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IMPACT OF ENVIRONMENTAL TAXES ON SUSTAINABLE ENERGY DEVELOPMENT IN BALTIC STATES, CZECH REPUBLIC AND SLOVAKIA

Dalia Štreimikienė

Introduction

Economic stabilization policies can be implemented with the aid of either monetary or fiscal policy. A forward-looking, medium-term oriented monetary policy provides the best framework to this purpose. Fiscal policies too should have a medium to long-term orientation and largely rely on automatic stabilizers in the short-term. Fiscal policy can promote macroeconomic stability by sustaining aggregate demand and private sector incomes during an economic downturn and by moderating economic activity during periods of strong growth. An important stabilizing function of fiscal policy operates through the so-called "automatic fiscal stabilizers". These work through the impact of economic fluctuations on the government budget and do not require any short-term decisions by policy makers. The size of tax collections and transfer payments, for example, are directly linked to the cyclical position of the economy and adjust in a way that helps stabilizing aggregate demand and private sector incomes. Automatic stabilizers have a number of desirable features. First, they respond in a timely and foreseeable manner. This helps economic agents to form correct expectations and enhances their confidence. Second, they react with an intensity that is adapted to the size of the deviation of economic conditions from what was expected when budget plans were approved. Third, automatic stabilizers operate symmetrically over the economic cycle, moderating overheating in periods of booms and supporting economic activity during economic downturns without affecting the underlying soundness of budgetary positions, as long as fluctuations remain balanced [17].

In principle, stabilization can result from discretionary fiscal policy-making, whereby governments actively decide to adjust spending

or taxes in response to changes in economic activity. The main fiscal and pricing policies aiming at implementation of sustainable energy development are related with promotion of sustainable energy which is the major source of environmental problems in EU [12]. The European Semester was established in 2010 as a mechanism to better coordinate economic policies in European Union countries. It was one of the EU's responses to the financial and economic crisis, which has resulted in economic contraction and rising unemployment in many EU countries. The European Semester is based on the idea that, because EU economies are highly integrated, enhanced policy coordination can help boost economic development in the EU generally. 'Greening the European Semester' is aimed to ensure that macroeconomic policies of EU member states are sustainable, not only economically and socially, but also environmentally. Environmental policies can contribute to sustainable economic recovery and jobs growth in many ways. Resource efficiency is clearly such a contribution, but there are many more themes, such as environmental fiscal reform, including tax shifts from labour to environmental pollution. European Commission prepares each year Country Specific Recommendations, and the Member States update their National Reform Programmes annually based on these recommendations. The main priorities identified by EC to be addressed by EU member states in their National Reform Programmes are the following:

- Taxation system should be designed to be more growth-friendly, by shifting the tax burden away from labor to taxes linked to consumption and combating pollution;
- Increase of resource efficiency and reduction of EU energy dependency;
- Promotion of resource efficiency by energy efficiency and recycling.

The aim of this paper is to review fiscal and pricing policies aiming at promotion of sustainable energy development in some new EU member states and to carry out comparative assessment of environmental taxes targeting sustainable energy development and achieved sustainable energy development targets in selected new EU member states.

Seeking to achieve this aim the main tasks are:

- to review literature on the impact of fiscal policies on promoting sustainable energy development;
- to define the main environmental taxes targeting sustainable energy development;
- to define the main indicators of sustainable energy development;
- to analyse environmental taxes aiming at promotion of sustainable energy development in Baltics and Czech Republic and Slovakia;
- to analyse sustainable energy development indicators in in Baltics and Czech Republic and Slovakia;
- to develop the main findings of analysis conducted.

The methods applied are comparative analysis, graphical analysis, generalization.

1. Environmental Taxes and Green Budget Reform

The environment protection is one of the important priorities to government institutions. Economic instruments such as taxes, tradeable permits or subsidy reform promise to achieve both environmental and economic objectives by raising the cost of environmentally harmful activities and at the same time lowering the cost of labour [13], [15]. The general idea has been around for quite some time, and instruments like Germany's green budget reform efforts in 1999–2003 [2] or the EU Emissions Trading demonstrate that such instruments work in principle – notwithstanding the widespread and often justified criticisms of their specific design and implementation ([4], [11], [19]). In important papers by Bovenberg and others ([6], [7], [8]) it was tested whatever the increasing the tax rate on a polluting good from its Pigovian level, and reducing pre-existing labor taxes in a revenue neutral fashion, will deliver a welfare gain. The main findings of the paper showed that, although environmental quality improved, the efficiency dividend didn't materialize. There

are other important paper in this area as well. In his paper Lucas [22] showed that shifting capital income taxation completely to labor income taxation has negligible effects on long-run economic growth in a model of endogenous growth which is calibrated to the U.S. economy. A similar theoretical results were obtained in several papers ([21], [5], [3]). They showed that, in a distorted labor market, substituting green taxes for labor taxes would increase employment and output and have eventually produce a detrimental effect on the environment and income. In other papers ([20], [18], [9], [27]) authorused a dynamic general equilibrium model to assess the impact of green tax reform. The results of effects of green tax reform is summarized in [10]. The recent developments of green budget reforms in EU member states were overwied in EU ([16], [15], [1]).

Economic instruments for pollution control and natural resource management are an increasingly important part of environmental and energy policy in the EU Member States. The range of instruments that are available and have impact on energy sector development trends includes environmental taxes, fees and charges, tradable permits and subsidies [1].

The environmental tax is one whose tax base is a physical unit (or a proxy of it) of something that has a proven, specific negative impact on the environment. Environmental taxes can be of four types: energy, transport, pollution and resource taxes. Energy taxes include taxes on energy products (e.g. coal, oil products, natural gas and electricity) used for both stationary purposes and transport purposes. In 2011 almost 75% of all environmental taxes were energy taxes. By convention, CO₂ taxes are also included in this tax category since they are usually levied on energy products. Including CO₂ taxes with pollution taxes rather than energy taxes would distort international comparisons. Transport taxes mainly include taxes related to the ownership and use of motor vehicles. Pollution and resource taxes cover different types of taxes: taxes on the extraction of raw materials; on measured or estimated emissions to air (e.g. NO_x and SO₂) and water; on noise and on the management of waste.

Environmental taxes have been increasingly used in energy sector to influence the behaviour of economic agents whether producers or consumers. These instruments provide a flexible and cost-effective means for

reinforcing the polluter-pays principle and for reaching environmental policy objectives in energy sector. The use of economic tools for the benefit of the environment in energy sector is promoted in the EU Environment Action Programme to 2020 — 7th environment action programme (EAP), the renewed EU sustainable development strategy and the Europe 2020 strategy.

Environmental tax revenue as a percentage of GDP has gradually fallen in EU, reaching a historical minimum of 2.32% in 2008. During the 2009–2012 it has been steady around 2.39%. The distribution of the tax categories has remained roughly the same [1].

In environmental taxes energy taxes (which include taxes on transport fuels) represented by far the highest share of overall environmental tax revenue, accounting for 75.0% of the EU-28 total in 2013. These taxes were particularly prominent in Lithuania and the Czech Republic, where they accounted for more than nine tenths of total environmental tax revenues. In some countries like Malta and Norway energy taxes slightly exceeded 50% of the revenues from environmental taxes.

Transport taxes represented the second most important contribution to total environmental tax revenues, with 20.1% of the EU-28 total in 2013. The smallest shares of transport taxes in total revenues from environmental taxes (less than 3.0%) were in Lithuania and in Estonia.

Pollution and resource taxes represented a relatively small share (4.9%) of total environmental tax revenues in the EU-28 in 2013. This category of taxes was implemented more recently in most European countries. In some EU Member States no taxes of this category have been levied. This can be due to specificities in the management of water and waste charges which may be collected by schemes other than taxes. Quite high share for pollution and resource taxes was observed in Slovakia (15.3%) and very low in Latvia. In the following section of paper the revenues of environmental taxes in Baltic States and Czech Republic and Slovakia were analysed in detail.

