characterised by a relatively larger share of foreign ownership in comparison to most developed countries, which in the Central Europe (CE) sub-region stands, on average, at 75% and in the Southeastern Europe (SEE) sub-region at a very high 85% of total banking sector assets [27]. So certain issues occur exactly now, when studies on CSR in less developed and transition countries have emerged and consequently additional, specific factors gain on relevance, such as, for example, the share of loans for final consumption in total bank loans granted to institutional sector of households. Taking into consideration all mentioned above, we recognize this factor as important and we relate it to bank social responsibility. As the granted loan structure in Croatia has been extremely unfavourable for a number of years, because of its orientation on personal consumption, while largely neglecting production and development, we propose the following hypothesis:

H_4: *Share of loans for final consumption in total bank loans granted to households is negatively related to social responsibility in the banking industry.*

3. Research Methodology

This part describes the research done at two different levels, data collection on bank social responsibility, how the CSP measure is calculated and research methods used to test hypotheses.

Due to a multi-level nature of the planned research, we have to clearly determine two different levels of analysis – individual and industry. In order to test the first three hypotheses, we need to address individual bank social responsibility. The forth hypothesis is related to the aggregate, banking industry social responsibility in a specific Croatian context. It is focused on the structure of granted loans, where the euro area average is used as a benchmark.

As reporting on social responsibility is not yet standardized, individual-level data of banks was collected during October 2011 by detailed insight in all publicly available information and documents on banks' web sites such as bank's sustainability, CSR or social reports, reports on progress, periodical reports on performance, codes of conduct and other web-based information, as well as information from national (Croatian National Bank, Croatian Banking Association, Croatian Business Council for Sustainable Development, Croatian Banking and Finance Employees Trade Union) and international organizations and NGOs (Global Compact). This method of data collection is justified because nowadays the internet is used as a medium for corporate information disclosure to the public [39]. Necessary additional information was collected via telephone interviews with bank representatives. Content analysis is used to measure the level of social responsibility in accordance with presented framework. Defined as a technique for gathering data that consists of codifying qualitative information in anecdotal and literary form into categories in order to derive quantitative scales of varying levels of complexity [1], it is found to be the appropriate method for identifying themes in the raw data

[13]. At the banking industry level, the main source of information were publications issued by the Croatian National Bank.

In order to assess social responsibility of individual banks, we evaluate banks with respect to various indicators, enabling a holistic stakeholder approach, evident in recent developments in CSR practice [63]. The framework for assessing bank social responsibility is derived and adapted from previous research conducted by Cuesta-Gonzalez, et al. [23] and Scholtens [81]. The main reason why these studies are taken as a reference point is that their methodology, contrary to some other available approaches, is transparent and easily measurable.

There are five groups of indicators: 1) sustainability reporting and networking, 2) corporate governance, 3) environmental management, 4) responsible financial products and 5) stakeholder issues. These groups reflect different aspects of social responsibility and altogether provide a comprehensive view of bank social responsibility.

By reporting and networking, which might also require compliance with certain standards on reporting (e.g. UN Global Compact), we conclude that a bank commits itself to socially responsible behaviour. Corporate governance gives an indication of policies and procedures promoted by the bank and communicated to all employees. Transparency about environmental performance allows us to assess how a bank operates in this respect [81], analysed through indicators of environmental risk management in lending policy and exclusion of specific sectors in bank financing activities (e.g. production causing ecological damages). The supply and development of "green" or socially responsible products is another means by which a bank can signal its commitment to social responsibility (see [81]). Finally, stakeholder issues comprising relationships with employees and the community reflect social conduct of a bank, both internally and externally.

We made certain adaptations to Cuesta-Gonzalez et al. [23] and Scholtens' [81] assessment framework. On the basis of interviews with subject matter experts, we selected 18 indicators relevant for describing socially responsible practices of Croatian banks. Some of the original indicators are not even available in banks' published documents, as social awareness of Croatian banks is still in the early stage of development. In order to test the validity of interviews' results, preliminary content analysis of banks' publications was conducted. It confirmed the selected 18 indicators, which were then analysed for each bank. Table 1 shows which indicators are used to assess individual bank social responsibility.

Tab. 1: Bank social responsibility framework – Part 1

Group	Indicator	Operationalization
Sustainability reporting and networking	1 Sustainability report / CSR report / Social report	Yes (1) or No (0)
	2 Global Reporting Initiative	Adopted (Yes/No)
	3 UN Global Compact Croatia	Adopted (Yes/No)
	4 Croatian Business Council for Sustainable Development	Member (Yes/No)
	5 Croatian Banking Association	Member (Yes/No)
	6 CSR Index	Participant (Yes/No)
Corporate governance	7 Code of Ethics / Code od Conduct	Adopted (Yes/No)
	8 Code of Corporate Governance	Adopted (Yes/No)
	9 Diversity	Women on board (Yes/No)
Environmental management	10 Environmental risk management in lending policy	Yes/No
	11 Exclusion of specific sectors	Yes/No
Responsible financial products	12 Socially responsible investing	Yes/No

Source: Adopted from Cuesta-Gonzalez, et al. [23] and Scholtens [81]

Tab. 1: Bank social responsibility framework – Part 2

Group	Indicator	Operationalization
	13 Sustainability products („Green loans", „Energy efficiency loans")	Yes/No
Stakeholder issues		
Employee issues	14 Training and education	Yes/No
	15 Trade unions	Activities of CBFETU (Yes/No)
	16 Feedback from employees	Anonimous, including all employees (Yes/No)
Involvement in the community and commitement to charitable work	17 Sponsoring and donations	Yes/No
	18 Croatian Banking Association workshops	Participant (Yes/No)

CSR Index = a project for assessment of Croatian companies' social responsibility, initiated by Croatian Chamber of Economy and Croatian Business Council for Sustainable Development, where a company's social responsibility is assessed according to methodology of UK's leading benchmark for corporate responsibility – Business in the Community Index; CBFETU = Croatian Banking and Finance Employees Trade Union

Source: Adopted from Cuesta-Gonzalez, et al. [23] and Scholtens [81]

Operationalization of the indicators is the following: if the bank performs or complies, it receives a positive score (1), otherwise zero (0). Such methodology is used in other academic studies as well (e.g. [81], [49], [78]). When banks do not report to be active with respect to some issue, we assume they are not, because it is exactly the transparency about social and environmental performance that allows us to assess how a bank operates in this respect (see [81]). The reasoning behind this is that it is becoming clear there ought to be a transparent and verifiable commitment to adoption of socially responsible practices. Generally, a principle of transparency is a constituent part of ethics applied in management and in economic decision-making [83]. And this is accomplished by explicit reference to social responsibility work banks are engaged in via reporting and publishing web-based information [29]. Communicating activities and results is especially important for banks, because their business depends on their credibility, and on the trust their stakeholders have in them [43]. In other words, clear, open and thorough communication is an integral part of a bank social responsibility.

The developed framework is applied to a population of 32 Croatian banks. As these banks make the whole Croatian banking sector, they are the best possible representation of a banking industry in a particular country. Six large banks, three medium-sized and twenty-three small banks are included in the study. Large bank in Croatia is a bank with individual assets larger than 5% of total banking industry assets, medium bank is a bank with individual assets larger than 1% and smaller than 5% of total banking industry assets, and small bank is a bank with individual assets smaller than 1% of total banking industry assets (amounting to EUR 53.00 billion in 2010). Fifteen of the banks are in foreign, while seventeen are in domestic ownership. Social responsibility of the observed banks is assessed and empirically related firstly to individual, bank-level factors (size, ownership status and financial performance) by using correlation analysis, and then to industry-level factor (dedicated granted loan structure) qualitatively.

4. Research Findings

Some general conclusions that can be drawn from descriptive statistics (see Tab. 2) are that Croatian banks accomplish the highest scores of social responsibility in corporate governance (relative average score of 53.1%) and stakeholder issues (51.3%) among all groups of indicators. Introducing

responsible financial products (12.5%) is least common among them. Possible explanation for this could be that the banks have already recognized potential materiality of certain social, environmental and governance issues, while they still do not use, at first sight less obvious, benefits arising from other issues. For example, benefits from sustainability reporting and networking may arise in a medium-to long-term, or, the banks are simply still not aware of a necessary expansion of financial products' offer, imposed not only by new industry trends but also by regulation (i.e. regulation regarding environment protection and energy efficiency).

Tab. 2: Individual bank social responsibility results

		Bank																														
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
Social responsibility	1	1	1	0	0	0	0	1	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	2	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3	0	1	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	4	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	5	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1	0	0	0	1	0	0	1	0	1	1	0	0	0	0	0	0	0
	6	0	1	1	0	0	0	0	1	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	7	1	1	0	0	1	1	1	1	0	0	1	0	1	1	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	1
	8	1	1	1	0	0	0	1	1	0	1	1	1	1	1	1	1	0	0	0	1	1	1	1	1	0	1	0	0	0	1	1	0
	9	1	1	1	1	1	1	1	1	1	0	1	0	1	1	1	0	1	0	1	1	1	0	0	0	0	0	0	1	0	0	0	0
	10	1	1	0	0	1	1	1	1	0	0	1	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0	0	1	0	1
	11	1	1	0	0	1	1	0	1	0	0	1	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0	1
	12	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	13	1	1	1	0	0	0	0	1	0	0	0	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	14	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	1	1	1	1	0	0	1	1	1
	15	1	0	1	1	0	1	1	1	0	1	1	1	0	1	0	1	1	0	0	1	0	1	0	0	1	0	1	0	1	0	0	0
	16	1	1	1	0	0	1	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
	17	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	0	0	0	0	1	0	0	1	1	0	1	0	0	1	1	1
	18	1	1	1	1	1	1	1	1	1	0	1	0	0	1	0	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
	T	83	83	56	33	44	56	61	78	28	33	50	28	78	50	22	44	6	6	0	22	28	17	11	17	28	22	33	0	11	28	17	28

Social responsibility: number relates to indicator defined in Table 1; Bank: number relates to each of the 32 banks; T = total score (percentage), calculated as a relative number of indicators on which a bank scores positive, e.g. the bank assigned number 1 receives a score of 83% because T=15/18=0.83.

Source: authors

Next, the nature of relation between bank-level factors and its social responsibility was investigated by using correlation analysis. Table 3 shows correlation coefficients (ρ) of social responsibility of Croatian banks and factors of size, ownership and profitability. Not surprisingly, our research findings support the first hypothesis as it is clear that a high positive correlation between bank size and social responsibility is established (ρ = .640, p = .000, N = 32), leading to a conclusion that larger banks, in terms of their assets, are associated with higher levels of social responsibility.

A more detailed analysis shows that medium-sized banks closely follow large banks, and in some aspects of social responsibility, like sustainability reporting and networking and corporate governance, even slightly

surpass them. On the other hand, small banks are evidently lagging behind although their relatively lower average scores in certain aspects of social responsibility can be reasonably expected. For instance, small banks in their everyday business, in comparison to larger banks, do not face challenges of financing large, environmentally or socially sensitive projects. This may explain their average score in environmental management of only 23.9%. Furthermore, they are oriented on retail business and serving local community, primarily by financing consumer loans and liquidity of small and medium enterprises. Therefore, the structure of their offer is different from the one at larger banks, what possibly explains their average score of only 6.5% for responsible financial products. However, their bad performance in other aspects of social responsibility, indicated by low average scores in other groups of indicators, cannot be so easily justified.

Furthermore, ownership status and social responsibility of observed banks are fairly correlated (ρ = -.480, p = .005, N = 32). (In order to quantitatively analyse variable *ownership status*, foreign-owned banks were assigned generic number 1, banks in domestic private ownership number 2, and banks in domestic public ownership number 3.) The medium and negative correlation between these variables points out that foreign-owned banks operating in Croatia in terms of their levels of social responsibility are in advance of banks owned by domestic parties. This is in accordance with the second hypothesis, proposing that foreign-owned banks are characterized by higher levels of social responsibility in comparison to domestically owned banks.

Results of an in-depth analysis indicate that foreign-owned banks, with their average score of 48.9%, perform better than domestically owned banks (21.9%) in all aspects of social responsibility. Moreover, a partial analysis of the two groups of domestically owned banks was conducted, differentiating between those owned by private parties and those owned by the government. This analysis shows that banks in domestic private ownership (average score of only 20.4%), with the only exception of responsible financial products offer, lag behind their domestic government-owned counterparts, indicating that the government, as a bank owner, is relatively more socially responsible in comparison to private parties at the same function. However, as far as it regards banks in domestic government ownership, one has to take into consideration that there are only two such banks in the sample, what makes social performance of these specific banks (33.3%) potentially hardly generalisable in other contexts. Therefore, it is more advisable to observe them as a specific group.

Finally, the findings indicate a very weak and positive correlation between bank profitability and social responsibility, meaning that there is little or almost no association between bank profitability and its level of social responsibility. However, the results are not statistically significant, so they cannot be generalized. Weak and non-significant correlation leads us to reject the third hypothesis, meaning that there is no empirical evidence that bank financial and social performance are positively related.

Tab. 3: Correlation coefficients for level of bank social responsibility and selected bank factors

	Social responsibility	Size (Assets)	Ownership status	Profitability (ROA)	Profitability (ROE)
Social responsibility	1				
Size (Assets)	.640**	1			
Ownership status	-.480**	-.410*	1		
Profitability (ROA)	.228	.340	-.121	1	
Profitability (ROE)	.218	.289	-.186	.923*	1

ROA = Return on assets; ROE = Return on equity
**Correlation is significant at the 0.01 level (2-tailed).
*Correlation is significant at the 0.05 level (2-tailed).

Source: authors

To analyse bank social responsibility at the industry level, we observe specific context in which the banks operate. As far as it regards the granted loan structure in Croatian banking industry, statistical data clearly indicate an unfavourable dedicated structure from the perspective of country's economic and sustainable development, and consequently also social development. One comes to alarming conclusions when analysing dedicated structure of loans granted to the largest institutional sector – households, receiving a major share (46.2%) of total bank loans. The most important financial liability of households should be home mortgages, as the most important households assets is home equity. However, analysis indicates a lower share of home mortgages (45.6%) compared to euro area average, where they represent more than two thirds of total loans granted to households (see Tab. 4). In Croatia, an extremely high share (54.4%) belongs to dedicated and non-dedicated loans for financing final consumption [22]. This share was higher and therefore even more unfavourable several years ago (59.8% in 2007) [22], but although nowadays consumer enthusiasm is evidently affected by financial crisis, it is still very high. This makes granted loan structure extremely negative, and much different from the one in euro area countries, but very much alike the structure in other CEE countries where, in this respect, Croatia is no exception. Looking from a wider perspective would indicate that other factors, besides bank owners' strategies, have also contributed to such an unfavourable granted loan structure (e.g. economic cycle, bank competition, disorder on Croatian real estate market, factual situation in particular industries).

Tab. 4: Dedicated structure of bank loans to households: a comparison of the euro area and Croatia

	2007		2008		2009		2010	
	Value	Share	Value	Share	Value	Share	Value	Share
	euro area (value in bln EUR, share in %)							
Home mortgages	3,425	71.5	3,488	71.4	3,546	71.6	3,701	71.7
Consumer loans	616	12.9	631	12.9	631	12.7	639	12.4
Other loans*	747	15.6	764	15.7	774	15.6	819	15.9
	Croatia (value in mln HRK, share in %)							
Home mortgages	45,232	40.3	52,318	41.5	52,960	43.3	57,981	45.6
Car loans	9,389	8.4	9,646	7.7	7,811	6.4	6,237	4.9
Credit card loans	4,923	4.4	5,530	4.4	5,022	4.1	4,387	3.5
Other loans**	52,821	47.0	58,429	46.4	56,403	46.2	58,531	46.0

euro area: Monetary financial institutions (MFI) sector excluding the Eurosystem; Croatia: commercial banks
*loans granted for purposes such as debt consolidation, education, etc. [31]
**cash general purpose loans, overdraft facilities, non-dedicated mortgage loans and all other household loans [22]

Source: European Central Bank [30a, 30b], CROATIAN NATIONAL BANK [22].

Available savings in Croatia are evidently used for financing consumption and stimulating consumer mentality of households, just as in the case of companies, the same banks have been financing high profitable short-term loans and neglecting development. Unfavourable granted loan structure in Croatian banking industry can in no way be considered as supportive of social responsibility, because it lacks credit support to restructuring and development of Croatian economy. The analysis of dedicated loan structure indicates social irresponsibility of banks in Croatia, where they do materialize their interests, but at the same time behave completely differently compared to how they behave in their parent countries, and opposite to Croatian national interests. We therefore accept the fourth hypothesis, as we conclude

that the share of loans for final consumption in total bank loans granted to households is negatively related to social responsibility in the banking industry.

Discussion and Conclusion

Research results bring forward some interesting points for discussion. They indicate that foreign owners have brought and implemented certain, higher level of social responsibility in Croatian banking industry. They have introduced the best practices from more advanced banking systems. However, the level of social responsibility is not as high as it could be, due to foreign-owners' motives, reflected through dedicated granted loan structure. Namely, the granted loan structure in Croatia, similarly to other CEE countries, has been extremely unfavourable for a number of years, reflecting the fact that primary interest of foreign owners differs from interest of domestic ones. This is true especially of the government, which is expected to be more oriented towards a development of local communities and towards economic and sustainable development of a country in general. If we take into consideration that more than 90% of total banking sector assets in Croatia is in foreign ownership, this reasoning seems obvious.

The study clearly shows that larger banks, in general, demonstrate higher levels of social responsibility. They are able to achieve higher levels due to having more resources, and they are in a way forced to comply or perform better due to being more visible. However, there are some outstanding exceptions among relatively small banks, which may possibly be explained by a high level of social awareness among their parent banks, pursuing the same socially responsible strategy in the whole bank group.