2. Environmental Tax Revenues in Baltic States, Czech Republic and Slovakia

The total revenue from environmental taxes in the EU-28 in 2013 was EUR 331 billion or 2.5%

of gross domestic product (GDP) and to 6.3% of the total revenues derived from all taxes and social contributions (TSC) in EU. In 2013, 21% of EU-27 total environmental tax revenue came from transport taxes. Only 4% of EU-27 total environmental tax revenue was raised by pollution and resource taxes in 2011. Compared with 1995, environmental tax revenue has increased by more than 110 billion EUR, which is an increase of 59%, but as percentage of GDP (and TSC) it has declined.

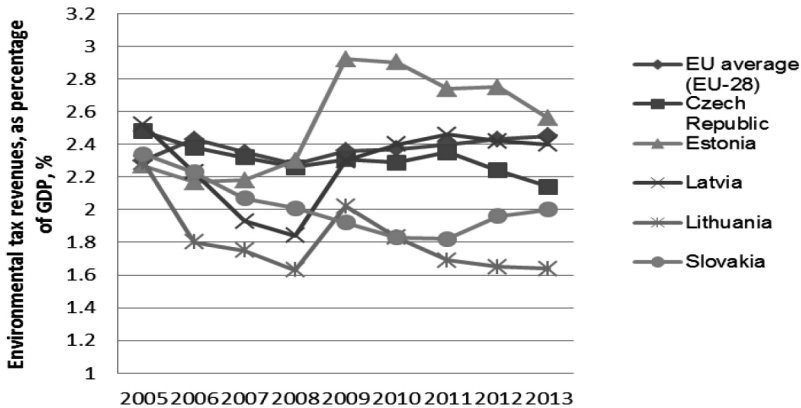
Though environmental tax revenues increased in value since 2009, the relation of these taxes to GDP and to the total revenue from all taxes and social contributions decreased. From 2006 to 2008, the ratio of EU-28 environmental tax revenue to GDP decreased modestly from 2.4% to 2.3% because environmental tax revenues rose at a slower pace than overall economic growth. In 2009, the ratio increased again due to a decrease of GDP which was more pronounced than the one for environmental tax revenue. Since 2009, the environmental tax revenues relative to GDP remained quite stable, around 2.4%. Environmental tax revenues as a share of total revenue from taxes and social contributions decreased from 6.4% to 6.0% during 2006–2008 period. After a recovery from economic crisis in 2009, the ratio was 6.3% [1].

When comparing the level of environmental taxation across European countries, differences should be analysed with caution. Low revenues from environmental taxes could signal relatively low environmental tax rates, or could result from high tax rates that have had the effect of changing behavioural patterns of consumption of the related products or activities. On the other hand, higher levels of environmental tax revenue could be due to low tax rates that incentivise non-residents to purchase taxed products across a border (as is the case for petrol or diesel) after implementation of high excise duties. In any case the comparison of the share of revenues as a percentage to GDP is a good indicator to compare EU member states in terms of importance of environmental taxes playing in state budget revenues and achievements in implementing green budget reforms.

Figure 1 shows the dynamics of environmental tax revenues in relation to GDP in Baltic States, Czech Republic and Slovakia.

Fig. 1:

Revenues from environmental taxes in Baltic States and Czech Republic and Slovakia as the percentage of GDP



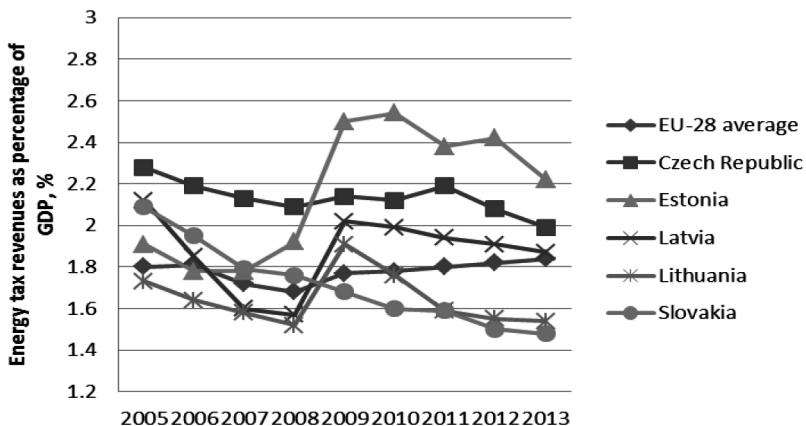
Source: EUROSTAT

As one can see from Figure 1 in 2013, the lowest ratios of environmental tax revenues to GDP were recorded in Lithuania, below 2.0%, following by Slovakia and Czech Republic. In Latvia the share of environmental revenues from GDP was similar to EU-28 average level in 2013.

The highest share of GDP by environmental revenues can be noticed in Estonia though the trends show significant decline after economic crisis in 2008. The same trend can be noticed in all analysed countries except Slovakia. As one can see from Figure 1 the environmental taxes

Fig. 2:

Dynamics of revenues from energy taxes in Baltic States and Czech Republic and Slovakia as the percentage of GDP



Source: EUROSTAT

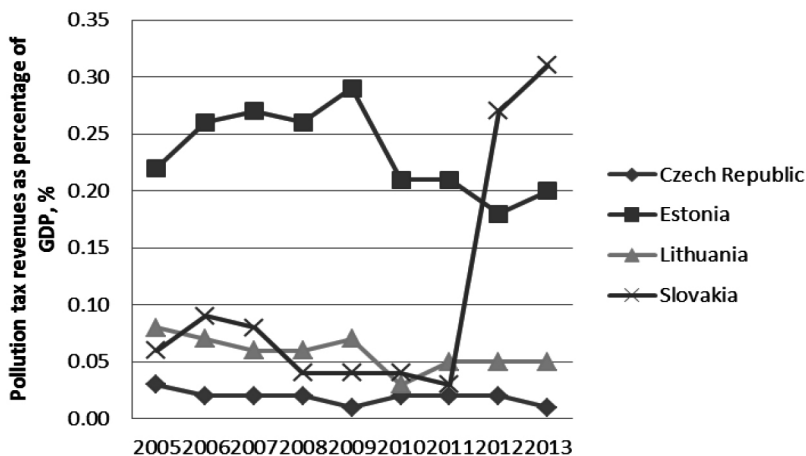
per share of GDP were declining since 2005 to 2011 and are increasing since 2012 though other countries are experiencing the trend of decrease onwards 2013.

In Figure 2 dynamics of revenues from energy taxes in Baltic States, Czech Republic and Slovakia is presented.

Comparing the environmental tax revenues according specific categories relevant to energy sector between Baltic States and Czech Republic and Slovakia, one can notice that the highest share of energy tax revenues to GDP is in Estonia and the lowest one in Slovakia (Figure 2).

Fig. 3:

Dynamics of revenues from pollution taxes in Baltic States and Czech Republic and Slovakia as the percentage of GDP



Source: EUROSTAT

In Figure 3 the dynamics of revenues from Pollution taxes as percentage of GDP in Baltic States, Czech Republic and Slovakia are presented.

Comparing revenues from pollution taxes as the percentage of GDP between analysed countries one can noticed that the highest share of pollution taxes to GDP is in Slovakia and Estonia. The lowest share is in Latvia (Fig. 3). The steep increase of the share of pollution taxes as percentage of GDP in Slovakia can be noticed in year 2011. This indicates that country is looking forward to green budget reform. In Latvia pollution taxes are very low and do not represent comparable share of GDP for comparative analysis between selected member states. Also very low revenues of pollution taxes to GDP are in Lithuania and Czech Republic.

The dynamics of revenues from environmental taxes as the percentage of total

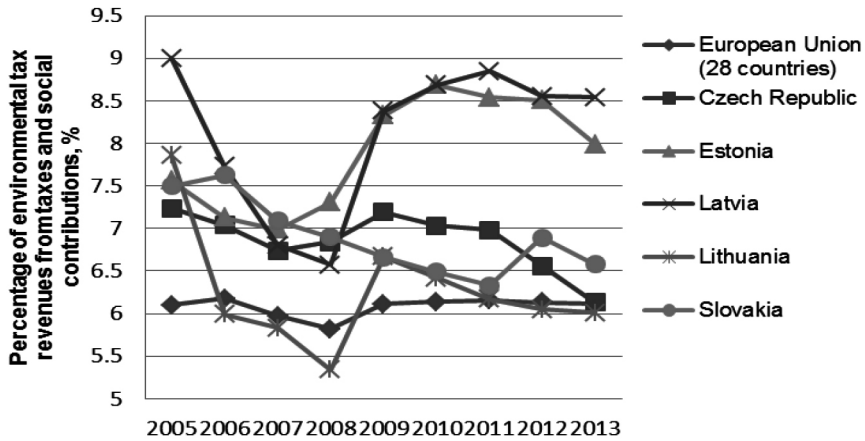
taxes and social contributions in Baltic States, Czech Republic and Slovakia are presented in Figure 4.

As one can see from Figure 4 the highest share of environmental tax revenues to total taxes and social contributions was in Latvia following by Estonia in 2013. The lowest share of environmental taxes was in Czech Republic and Lithuania however these shares correspond to EU-28 average level. When comparing environmental tax revenue to total taxes and social contributions a vast majority of European countries showed levels of environmental tax revenue in a band ranging from 6% to 10% of total taxes and social contributions in 2012. The EU-28 average was 6.2% of total taxes and social contributions in 2013.

Across those EU Member States for which a distribution of 2013 data by economic activity is available, businesses paid half (50%) of all

Fig. 4:

Dynamics of revenues from environmental taxes in Baltic States and Czech Republic and Slovakia as the percentage of total taxes and social contributions



Source: EUROSTAT

energy tax revenue, while the contribution of households rose to 48%. The remainder (2%) was paid by non-residents. The share of energy taxes paid by households was highest in Slovenia (74%) between all EU member states. The share of taxes borne by households was lowest in Czech Republic (20%). Generally the highest share of energy tax revenues from businesses came from industry, construction and services other than those related to transportation and storage. The shares for this activity grouping ranged between 15% and 59% of total energy taxes. The share of energy taxes borne by transport varied, from 5% in Slovenia to 30% in Estonia. The contribution of agriculture, forestry and fishing to the total energy taxes was less than 3.0% in most of the EU Member States.

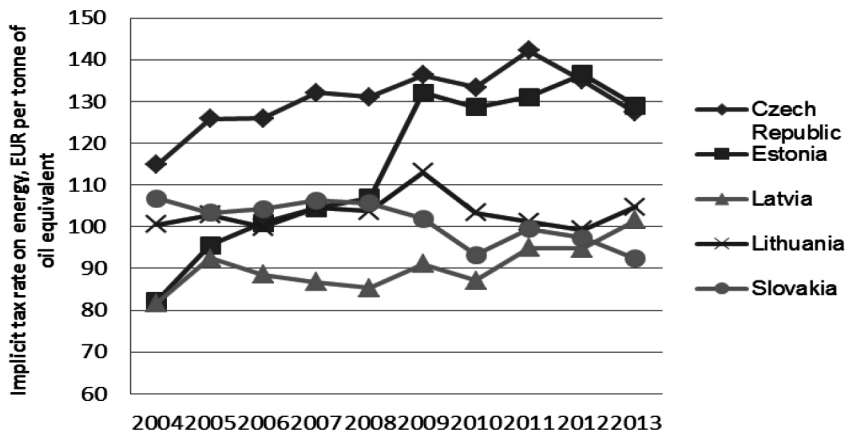
There is important indicator used by EUROSTAT – the implicit tax rate on energy showing the importance of energy taxation in energy sector and economy of the country. The higher is implicit tax rate the higher taxation burden is imposed on energy consumption in the country. It is defined as the ratio of energy tax revenues to final energy consumption calculated for a calendar year. Energy tax revenues are measured in constant price euros (deflated with the final demand deflator)

and final energy consumption is measured in tonnes of oil equivalent (toe); as such the implicit tax rate on energy is expressed in terms of euros per tonne of oil equivalent (EUR per toe). The implicit tax rate on energy is not influenced by the size of the tax base and provides a measure of the effective level of energy taxation. From 2006 to 2013, the implicit tax rate on energy increased by 11% in real or after deflating the energy tax revenue, prices of year 2010 and changing from EUR 191.8 per toe to EUR 212.3 per toe. However two dips were observed during this period: the first one in 2008 was due to a decline in energy tax revenue; the second one in 2010 resulted from a substantial recovery in energy consumption (following a strong reduction in 2009) which exceeded the increase of energy tax revenue in the same year. In Figure 5 implicit tax rate on energy is presented for analysed countries.

As one can see from Figure 5 the highest implicit tax rate in 2013 was in Estonia and Czech Republic and lowest in Slovakia, followed by Latvia and Lithuania. Therefore effective energy tax level is the highest in Czech Republic and Estonia.

In the next section of paper the environmental tax rates will be compared between Baltic States

Fig. 5: Implicit energy tax in Baltic States, Slovakia and Czech Republic



Source: EUROSTAT

and Czech Republic and Slovakia with the aim to define why there are such huge differences between analysed countries in effective tax rates and revenues from environmental taxes targeting energy sector.

3. Environmental Tax Rates in Baltic States, Czech Republic and Slovakia

In energy sector the most important environmental taxes are energy taxes and pollution taxes. These taxes are the main economic tools affecting behaviour of economic agents in energy sector.

EU Energy tax Directive (2003/96/EEC) establishes the minimum rates for energy products and electricity. The tax rates of excise duties on energy products and electricity in Baltic States and Slovakia and Czech Republic are given in Table 1 alongside minimum rates set by Energy tax directive and the EU-28 average rates.

The excise duties on energy products and electricity show that all analysed countries are meeting or exceeding minimum rates set out in Energy tax directive. There are just several exemptions: for natural gas Lithuania has

exemption under Article 15(1) of energy tax directive. Slovakia has exemption for natural gas used as propellant until 01.01.2020 and the current rate which is lower than minimum rate will be increased gradually until 2020. Also electricity used for households is exempted from excise duty in Slovakia under Article 15 (1) (h) of Energy Tax directive.

In comparison to EU-28 average Slovakia has higher rates for all energy products except LPG, diesel and natural gas for propellant use. All other excise duties in Slovakia are well above EU-28 average level except natural gas and coal for heating purposes. Czech Republic has quite similar duty rates to Slovakia however in some cases like natural gas for propellant use and LPG for commercial use the rates are significantly lower than in Slovakia and other analysed countries. In comparison to the EU-28 average rates Lithuania is well below average European rates. In Latvia all excise duties are well below EU-28 average and almost in all cases below tax rates of all analysed countries except LPG for propellant use rate which is lower in Estonia. Latvia distinguishes with very low rates for gasoil and kerosene comparing with other analysed countries. In Estonia the

Tab. 1: Excise duties in Baltic States, Slovakia and Czech Republic on energy products and electricity as at 1st July 2015, EUR (European Commission, 2015)

	Unit	Czech Republic	Slovakia	Lithuania	Latvia	Estonia	Minimal rate	EU-28 average
Transport fuels								
Leaded Petrol	per 1000 litres	498.5	–	579.0	455.3	422.8	421.0	580.0
Unleaded Petrol	per 1000 litres	466.9	550.5	434.0	411.2	422.8	359.0	511.0
Diesel (Gas oil)	per 1000 litres	398.2	386.4	330.0	333.0	392.9	330.0	425.0
Kerosene	per 1000 litres	398.2	481.3	330.0	333.0	330.1	330.0	434.0
LPG	per 1000 kg	143.0	182.0	304.0	161.0	125.3	125.0	197.0
Natural gas	Per GJ	0.69	2.6	6.55	2.67	n.a.	2.6	2.9
Motor fuels-Industry/Commercial use								
Gas Oil	per 1000 litres	398.2	386.4	330.0	56.9	392.9	21.0	233.0
Kerosene	per 1000 litres	398.2	481.3	330.0	21.3	330.1	21.0	300.0
LPG	per 1000 kg	46.9	182.0	304.0	161.0	125.3	41.0	134.0
Natural gas	per GJ	0.31	2.6	–	0.46	n.a.	0.3	1.9
Heating –Business use								
Gas Oil	per 1000 litres	398.2	386.4	21.0	56.9	111.0	21.0	178.0
Kerosene	per 1000 litres	398.2	481.3	330.0	21.3	330.1	0	265.0
HFO	per 1000 kg	17.2	111.5	15.0	15.7	15.0	15.0	71.0
LPG	per 1000 kg	0	0	0	0	n.a.	0	78.0
Natural gas	per GJ	0.31	0.37	0	0.46	0.84	0.15	1.38
Coal and coke	per GJ	0.31	0.31	0.15	0.3	0.3	0.15	1.23
Heating – Not business use								
Gas Oil	per 1000 litres	398.2	386.4	21.0	56.9	111.0	21.0	185.0
Kerosene	per 1000 litres	398.2	481.3	330.0	21.3	330.1	0	275.0
HFO	per 1000 kg	17.2	111.5	15.0	15.7	15.0	15.0	75.0
LPG	per 1000 kg	0	0	0	0	n.a.	0	110.0
Natural gas	per GJ	0.31	0.37	0	0.46	0.84	0.3	2.11
Coal and coke	per GJ	0.31	n.a.	0.3	0.3	0.3	0.3	1.69
Electricity								
Business use	per kWh	1.03	1.32	0.52	1.01	4.47	0.5	10.2
Non-business use	per kWh	1.03	–	1.01	1.01	4.47	1.00	14.7