Furthermore, the results confirm bank size and ownership status as determinants of bank social responsibility, indicating that a bank's motivation and capacity to take on or to improve its social responsibility is related to these factors. At the banking industry level, orientation on financing final consumption has a significant influence on industry's social responsibility, which, in the case of Croatia, proved to be a hindering factor. In sum, through empirical analysis three out of four hypotheses were confirmed, proving that size, ownership status and share of loans for final consumption in total granted loans are significant determinants of bank social responsibility. Only third hypothesis was rejected, as the empirical analysis indicated a very weak association between bank profitability and social performance, leading to a conclusion that bank financial performance is not related to its social responsibility.

Conducted research has several limitations. Results identified are dependent on how well the measures operationalize the construct of social responsibility, as they are subject to limitations inherent in the measurement of corporate social performance. Futhermore, the analysis is focused only on compliance or performance of social responsibility, but does not aim at addressing the intensity by which the bank does so. It heavily relies on information provided by the institutions themselves, which might suffer from the self-reporting bias. We did not examine trustworthiness of available information as the primary intent of this research was to indicate compliance or performance among Croatian banks. However, in spite of mentioned research limitations, they are common and acceptable in this emerging and still underdeveloped research field (see [81]). Therefore, conducted analysis and obtained results provide an assessment of social responsibility among Croatian banks and its relation to specific factors in the banking industry, and they may serve as a basis for further development of socially responsible practices among Croatian banks.

These findings have very important implications for practitioners. They denote which banks are more likely to be socially responsible, and what is more, after considering pre-determined bank factors, in what aspects of social responsibility are these banks generally expected to be active. Findings also indicate that bank managers in Croatia are becoming aware of the importance of social responsibility, which can be recognized from existing socially responsible practices.

This study may be of use also to bank managers seeking to implement or improve socially responsible practices. Socially responsible loans can be obtained by focusing more on real needs of bank customers and by eliminating or at least decreasing predatory lending practices. Preferring and pushing loans for final consumption to households while neglecting demand for more vital purposes such as housing can in no way be considered as socially responsible. Moreover, meeting the needs of the community to a larger extent than

present is possible and necessary not only in the retail segment, but also within corporate business. This would primarily imply providing crucial long-term credit support to creditworthy companies, needed for development and sustainability of economic activity, and not only running for more profitable short-term loans. It should be emphasized that a "short-term" policy, however profitable it may be, is not socially responsible and definitely not sustainable. There are many different ways to lend money and what bank managers should be aware of is that ethical decisions and behaviour are not necessarily inconsistent with profitability. From the bank's point of view, improving its relation with community in the form of a more socially adapted loan structure may result in increasing existing customer trust, attracting new customers, and sustaining the brand name, which all may distinguish the bank from its competitors. These benefits that may arise from implementation of CSR policies and practices are in today's turbulent times more important than ever before for bank's survival and sustainability.

This paper also provides new insights into various socially responsible practices of Croatian banks and adds value to the existing literature. Therefore, it presents a useful reference point both for researchers and bank managers in their understanding of social responsibility in the banking industry, tested empirically on the whole banking industry in a particular country. It can serve as a model for further development of bank social responsibility in less developed and transition countries.

In order to confirm the study findings, there is a need for more extensive, confirmatory research on the relation of social responsibility and selected factors in the banking industry in the future. For further research we suggest including more variables in the analysis. What is more, investigating on the causal relationship between selected factors and social responsibility on the same sample of banks would be interesting and necessary. Results obtained in such a research could give a more transparent overview of a socially responsible banking or could potentially serve as an incentive for taking on socially responsible practices, depending on the results of the analysis.

Finally, as the issue of social responsibility is still rather new among Croatian banks, for now it was not possible to analyse development of Croatian banks' social responsibility through time. However, within a couple of years forward a planned longitudinal research would provide us with new insights. Therefore, we recommend it as an important and necessary guideline for future research.

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Abstract

DETERMINANTS OF BANK SOCIAL RESPONSIBILITY: CASE OF CROATIA

Ana Ivanisevic Hernaus, Alen Stojanovic

Recently financial sector and its responsibilities have come under great scrutiny. This has led to putting more emphasis on social responsibility of financial institutions, primarily banks, due to their powerful and influential position. Banks have an impact not only on financial and economic system, but on a wider community as well. Their socially responsible practices in particular may have important social implications, what is even more emphasized within bank-centric financial systems, typical of CEE countries. Due to a lack of existing research, the aim of the paper is to assess social responsibility of banks at individual and industry level in a specific CEE context. At bank individual level, focus is put on factors of bank size, ownership status and financial performance, while at the bank industry level the structure of granted loans is included in the analysis. The framework for assessing bank social responsibility is derived and adapted from previous research conducted by Cuesta-Gonzalez, et al. [23] and Scholtens [81]. It is applied to Croatian banking sector, while the level of social responsibility is empirically related to factors at bank individual and industry level.

Research findings offer an overview of social responsibility of Croatian banks. The results demonstrate that bank social responsibility is related to factors of bank size and ownership status at the individual level, and to the structure of granted loans at the industry level. However, the nature of the link between bank social and financial performance did not prove significant. Such findings offer a wider lesson of what factors are associated with social performance of financial sector. Additionally, they may serve as a useful reference point for further investigation of socially responsible practices in Croatia and other CEE countries.

Key Words: *Banks, social responsibility, Croatia.*

JEL Classification: *G21, M14.*

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FOREIGN MARKETS ENTRY MOTIVES AND STRATEGIES OF POLISH EXPORTERS

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Introduction

The paper aims to assess the strategies of Polish exporters in entering foreign markets. The paper is comprised of three parts. The first part presents strategies of international marketing, its elements, types, nature, and conditions – the premises and motives for internationalization of a company. It is mainly a synthetic reflection based on the review of literature. It is a starting point in presenting a research project concept. The second part shows the methodology of an empirical study. The third part consists of analysis and generalised overview of the results of the study on marketing strategies of Polish exporters. This broad study focuses on identifying strategies that are being employed by Polish exporters in the process of internationalization and the motives behind international activities. Such definition of the main goal of the article touches upon the notion of international growth of companies and constitutes attempt to find a specific answer to the questions regarding strategies of internationalization, questions that are critical in the contemporary, global, open economy. We focused our attention on two important and fundamental aspects – motives for expansion and strategies of entering foreign markets. This empirical study is the result of the Ministry of Science and Higher Education grant for a team of researchers from the Marketing Department of Cracow University of Economics. The Project entitled "Corporate Marketing Strategies on International Markets" (N N115 042937) was implemented under the author's supervision in 2009–2011 [22].

1. A Theoretical Approach to Foreign Markets Entry Strategies

1.1 Reasons for Corporate Internationalization

In small open economies all firms have to interact with the international market if they are to become internationally competitive. Internationalization is dependent on the firm´s ability to carry out strategies in the international marketplace and the actual skills in international business operation [7].

Geographical expansion of business activities over national borders is the definition of internationalisation of business activities. The reasons for business activities in an abroad market are the focus of internationalization theory. Motives and entry strategies are the focus of international marketing. The fundamental reason for exporting, in most firms, is to make money. But it is not the only motive for international market entry. It can be found through various literary sources a list of motives for moving to international markets. Hollensen identified two categories of motivation for internationalization (see Tab. 1): proactive motives (focused to exploiting unique competences as, for example, special technological knowledge) and reactive motives (as reaction to pressure in its home market). The list of motives presented in conclusions of research and in textbooks in not complete. Special situation was in transformed economies of East Europe in 90s. Managers searched foreign market where real cash flow in trade relations existed. Motives are usually presented only from an export perspective [10], [12], [13]. But similar motives are driving power for other internationalization strategies too. Firms looking to international/foreign market usually see opportunity in that market.

Tab. 1: Major motives for starting export

Proactive motives	Reactive motives
– Profit and growth goals. – Managerial urge. – Technology competence/unique product. – Foreign market opportunities. – Economies of scale. – Tax benefits.	– Competitive pressure. – Domestic market: small and saturated. – Overproduction/excess capacity. – Unsolicited foreign orders. – Extend sales of seasonal products. – Proximity to international customers/ psychological distance.

Source: [7]

"Motives for why companies migrate abroad can be the diversification of sales. If companies consider the home market as unstable they have an effort to eliminate the risk" [2]. Expansion into markets in foreign countries is an excellent way for a company to grow. A motive for internationalization can have its origin in the fact that a company may not be able to reach their goals in their domestic market and therefore has to expand into a foreign market. Business entity applying growth strategy will note sooner or later the necessity to develop its business activities not only in the home market but in foreign market too. Business activities of SME´s in international market are phenomena mostly of the last decade [19], [25].

The rationale for internationalization can be divided into three groups [23, p. 25-28]:

- economic reasons,
- market-related reasons (marketing),
- legal reasons (political).

Generally, one can say that companies strive to achieve business results following economic incentives – they hope to increase sales of their products or to reduce production costs per unit. Market (marketing) reasons stem from the need to expand markets and seek out new customers. The last group of reasons relates to legal (political) reasons for company's internationalization. One can note a variety of incentives, but restrictions originating in the host country are of particular interest.

Pertinent literature also cites a division of reasons for foreign expansion which may also include [20]:

- internal stimuli and
- external stimuli.

Internal stimuli are endogenous, company-related factors. Here one can point out, for example, a company's command of unique resources (knowledge, product), the desire to develop the company or an excessive accumulation of inventories. External reasons stem from the domestic and foreign business environment (such as a decline in demand in the domestic market, favourable tax regime abroad, an inquiry from abroad).

Hollensen presents the general classification of motives [7]. Specific market situation, category of industry or company life cycle stage are determining for international market entry strategy and motives. For firms located in transforming economy countries one of main criteria for foreign market selection was territorial proximity of that market. The motives and dominant strategies over time in Polish SME´s are presented in Tab. 2.

1.2 International Market Entry Modes

Undoubtedly, entering foreign markets requires strategic decisions which will shape the company's subsequent activities and its growth opportunities in international markets. The key decision involves determining the entry strategy into a foreign market. In pertinent literature, in parallel with the term "entry strategy", there also exist terms such as „entry mode" and „entry form". A company's strategy of entry into foreign markets can be defined as activities that enable the company to implement a market strategy for its products abroad. This may consist either in pursuing merely marketing activities in foreign markets or production and marketing entirely coordinated by the company or by the company itself in collaboration with others [18]. The entry strategy includes not only the mode of action at the start of operations in a new market, but also the way in which the company operates in this market.

Kotabe and Helsen [9, p. 286-290] point out the criteria underlying the selection of the

Tab. 2: Motives and strategies of Polish SME´s over time

Period of years	Motives	Dominated strategy	Comment
70–80 of 20th century.	To receive foreign currency.	Indirect export	Foreign trade (export and import) was centralized in special state companies.
Start of 90s	To receive foreign currency and real cash flow, exploration of free capacities.	Direct export	Slow liberalization of foreign trade, with state regulation.
2nd half of 90s	To receive know-how, to explore cheap resources, effort to find foreign partner.	Direct export, join ventures, foreign direct investment	Disturbance of state foreign trade companies.
Start of Millennium	To find partner for cooperation.	Direct export, creation of alliances	Liberalization of foreign trade.
Last decade	To sell license, to survive, to brave against financial crisis.	The first globally born companies	Expansion of cyber space, influences of economic crisis.

Source: own conception

entry strategy, which can be divided into factors inherent in the company's foreign environment and within the company itself. External conditions underlying decisions surrounding the entry mode include:

- market size and its changes,
- risk of change in the political and economic environments,
- legal regulation of the movement of goods, services, capital and people,
- cultural differences between the home country and the foreign market,
- competitive situation in the foreign market and
- infrastructure available abroad.

The entry mode into new, foreign markets is also affected by the company's internal conditions, including specifically:

- company's objectives,
- range of control the company wishes to exercise over its foreign operations,
- a company's resources.

Hollensen [8, p. 326-327] identifies two other groups of conditions governing the form of entry into a foreign market. These are:

- desired goals underlying the entry strategy,
- factors affecting the level of transaction costs.

In deciding on the entry strategy into foreign markets, companies must take into account the degree of risk associated with a particular form of entry. Simplifying things, one can assume that the greater the commitment of capital, the greater the risk underlying operations in foreign markets. The entry mode selected by the company also determines the extent of control which the company may have over its operations abroad – this applies in particular to the shaping and monitoring of the use of marketing tools. Depending on the entry strategy into foreign markets, the company has a varied ability to flexibly respond to changes in the environment. For example, direct investment abroad would hinder a quick response to a transformation of market conditions.

The premise underlying the selection of the entry strategy may also be the amount of transaction costs which the company would have to incur while establishing business relationships with foreign partners, in particular with intermediaries operating in foreign markets. Costs of operations in new markets may arise from a search for potential contractors and verification of their credibility, the preparation and contractual negotiation and coordination of cooperation between the company and its business partners. The company must therefore compare the costs of engaging in certain activities (e.g. distribution) on its own with the same if it relied on intermediaries. It should be noted that such specific business know-how, organizational culture and adopted ways of customer service constituting a competitive advantage may well mean that the fulfilment

of these functions by external entities will be especially difficult. In such cases, companies will be willing to keep full control over their activities in foreign markets.

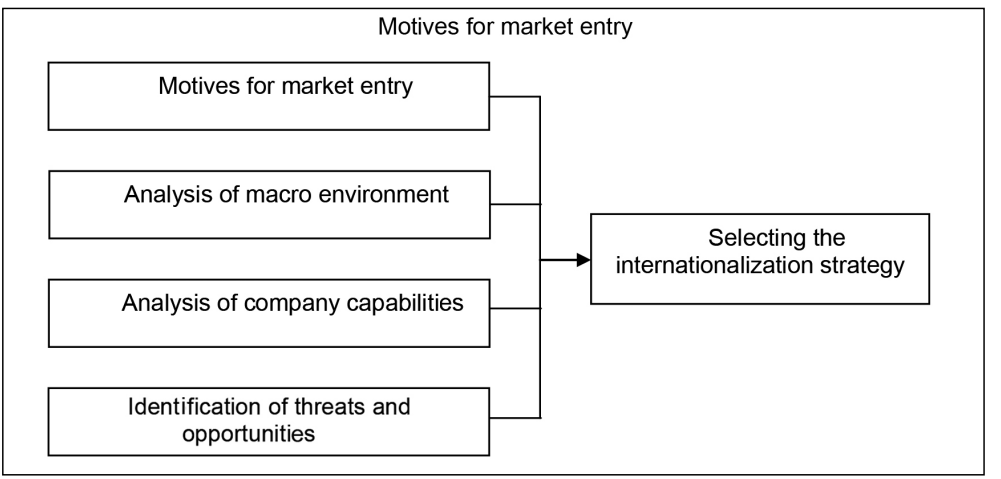
Conditions in the domestic market complement the premises underlying the form of entry into foreign markets. They may be determined by the kind of culture perceived from the perspective of power distance. Companies from low power distance countries are more inclined to strike strategic alliances with foreign partners. Entrepreneurs from high power distance cultures will strive for more centralized management. In terms of the domestic environment, one must also indicate actions pursued by the government in the home country, which may, for instance, promote exports (e.g. subsidies for exporters, export credit guarantees), or impede the transfer of capital abroad.

The choice of the export strategy into foreign markets is therefore dependent upon various factors. Analysis of pertinent literature allows for the synthesizing of these conditions into four groups characterized by [14]:

- domestic environment,
- foreign environment,
- company,
- type of transaction.

The main determinants for selection of market entry strategy to the international market (strategies of internationalization) are presented in model – see Figure 1.

Fig. 1: Determinants of choice of strategy of internationalization of companies



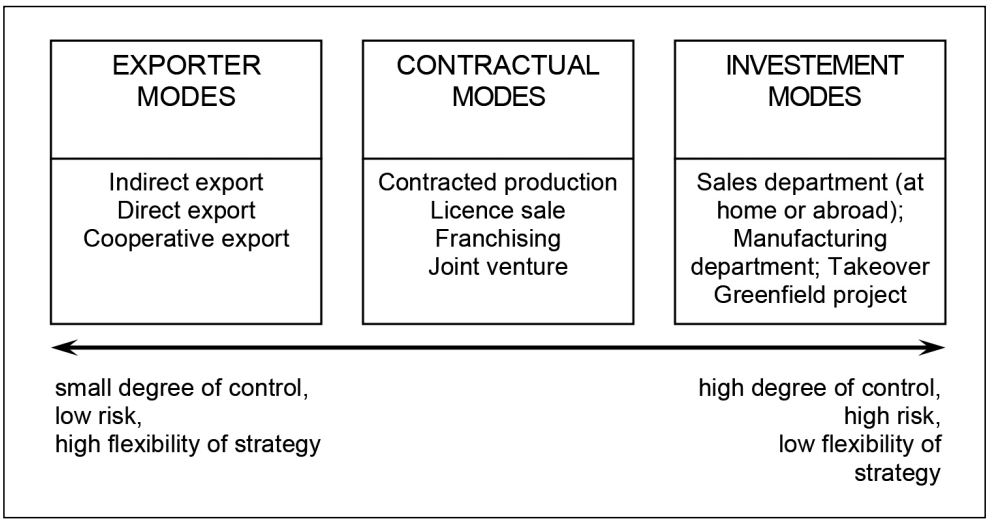
Source: own conception

The wide variety of reasons for choosing a given form of entry justifies the introduction of different classifications of these strategies. Generally, entry modes can be divided into strategies ensuing no investment abroad, and strategies underpinned by capital involvement in foreign markets [15, p. 537]. Strategies in which companies do not invest in foreign markets require of those companies only a small range of control over foreign operations. Investment involvement is associated with a strong need to control activities in international markets. Another division of strategies, one taking into account the extent of control over the company's activities beyond the borders and the risks undertaken by the company as well as the degree of flexibility inherent in entry forms was proposed by Hollensen. This classification is shown in Figure 2. In it, we can distinguish three groups of strategies: export, contractual, and associated with full commitment to capital.