Source: [24]

general approach was to homogenise tax rates across different fuels and for some fuels the rates are well above the minimum set by Energy Tax directive however the majority of rates are below the EU-28 average. Electricity duties are set well above the EU-28 average level and well above excise duties of all analysed countries. In general Slovakia and Estonia has the highest excise duties for energy products and Latvia has the lowest one.

Air pollution taxes are important flexible pollution reduction measure in energy sector as

energy sector is the major sources of classical pollutants (SO₂, NO_x, Particulates, CO) which are usually being charged by air pollution taxes in major EU member states and other countries all over the world.

The tax rates for the main pollutants discharged from stationary sources of pollution is set for one tonne of pollutants discharged into the environment. The tax rates for pollutants discharged into the atmosphere in analysed countries are presented in Table 2.

Tab. 2: Air pollution tax rates in Baltic States, Czech Republic and Slovakia, valid since 2015, EUR/t

	Czech Republic	Slovakia	Lithuania	Latvia	Estonia
Ammonia	38.50	66.38	4.0	18.50	122.32
Carbon monoxide	23.10	32.00	24.0	7.83	7.7
Heavy metals	769.9	1,280.2	3,855	1,138.3	1,278
Nitrogen oxides	30.80	48.01	196	85.37	122.32
Solid emissions (particulates)	115.5	160.0	61	75.0	146.16
Sulphur dioxide	38.50	64.01	104	85.37	145.5
Volatile organic compounds	76.99	66.38	4.0	85.37	122.32

Source: EUROSTAT

As one can see from information provided in Table 2 the highest rates for classical pollutants in energy sector are being applied in Estonia and Lithuania. The lowest rates for classical pollutants are being applied in Czech Republic and Latvia.

Though selected countries distinguishes with quite different environmental pollution and energy tax rates it can be concluded from analysis of environmental taxes in these countries that Estonia can be considered as country having highest burden of environmental taxes relevant to energy sector between analysed 5 countries. In the following sections of paper analysis of sustainable energy sector development trends will be compared between Baltic States and Czech Republic and Slovakia in order to define the impact of environmental taxes on results achieved by new EU member states in implementing the main EU energy and environmental policy targets. For this purpose sustainable energy development framework and analysis of EU energy policy targets were applied.

4. Sustainable Energy Development Indicators

There are a several frameworks of indicators developed to assess the trends towards sustainable development. The Energy Indicators for Sustainable Development (EISD) have been developed by International Atomic Energy Agency (IAEA) [24]. The EISD is an analytical tool developed which can help energy decision- and policy-makers at all levels to incorporate the concept of sustainable development into energy policy. The EISD set is used to present energy, economic, environmental and social data for policymakers in a coherent and consistent form, showing their linkages and their usefulness for making comparisons, trend analyses and policy assessments. Some indicators from EISD set can be selected and applied for the analysis of the EU energy policies in Member States and for the assessing their success towards implementation of the main targets set by directives and other policies establishing goals for energy efficiency improvements, use of

renewables and greenhouse gas emission reduction. Therefore indicators relevant to EU energy policies will be selected from the EISD list. The additional indicators to define targets established by EU policies will be developed as well. EISD core set is organized following the conceptual framework used by United Nations Commission on Sustainable Development. There are 30 indicators, classified into three dimensions: social, economic and environmental. Trends in overall energy productivity, supply efficiency, end-use productivity, and fuel mix and energy security will be analysed using economic dimension indicators. Climate change mitigation issues will be addressed by environmental dimension indicators.

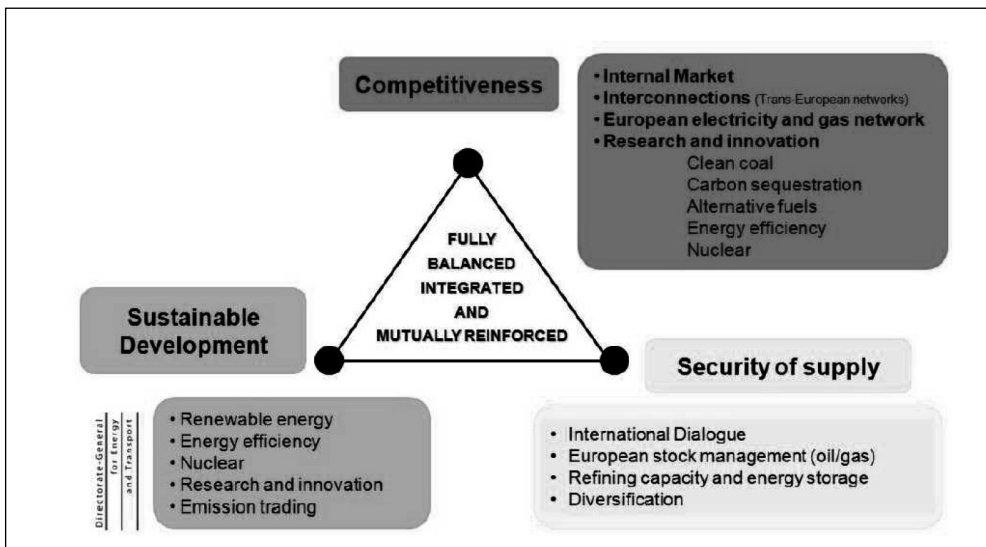
The main priorities of EU sustainable energy development policies are: competitiveness, environmental sustainability and security of supply. In Figure 6 the main priorities of EU energy policy is presented. The main target is competitiveness followed by security of supply. The economic competitiveness focuses on the Lisbon strategy and Europe 2020 strategy aiming to make European market the most competitive market in the world. EU also wants

to be the role model setting and achieving environmental sustainability objectives, such as reducing CO₂ emissions, increasing the share of renewable energy and improving energy efficiency.

The appropriate EISD were selected to address requirements of EU directives targeting security of supply (ECO15), energy efficiency improvements (ECO1, ECO2), promotion of renewables (ECO11, ECO12, ECO13) and greenhouse gas (ENV1). The selected indicators were grouped by 4 priority areas established by EU energy policy: increase of energy efficiency, use of renewables, increase of energy security and greenhouse gas and other atmospheric emission reduction. The indicators framework for EU energy policy analysis are presented in Table 3.

All these selected EU energy policy indicators can be connected to each other via the chain of mutual impacts based on examples of application of ISED framework in order to develop comprehensive policy framework for monitoring implementation of EU directives and tracking various interacting policy measures targeting relevant indicators. The last indicator in EU energy policy indicators framework

Fig. 6: The main priorities of EU sustainable energy development policy



Source: [2]

is greenhouse gas emission indicator as all other EU policies (targeting energy efficiency improvements, promotion of renewables, and increase in energy supply security) in the end have positive impact on greenhouse gas emission reduction. In the next section of paper the dynamics of the main indicators of sustainable energy development in Baltic States and Czech Republic and Slovakia will be analysed by applying graphical analysis in order to define the best performing country. Based on analysis of environmental tax rates and revenues collected from environmental taxes as percentage of GDP the highest rate of environmental taxes to GDP has Latvia following Estonia however the highest tax rates are in Slovakia and lowest are in Latvia.

5. Trends of Sustainable Energy Indicators Development in Baltic States, Slovakia and Czech Republic

The trends of sustainable energy development indicators during 2005–2012 for Baltic States, Czech Republic and Slovakia selected based on Table 3 are presented in Figures 3–9. The most important indicator of sustainable energy development is energy intensity of GDP as this indicator represents also competitiveness, environmental sustainability and energy security issues. Reduce of energy intensity in member states has direct impact on environmental and pollution reduction, climate change mitigation and on increase of competitiveness of economy

Tab. 3: Indicators selected for EU energy policy analysis

Indicators	Acronym	Subtheme	Directive or policy document	Target	Date for achievement
Energy efficiency					
Energy intensity of GDP	ECO1	Energy efficiency	Directive 2012/27/EC on energy efficiency, amending Directives 2009/125/EC and 2010/30/EU and repealing Directives 2004/8/EC and 2006/32/EC	Reduce energy intensity by 20% from year 2005 level	2020
The share of CHP in electricity production	ECO2	Energy efficiency	Directive 2004/8/EC on the promotion of cogeneration based on a useful heat demand in the internal energy market and amending Directive 92/42/EEC	35%	2025
Use of Renewable energy sources)					
The share of renewables in electricity generation	ECO11	Renewables	Directive 2001/77/EC on the promotion of electricity produced from renewable energy sources in the internal electricity market	21%	2020
The share of renewables in fuel used in transport	ECO12	Renewables	2003/30/EC Directive on the promotion of the use of biofuels or other renewable fuels in transport	10%	2020
The share of renewables in final energy	ECO13	Renewables	Directive 2009/28/EC on the promotion of the use of energy from renewable sources and amending and subsequently repealing Directives 2001/77/EC and 2003/30/EC	20%	2020
Security of Supply					
Energy independency	ECO15	Security of supply	"2020 Climate and Energy Package"	50%	2030
Atmospheric pollution reduction					
Greenhouse gas emissions (CO ₂ emissions from energy sector)	ENV1	Climate change	"2020 Climate and Energy Package"	Reduction by 20% of year 1990 level	2020

Source: own

and security of energy supply. In Figure 7 the trends of energy intensity of GDP is compared in Baltic States, Czech Republic and Slovakia.

As one can see from Figure 7 though all Baltic States and Czech Republic and Slovakia have energy intensity well above EU-28 level the highest energy intensity is in Estonia and the lowest one in Lithuania. Comparing data of year 2004 with energy intensity in 2012 one can notice that energy intensity was decreasing since entering EU in all analysed countries however economic crisis had negative impact and energy intensity started to increase however in Estonia energy intensity increase can be noticed since 2007 but in 2010 this trend has dramatically changed and energy intensity began to decrease. In other analysed countries the trend of energy intensity decrease can be noticed following the recovery from economic crisis in 2010. Though countries have implemented various policies and measures to ensure energy efficiency energy and pollution taxes have also important effect on energy intensity decrease [26].

Increase of utilisation of renewable energy sources is important priority of environmental sustainability of energy sector development. All countries have introduced additional

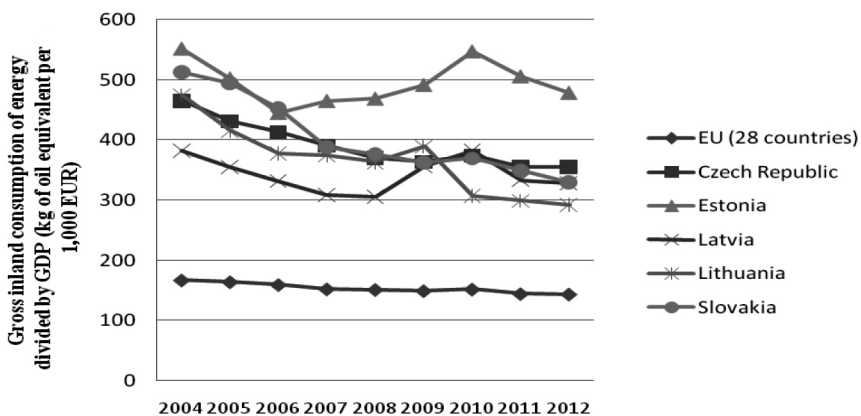
measures to environmental taxes to increase usage of renewable energy sources [25]. In Figure 8 the trends of important indicator representing penetration of renewables in final energy consumption of Baltic states and Czech Republic and Slovakia are presented.

As one can see from Figure 8 Latvia distinguishes with very high share of renewables in final energy which is well above EU-28 level. In Estonia and Lithuania the share of renewables in final energy is also above EU-28 level and has increased significantly since 2004 (by almost 70%). The high share of renewables in Latvia is related with the natural conditions and high share of hydro in electricity generation. The lowest share of renewables is in Slovakia and Czech Republic and though since 2004 use of renewables in final energy was increasing in all analysed countries the highest increase was achieved in Estonia. Comparing results achieved by new EU member states with target one can notice that Estonia achieved level above target set for 2020 in 2011. Other countries in 2012 have the shares of renewables well below established target for 2020.

Another important indicator representing progress achieved by EU member states in

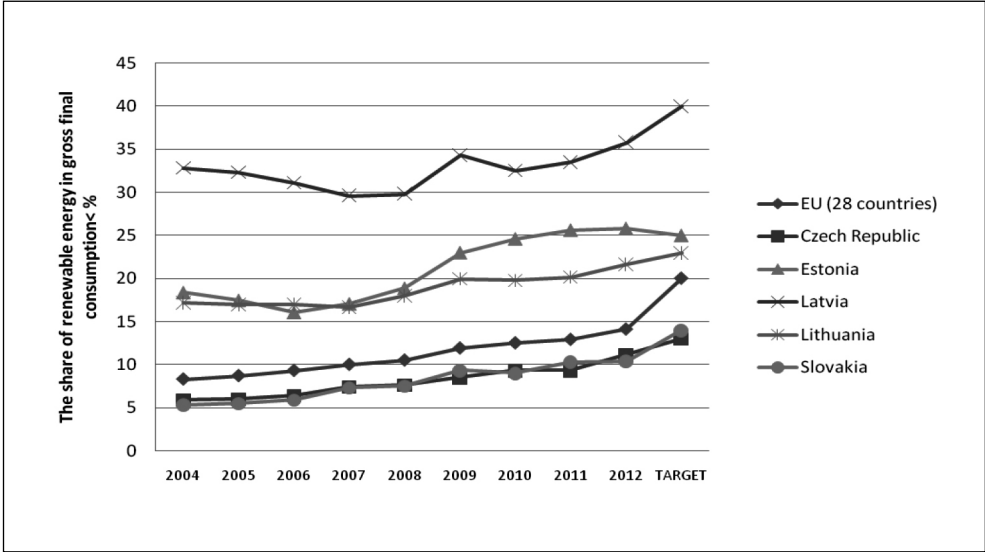
Fig. 7:

Development of energy intensity of the economy in Baltic States, Czech Republic and Slovakia



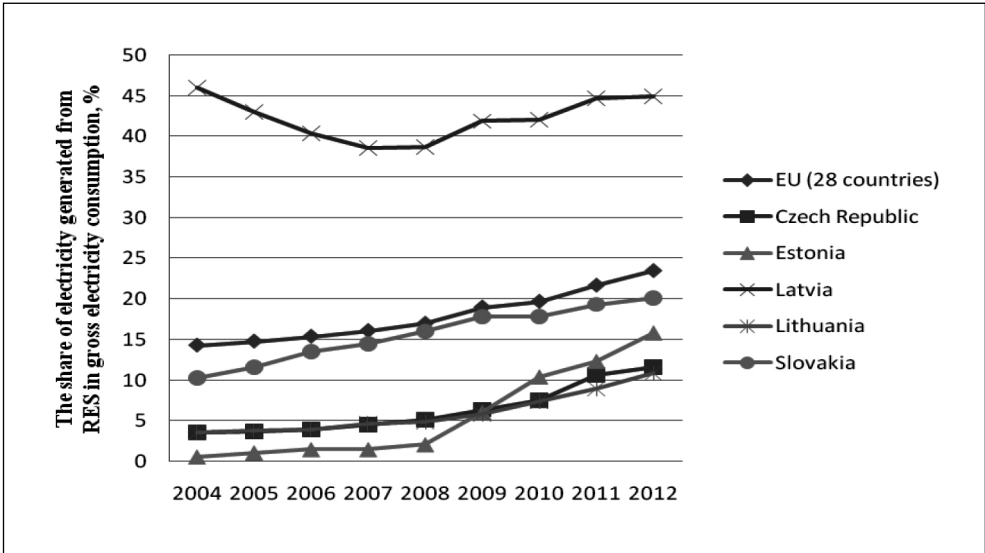
Source: EUROSTAT

Fig. 8: Development of the share of renewables in final energy consumption and target for 2020



Source: EUROSTAT

Fig. 9: Development of electricity generated from renewable sources in gross electricity consumption in Baltic States, Czech Republic and Slovakia



Source: EUROSTAT

implementing EU energy policy targets is the share of renewables in electricity generation. In Figure 9 the trends of electricity generated from renewable energy sources in Baltic States, Czech Republic and Slovakia are presented.