The above classification does not seem however to fully correspond to the common practice approach to exports. The basic feature

of this form of entry into the foreign market is the production of goods in the home country and their sale abroad. When the company has only a representative office in the foreign market (sales department abroad, distribution company) – based on this division – one cannot talk about export. The same holds true in the case of direct export, where the company, on its own, looks for buyers of its products and organizes their sale at the same time coordinating these activities from the home country. It is hard not to consider this form as an export strategy, particularly in the macroeconomic context - the context of international exchange.

Fig. 2: Breakdown of entry strategies into foreign markets in terms of the scope of control and the risks borne by the company



Source: [8, p. 317]

This breakdown of entry strategies ignores the location where products offered to foreign buyers are manufactured. This factor can however be important in shaping companies' competitive advantage. Concentration of production in one place allows the company to obtain, among others, economies of scale and lower unit cost. Classification of entry strategies based on the production site, in conjunction with the degree of the company's capital involvement abroad is proposed, amongst others by Kulhavy [11, p. 13]. He breaks down entry forms into strategies relying on:

- domestic production without foreign investment (indirect export and direct export through non-proprietary distribution channels),
- domestic production with capital involvement abroad (direct export with proprietary distribution channels),
- production abroad without investment (sale of licence, franchising, contracted production),
- production abroad with capital involvement (joint venture, proprietary production subsidiary).

The decision to what entry strategy to choose is taken step by step. As stated by Pan and Tse [15], the company will determine at first whether its entry will require capital involvement. Only in the next step, will it select the appropriate form of entry strategy from among a set of strategies involving investments or strategies from among a group without involvement of the company's assets. It should be noted however that many companies opt for the simultaneous use of different entry strategies [16].

2. Methodology of Approach to the Empirical Study

2.1 Goals and Study Hypotheses

On the cognitive level, this article's goal is:

- The enunciation of the actual premises behind decision making of Polish exporters, who wish to internationalize their businesses and what are their true motives to enter foreign markets,
- To assess the strategies to entering foreign markets, both in context of various forms of export and in exploiting alternative ways to go overseas.

Based on pertinent literature and knowledge of Polish companies' activities in foreign markets, the following hypotheses were formulated:

H-1 The most important group of incentives for Polish companies' internationalization is market related.

H-2 Political and legal incentives help only slightly to encourage Polish companies to enter foreign markets.

H-3 Market size measured in terms of the number of potential customers plays a crucial role as a reason for Polish exporters' entry into foreign markets.

H-4 The size of the company has a bearing on the kind of motivation for internationalization: smaller companies are often guided by defensive reasons while bigger exporters by offensive ones.

H-5 Direct export is the main form of exporting used by Polish companies.

H-6 Polish exporters rarely use entry strategies other than export.

H-7 Apart from exports, direct foreign investment in the form of sale departments abroad and foreign subsidiaries is the most often used mode of entry.

H-8 In terms of organisation, the waterfall strategy is the most often used mode of entry into foreign markets.

In the course of analysis, the Pearson's chi-squared test facilitating assessment of interdependences between the variables measured on nominal scales was used. In the subsequent part of the work, in the statistical analysis of relationships between variables, a significance level of $p = 0.05$ was taken into account, unless otherwise indicated

The study of a company's internationalization poses serious methodological challenge. There are three points to distinguish: the notion and identity of Polish exporter, methods of realization, and a study sample.

2.2 The Notion and Identity of Polish Exporter

In the Polish market there are companies operating according to various business, law, proprietary, capital, and organizational characteristics. A Polish market is an open one and it is an important element of the internal EU market. It is devoid of internal boundaries and duty protection between Poland and EU countries; furthermore it has been normalized – in the context of Europe – sphere of exchange mechanisms and entrepreneurial activities. As a domestic market and a common normalized one, it is based on four fundamental values of freedom: freedom of the movement of people, goods, services, and capital. Poland's presence in the EU, accessibility of its domestic market for foreign capital, both European and from outside of the Old Continent, expansion possibilities for home companies in the larger international context, it all forms specific and interesting area of study and empirical scholarship.

The Polish domestic market has become an important one and very attractive, offering positive incentives for all sorts of business activities performed by foreign capital entities. Once such a company has its trade record – the REGON system of the National Statistical Bureau – it gains the status of a Polish company, registered in Poland. There is no special significance of the country, from which the capital is coming, or the organizational framework in which it will operate in Poland. The above explains the presence of number of leading European and global companies in the subjective structure of Polish exporters.

The project introduces categories of 'export' and 'exporting company', the latter has different contents in relation to the definition and content of 'export', as well as formal legal regulations. An 'Exporting company' is any entity selling its products not only across border – in the narrow sense, outside of customs territory, but also within its territory, and therefore through the employment of the category of EU supplies (trade within the common market of EU). Consequently, a Polish exporter is every company registered in Poland, according to Polish law, manufacturing its goods in Poland that are, in turn, sold elsewhere, regardless of the origin of the founding capital. Such

definition helps to overcome Polish exporter 'identity dilemma' and to assess the sample for the study. In literature, part of the research on internationalization, as a study sample takes into account companies in general and focuses cognitive efforts on the functional aspect of export or 'sphere of foreign trade'. This study assumes a dissimilar starting point and a different way of assessing a study sample. The sample constitutes companies for which export and internationalization are stable and a distinct point of reference and is from companies that rank among major exporters.

2.3 Methods of Realization

This Scholarly instrumentation was designed to achieve goals of the project, ergo insight into international marketing strategies, including strategy pursued by Polish exporters. The goals were subsumed in two groups – quantitative and qualitative. The former reflect a positivist nature, the latter – interpretative. Both approaches meet the fundamental functions of scientific investigation – revealing certain fragment of reality, its clarification, interpretation, and the pointing out of changing patterns and what the future developments would be like. The qualitative strand was dealt with by means of various polling – telephone questionnaire, online poll, standard poll. The questionnaire was used in a pilot research in two large companies that have won international prestige. For the qualitative part, an in-depth interview was linked with direct observation, conducted in the formalized style, using a list of questions and observation notebook.

The methods enabled the acquisition of a vivid picture of the internationalization strategies of Polish exporters, in aspect of their foreign activities, motives, conditions, premises, and profits from entering foreign markets as well as finding out assessment methods, and selecting expansion markets and strategies with presence in the international markets. Such group of issues was investigated by means of a poll, questionnaire, and a direct interview scenario.

2.4 Study Sample

The principles of public statistics make it impossible to build a data base containing characteristics of export companies, therefore the selection of a sample proved complex. The problem of conceptualizing 'base of Polish exporters' was solved in the following way.

Quantitative research was conducted among two separate samples. The first one is the group of companies that form 'Polityka' magazine ranking – 100 largest Polish exporters in the 2005–2009 period. This publication, during its five year course was comprised of 173 companies. In this group, the research was realized in two phases. In the first, the questionnaire was sent via internet and by post to the CEO's, managers responsible for marketing, export and international trade. The papers were addressed, in many cases – when the CEO's were foreigners – written in English. All the surveyed companies were addressed by telephone, with the formal request to take part in the research, their officials were informed on the goals and practices and asked for further explanations. The research was conducted between 11'2010–03'2011. In this stage, there were 29 answers out of 173 companies – the ones that form the above mentioned list in 'Polityka' magazine (turn indicator of 16.7%).

The second group surveyed were companies in the data base of 'Poland-Export' portal. The portal is mainly dedicated to issues connected with Polish export, analyses of problems, and conditions of growth, trends, and changes. In 2010, 'Poland-Export' had at its disposal the data of 20,000 Polish companies that exported their goods to other countries. The research was online, conducted during 03.2011–05.2011. 'Poland-Export' sent emails (4) with link to questionnaire (electronic), on the site of the Economic University in Krakow. During its course there were 730 visits to the survey, some questions were answered (most often general information on company was provided). For detailed analysis 112 questionnaires were accepted (which stands for 0.6% of the 'Poland-Export' registered companies). This scant turn indicator can only confirm the critical dilemma in studies on international marketing. Challenges of scientific study and its cognitive requirements form certain premise for constructing questionnaire or list of questions for interview. It may turn out, and this is the most probable case – that the degree of difficulty of the poll plus its complexity was too big a barrier for officials. This type of situation poses an important dilemma, in general, and in particular when it comes to studies in the international environment. Quantitative research involved 141 companies with the identity of 'Polish exporter'.

Qualitative research was conducted among 13 companies. The choice resulted from two premises. Firstly, these were Polish export companies that had major successes in their international operations.

Success was defined by internationalization indicator, brand recognition, strength of business ties with foreign partners, market position in Poland and abroad, period of exporting activity, etc. Secondly, the companies had an understanding for the research purposes, its characteristics, and expressed willingness to grant access to information on their activities related to foreign markets, and further information required in interviews. Enlisting companies turned difficult and complex with the stage in the study procedure on internationalization of Polish companies. Personal contacts were crucial. A group of 13 companies, subjected to qualitative research, doesn't allow for generalisations, however it forms a premise for detailed identification and in-depth interpretation of international marketing problems [26, p. 54-61]. This specific area of study and its understanding go beyond the framework of this article.

The analysed of the group of 141 companies had the following characteristics:

1. Headcount: 730 employees in both groups of companies. However, distribution of firms was diversified: micro businesses with up to 10 employees accounted for 23% of the sample, large companies with 250–1,000 employees – 17%, and those with more than 1,000 employees – 13%. The two largest analysed companies had 22,000 and 18,000 employees.
2. The study identified 17 different countries as geographic overseas sales targets. The major countries included Germany (55% of respondents), the Czech Republic and France (26%), Russia (25%) and Ukraine (24%). The responses confirm the macroeconomic statistics and geography of Poland's foreign trade – after 2009, Poland's major export targets include 1. Germany (26.2%), 2. France (6.9%), 5. The Czech Republic (5.8%), 7. Russia (3.7%) [22]. This classification reflects the concentration of marketing activities carried out by exporters on one specific market. For most companies such a market generates more than 50% of export revenues, being the major overseas sales target.
3. The internationalization ratio (WEx) was a significant characteristic of the analysed companies. It expresses the relation between export and total sales revenues. It provides information on the company's international activities and the significance of overseas markets in accomplishing corporate missions. In the case of Polityka's 100 largest exporters, WEx was at the level of 47.5%, and for the group of 112 companies from Poland Export's portal – 44.1%. These figures are comparable, indicating an important role of international activities in both groups of companies. It should be noted, however, that the internationalization ratio was considerably different for the particular entities within E-100 and E-P groups with some of companies starting their international operations (WEx at the level of 0–10% for 20% of companies) as well as those which export nearly all their products (90–100%) (accounting for 8.7% of entities representing the E-100 – 15 out of 173 companies).
4. The identity of the E-100 companies is marked by their position in Polish exports. A detailed analysis confirms a large share of 100 largest exporters in Poland's total exports. In 2005–2009, these companies accounted for 1/3 of Poland's exports (36.3%). The E-100 companies perform a key function in the structure of Polish foreign trade and can be treated as a barometer of economic prosperity and a driver of Poland's economy and its export.

3. Foreign Markets Entry Modes – In the Light of the Research Results

3.1 Reasons for Entry into Foreign Markets

The development of marketing strategies in foreign markets is based on the factors that encourage companies to engage in overseas operations. It was therefore important to get to know what kinds of reasons guide the surveyed companies – whether they are market related, economic, political, or legal ones. Having an awareness of the key stimuli may be a valuable source of information for institutions supporting the development of Polish exports and an indication of directions for further action.

The reasons for undertaking export activities are presented in Table 3. The analysed

Tab. 3: Major reasons for undertaking export activities (N=141)

Group of motives	Incentive	Balance of respondents (%)*
Market-related motives	Size of foreign market	48.9%
	Enquiry tenders or foreign orders	44.0%
	Foreign market proximity	29.8%
	High pace of foreign market development	18.4%
	Attempts to pursue hitherto domestic clients who engage in overseas operations	5.0%
Economic motives	Possibility of increased production capacity or more effective use of domestic production potential	46.8%
	Possibility of achieving higher profitability ratios	31.9%
	Declining sales of products on domestic market (decreasing demand, stiffer competition, excess production capacity in company or industry)	28.4%
	Risk mitigation through diversification	22.7%
Legal motives	Favourable regulations in foreign market	2.8%
	Support offered to overseas operations by Polish institutions	1.4%

* Exporters could indicate three motives simultaneously, so the presented figures do not add up to 100%.

Source: own research

companies regard market-related (marketing) factors to be decisive, indicating the possibility of acquiring consumers in countries with large populations (48.9% of respondents) as well as those in proximity to Poland's territory (29.8%). The frequent reason for export activities is the response to prospective clients' interest in the company's products (44%).

The economic incentives are slightly less significant – they facilitate a more effective use of production capacity (46.8%) and provide an opportunity for generating additional profits (39.1%).

The political and legal factors turn out to be the least significant reasons for entering foreign markets. Favourable legislation and support offered by Polish organizations seem to be less significant in stimulating overseas business operations. In fact, it confirms the ranking of export drivers presented in professional literatures [13, p. 740].

The analysed companies refer to the size of a foreign market measured by the number of prospective clients as the major reason for entering overseas markets (nearly half of the respondents), while 64% of them regard Germany, Ukraine and Russia to be their major export targets. Moreover, 83% of the companies believe that the potential represented by their major export markets to be a favourable, or a very favourable component of the business environment. The presented data confirm the significance of the market's size as the reason for which Polish companies expand their business operations in overseas markets.

The second significant reason to enter foreign markets is the possibility of increased production capacity or a more effective use of the domestic production potential (nearly half of the responses). This incentive is offensive and internal in character, which is also true of higher profitability ratios. The prospects for additional profits are indicated by nearly 1/3 of companies (this motive ranks fourth in the general classification). Expected higher profits together with increased production capacity and a more effective use of the production potential turn out to be powerful internationalization drivers. The significance of at least one of these factors is stressed by 65% of the analysed companies, which may testify to the carefully thought through expansion plans in foreign markets in

most exporting companies and the fact that they adopt a proactive approach in pursuing new markets.

Tender enquiries and overseas orders are the third most significant international driver (44%). Notably, this is an external and reactive factor which provides an opportunity for low risk export activities, but which also makes such activities dependent on the behaviour of foreign entities. This factor is clearly dependent on the company's size and the number of target countries (Tab. 4). Smaller companies are less inclined to actively engage in pursuing foreign consumers probably due to the lack of qualified staff or scarce financial resources (necessitated, for example, by marketing research projects). The study indicates that tender enquiries and overseas orders are less significant as foreign expansion drivers in the event of a larger number of foreign countries – export targets. Therefore, experience gained in the process of serving foreign markets seems to encourage companies to actively pursue new consumers.

A significant internationalization driver, recognised by 30% of respondents, is the foreign market's geographical closeness. The overwhelming majority of companies in this group (92.5%) state that their largest export market is one of Poland's neighbouring countries (Germany, Slovakia, the Czech Republic, Ukraine or Russia).

Tab. 4: Tender enquiries or overseas orders – internationalization drivers depending on selected features of the company

Variable	Value of the variable	Balance of respondents (%)
Number of employees (N=133)	1–10	58.1%
	11–50	54.6%
	51–250	44.8%
	251–1,000	26.1%
	above 1,000	17.7%
Number of countries to which company exports its products (N=126)*	1–3	29.1%
	4–6	29.1%
	7–10	20.0%
	11–20	12.7%
	above 20	9.1%

* With regard to the number of countries, this correlation is significant when p=0.1.

Source: own conception

Another motive for starting export activities, initiated by 28.4% of companies, is the saturation of the domestic market, which makes the sales of products more difficult. The problems result from declining demand, stiffer competition, or excess production capacity in a given industry.

The following motives are indicated as significant by relatively few respondents:

- Risk mitigation through diversified activities (22.7%).
- High pace of foreign market development (18.4%).
- Pursuing existing domestic clients who start overseas activities (5%).
- Favourable regulation in foreign markets (2.8%).
- Support to overseas operations offered by Polish institutions (1.4%).

The research study indicates that the frequency of occurrence of some of the factors depends on a given company's membership in the group of Polish largest exporters. These factors are presented in Table 5. As regards the indicated motives which are not included in the Table, no significant differences are recorded between the companies included in „Polityka's" ranking (E-100) and those cited by other sources (E-O).

Overall, it can be concluded that proactive and internal internationalization drivers are recognised as more significant by companies included in „Polityka's" ranking. The remaining companies more frequently enter foreign markets in response to external factors. Such results confirm the significance of the source of motivating factors in the company's successful market performance. Companies which adopt a proactive approach in conquering foreign markets are likely to generate higher export revenues than the ones which engage in export activities in response to external factors.

Tab. 5: Internationalization factors – E-100 and E-O (N=141)

Motive	E-100	E-O
Increased production capacity or more effective use of domestic production potential	65.5%	42%
Risk mitigation through diversified activities	37.9%	18.8%
Tender enquiries or overseas orders	20.7%	50%
Declining sales of products on domestic market (decreasing demand, stiffer competition, excess production capacity in company or industry)	10.3%	33%

Source: own conception

3.2 The Choice of a Foreign Market Entry Mode

Consideration given to the degree of engaging company capital outside the home territory and the location of production facilities as two internationalization dimensions is a basis for identifying several different modes of entry into international markets. The available results of research indicate that export is the major entry mode applied by Polish companies [3], [4], [5], [6], [21], [24], [27].