As one can see from Figure 9 Latvia again distinguishes with very high shares of renewables in gross electricity consumption between analysed countries. As hydro energy production depends on the weather conditions the share of electricity generated from hydro is fluctuating in Latvia. All other new EU member states have this share of electricity generated from renewables well below EU-28 average level. In all countries the trends of increase of electricity generated from renewables can be noticed. Slovakia has the highest share of electricity generated from renewables (20%) between other countries included in analysis except Latvia. Lithuania and Czech Republic have very similar shares in 2012 – slightly above 12%. In all analysed countries the continuous trend of increase of the share of renewables in electricity generation can be noticed during 2004–2012 year period. The highest increase is achieved in Estonia.

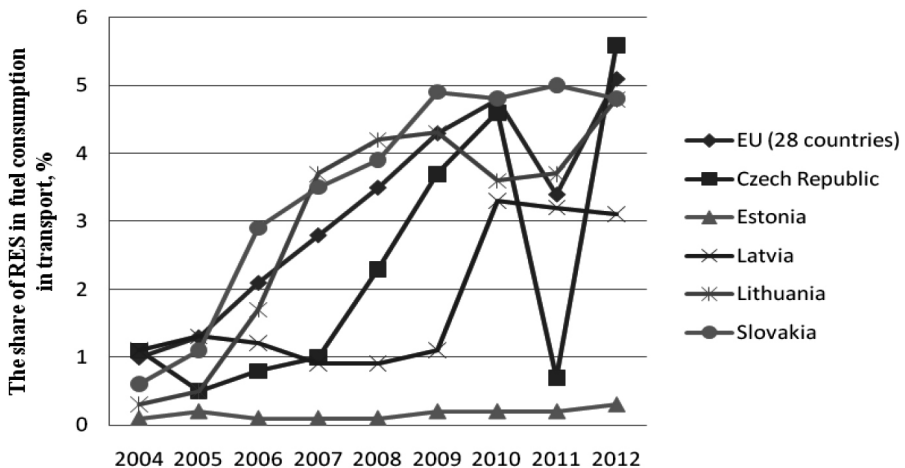
In Figure 10 the trends of use of renewable energy in transport in Baltic States and Czech Republic and Slovakia are presented during 2004–2012 year period.

As one can see from Figure 10 the Estonia distinguishes with very low shares of renewables in fuels used in transport. The highest share of renewables in transport fuel consumption well above EU-28 level was in Czech Republic in 2012 though in 2011 country has experienced sharp decrease in renewables consumption in transport. Slovakia and Lithuania also has achieved high share of renewables in fuel consumption in transport in 2012 – almost 5% and are in line with requirements set by 2003/30/EC Directive on the promotion of the use of biofuels or other renewable fuels in transport.

The combined heat and power production allow to increase significantly energy efficiency therefore it is important indicator of environmental sustainability achieved by EU member states. In Figure 11 the development of combined heat and power generation in gross electricity generation in Baltic States, Czech Republic and Slovakia is presented.

As one can see from Figure 11 the highest share of combined heat and power (CHP)

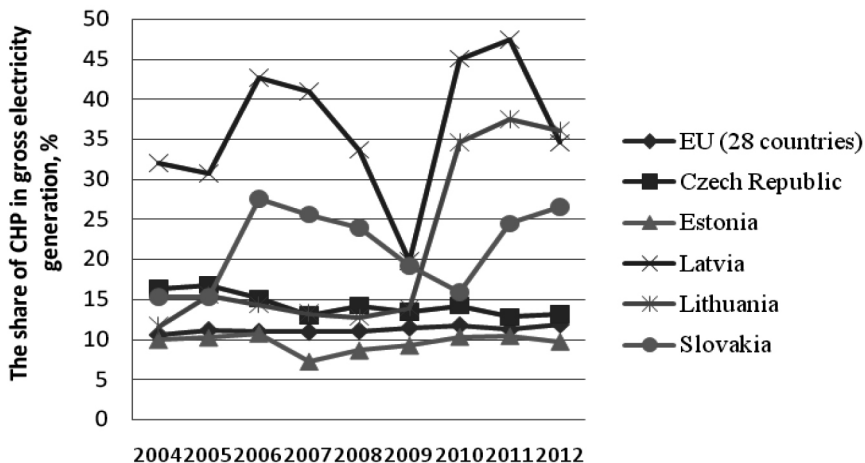
Fig. 10: Development of the use of renewable energy in fuel consumption of transport in Baltic States, Czech Republic and Slovakia



Source: EUROSTAT

Fig. 11:

Development of combined heat and power generation in gross electricity generation in Baltic States, Czech Republic and Slovakia



Source: EUROSTAT

in gross electricity generation is achieved in Lithuania and Latvia though in Latvia because of the high share of hydro in gross electricity generation there are big fluctuations of the share of CHP in gross electricity generation during investigated period. Estonia has quite low share of CHP in gross electricity generation even below EU-28 average. In other analysed countries the share of CHP in gross electricity generation is above EU-28 level. Especially high increase of CHP in gross electricity generation can be noticed in Lithuania (from 10% to 36%) and Slovakia (from 15% to 27%) during investigated period.

GHG emissions is important indicator of energy sector sustainability and expresses results achieved in other indicators of sustainable energy development: energy efficiency improvements and increase of the share of renewables as these are major ways to reduce GHG emissions from fuel combustion. In Figure 12 the development of GHG emission intensity of energy consumption in Baltic States and Czech Republic and Slovakia is presented. This ratio indicator is selected instead of total GHG emissions for the comparison between countries as indicator of total GHG emissions

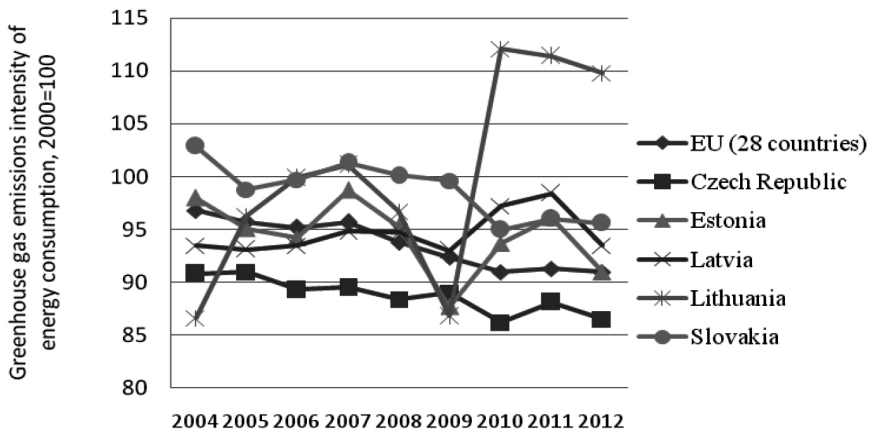
do not allow to compare countries because of the difference in size of economy.

As one can see from Figure 12 the Czech Republic has achieved the best results of GHG emission reduction in energy sector following Estonia. The worst situation with this indicator is in Lithuania because of the closure of Ignalina NPP in 2009 and the increase of fossil fuel consumption replacing carbon free nuclear fuels. However since 2010 the trends are positive and carbon intensity of energy is also decreasing in Lithuania. Slovakia achieved significant decrease of carbon intensity of energy since 2004. The Slovak Republic is one of the countries that have managed to curb down greenhouse gas emissions considerably since 1990. At the same time, it is progressing well in decoupling the economic growth from emissions. Estonia also reached good results in decreasing of carbon intensity of energy because of good results achieved in penetration of renewable energy sources in energy sector except renewables used in transport sector.

In Figure 13 the trends of energy dependency in Baltic States and Czech Republic and Slovakia are presented.

Fig. 12:

Development of greenhouse gas emissions intensity of energy consumption in Baltic States, Czech Republic and Slovakia, 2000=100



Source: EUROSTAT

As one can see from Figure 13 the highest energy dependency rate in 2012 was in Lithuania. This is related with the closure of Ignalina NPP in 2009 and increase of energy import. Before closure of Ignalina NPP Lithuania was net energy exporter. The lowest energy import dependency is in Estonia though it has slightly decrease in 2012 comparing with year 2011. Estonia has abundant oil shale resources and has been utilising these resources in energy sector quite intensively however with entrance in force of stringent EU environmental regulations the use of oil shale having high sulphur content is diminishing. Czech Republic also has quite low energy import dependency because of availability local coal resources. Slovakia and Latvia have high energy dependency rate well above EU-28 level however the trends in Latvia and Slovakia are very positive and energy dependency rates have decreased in these countries from almost 70% in 2004 to 55–60% in 2012.

Conclusions

The main benefits of greening national tax system is related with double dividends such as economic growth because and reduction of

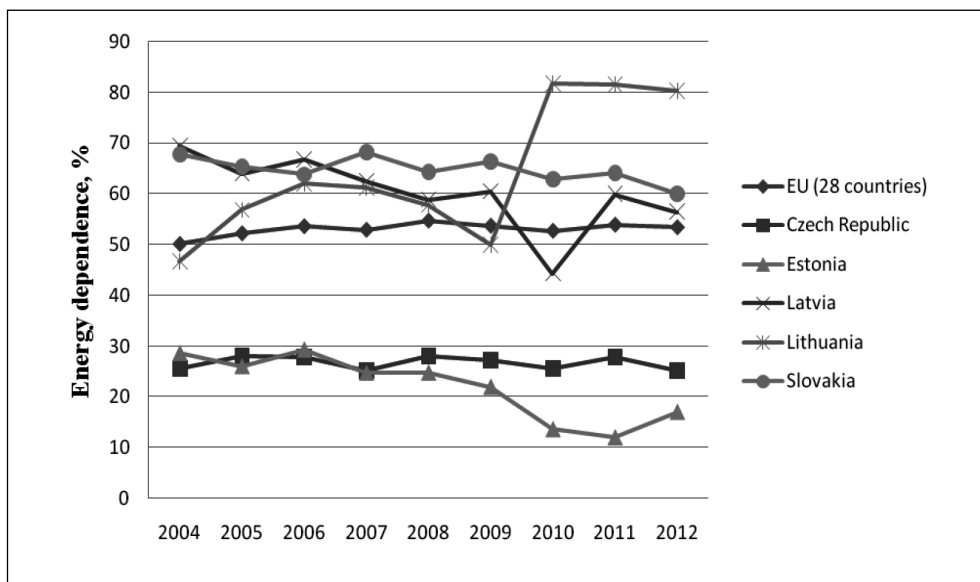
environmental impact because of the changes of tax structure from taxes on labor and income to the environmental and resource taxes.

Energy sector is the major source of environmental pollution therefore increase in environmental taxes is anticipated to have positive impact on sustainable energy development which means competitive, secure and environmentally sound energy sector development

The process of greening national tax systems in all European Union is undergoing however there significant differences among new EU member states. Analysis of environmental taxes in three Baltic States and Czech Republic indicated quite different energy and pollution tax rates as well as quite large differences in the share of environmental tax revenues as percentages of GDP in these countries.

The conducted analysis revealed that Estonia distinguishes from analysed fifth countries with the best results in greening environmental tax system. The highest rates of pollution and energy taxes imposed in Estonia also provides for high shares of environmental taxes as the percentages of GDP in this

Fig. 13: The trends of energy dependency rates in Baltic States, Czech Republic and Slovakia



Source: EUROSTAT

country. Latvia has one of the lowest shares of environmental taxes as percentage of GDP. Low revenues from environmental taxes could signal relatively low environmental tax rates, or could result from high tax rates that have had the effect of changing behavioural patterns of consumption of the related products or activities.

Higher levels of environmental tax revenue could be due to low tax rates that incentivise non-residents to purchase taxed products across a border (as is the case for petrol or diesel).

Though there are other policies and measures to promote sustainable energy development in selected countries such feed-in prices for electricity produced from renewable energy sources, subsidies from EU Structural Funds etc. environmental taxes relevant to energy sector may also play important role in promoting sustainable energy development.

Comparing Baltic States and Czech Republic and Slovakia in terms of progress achieved in sustainable energy development and meeting EU energy policy targets several indicators of sustainable energy development

were selected. The trends of security of energy supply, energy efficiency, penetration of renewable energy sources and GHG emissions were compared among five new EU member states.

Estonia distinguishes from analysed countries with good results achieved in achieving several sustainable energy development targets, such as high share of renewables in final energy consumption, high security of energy supply (low rate of energy independency), significant decrease in energy intensity and carbon intensity of energy. Czech Republic has achieved good results in increase of security of energy supply and decrease of energy intensity of GDP and carbon intensity of energy. Latvia distinguishes with very high shares of renewables in electricity generation and in final energy consumption however it is more related with favourable climate conditions and well developed hydro power plants.

The improvements of environmental tax systems give a relevant and strong motive for the sustainable energy development in the countries. Certainly the evolution of environmental taxes is based on historical

heritage of the European Union and economic aspects such as the level of economic development, size of the state, population and other reasons. Because of steady development and growing of standard of living, which environment is part of, the tax greening is anticipated to be continued in all analysed countries.

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Abstract

IMPACT OF ENVIRONMENTAL TAXES ON SUSTAINABLE ENERGY DEVELOPMENT IN BALTIC STATES, CZECH REPUBLIC AND SLOVAKIA**Dalia Štreimikienė**

Environmental taxes have direct impact on sustainable energy development as energy production and consumption is the major source of GHG and classical pollutants emissions. There are number of EU member states which are using environmental pollution taxes as the main economic instrument of atmospheric air pollution reduction. The energy sector is the main source of atmospheric pollution therefore environmental taxes should have direct impact on sustainable energy development as these taxes create incentives to reduce consumption of fossil fuels and to switch to renewables and cleaner fossil fuels such as natural gas. The comparative study of environmental taxes and indicators of sustainable energy sector development in Baltics and Czech Republic and Slovakia was performed to assess what role environmental taxes are playing in achieving sustainable energy development in selected new EU member states.

Analysis of environmental taxes in three Baltic States and Czech Republic indicated quite different energy and pollution tax rates as well as quite large differences in the share of environmental tax revenues as percentages of GDP in these countries. Estonia distinguishes with the best results in greening environmental tax system and one of the best results in achieving sustainable energy development targets. Latvia has one of the lowest share of environmental taxes as percentage of GDP and has very high shares of renewables in electricity generation and in final energy consumption however it is more related with favourable climate conditions and well developed hydro power plants.

Key Words: *Environmental taxes, sustainable energy development, indicators, Baltic States, Czech Republic, Slovakia.*

JEL Classification: E62, Q01, Q43, Q56.

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A COMPARISON OF EDUCATIONAL MISMATCHES ACROSS EUROPE

Kateřina Maršíková, Václav Urbánek

Introduction

Mismatches in the labour market are a current topic of discussion for researchers, scientists, politicians and even the general public. The literature focuses both on educational and job mismatches. The aim of this paper is to compare the situation concerning educational mismatches as evidenced by European data. Labour market data in almost all developed countries shows that university graduates more easily find employment compared to less educated people. Their jobs are also more qualified, more interesting and better paid [14]. Common government policies in these countries encourage participation in tertiary education. The cornerstone of such policies lies in the belief that a more educated labour force leads to increased economic growth [13]. This situation can be illustrated by the number of students enrolled in tertiary education (both public and private) in the Czech Republic where the enrolment of 19-year olds starting university between 2003 and 2010 increased by more than 20% [7].