In choosing an export strategy as an entry mode, companies can decide on direct, indirect and collaborative export, or combine different forms of export activity. Figure 3 presents the export modes applied by Polish exporting companies. More than 1/3 of respondents rely exclusively on direct export. This group is dominated by small companies (52% of them employing up to 50 employees), which export their products to a limited number of countries (63.4% of respondents operate on not more than 6 markets). The characteristics of direct export make this mode more suitable when applied on a smaller number of markets. Interestingly, direct export is mainly applied by small businesses. It is likely that the necessity of engaging a larger part of company assets is compensated for by the possibility of generating relatively higher profits (no agency margins) and maintaining closer relationships with clients. The use of direct export is likely to result from greater opportunities offered by the internet in serving international clients. The use of internet services facilitates communication with overseas clients as well as the distribution of products without agency services.

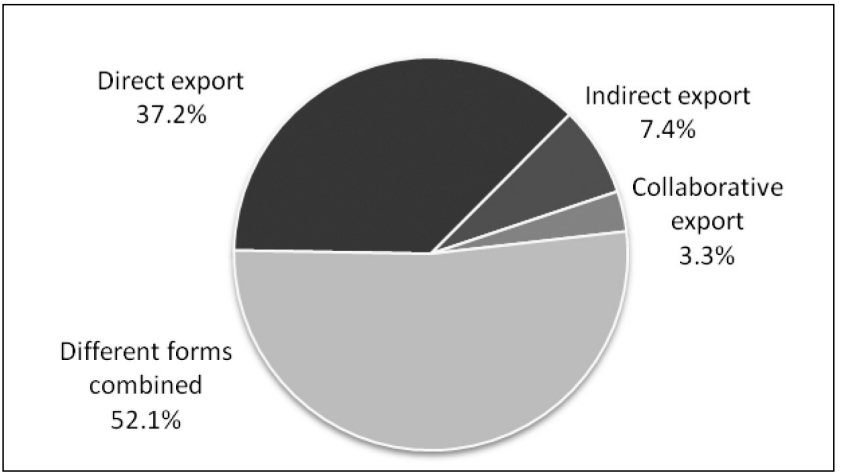
Direct export is used by merely 7.4% of respondents, while 3.3% of them rely exclusively on cooperation with other exporters in delivering their products to overseas clients. The study indicates that the majority of companies (52.1%) choose to make use of different export modes. Such diversified activities aim to strike the right balance between the particular export modes.

The results of the study indicate that 20.6% of exporters use different export modes of entry. No correlations are recorded between the adopted strategy and the company's characteristics. Only 20 companies in this group (14.2% of the entire sample) indicate other specific entry modes:

- overseas subsidiary (sales office) – 8 respondents,
- overseas daughter company – 7 respondents,
- production facility – 5 respondents,
- assembly plant – 4 respondents,
- sale of licences – 3 respondents,
- joint venture – 3 respondents.

It should be noted that most respondents (13 out of 20) indicate only one different entry

Fig. 3: Export modes applied by Polish companies (N=121)



Source: own conception

mode. Four companies use two additional entry modes, two exporters use three entry modes, while one of the respondents chooses a highly diversified method resorting to as many as five different entry and business presence modes.

One of the major dimensions of a foreign market entry mode relates to organizational issues – decisions concerning the number of target markets and the order of market entries. Companies can adopt a waterfall, a sprinkler or mixed strategies [1, p. 42-49].

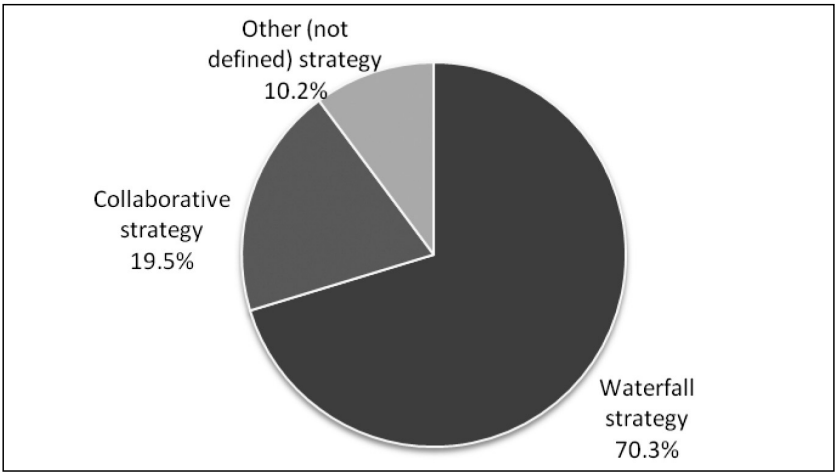
In the conducted survey, Polish exporting companies indicate the adopted foreign market entry mode (from the organizational perspective). The results are presented in Figure 4.

The majority of respondents (70.3%) adopt a gradual mode of entering into foreign markets, following the waterfall strategy. It is, as declared by the surveyed companies, a slow entry divided into phases, combined with the process of learning and gaining international experience. Nearly 20% of companies adopt a mix of strategies, originally focusing on one market or a limited number of markets. The gained experience facilitates further simultaneous expansion on a number of new markets. Exporters do indicate that they start simultaneous operations on many foreign markets, but it does not concern all the markets that they actually serve. Answering the previous question in the survey, respondents indicate different years in which they enter into overseas markets, so their adopted entry modes represent a mix of strategies rather than the sprinkler strategy. Some respondents (10.2%) name a different entry mode. A thorough analysis of the respondent's answers leads to the conclusion that in this particular case, company's decision to enter into new markets are conditioned by external factors (especially the prospective clients' behaviour), and that companies do not adopt any of the aforementioned strategies. It is confirmed by the following statements made by some of respondents: "if we get lucky, we'll make it"; "let's just wait for customer orders"; "it depends on customer needs"; "we do not have a strategy".

A detailed analysis indicates that the choice between a mix of strategies and the waterfall strategy is dependent on two company characteristics: the number of employees and the number of existing markets. A mix of strategies is more frequently adopted by larger companies and those exporting their products to many countries (see Tab. 6).

Larger companies have easier access to financial and HR resources, and the adoption of a mix of strategies that involve simultaneous entry into a number of markets requires a maximum commitment of company

Fig. 4: **Organizational dimension of foreign market entry modes adopted by Polish exporters (N=128)**



Source: own conception

Tab. 6: **A mix of strategies as a foreign market entry mode depending on selected features of the company (N=115)**

Variable	Value of the variable	Balance of respondents (%)
Number of employees	1–10	4.17%
	11–50	16.0%
	51–250	22.2%
	251–1,000	35.0%
	above 1,000	41.7%
Number of countries to which company exports its products	1–3	5.3%
	4–6	15.4%
	7–10	21.1%
	11–20	36.8%
	above 20	42.1%

Source: own conception

resources in a limited period of time as well as great organizational effort. It may be a likely reason for which smaller companies choose the waterfall strategy. On the other hand, a larger number of existing markets enable companies to gain experience which helps them carry out business operations on a number of markets.

Conclusions

The conducted study and its results confirm the previously formulated hypotheses concerning reasons for undertaking export activities. In fact, market factors are the most significant reasons for the internationalization of Polish companies (H1), with the size of the target

expansion market being the most frequently indicated factor (H3). Political and legal factors, on the other hand, are the least significant internationalization drivers considered by Polish exporters (H2).

The hypothesis (H4) which states that the company's size has an impact on the type of international factors and, in a broader sense, that smaller companies are more likely to be driven by defensive factors while larger entities – by offensive ones, is not confirmed by the study. The company's size only affects the decision to start export activities in response to tender enquiries and overseas orders for products. Smaller companies are far more likely to be influenced by this factor. On the other hand, exporters representing the E-100 group are more frequently driven by offensive factors than the members of the E-O group

An analysis of the answers given by Polish exporting companies leads to the conclusion that direct export is the most commonly applied method (H5). It is true that only 37% of companies use direct export as the exclusive export mode, but more than half of respondents apply other forms of export as well.

Additionally, other than export modes of foreign market entry are applied by less than 1 out of 5 Polish exporters (H6). Consequently, it can be assumed that export remains the major form of serving foreign markets, with other forms playing a far less significant role. In the expansion process exporters rely on foreign direct investment by establishing sales representative offices and daughter companies which engage in the distribution of products (H7).

The results of the study fully support the hypothesis (H8) which states that the waterfall strategy is the most commonly applied foreign market entry mode (more than 70% of respondents).

This article presents the assumptions that don't allow for broad generalizations. With theoretical and methodological reflection at hand, the presented study could make certain contribution in the scientific formulations process and international business practice development. It can become grounds for deepened scientific discussion on internationalization of marketing, methodology of formulating marketing strategies, their nature and effectiveness of assessment. It is encouraging other researchers to continue with the subject, in international teams.

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Abstract

FOREIGN MARKETS ENTRY MOTIVES AND STRATEGIES OF POLISH EXPORTERS

Jaroslav Ďaďo, Jan W. Wiktor, Agnieszka Żbikowska

The article presents the results of research on the strategy of Polish companies that export their products to foreign markets. It presents motives, conditions and forms of expansion and is comprises of three parts. In the first one, the theoretical aspects of a company's internationalization are discussed, with stress on motives and forms of entering foreign markets. The second part is concerned with the complex problems regarding methodology of research – goals, hypotheses, methods and description of study sample are the main focus here. The synthetic, summation of the results of the study are presented in the third part.

The study verifies the hypotheses regarding motives of internationalization and concrete forms of entering foreign markets. The most powerful premises to internationalize Polish companies are market motives. The relationship between the size of the company, decision to start export goods and the nature of expansion (offensive, as well as defensive) has been ascertained. One of the strong motives for internationalization among companies belonging to SME group, were encouragements and invitations for cooperation from foreign partners. However, the main strategy was direct export, complemented by other forms of expansion, of lesser importance. In the expanding process Polish exporters took advantage of direct investments, via establishing divisions and subsidiary companies that deal with distribution of products. The waterfall strategy proved to be the most common in entering foreign markets – used by roughly 70% of the examined exporters.

The research could be a contribution into the process of scientific examination and development of international business practice. It can also provide a ground for further discussion on marketing internationalization, methodology of formulating marketing strategies, their nature and assessing their effectiveness on international markets. Last but not least it can encourage more such scientific studies and research conducted by international teams of scholars.

***Key Words**: Internationalization, export motives, entry modes, Polish exporters.*

***JEL Classification**: L2, M21, M31.*

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THE IMPORTANCE OF DESIGN IN BUSINESS PRACTICES OF CZECH COMPANIES

Jan Kramoliš, Pavla Staňková, Michal Richtr

Introduction

As a result of rapid changes and a growing competitiveness of companies at present, design is becoming one of the key instruments of innovation and also the key instrument of companies´ performance [8], [1]. For the reason of having products more and more technically alike, it is the design that is becoming an instrument of competitiveness as well as the criterion for decision making of final consumers.

Innovation by Urabe, Child & Kagono [19] consists of the generation of a new idea and its implementation into a new product, process, or service, leading to a creation of pure profit for the innovative business enterprise.

Design management is a term for which there is no clear-cut definition. However, it is evident that this term stands for connecting two fields – design and management.

Design by Bruce & Bessant [3] is essentially the application of human creativity to a purpose – to create products, services, buildings, organizations and environments which meet people's needs. It is the systematic transformation of ideas into reality.

In the context of innovations, we are able to specify three interpretations of the term design [18]:

- Design is a tangible outcome.
- Design is a creative activity.
- Design is the process by which information is transformed into a tangible outcome.

Fairhead [18] refers to four different levels of understanding of design:

- Design is seen as "styling".
- Design is about better products.
- Design shares the interface between company and audiences.
- Design is integration: A whole process.

The connection of terms design and corporate is used by Vysekalová & Mikeš [21]. In her point of view, the corporate design is a part of visual identity and it is a set of visual constants that is used in internal and mainly external communication. It includes following factors: name of the company and the way of its presentation, company logo, product brands, promotional items and printed materials, script and colour, structure and nomenclature of the buildings and interiors, employees wear, container graphics, gift items, etc. The graphical image of these components should be included in a so-called design manual. Design manual is a summary of rules and recommendations for printed and electronic visual presentations of the company, e.g. graphical rules, layout of the documents, rules concerning usage of founts, colours, logo and its variations, company documents, and the like.

By the Kathryn Best [5], in the area of design management a wide variety of perspectives exist that reflect the rich array of individuals, professions and context involved. Hollins [10] define design management as the organisation of the processes for developing new products and services.

Bruce & Bessant [3] identify fundamental issues of design management:

a) How do particular perspectives fit into the design process and what they can bring?
b) How can design professionals support these different contributions?
c) How tolls/techniques are available to help make this contribution?
d) How can effectiveness of the design process be measured?
e) How can the process be improved?

According to Design Management Institute in Boston [6] definition encompasses Design management the ongoing processes, business decisions, and strategies that enable innovation and create effectively-designed products,

services, communications, environments, and brands that enhance our quality of life and provide organizational success. On a deeper level, design management seeks to link design, innovation, technology, management and customers to provide competitive advantage across the triple bottom line: economic, social/cultural, and environmental factors. It is the art and science of empowering design to enhance collaboration and synergy between "design" and "business" to improve design effectiveness. The scope of design management ranges from the tactical management of corporate design functions and design agencies, including design operations, staff, methods and processes—to the strategic advocacy of design across the organization as a key differentiator and driver of organizational success. It includes the use of design thinking—or using design processes to solve general business problems.

There is a strong link between marketing and design management which mentioned Gorb [7] and also Melewar, Dennis, Kent [13], and Adir & Pascu [2] presents in their paper the importance of a logo as a graphic element to support a corporate identity. They described the basic idea: That the logo design is a creative work which allows to a company to be seen through a symbol as a visual and graphic message.

Design offers four powers or directions through which to create value in management, and these four directions can be seen as a system with the vision in the center according to Mozota [14], [15], [16]. The design value model and its application through the Balanced Score Card toolkit provide a common language for designers and managers and this can help the design profession effect a change from project-based to knowledge-based.

1. Theoretical Background

Walker [22] deals with a specific field of management. He presents the differences between managers and designers – see Tab. 1. The differences between the managers and designers are mainly in the area of personality specialities, habits of thinking and working, and education background.

Tab. 1: Differences between managers and designers

Characteristic	Managers	Designers
Aims	Long term Profits/return Survival Growth Organizational durability	Short term Product/service quality Reform Prestige Career building
Focus	People Systems	Things Environment
Education	Accountancy Engineering Verbal Numerical	Grafts Art Visual Geometric
Thinking style	Serialist Linear Analysis Problem oriented	Holist Lateral Synthesis Solution led
Behaviour	Pessimistic Adaptive	Optimistic Innovative
Culture	Conformity Cautious	Diversity Experimental

Source: [22]

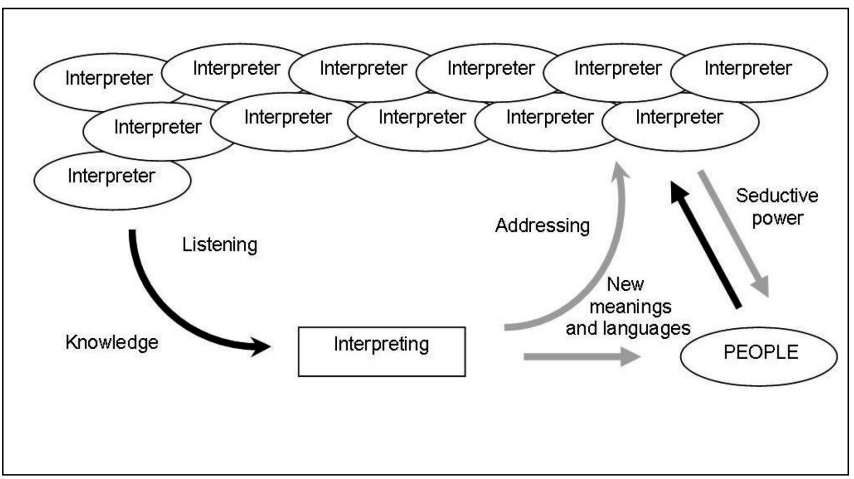
Design management according to Kathryn Best [5] includes three main phases:

1. Managing design strategy – the aim is the identification and looking for conditions most suitable for having successful design management. This includes mainly implementation of design into organization strategy, identification of opportunities for design, interpretation of will and needs of the customers, and looking for benefits of design for business;
2. Managing design process – it is the realization of design itself and making it visible. It helps the organization identify opportunities for particular projects concentrating on design, making a creative team, visual communication of the organization and presenting its ideas outward;
3. Managing design implementation – this phase concentrates on particular project management in practice, design specification, specifying the level of cooperation and ethical responsibility. The evaluation of the project forms an essential part of the implementation that provokes positive response regarding design efficiency.

Verganti [20] introduces the term design-driven innovation. He also defines three phases related to innovation management by means of design:

a) listening,
b) interpreting,
c) addressing (see Fig. 1).

Fig. 1: Phases related to innovation management by means of design



Source: [20]

In the first phase 'listening', there is listening to the key groups, i.e. interpreters. Interpreters are people who predict future development of customers' needs by means of their own research. The aim of 'listening' is to find the key groups of interpreters and predict benefits of their thoughts for business. The main key groups according to Verganti [20] are artists, cultural organizations, sociologists, anthropologists, marketers, retail and delivery firms, people, designers, firms in other industries, developers of pioneering projects, technology suppliers and research and educational institutions. The second phase is 'interpreting'. Its purpose within the company is to create such conditions that would propose a motion. The organization communicates with the interpreters and integrates their ideas with technology and possibilities of the company. The third phase is 'addressing'. This means making such conditions to be able to innovate, and to discuss the rationality and attractions of the change.

Bruce & Bessant [3] also state the major benefits of design management:

- Increase profit by increasing sales or by decreasing manufacturing costs.
- Increase market share.
- Gain a competitive advantage.
- Revamp mature and failing products.
- Provide a strategy for growth.
- Design is a way of launching a new product of service.

The UK Design Council focuses on the contribution made by design and presents mail responses [3]:

- 91% felt it improved the image of their company.
- 90% felt it improved quality of their products.
- 88% felt it helped them communicate more effectively with their customers.
- 84% felt it helped increase profit.
- 80% felt it helped into new markets.
- 70% felt it reduced costs.

Mazota [15] deals with topic Design as a competitive edge. Author measures impact of design on product, classifying the reasons for launching new products and the tacit knowledge of design. This research can be useful for professional design managers because it isolates variables that are pertinent to explain how design transforms management processes and which process it changes.

According to Bruce & Cooper & Vazquez [4] small companies have a range of business needs for design, but have varying levels of awareness and competency to manage design effectively. Two different types of companies could be discerned from the study: 'confident' and 'apprehensive' design users. The former companies had had experience with design, typically in previous work experience and the latter had little awareness of design. For the inexperienced design companies, various factors were identified that assisted the effective design outcome: the relative simplicity of the project, possession of strong briefing skills acquired in a different discipline, sourcing skills, such as personal recommendation form a trusted intermediary, and evaluation skills obtained through an intermediary or acquired in a different discipline.

2. Problem Formulation

The basic aim of research is to investigate the importance of design in Czech companies from the management of businesses´ point of view. This paper also attempts to analyse and identify the awareness of companies of various sizes concerning the importance of design. The emphasis is put on the issues related to the correct targeting of such activities, which is closely related to the importance of design within companies. Finally, based on an analysis of the data collected, the study shows the current situation in Czech business.

2.1 Research Methods

The research consists of two main parts. In the first part of research done from January to March 2014, a method of smart internet questionnaires was used. It was designed by the authors of the paper based on the experience from their previous research.

The primary aim was to investigate companies´ concern for design in relation to other factors. This was done by asking specific questions. The secondary aim was to investigate companies´ concern for the importance of design itself.

In the second part of research, the results were analysed using quantification and by means of seeking a mutual dependence. The questionnaire form contains 16 questions. The responses were divided into several categories with common features. In total 168 entries collected from 305 addressed respondents took part in the research. The results obtained were subjects to a statistical study.

The results were subjects of critical assessment and a synthesis with already discovered and published data (secondary data) was carried out.

The table below shows the occupational structure of respondents who participated in the e-research.

The table above indicates that B2B and B2C were almost equally represented (53.5% and 46.5%) in the investigated area. The zero share in the respondent structure is represented by B2G business. This means that the major share should just have B2C and B2B sector. Firstly, a list of selected suitable subjects was done. Then, this list was sent to be filled in through the internet research questionnaires.

Tab. 2: Target group characteristics

	relative (%)	market orientation
Subcontractor	26.8	B2B 49.8%
Producer	30.1	
Service provider	29.4	
Merchant	13.7	

	relative (%)	market orientation
Subcontractor	9.7	B2C 50.2%
Producer	33.8	
Service provider	35.3	
Merchant	21.1	

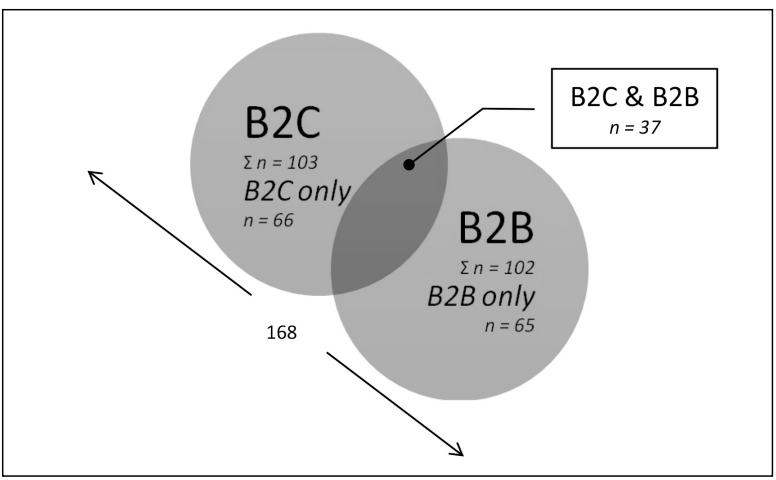
Source: own

Venn diagram visualisation was used for a better illustration (see Fig. 2). It is evident that some companies operate in both fields, whereas certain number of companies operates in one field only.

The Figure 3 shows the sectors structure of respondents, in which they operate.

The sample which has been used for the purpose of this paper contained 23% service respondents, 15% trade respondents, 10% building respondents, 13% engineering respondents, 4% food industry respondents, 1% textile industry respondent and 34% respondents that operate on the other sectors.

Fig. 2: Venn diagram target group characteristics



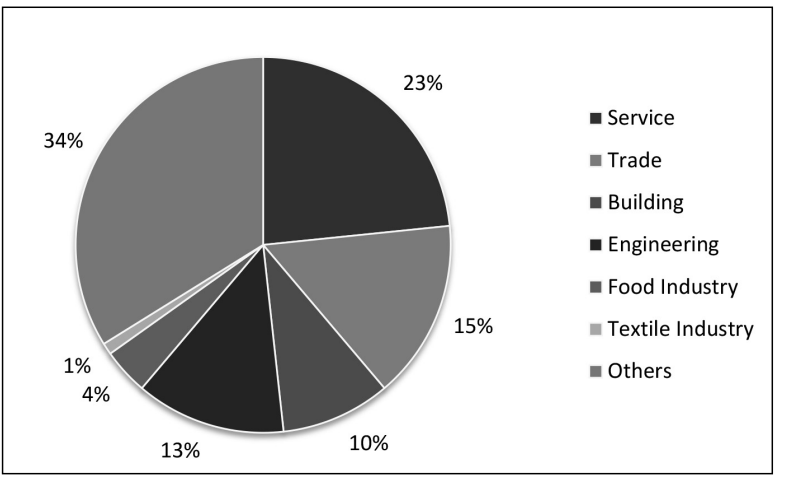
Source: own

Tab. 3: Target group characteristics: Business size distribution – Number of employees

Number of employees	B2B only	B2C only	B2C and B2B (both only)	Relative (%)
1–10 (Micro)	9	18	1	16%
11–50 (Small)	10	11	8	17%
51–200 (Medium-sized)	15	15	6	22%
200 + (Huge/big)	31	22	22	45%

Source: own

Fig. 3: Target group characteristics: Operating sectors



Source: own

3. Problem Solutions

The current state of the importance of design in a business concept of Czech companies in subjects examined on the Czech market is characterized by the following queries. In the case of a majority consensus, the data are quantified by a relative indicator and supplemented by important findings in the form of a comment. In the case of fragmentation of answers, only the most important findings in the surveyed area are listed.

Based on the problem solution above, two hypotheses were established. Hypotheses were tested on the level of significance of α = 0.05. The H1 hypothesis was a subject to the Pearson´s chi-squared χ^2 test of independence [12] for a contingent table, using IBM SPSS Statistics software. P-value and Excel XLStatistics5 programme were used for statistical evaluation of the H_2 hypothesis.

The value of the test-statistic is

$$x^2 = \sum_{i=1}^{r} \sum_{j=1}^{c} \frac{O_{ij} - E_{ij}}{E_{ij}} \quad (1)$$

χ^2 = Pearson's cumulative test statistic;

O_i = an observed frequency in a given contingency table;

E_i = an expected (theoretical) frequency, asserted by the null hypothesis;

r and c are the number of rows and columns in the table, respectively. [9]

Then a standard deviation was calculated. This enabled us to see up to what extent typical cases vary within the set of examined numbers.

3.1 Design with Respect to the Market Type

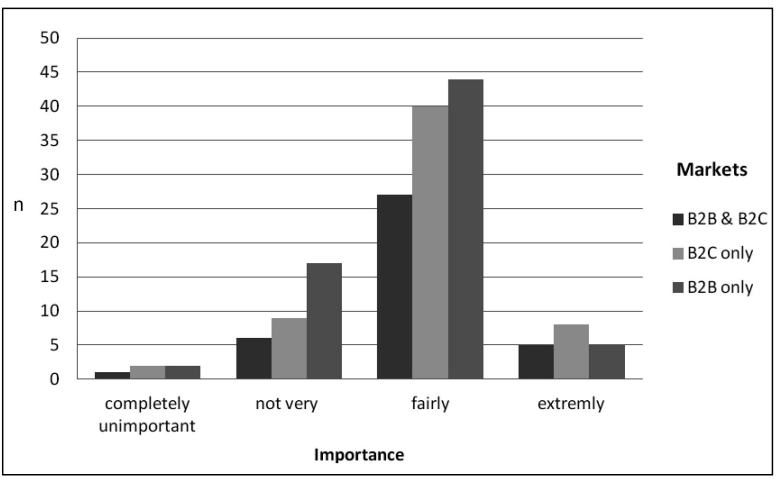
Concerning the evaluation of design as one of the most important factors in the company, the following hypotheses were defined.

$H1_0$: Referring to the importance of **design** in relation to the success rate of the company **there is no difference** between the companies having business in B2B and B2C markets.

$H1_A$: Referring to the importance of **design** in relation to the success rate of the company **there is difference** between the companies having business in B2B and B2C markets.

The figure from above demonstrates the importance of design within the company according to its field of business. It is evident that across the spectrum 'fairly important' prevails. According to these numbers, companies in B2B market only are aware of a great importance of design. Slightly lower numbers are recorded within companies in B2C market. Companies having business in B2B and at the same time in B2C markets took last place. Extreme numbers at both poles, i.e. 'extremely important' and 'completely unimportant', are very rare.

Fig. 4: **Graphical record of the evaluation regarding the importance of design from the perspective of companies and their business activities in the markets**



Source: own

The next part focuses on the importance of design from companies' point of view. In the following Pearson´s chi-square test for independence, the researchers strived to evaluate the importance of design from companies' point of view. The criterion of evaluation concerning the importance of this factor consisted of four levels: extremely important, fairly important, not very important, and completely unimportant.

Based on the hypothesis when p-value at 0.05 significance level was calculated with result of 0.756443221, is this hypothesis H0 rejected. It means that we cannot claim that there is no difference among the companies from B2B or B2C markets with respect to the importance of design.

Tab. 4: Screenshot for H1 Chi-square Test

(Pearson) Chi-square Test	
(For independence of importance of design and typ of market	
H_0: Variables are independent (no interaction between variables)	
H_1: Variables are dependent (interaction between variables)	
Chi-square	3.405907985
DF	6
p-value =	0.756443221

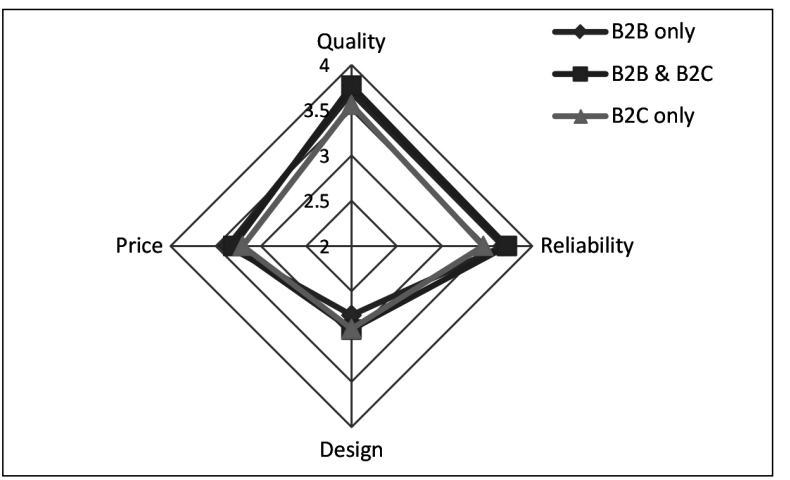
Source: own

From the visual representation of respective factors concerning the importance of companies´ activities in the markets, a simple spider graph analysis was drawn up. The spider analysis includes criteria according to which the companies consider the importance. These are quality, reliability, design and price. Low numbers show insignificant importance (1 – completely unimportant), whereas high numbers represent great importance (4 – extremely important). This reflects degrees of importance concerning the evaluation of internal factors based on a well thought-out indicator system. The factor rating enables us to answer the following questions: 'What are the most important factors within companies?' and 'What is the situation like regarding the selected factor within a company?' A structure of the factor-rating model is to be found in Figure 5 below.

For a more precise representation of the measured results, the axis numbers in the spider graph were adjusted at number intervals 2.0 to 4.0. This spider chart represents that in the market B2C only, quality is the most important factor with the value of 3.56, then there is reliability with the value of 3.46, price with the value of 3.20, and design with the lowest value of 2.92.

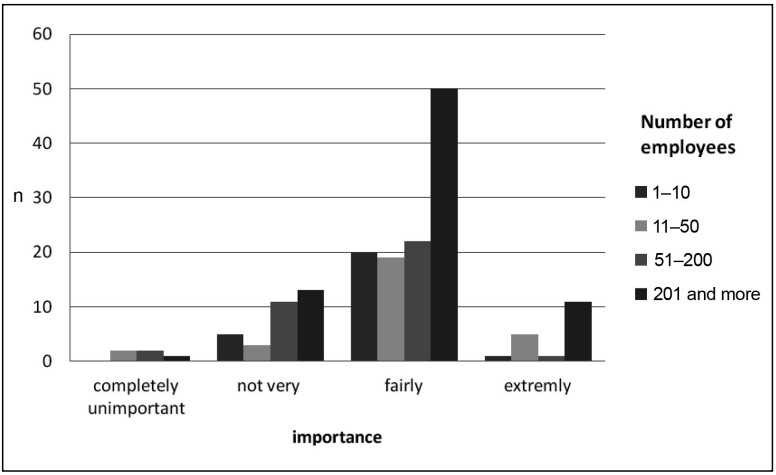
In the market B2B only, quality with the value of 3.69 is the most important factor together with reliability with a very similar value of 3.68. The

Fig. 5: Spider chart regarding the importance of respective criteria



Source: own

Fig. 6: **Graphical record of the evaluation regarding the importance of design from the perspective of companies´ size**



Source: own

factor of price reached a lower value of 3.37 and design is again of lowest importance with the value of 2.76. In the companies that have their business activities in B2B and B2C markets, the situation is almost identical. Quality is again the most important factor with the value of 3.77, then reliability with the value of 3.72. Price is at the value of 3.31 and design is again of the lowest importance with the value of 2.92.

3.2 Design with Respect to the Company Size

For the purpose of research concentrating on the importance of design compared with the company size, the following hypotheses were defined.

$H2_0$: Referring to the importance of design in relation to the success rate of the company there is no difference among small, medium-sized and large businesses.

$H2_A$: Referring to the importance of design in relation to the success rate of the company there is difference among small, medium-sized and large businesses.

Considering the evaluation of design itself as one of the factors that were stated by the companies in the graph above, we are able to note the following. Small businesses with 1–10 employees and medium-sized businesses with 11–50 employees as well as large businesses with 51–200 employees are of a very similar opinion. According to their opinion, the statement that design is relatively important occurs most often. A small number of businesses consider design extremely important, not very important or completely unimportant. A very similar situation is in large businesses with 201 employees and more when 50 businesses consider design fairly important. The entry 'extremely important' is insignificant and 'not very important' is of almost identical low value as 'extremely important'.

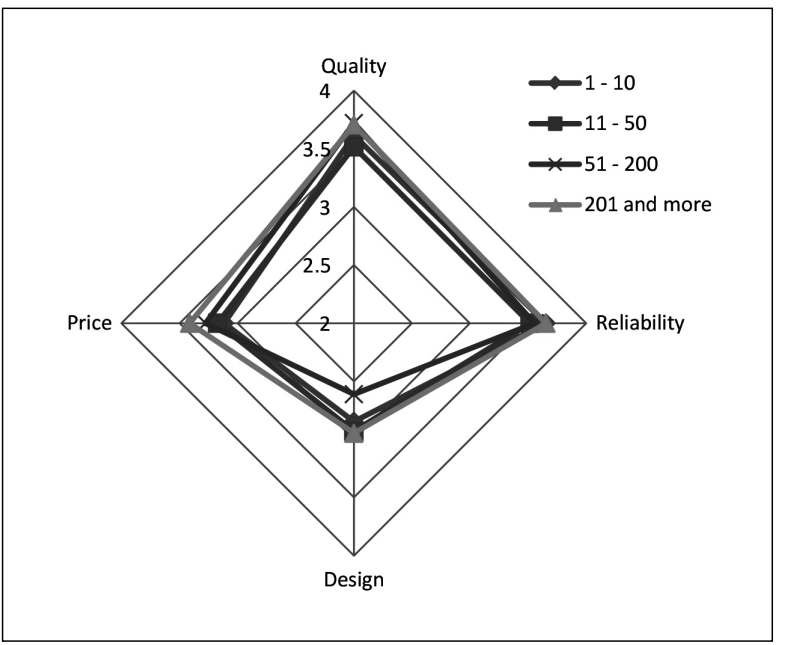
Based on the hypothesis when p-value at 0.05 significance level was calculated with result of 0.143148809, is this hypothesis H0 rejected. It means that we cannot claim that there is no difference among the companies regarding the dependence on number of employees and the attitude towards the importance of design. Spider graph analysis regarding visual record of the evaluation of respective criteria from the perspective of companies´ size was made.

Tab. 5: Screenshot for H2 Chi-square

Analysis of r x c tables	
(Pearson) Chi-square Test	
(For independence of importance of design and number of employees)	
H_0: Variables are independent (no interaction between variables)	
H_1: Variables are dependent (interaction between variables)	
Chi-square	13.45319424
DF	9
p-value =	0.143148809

Source: own

Fig. 7: Spider chart regarding the importance of respected criteria from the perspective of companies´ size



Source: own

The spider analysis was done by means of quantified responses. The number 4.0 represents the highest importance, whereas the number 1.0 represents the lowest importance. For a more precise representation of the measured results, the axis numbers in the spider graph were adjusted at number intervals 2.0 to 4.0. It is evident that regarding small businesses with 1–10 employees, reliability with the value of 3.65 is of the highest importance. Then, quality with the value of 3.62 follows. Price with the value of 3.12 comes third.

Design with the lowest value of just 2.85 takes last place concerning the importance. Medium-sized businesses with 11–50 employees see the importance of respective factors as follows: quality and reliability with the same value of 3.52, price with the value of 3.17, design again with the lowest value of 2.93. Medium-sized businesses with 51–200 employees reached very similar values as medium-sized businesses with 11–50 employees. The most important factor is quality with the value of 3.72, reliability with the value of 3.56 follows. Then, there is price with the value of 3.28. Design takes last place with the value of 2.61. Large businesses with 201 employees and more evaluate the selected factors in the same order as medium-sized businesses: quality (3.71), reliability (3.65), price (3.41), and design (2.95).

3.3 The Importance of Design Regarding Characteristic of Data´s Position and Variability

From the data collected through electronic forms, the following statistical indexes were calculated: characteristics of data´s position (arithmetic mean and median value) and characteristics of data´s variability (variance and standard deviation).

Arithmetic mean of 2.86 represents a typical value describing a file of various values. We state that there is not a great difference regarding values recorded within respective fields of business (Fig. 5) or company size (Fig. 6). The data examined reaches a low variance of 0.4, which represents favourable data consistency. Standard deviation of 168 entries regarding the importance of design within companies shows how typical cases within the data collected vary. The value of 0.63 means that in most cases the elements within data collected are alike, therefore only a low disparity occurs.

Tab. 6: Calculation of selected statistical indexes of data file under review

Number of values (*n*)	168
Arithmetic mean	2.86
Median value	3
Variance (s^2)	0.4
Standard deviation (*s*)	0.63

Source: own

From the analysed results, we understand that companies with respect to their size and business activities in particular markets see the importance of the following factors: quality, reliability, design and price. In general, design is least important. Regarding almost all the fields, quality comes first, and then, reliability together with price is of the same importance in the second and third place.

Conclusion

Nowadays, businesses are definitely aware of design being an important part of business prosperity. One of the major criteria is to become different in the market and for that reason design is fundamental in this discipline. Many businesses have already started working on it; others are in the phase of being aware of it but not concentrating on this area. These have not started solving the situation in any way. They probably feel that design is their weakness that they want to work on and improve in the future.

At present, companies are becoming more aware of the importance of design regarding their products as well as their marketing materials. Unfortunately, in comparison with international research activities it must be declared that majority of companies in the Czech Republic still underestimate the role of design. Even though companies pay attention to design, they do not consider it strategically important for business prosperity. By doing the research in the Czech Republic using a sample of 168 companies it was found out that there is a difference regarding perception of the importance of design in B2B and B2C markets. This corresponds with an increasing importance of design for final consumers. Design represents a very important competitive

factor that influences their final decision. On the contrary, the company size specification from number of employees' perspective does not influence perception of the importance of design in Czech companies.

Companies put emphasis on the quality of products in the first place. In fact, a long-term and transactional marketing considers the quality as one of essential pillars of successful marketing strategy. Reliability comes second, not design. The explanation is clear. Companies´ great concern is to offer a high-quality product, to be reliable (accuracy, amount and perfection of supplies, invoice payment, and trust in business partner). Then, there is the price of product. Czech market is traditionally very sensitive to the price and companies are definitely aware of this fact. For this reason, design is naturally moving to the last place with respect to these four basic criteria. Novotný and Duspiva [17] present very similar results in their research. They define the factors influencing consumers' buying behaviour and their importance for enterprises. Based on their results of the research a model of identical and nonidentical factors influencing purchase consumers' behaviour and the model cobwebs were drawn. Novotný and Duspiva [17] define following 15 factors:

1. Quality.
2. Price.
3. **Design.**
4. Service.
5. Experience.
6. Colour.
7. Discount.
8. Convenience.
9. Reference.
10. Brand.
11. Origin.
12. Public relations.
13. Trends.
14. Advertising.
15. Package.

As we can see, the research confirms results of our research.

It is evident that nowadays, in the period of economic stagnation, companies must primarily maintain their position in the market which is typical for poor demand. They cannot afford to invest money and energy in the development of high-quality design. According to estimates of Czech Ministry of Finance and The European Central Bank, we expect the growth in gross domestic product of Czech economy in 2015 by 1.7–2.0 percent [11]. With respect to economic growth and positive market news, companies could make their economic situation more stable and start dealing with design more strategically.

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Abstract

THE IMPORTANCE OF DESIGN IN BUSINESS PRACTICES OF CZECH COMPANIES

Jan Kramoliš, Pavla Staňková, Michal Richtr

In the context of discussions about the role of innovation in business policy and marketing activities, questions of design to participate in the innovation success are often considered. The main aim of this paper is to comprehensively review the sources of design management. Furthermore, the study shows current situation in Czech business. This paper also attempts to analyse and identify the awareness of companies of various sizes concerning the importance of design. The primary aim of research was to investigate companies´ concern for design in relation to other factors: price, quality and reliability.

A comprehensive review of the extant literature and journals identified several sources of design approach for Czech companies. The research consists of two main parts. Firstly, a method of smart internet Google SpreadSheets questionnaires designed by the authors was used. Total of 168 entries collected from 305 addressed respondents were used in the research. In the second part of research, the results were analysed using quantification and by means of seeking a mutual dependence. The results obtained were subjects to a statistical study. The results of the research have offered interesting findings. It was discovered that design represents a very important competitive factor that influences firms' final decision. On the other hand, quality, reliability and price are still perceived as more interesting factors of innovation. Briefly, design is not likely to be perceived as the main innovation factor in the Czech Republic.

This paper identifies several interesting aspects regarding design within Czech companies, including the mindset of management.

Key Words: *Innovation, design, management, quality, price, reliability.*

JEL Classification: *M21, O31.*

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COMPUTER LITERACY AND USE OF ICT AS KEY FACTORS OF MICRO-ENTERPRISE SUCCESS

Borut Werber, Uroš Rajkovič, Marko Urh, Anja Žnidaršič

Introduction

Europe and most of the word is dealing with economy crises and everyone is searching for solutions. Many large companies were destroyed by their own greed and because of their stocks manipulations without solid financial coverage. Because of that also many micro-enterprises have stopped working, but on the other hand more new ones were formed. How to distinct die-hard, high quality, high growth enterprises from low profitable? Why we are interested in micro-enterprises in the first place? Here are some facts and an example that inspired our study.

No generally accepted definition of a micro-enterprise can be found in the research literature. The most common criterion for a micro-enterprise is the total number of employees, often combined with some financial indicators, such as the firm's annual turnover and assets. In the absence of a precise definition, micro-enterprises are defined in different contexts in various business cultures. Sometimes, the definition of a micro-enterprise depends on the industry [13]. In the USA the definition for small enterprises in most cases is less than 500 employees depending on industry [6]. Industry Canada's definition of a "small business" is a firm that has fewer than 100 employees [9]. On the national front, 78% of Canada's one million businesses employ fewer than five people. Because of that we must be careful when we compare results between nations. In a research in Slovenia in 1999 [27] the computerisation of small businesses were analysed. From 122 included small firms with 1 to 50 employees, the average number of total employees was only 5.7.

In some studies micro-enterprises are represented only by entrepreneurs. For most readers the notification of entrepreneurship and "the entrepreneur" is so familiar that they need no explanation yet, according to Mills et. al. [18], the concept of entrepreneurship itself remains nebulous, broadly conceived, open to a range of definitions and differently employed. It is hardly surprising that there is no concordant and comprehensive definition of the entrepreneur.

If we know the fact that the number of micro-enterprises organized as legal and private persons (entrepreneurs) is almost equal (45% and 55%) than we can assume that the whole group needs special attention.

In the last decade European Union (EU) recognized the importance of micro, small and medium-sized enterprises in terms of growth and economic development. On May 6th, 2003, the Commission of the European Communities [25] adopted Recommendation 2003/361/EC regarding the definition of micro, small and medium-sized enterprises (SME) in Community policies applied within the Community and the European Economic Area. Within the SME category, a micro-enterprise is defined as an enterprise that employs fewer than 10 persons and whose annual turnover and/or annual balance sheet in total does not exceed EUR 2 million. Slovenia as a member state of EU accepted this recommendation.

In Slovenia, there were 169.360 enterprises registered in 2011; 94.5% of them were micro-enterprises, 4.1% were small enterprises, 1.2% were medium-sized and 0.2% large enterprises [15]. The overall share of micro-enterprises organized as natural persons (individual private entrepreneurs) was 55.5% and of legal persons was 44.5%. Most persons were employed in large enterprises (30.6%), followed by micro-enterprises (27.7%), medium-sized (24.8%) and small enterprises (16.9%). Micro-enterprises in 2011 generated around one fifth of the total turnover (19.7%). Similar share of annual turnover was generated by small (20.4%) and middle-size enterprises (26.4%).

In Slovenia in 2011, the number of enterprises increased by 2.0% and turnover by 4.7%. However, the number of persons employed was 2.4% lower than a year before. The increase in the number of enterprises and the increase in their turnover were mostly recorded in electricity, gas, steam and air conditioning, supply and water supply, sewerage, waste management and remediation activities. The largest decline in the number of employees and the largest decline in their turnover were observed in construction.

How micro can become big we can read in success story [22] about Slovene sewing micro-enterprise Prima, owned by Nataša Pristav. Between September 1st and December 10th, 2009, in premises measuring 130 square meters three seamstresses, Pristav herself and her husband sewed numbers for the athletes which were employed at the Olympic and Paralympic Games in Vancouver 2010. Nataša as a former student of University Ljubljana, Faculty for Textile Technology, inherited the family business on her mother's retirement in 1991 and a good reputation allowed her to find a business partner in the large Austrian market. And so, via an agency in Innsbruck with which she has been working for a number of years, she beat off competition from all over the world to win the above order for the Olympic Games in Canada. 'Colours, specifically a dark blue shade that is very difficult to get on a printer, were decisive in the company getting the order,' explains Nataša. What were the success factors in this example? First of all owner of business possesses the knowledge and formal education from textile business she runs. Enterprise is a partner with other enterprises in Austria and is promoted by agency in Innsbruck. How did they find them? Business production is based on a computer supported print and design of textile. To operate such machines computer skills are required. To finish order in time they invested in additional hardware. These and other factors made this firm successful.

Due to the impact of micro-enterprises on economy, recent Slovene statistical data and present legislation, we decided to focus our attention on micro-enterprises and factors related to business success, owner and ICT use as key factors for recognition of perspective micro-enterprises.

1. Literature Review

To understand the nature of micro-enterprise we must know their characteristics, more precisely, their organisational characteristics, management, use of strategic planning, use of ICT, owner and employees' characteristics and the environment surrounding the companies. Enterprise characteristics can be according to Levy and Powell [17] described with five stages of development where the **first stage of growth is known as Commencement.** These organisations have the following characteristics:

- Lack of financial sources for the purchase of ICT, training, etc.
- The corporate strategy can be described as „survival" and maintaining its position in the competitive environment of the market.
- Limited number of employees.
- Insufficient knowledge of ICT.
- Communication with the customers and suppliers only by e-mail, phone or in writing.
- Information support is by an office software package.
- Failure of the customers to comply with financial obligations.
- Often little specialization of individual associates with everybody doing what is presently needed.

2nd Stage of Growth: Survival

Enterprises with several years of successful work will reach the ability to cope with all market demands, so they employ more part time or full time employees and are challenged with new organisational problems that demand ICT support. Most of them will in first place hire accounting and bookkeeping service that will support their business process.

3rd Stage of Growth: Successful Position in the Market

The company is successfully growing and the manager begins to undertake mid-term planning. In this phase of development the further growth of the company significantly depends on the approach of the manager or owner. Using ICT is based on applications such as CAD (Computer Aided Design – software design application), in addition to accounting and other administrative applications. They will tend to integrate electronic shopping and organizational structure into their business model.

4th stage of Growth: Expansion
With an increasing number of employees there is a need for the owner to formalize the organisational structure and to delegate responsibility. This group differs from the previous groups of organisations by their higher utilisation of knowledge of their employees. The organisations have defined a corporate and information strategy, they have a hierarchical organisational structure and they need to optimize their processes with information support. They use standard ERP (Enterprise Resource Planning), systems for communication with their partners, so they utilise the electronic exchange of data. In most cases this is the barrier between micro and small business.

5th Stage of Growth: Maturity
These organisations typically have higher number of employees (80–250), are managed by a team of managers and have hierarchical structure of leadership.

We can conclude that micro-enterprises are mostly in first three stages of growth. Because of that we are certain that micro-enterprises should be studied separately from other sized enterprises. If we try to determine the growth stage of our best practice micro-enterprise Prima, our case from introduction section, we can define it as in the third stage of growth since they used high tech ICT for colouring and cutting of textile and they were a part of an international business networking.

In most cases micro-enterprises work in environment that prevents them progressing and development. Micro-enterprises are negatively affected by the following environment factors [2]:

- Low economic power compared to large companies.
- Difficultly gaining access to capital with a consequently limited ability to finance development activities.
- Worse access to specialized training and education compared to larger companies.
- Lower access to necessary information and consultancy services.
- Unfair competition from large companies and dumping prices of imported products.
- Limited sale of finished products on the domestic market and increased cost of export.
- Competition of retail organisations managed by financially strong companies.
- Weak position in public tenders.
- Failure to and delay in receiving payments resulting in a secondary financial insolvency.
- High administrative demands from government bodies and agencies.

Policy makers often think that creating more start-up companies will transform depressed economic regions, generate innovation, and create jobs [23]. This belief is flawed because the typical start-up is not innovative, creates few jobs, and generates little wealth. Getting economic growth and jobs creation is about encouraging the formation of high quality, high growth companies. Policy makers should stop subsidizing the formation of the typical start-up and focus on the subset of businesses with growth potential [23]. In many cases we can find micro-enterprises formed because of saving on human costs. Employees are put in a situation to form their own business and work as subcontractor or they become unemployed. Most of newspaper stands in Slovenia work on this basis. Also employees from repair and service sector from large enterprises such as beer industry become entrepreneurs on the same basis. There are also so called “bypass enterprises” with function to hide financial transactions or to transfer employees from the parent enterprise so that they can downsize. To recognize such micro-enterprises we need factors that form relevant filters.

In research by Hoxha and Capelleras [12] the contribution of fast-growing firms to employment and the determinants of fast growth in Kosovo were analysed. The sample consisted of 585 firm founders. In terms of the firm-related component, the most robust predictor of firm fast growth is the startup size. Results show that smaller firms at startup tend to grow faster than the rest of firms. This is significant for our study because it confirms our assumption that micro-enterprises are an important segment of the fast growing firms. On the other hand, the age of the firm did not show any influence in the firm’s fast growth. As the most important factor for fast-growing firms was owner’s intention to growth. The drastic changes in size confirm that fast-growing firms experience tremendous organizational changes, furthering managerial complexity, and increasing internal turmoil, challenges that are

not easy to cope with especially in the short run. Thus, the growth of the firm might not be always desired by the entrepreneurs.

One of possible factors for firm's success is adoption of ICT and its use. In research of Antlova [2] they focused on SME management's approach to ICT, its utilization for competitive advantage and its relation to and defining of business and information strategy. Other aspects of the study looked at the effect of ICT on organizational performance, knowledge and skills of the employees, training and organizational culture. The analysed organizations were divided into five groups according to the level of their development during their business existence. Each group has its specific way of managing the organization, its organizational structure, presence or absence of the corporate strategy, level of utilization of ICT, internal and external integration of ICT supporting processes in the organization and the way of utilization of knowledge of the employees.

In another research of Antlova et al. [3] they identified the most important ICT competencies that influenced a long term growth in the SMEs. They showed that there is no unique competency that would characterize growing or non-growing companies absolutely. It implies that it is always necessary to combine more competencies connected with business and information strategy. The competencies which were connected with information strategy, ICT strategy alignment, business process design and technology analysis resources have the key importance. Therefore they suggest that the managers or owners of SMEs should support educational activities in this area and it is also a challenge for universities to help SMEs to increase their competitiveness with the educational internship.

In research of Burke et al. [5] we found results that show personal characteristic of owner as important for die-hard entrepreneur. For men, inheritance encourages persistence, and facilitates initial self-employment. Having a self-employed father as a role model makes their sons persist longer. Similarly, higher levels of education tend to be associated with entrepreneur persistence among both males and females. However, somewhat surprisingly, early experience of unemployment does not affect the probability of self-employment, while reducing persistence.

In Gill et al. [9] similar factors were analysed. They wanted to extend the findings regarding factors that affect the propensity of small business owners to grow and expand small businesses. A total of 218 Canadian small business owners were surveyed and reported their perceptions of various factors that adversely affect their propensity to grow and expand their businesses. The findings suggest that the factors are perceptions of lack of expertise, family-business role conflict, and lack of management skills. Similarly in the study of Verhuel et al. [26] they have found differences between female and male entrepreneurs. They have found that on average women invest less time in the business than men. This can be attributed to both a lower preference for work time (driven by risk aversion and availability of other income) and a lower productivity per hour worked (due to lower endowments of human, social and financial capital). Productivity of time is positively related to financial capital invested, industry and relevant experience, contact with other entrepreneurs, number of employees, running an existing firm, having separate business premises and the prevalence of outsourcing activities.

The decision-making process is often more intuitive than based on reliable, precise and unambiguous information. In particular, innovative business ideas require people to make decisions based on very little evidence [1], [14]. Small firms generally lag behind medium and large companies in adopting and implementing computerization [16]. This is due to severe constraints on financial resources, lack of in-house expertise, and a short-term management perspective imposed by a volatile competitive environment. The average technical efficiency for large firms is higher than that of SMEs [26]. The estimates on the determinants of technical efficiency show that being a subcontractor has a statistically significant positive influence on SMEs' technical efficiency, but the effect decreases with larger firm size.

In study of Pšeničny and Novak [19] special emphasis was placed on establishing the effect of the factor for dynamic enterprises. As most important was the entrepreneur as holder of the administrative/governance (ownership) and management. Only in the case of a company with over 50 employees, the entrepreneur is required to strengthen the company with professional managers, hire consultants and,

to a greater extent, include employees in the decision-making and management processes.

The study of Koellinger [14] provides empirical data on the emergence of different types and degrees of entrepreneurial innovativeness. The results suggest that entrepreneurial innovativeness depends on both individual factors and the environment in which the individual lives. In particular, high educational attainment and a high degree of self-confidence are significantly associated with entrepreneurial innovativeness at the individual level.

Steam and Wennberg [24] conducted an empirical study on the effects of research and development (R&D) on new product development, interfirm alliances and employment growth during the early life course of firms. The effect of initial R&D on high-tech firm growth is through increasing levels of interfirm alliances in the first post-entry years. R&D efforts enable the exploitation of external knowledge. Initial R&D also stimulates new product development later on in the life course of high-tech firms, but this does not seem to affect firm growth. R&D does not affect the growth rate of new low-tech firms, which seem to be driven mainly by the growth ambitions of the founding entrepreneur. Similar conclusions were found also by Hansen and Hamilton [10] where the owners and managers of the growing firms contrasted from the non-growth firms in their growth ambitions, their optimism and opportunistic strategic thinking. The growing firms were more adaptable, proactive and innovative, particularly towards international market opportunities.

In contrast, micro-enterprises demonstrate a high level of ability to adapt to changes in the environment. They use ICT for automation of existing processes, rather than for decision support, or to increase the flexibility of the firm and thereby gain competitive advantage. While large firms are typically capital and equipment intensive, labour-intensive micro-enterprises may be able to increase productivity and provide value-added services through increased computerization and digitization [16].

Formal and informal networking seems to be one of essential factors for micro-enterprise survival and growth [10]. The owners and managers of the growing businesses were highly networked individuals and emphasized how important this was to success. The most important were private business networks, which were largely formed and developed through involvements in multiple businesses. In research from Watson [27] the association between networking and firm performance for both female and male-controlled SMEs was search for. They results showed little difference in the networks accessed networking by female and male SMEs owners after controlling for education, experience, industry, age and site. The results also indicate that several formal and informal networks are positively associated with firm survival but only formal networks appear to be associated with growth. In particular, accessing an external accountant is associated with survival and growth.

The Internet is gaining commercial viability and is particularly suited to small business, where it enables them to keep doors open 24 hours a day at minimal cost to customers all over the world. With access to increasing markets throughout the world, businesses, including those in rural areas, have a unique opportunity to expand from the traditional and local to the global. Whether a firm trades online with customers or not, however, the internet can give firms the advantage of increased profile in that it can allow companies to present information to potential customers and provide another channel for the purposes of brand building, advertising, and marketing. The intranet could be a very suitable tool for company's internal communication [11]. The range of intranet usage is wide. The intranet can be only a notice board for information but it can also be a full-value communication portal which makes the internal communication process more effective. It should be emphasize that internal communication has a significant impact on company's operations, job performance, and work behaviour and attitudes of employees.

2. Data Collection and Methodology

After having reviewed the literature on entrepreneurs, micro, small and SME enterprises, a structured interview framework was developed to help address the research objectives. We decided to use annual turnover as indicator for business success. Because of our previous experiences with micro enterprise owners [30] we offered them too chose among ranges of annual turnover instead to record precise annual turnover. We expected that annual turnover [13], [28] will depend upon characteristic of business [29], [16], [19] characteristics of the

owner [27], [21], [12], available ICT [20], [2], and level of Internet use [11], [13]. To visualize and define factors we proposed a research model of annual turnover dependency in micro-enterprise illustrated in Figure 1.

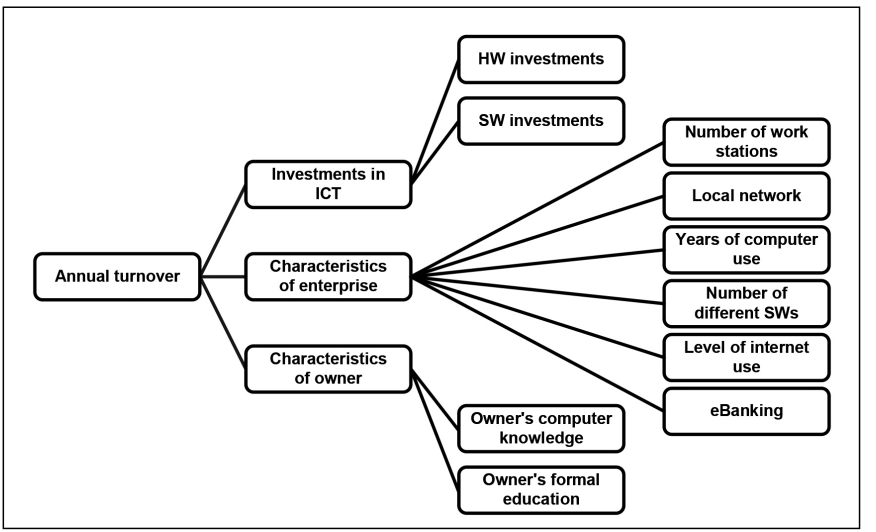
Based on this premise, we proposed the following three research questions:

RQ1: Have higher investments in ICT any impact on higher annual turnover?

RQ2: Have characteristics of enterprises (number of workstations, use of local network and similar) any impact on annual turnover?

RQ3: Have characteristics of owners of the enterprises any impact on annual turnover?

Fig. 1: Model of studied factors in dependency with annual turnover



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According to the 1st research question, we proposed the following two null hypotheses regarding average annual turnover and investments:

H0_1 There is no correlation between average annual HW investments and enterprise annual turnover.

H0_2: There is no correlation between average annual SW investments and enterprise annual turnover.

Null hypotheses H3_0 to H8_0 are set based on the 2nd research question and combine characteristics of the enterprises with their annual turnover:

H0_3: There are no differences in average number of work stations between groups of enterprises with different annual turnover.

H0_4: There are no differences in annual turnover between enterprises that do or do not use local networks.

H0_5: There is no correlation between time of computer use in years and enterprise annual turnover.

H0_6: There are no differences in different number of used SW among groups of enterprises with different annual turnover.

H0_7: There is no correlation between level of internet use in micro-enterprises and enterprise annual turnover.

H0_8: There are no differences in annual turnover between enterprises that do or do not use eBanking.

Below are two hypotheses based on the 3rd research question referring to characteristics of

the owner:
H0_9: There are no differences in annual turnover between enterprises with owners that have different formal education.
H0_10: There is no correlation between level of owner's computer knowledge and enterprise annual turnover.

The study was conducted in two stages: the preliminary pilot interviews and the main study. The interview was tested in 36 selected small and micro-enterprises in Slovenia. Repeated contact with respondents helped to improve the accuracy and relevance of the interviews. Interviews were conducted between June and July 2009. Out of the total of 36 interviews, only 16 met the criteria for inclusion in the main study mainly due to the (too big) size of the enterprise.

Data for the main study were collected via structured interviews with owners or top managers of Slovene micro-enterprises between October and December 2009. Several other studies [28], [16], [14] showed that this group plays a dominant role in decision-making process in small enterprises. In the interview mostly closed-response questions were used. Except for demographic data, respondents either rated statements on scale from 1 to 5, or responded to multiple choice questions. In total, 123 interviews were conducted. Five of them were not usable because the interviewed businesses did not meet the criteria for a micro-enterprise in different areas (annual turnover, business type etc.), or because of too many questions left unanswered. At the end our sample consisted of 16 + 118 = 134 micro-enterprises.

For data gathering MS Access database was created with special designed forms to prevent input off incorrect data. Tests were performed using SPSS Statistics version 17.0. The t-test, analysis of variance (ANOVA) and correlations tests were used in hypothesis testing. We found many additional significant factors on second level dependency such as level of internet use depending on owner's formal education, computer knowledge, age etc., but to assure the consistency we didn't use them in our model. Unexpectedly we didn't find annual turnover statistically significantly dependent on a number of employees and/or industry of micro-enterprises.

3. Results

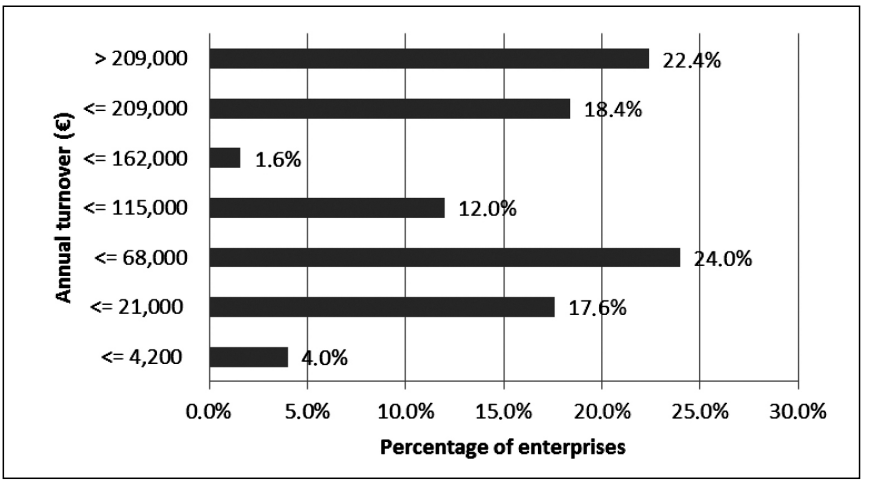
3.1 Characteristics of the Enterprises Participating in the Study

Respondents came from a wide variety of business backgrounds and sizes. The overall share of individual private entrepreneurs was 56% and of limited liability companies 40%. Enterprises organized in other organizational forms represented only 4% of the sample. Among 134 enterprises, 44% were family owned. The average number of total employees was 3.4, including the owner of the enterprise. In the micro-enterprises analysed three years ago, average number of total employees was 3.2. Based on the data we can conclude that the micro-enterprises in-average employ more employees than three years ago despite of the economic crisis Our results can be confirmed with the statistical data of employment in micro-enterprises in years 2008, 2009 and 2010 on the website of Statistical Office of Slovenia under the option "Enterprises by activities", where the growth in number of employees among micro-enterprises is also evident. In 2008 there were 217,874 persons employed in micro-enterprises. In 2009 the number increased to 226,638 employed persons and in year 2010 to 227,225 employed by micro-enterprises [15]. According to data there was 4.3% growth in number of employees in micro-enterprises in year 2010 compared to 2008. To be sure we have checked also the number of micro-enterprises in years 2008 to 2010. It seems that economic crisis hasn't yet been fatal for micro-enterprises because their number is still growing from 142,283 in year 2008 to 156,305 in year 2010. In comparison with small, medium and large enterprises, where the number of businesses and employees is lower from year to year, only in micro-enterprises the numbers are growing. What about annual turnover? We found out that the sum of annual turnover in €1000 was highest in year 2008 (18,491,893), lowest in year 2009 (16,424,546) and raised again in year in 2010 (17,410,106) but was still lower than in 2008. We can assume that this is a result of many new formed micro-enterprises for self-employment of recently unemployed people from large and medium sized enterprises especially in construction.

The largest share of enterprises in our sample came from service sector (28.4%),

manufacturing (13.4%), construction (12.7%) and retail (10.4%). Others were from tourism (8.2%), servicing and repair (7.5%), agriculture (6.7%), wholesale (6.0%), transportation (4.5%) and other (2.2%). The average existence time of micro-enterprises was 12.3 years. Most small enterprises (24.0%) reported annual turnover (Fig. 2) of between €21,000 and €68,000. Annual turnover of more than €209,000 was reported by 22.4% of micro-enterprises.

Fig. 2: Micro-enterprises according to annual turnover



Source: own

The majority of enterprises (76%) outsourced accounting and bookkeeping to an external partner who is specialized in selling accounting services to small companies.

On average Slovene micro-enterprises use 359 hours of student work per year. The legislation is in favour of hiring students because the taxation and costs are lower in comparison to employment of regular workers. The highest value of student work in analysed micro-enterprise was 6,000 hours per year. This means that in this company they could hire three employees for the entire year. In Slovenia there were 159,986 micro-enterprises with 0 to 9 employees in year 2011. So, theoretically, there were available 57,434,974 working hours. If we use only half of them, that would represent 27,613 jobs for the entire year, In Slovenia in January 2011 there were 115,132 registered unemployed workers that represent 12.3% of entire working force. If we add also available working hours in small, medium and large enterprises, the unemployment would be considerably lower.

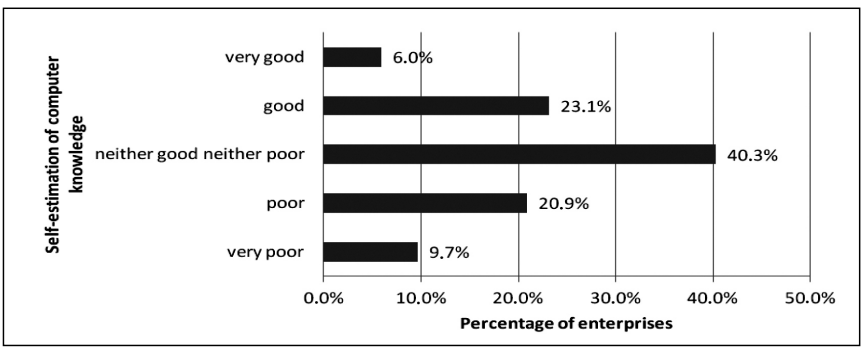
It is well known that micro-enterprises are similar to small and medium enterprises (SMEs) but on the other hand they have also particular problems in adopting and using ICT in regard to their size. They usually do not have the appropriate skills available in-house and thus have to train existing staff or purchase those skills in the marketplace. When we asked them what kind of formal education has the person in charge of ICT in their business, we were not surprised with the results, although they are rather alarming. Only 7.5% micro-enterprises in our sample employ somebody with formal computer knowledge. Mainly they were computer engineers, computer technicians or similar. Six percentages of businesses outsources such services. In all other (86.5%) of micro-enterprises ICT depends on employees who do not have a formal education from computer sciences such as economists, commercialists, construction, electro or mechanical technicians. They have also rather exotic employees that are in charge for their ICT field, e.g. cook, hairdresser, auto mechanic and a lawyer.

3.2 Characteristics of the Respondents

The majority of respondents (76.1%) were the owners of their businesses, 10.4% were executive directors, 6.0% owner-relatives and 7.5% were some other employees. The age of most of them (44.8%) was between 31 and 45 years, 33.6% between 46 and 55, 10.4% were older than 55 years (Fig. 2). Only 2.2% were between 21 and 25 and 9.0% between 26 and 30 years.

There were 71.8% male and 28.2% female respondents. We did not find any statistically significant differences between gender and studied factors. There were differences only in the way of information searching. If male owners would search for new information on the internet by themselves or in journals the woman would rather ask somebody (relatives, acquaintances, IT vendors). In most cases, their formal education was secondary school (50.4%), 12.0% vocational level, 11.3% higher, 22.6% graduate and 3.8% postgraduate. The majority of respondents (40.3%) self-estimated their computer knowledge (Fig. 3) as neither good, nor bad. 30.6% of respondents estimated their computer knowledge as poor or very poor. Most of respondents (70.7%) declared that they actively use computer for their work (know how to use business applications), 25.5% passively uses computer (only for the personal use) and 3.8% doesn't use computer at all.

Fig. 3: Self-estimated computer knowledge of respondents



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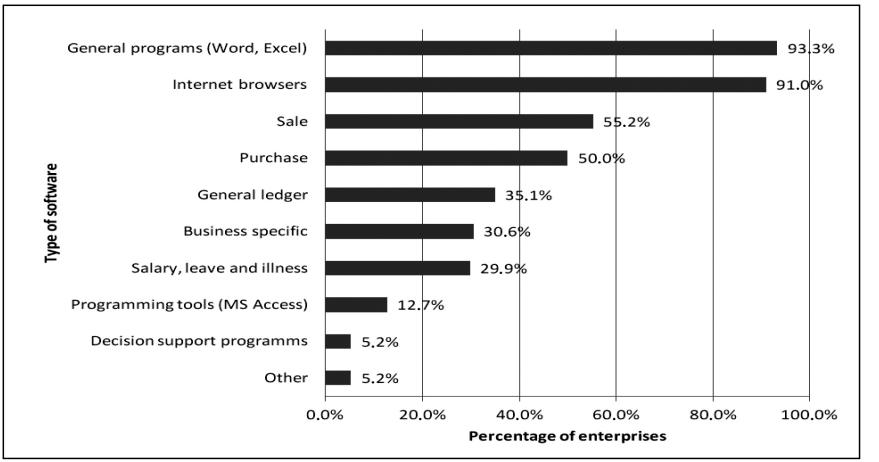
3.3 Computer Hardware and Software

The average number of laptops per company was 2.6, desktops 1.5, workstations 0.2 and network servers 0.4. In total, companies from our sample had 4.7 computers per organization (and 1.4 computers per employee). Micro-enterprises in our sample had on average 8 years and 11 months years of computer experience. On average, micro-enterprises invest €1,538.6 per year in computer hardware or computer hardware services and 880.4 in software or software licenses. Almost all (98.5%) of the enterprises had internet connection.

Most enterprises (94.0%) use some version of the Windows operating system (XP, Vista, NT). The other 4.5% of the enterprises use Linux and 1.5% use SuSe. Figure 4 shows that in 93.3% of companies general programs (word processor, spreadsheets, databases etc.) were installed, but only a few of them used them to analyse data from their databases or to prepare customized reports. These tools were mostly bought together with the computers, which may explain why they are rarely used. Insufficient computer knowledge and skills of the owners/managers and employees may be a possible explanation for the non-use of software tools. The relatively low self-assessment of computer knowledge and skills found in our study (Fig. 3) supports this assumption.

Fig. 4: Type of software used by micro-enterprises



Source: own

Only 12.7% of businesses used some type of package for application development (MS Access etc.), and 5% had applications for decision support. Almost half of enterprises (48.9%) use some kind of illegal software.

3.4 Use of Internet

Almost all enterprises (98.5%) had internet connection. Not surprisingly, Slovene micro-enterprises mostly use the Internet for e-mail (94.0%), followed by searching for information (92.5%) and 78.2% used internet for electronic banking. Web pages are used in 51.1% of enterprises for their business advertising (simple hosted web page) and in 36.8% for advertising of their products and services (their own domain). Internet based business programs are used in 18.8% of enterprises while 13.5% of surveyed enterprises offered their customers the possibility to buy products/services over the Internet.

3.5 Results of Hypothesis Test

With an analysis of the data from 134 micro-enterprises in the sample, we found that:

Correlation between the average annual turnover and average annual HW investments is statistically significantly positive (Pearson correlation coefficient is 0.239, p-value is 0.007, and it is significant at 1% level (Tab. 1); so we can reject the null hypothesis H0_1), which means that enterprises with higher HW investment also have higher annual turnover.

There exist also statistically significantly positive correlation between the average annual turnover and average annual SW investments (Pearson correlation coefficient is 0.230, p-value is 0.011, and it is significant at 5% level (Tab. 1); so we can reject the null hypothesis H0_2). Therefore we may conclude that enterprises with higher SW investment also have higher annual turnover.

The null hypothesis H0_3 was tested with a t-test where enterprises were divided into two groups (Tab. 2): enterprises with annual turnover lower of higher to €68,000. There are statistically significant differences in the average number of work stations used in both groups of enterprises with different annual turnover ($t=-2,080$, p-value is $0.040<0.05$; so the null hypothesis H3_0 can be rejected at 5% significance level). Enterprises with annual turnover €68,000 or less have on average 0.06 workstations, while enterprises with annual turnover higher than €68,000 have in average 0.25 working stations.

Tab. 1: Correlations between annual turnover of enterprises, investments in HW and SW and level of internet use

		Annual turnover	Investments in HW	Investments in SW	Level of internet use
Annual turnover	Pearson Correlation	1	.239**	.230*	.303**
	Sig. (2-tailed)		.007	.011	.001
	N	125	125	122	123
Investments in HW	Pearson Correlation	.239**	1	.361**	.238**
	Sig. (2-tailed)	.007		.000	.006
	N	125	133	130	131
Investments in SW	Pearson Correlation	.230*	.361**	1	.250**
	Sig. (2-tailed)	.011	.000		.004
	N	122	130	130	128
Level of internet use	Pearson Correlation	.303**	.238**	.250**	1
	Sig. (2-tailed)	.001	.006	.004	
	N	123	131	128	132

** Correlation is significant at the 0.01 level (2-tailed).
* Correlation is significant at the 0.05 level (2-tailed).

Source: own

Tab. 2: Descriptive statistics and results of t-test for number of workstations in groups of enterprises with different annual turnover

	Enterprises with annual turnover						t-test	
	€68,000 or less			higher than €68,000				
	N	Mean	SD	N	Mean	SD	t	p
Number of workstations	54	0.06	0.302	67	0.25	0.704	-2.080	**.040**

Source: own

Tab. 3: Descriptive statistics and results of t-test for annual turnover in groups of enterprises with or without local network

	Use of local network						t-test	
	Yes			no				
	N	Mean	SD	N	Mean	SD	t	p
Annual turnover	39	169,412.8	81,543.7	78	80,107.7	72,729.6	6.011	**.000**

Source: own

We performed the mean difference test (the t-test) among groups of enterprises that use local networks or not (Tab. 3). We used mean value of classes instead of class number of annual turnover and discovered that there is a statistically significant positive effect of use of local networks on average annual turnover ($t = 6.011$, p-value is $0.000<0.01$; so we can reject the null hypothesis H0_4 at the 1% significance level). The enterprises that use local networks have on average €169,413 annually turnover in comparison to those that do not use local networks where on average annually turnover is more than half smaller.

Tab. 4: Results of correlation between the average annual turnover, owners' computer knowledge and years of computer use

		Annual turnover	Computer knowledge	Years of computer use
Annual turnover	Pearson Correlation	1	.224**	.292**
	Sig. (2-tailed)		.009	.001
	N	133	133	133
Computer knowledge	Pearson Correlation	.224**	1	.095
	Sig. (2-tailed)	.009		.273
	N	133	134	134
Years of computer use	Pearson Correlation	.292**	.095	1
	Sig. (2-tailed)	.001	.273	
	N	133	134	134

** Correlation is significant at the 0.01 level (2-tailed).
* Correlation is significant at the 0.05 level (2-tailed).

Source: own

Correlation between the average annual turnover and years of computer use is statistically significantly positive (Pearson correlation coefficient is 0.229, p-value is 0.001 (Tab. 4), and it is significant at 1% level; so we can reject the null hypothesis H0_5), which means that enterprises with longer time of computer use also have higher annual turnover.

The null hypothesis H0_6 was tested with an analysis of variance. Variances among groups of enterprises with different annual turnover are not statistically significantly different (Leven statistic is 1.551, p-value is 0.168>0.05), therefore ANOVA can be performed. The results (Tab. 5) showed that there are statistically significant differences in the average number of used SW in groups of enterprises with different annual turnover (ANOVA: F=4.282, p-value is 0.001<0.01; so the null hypothesis H0_6 can be rejected at 1% significance level). With multiple comparisons (LSD test) we found out that there are statistically significant difference between enterprises with higher annual turnover than €209,000 and all other categories of enterprises (except for enterprises between €11,500 and €162,000). In general, average annual turnover is higher in businesses with higher number of used SW (which could be confirmed also with Pearson correlation coefficient between a number of different SWs used and annual turnover which is significant at 1% significance level and is equal to 0.394).

Tab. 5: Descriptive statistics and results of ANOVA for number of used SW in groups of enterprises with different annual turnover

Annual turnover (€)	Number of SW			ANOVA	
	N	Mean	SD	F	p
<= 4,200	5	3.00	1.414	4.282	**.001**
<= 21,000	22	3.32	1.492		
<= 68,000	30	3.70	1.291		
<= 115,000	15	3.73	1.223		
<= 162,000	2	3.00	1.414		
<= 209,000	23	4.26	1.453		
> 209,000	28	5.11	1.812		

Source: own

Correlation between the class > of annual turnover and level of internet use is statistically significantly positive (Pearson correlation coefficient is 0.303, p-value is 0.001, and it is significant at 1% level (Tab. 1); so we can reject the null hypothesis H7_0). Similar to Jungwoo [13] the level of internet use has statistically significant positive effect on annual turnover; higher level of internet use leads to higher annual turnover and vice versa. The above results are supported with representation of average annual turnover in groups of enterprises with different levels of internet use (Tab. 6). The enterprises on second level of internet use (who use internet just for information retrieval) have the lowest annual turnover on average and on the other hand enterprises that use internet for eBusiness have the highest average annual turnover.

Tab. 6: Characteristic of enterprises with different level of Internet use

Level of Internet use	Annual turnover		Number of employees		Owner computer knowledge	
	Mean (€)	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.
1 Information searching	21,833.3	19,629.9	2.3	0.58	1.7	1.16
2 Use of e-mail	57,009.1	65,807.7	3.1	1.83	2.6	1.24
3 Simple hosted web page	45,650.0	36,521.5	1.8	0.50	2.8	0.50
4 Advanced web page with own domain	125,000.0	78,426.4	3.8	3.19	3.3	1.86
5 eBanking	112,200.0	88,988.5	3.5	2.23	2.7	0.87
6 eBusiness	173,750.0	72,604.9	3.5	2.03	3.5	0.78
7 An Internet based business	128,147.6	91,511.6	3.6	2.14	3.4	0.96

Source: own

It could be said that use of eBanking divides enterprises among successful and unsuccessful. We have tried to establish if this statement is true for Slovene micro-enterprises. The enterprises report their annual turnover in categories therefore we changed the answers into mid-values of corresponding intervals before the analysis. We used t-test for group comparison (t=3.102, p-value is 0.003<0.01, so we can reject null hypothesis H0_8 at 1% significance level). There are statistically significant differences (Tab. 7) between enterprises which use eBanking and those which do not in the average annual turnover. Businesses that practice eBanking have on in average €123,539.6 annual turnover while businesses that do not practice eBanking on average have €73,886.2 annual turnover.

Tab. 7: Descriptive statistics and results of t-test for annual turnover in groups of enterprises using eBanking or not

	Use of local network						t-test	
	No			yes				
	N	Mean (€)	SD	N	Mean (€)	SD	t	P
Annual turnover	29	73,886.2	73,756.3	96	12,3539.6	89,149.4	-3.020	**.004**

Source: own

If there exist any difference in average annual turnover in groups of enterprises with different owner's level of formal education (the null hypothesis H0_9) was tested with an analysis of variance (Tab. 8). There were no statistically significant differences in variances among groups with different levels of owner's educations (Leven statistic was 0.533 and p-value 0.712) therefore ANOVA is suitable test. We can reject the null hypothesis H0_9 (ANOVA: F=3.236, p-value is 0.015<0.05) at the 5% significance level. Average annual turnover in businesses of lowest formal education level owners is €78,225, while the average annual turnover in businesses with postgraduate owners is more than double.

Tab. 8: Descriptive statistics and results of ANOVA for average annual turnover in groups of enterprises with different level of owner's education

Level of education	Annual turnover			ANOVA	
	N	Mean (€)	SD	F	p
vocation level	16	78,225.0	83,365.8	3.236	.015
secondary school	62	100,912.9	85,055.2		
higher vocational level	13	90,592.3	88,108.4		
graduate	28	150,128.6	84,347.8		
postgraduate	5	176,100.0	77,228.9		

Source: own

Correlation between the average annual turnover and owners' computer knowledge (Tab. 4) is statistically significantly positive (Pearson correlation coefficient is 0.224, p-value is 0.009, and it is significant at 1% level; so we can reject the null hypothesis H0_10), which means that enterprises with higher owner's computer knowledge also have higher annual turnover. There is also significant positive correlation between years of computer use and average annual turnover of enterprises (Pearson correlation coefficient is 0.292, p-value is 0.001). Additionally, this result is in accordance with the findings of prior research [6] that the characteristics of decision makers influenced the decision over ICT adoption in SME, even though prior research was focused on team of managers.

Conclusion

According to our findings in order to take full advantage of the existing technology current owners and managers of micro-enterprises are aware that they should increase the level of their computer skills and knowledge, stay informed about new trends, developments in the ICT and acquire technical and managerial competences needed to effectively manage the IS. Training in using of PC based end-user tools, and their use for data analyses may also help owners, managers and employees of micro-enterprises to gain self-confidence in using ICT, and better exploit the available technology. Because of that investments in education and training are unavoidable.

As concluded in Lee et al. [16], our results also show that it is imperative for micro-enterprises to adopt computerisation to achieve improvements in business performance. Micro-enterprises in Slovenia are relatively well equipped with ICT (1.4 computers per employee), but they are rather far from exploiting its full potential. Similar to Wiklund et al. [28] and Jungwoo [13], our investigation showed that owner/managers' personal attitudes directly and/or indirectly influence their businesses. Implementation and successful operation of computerised business and achieved annual turnover is strongly related to the characteristics of the owner/manager (formal education, computer knowledge and skills). In case of Kosovo [12] the formal education was less important than the informal knowledge. This implies that specific human capital, gained during operation through specialized trainings, contributes more than formal education to the rapid growth of the firm. Therefore, we can assume that the education gained in

universities is of that kind that does not offer proper foundation in which entrepreneurs can build their competitive advantage and thus enlarge their businesses as well the extreme conditions for entrepreneurship where formal education plays little role in the fast growth of the firm.

Micro-enterprise owners/managers in general recognise and value ICT, but they use it mainly to support daily operations of the business rather than to support decision-making and are mostly not aware of its strategic and organisational impact.

The results in our study confirmed relation between number of used SW and higher annual turnover. We also discovered that investments in HW and SW are in correlation with level of annual turnover. All that indicates that business success also depends on use of ICT.

Entrepreneurs should put efforts in establishing relations with foreign partners, and consider to start the firm in teams rather than individually [12]. The government and Chamber of Commerce and Industry of Slovenia should inspire national and international networking, consult and involve micro-enterprises in business and finance opportunities of EU. They should organize formal and informal education of micro-enterprise owners especially from fields of management and informatics.

Suitable policy interventions from government and active support from the private sector are needed to address the issue. The government needs to take leadership to facilitate a regulatory environment, improve national infrastructure and continue to help with ICT education.

One of the most important factors of micro-enterprise growth are financial resources. If they cannot finance by themselves they depended on banks that offer high rated credits. If the financial policy in country is not well controlled, a lot of micro-enterprises will be lost because of debts by contracting firms they work for.

Opposite to that also financial support is no guaranty for micro-enterprise success. In research by Bradley et al. [4] they concluded that capital alone is not a 'silver bullet' for the problem of poverty in developing economies. They have shown that, similar to developed nations, innovation is necessary for microcredit businesses to achieve firm performance, which contribute to increases in income and standards of living. They also show that, through innovation, human forms of capital – specifically business expertise and exposure to family business – lead to higher firm performance than financial or social forms of capital.

Finding mechanisms to identify entrepreneurs [18] who are likely to succeed and that help tailor entrepreneurship education and enterprise support to their needs is therefore an important objective, particularly if we are to ensure the optimal use of limited educational and business support resources. A great number of SMEs do not devote any resources to improving their organizational learning process. Furthermore, SMEs often fail to even effectively use publicly subsidized offers of individual lifelong learning programmes for their employees [21]. Firms with entrepreneurial orientation characteristics would focus the attention of individual and departments on promoting mutual learning in which members would remove the ideological package and share knowledge with others.

A Chinese proverb says »Give a man a fish and you feed him for a day. Teach a man to fish and you feed him for a lifetime«. We should learn from this proverb. It is better to teach and inform micro-business owners how and where to earn money, where and how to find new business opportunities and customers, as to lend them the money. The Competitiveness and Innovation Framework Programme (CIP) of European Community [7] with small and medium-sized enterprises (SMEs) as its main target, supports innovation activities (including eco-innovation), provides better access to finance and delivers business support services in the regions. It encourages a better take-up and use of ICT and helps to develop the information society. The CIP runs from 2007 to 2013 with an overall budget of 3,621 million. One of three operational programmes is specially dedicated to ICT use called The Information and Communication Technologies Policy Support Programme (ICT-PSP) and aims at stimulating a wider uptake of innovative ICT based services and the exploitation of digital content across Europe by citizens, governments and businesses, in particular SMEs. The European Commission's eGovernment Action Plan 2011–2015 supports the provision of a new generation of eGovernment services [8]. eGovernment is about using the tools and systems made possible by ICT's to provide better public services to citizens and businesses.

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Abstract

COMPUTER LITERACY AND USE OF ICT AS KEY FACTORS OF MICRO-ENTERPRISE SUCCESS

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The objective of this paper is to emphasize issues connected with micro-business financial success and adoption of information and communication technology (ICT) as possible factors to determine further organisational growth. This understanding is based on the results of an investigation conducted in Slovenia between May and December 2009 in 134 Slovene micro-enterprises. Data for the main study were collected via structured interviews with owners or top managers of micro enterprises. We used some demographic questions about the business annual turnover, computerisation, owner's characteristics and some questions about the financial investments in ICT. To visualize and define factors we proposed a research model of annual turnover dependency in micro enterprise. The research focused on characteristics of owners of the enterprise, investments in ICT and characteristics of enterprises' usage of available ICT in correlation to business annual turnover. The results indicate that adoption, the number and type of hardware and software are positively associated with the micro- enterprise success. An important factor is also formal education of the manager and/or owner and his or her computer and ICT knowledge and skills. We also found out that use of internet, eBusiness and number of used business software contribute to enterprise's success. We can confirm that micro-enterprise informatisation can be the basis for a healthy economy growth if adequate knowledge and skills are present. To increase growth in micro-businesses we can use this and additional factors (intentions to growth, size, annual turnover, industry type,…) as filters to separate potential growing micro-enterprises from others that represent more than 94% of all enterprises in country. When we defined target group we can start to encourage growth with knowing methods from best practices all over the world. Based on our survey and on the review of literature, recommendations have been given how to be more effective and efficient in encouraging the growth of micro-enterprises.

Key Words: *Micro-enterprise, annual turnover, entrepreneurs, usage of information and communication technology.*

JEL Classification: *O44, M15, C81.*

DOI: *10.15240/tul/001/2015-2-012*

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