The traditional functions of education, which include teaching students methods and theories and how they are applied in practical life, making students more culturally-aware and providing them with the tools and skills they need to perform qualified work are contradictory to the labour market's needs and basically have an impact in two directions. On the one hand, the expansion of university education is understood as a phenomenon of market growth, and on the other hand, in connection with this issue, we talk more often about overeducation, overqualification or overschooling. This is a situation where graduates have problems finding jobs which correspond to their level of education [12], [15].

There has appeared abundant literature on overqualification in recent decades, both in

theoretical and in empirical fields. This issue has also become topical in the Czech Republic. To present the current situation not only in the Czech Republic, but also throughout Europe, researchers use several surveys such as the international survey Reflex, the ESS (European Social Survey), the ISSP (International Social Survey Programme) and the VŠPS (Selected Survey of Labour Force) of PedF UK and its international counterpart, the LFS (Labour Force Survey) [15]. The latest data used for making an analysis of overeducation originate from the PIAAC 2013 survey (Programme for International Assessment of Adult Competencies), collected by the OECD in 24 highly industrialized countries (the results are introduced later in this paper based on an analysis of [18]).

After providing a detailed literature overview on the topic of overeducation and job mismatches, the main part of this paper introduces the results both from secondary data published topically on this issue (PIAAC) in 2013 as well as a comparison of previous analyses from ESS surveys.

1. Overeducation: An Overview of the Literature

As the average level educational attained by the labour force has risen, there is an indication that the job structure has not been able to absorb this increased supply of educated workers into the traditional occupational rungs, and a state of overeducation has emerged in the labour market [27]. One of the first authors who was concerned with the economic analysis of overqualification from the macroeconomic point of view was Richard B. Freeman in his publication entitled *The Overeducated American*. In 1976, Freeman found that the rate of return to higher education had fallen in the USA in the 70s and he attributed it to an

excess supply of graduates [1]. Heckman and Kruger pointed out that the economic value of a bachelor's degree in the 70s plummeted in the U.S.A. It led Harvard labour economist Richard Freeman to fret over the plight of the "overeducated American" [12].

1.1 Definitions of Overeducation, Required Education and Undereducation

The literature used in this paper is focused on educational mismatch and defines key terms as over and under education and over and under qualification. For example, CEDEFOP classifies overeducation as a situation in which an individual has more education than the current job requires (measured in years). On the contrary, undereducation is a situation in which an individual has less education than the current job requires (measured in years) [3]. In this paper, we empirically address overeducation and undereducation. However, some of the literature understands overqualification and overeducation to be synonymous terms. A worker is said to be overeducated if he/she has acquired more education than is required to perform his/her job [21]. Chevalier in [14] presents the results of surveys in extent literature and concludes that empirical work relies on three different definitions of overeducation.

In the first definition, education is compared to their self-assessed qualification required to perform one's job. As many authors (e.g. [9], [16], [20]) point out, this subjective method is also the most popular method used in empirical research and provides reliable internationally comparable data (including ESS and PIAAC, analyzed in the paper below) [17]. Groot and van den Brink [9] call this method as a subjective (self-assessment) method and it can be direct or indirect one: in the direct type, workers are asked directly whether they are overeducated or undereducated for the work they do; in the type of indirect method, workers are asked what the minimum educational requirements are for (a new worker in) the job ([9], p. 150).

Second, an "expert" definition of an educational requirement for a given occupation is used. Expert analyses have been developing mainly in the USA within the traditional O*NET (occupational information network) programme. It provides updated information about hundreds of occupations listed by occupation experts

covering approximately 97% of the occupations on the US labour market [18]. A job analysis conducted by experts brings the best results [9]. However, this data is rarely available and we can find subjective measures in most overeducation analyses [10]. From a meta-analysis of 25 studies of overeducation and overqualification [9, p.153], 50 estimates on the incidence of overqualification and overeducation were obtained and 36 estimates for the incidence of undereducation were obtained. The unweighted average of the incidence of overeducation and overqualification was 23.3% (with a standard deviation of 9.9%) and the unweighted average of the incidence of undereducation and underqualification was 14.4% (with a standard deviation of 8.2%). In a study of the U.K. graduate labour market [4], 38% of all graduates were overeducated in their first job. This proportion fell to 30% after six years. The results for the Czech Republic can be found in a study of 25 European countries [8] and are as follows: 49.5% overeducated; 44.3 undereducated.

Third, the distribution of education is calculated for each occupation; employees who depart from the mean or median by more than some ad hoc value (generally one standard deviation) are classified as overeducated [9].

1.2 Overeducation, Required Education and Undereducation in the Labour Market

In connection with labour market mismatch, authors often talk about over or under education. Another aspect related to the mismatch in jobs and graduates is the difference between the field of study of graduates and the actual demand on the labour market (skill mismatch). Most literature is focused on the educational mismatch and only a small portion on skill mismatch. Far less attention is paid to job mismatches referring to the field of education obtained (exceptions are e.g. [25], [30]). There are mainly two reasons for this aspect of job-mismatch. First of all, school-leavers have to compete for the available jobs with those who have already gained a position on the labour market. Their lack of work experience often forces them to face unemployment. Secondly, a relatively large number of school-leavers ends up in jobs that do not match their educational qualifications. These job mismatches can be the result of incomplete information on the abilities

of school-leavers and the characteristics of jobs offered by employers. In the literature, job mismatches are reported to have serious effects on a number of labour-market outcomes. There has been significant written evidence on the influence of over or undereducation on earnings (mentioned below in part 1.3). In the case of job mismatches with regard to the field of education, Wolbers confirms that there are also wage effects: individuals working in their own field of education earn higher wages than those working outside it [32]. The third possible issue of job-mismatch deals with the imbalance of the use of gained abilities and qualification [25].

Job-matching theory according to Sattinger states that the quality of a job match, i.e. the degree of fit between required and acquired skills, determines the productivity level and earnings in a job. If an employee works in a non-matching job, his/her acquired skills are under-utilized. This imposes a limitation on his/her labour productivity, resulting in lower wages. The allocation of workers is optimal if every worker is matched to a job in which, in relative terms, he/she performs better than all other workers. The incidence of job mismatches, then, is explained by differences in the shares of vacant jobs of a given level and available workers with adequate educational qualifications [23], [31]. Tools to increase conformity between required and offered skills and educational levels in the labour market can help to minimize job mismatch. Countries can influence the quality of provided education, and map the requirements of employers and the expectations of graduates on the labour market.

Wolbers [32], in his cross-national data analysis, concludes that better-educated and occupation-specifically qualified school-leavers are less often employed in a job that does not fit the field of education the students attended in their initial education than lower educated and less occupation-specifically qualified school-leavers. Moreover, the likelihood of having a job mismatch is also determined by different job characteristics. Job tenure has a negative effect on the likelihood of having a job mismatch. Wolbers also confirms that structural characteristics affect the probability of having a job mismatch. In times of high unemployment, the likelihood of having a job mismatch is higher than in times of low unemployment. When comparing job mismatches between selected

European countries, he found out that almost one-quarter of the variation between countries can be attributed to national differences in the vocational orientation of the education system. There is evidence that countries in which the share of upper secondary education students in school-based vocational education is high, have a higher incidence of job mismatches among school-leavers than countries in which this share is low [32].

There also exists empirical evidence on skill job-mismatch in the Czech labour market between graduates with a secondary degree. The author states that there will be always be some level of job mismatch (both skill and educational) and an imbalance between the supply and demand of workers with a different field of study or achieved degree on the labour market. This can occur due to shortages in the labour market as well as qualitative and quantitative shortages of employees themselves [29]. The requirements of employers can originate from special surveys between employers as well as from data provided by employment agencies about their clients' (employers) requirements. The problem with this method is that it is an inadequate systematic approach for data collection. However this method has recently been given greater importance for searching for a collective approach to connecting data at national levels. For these purposes, researchers can use data from the European Commission (DG Employment) or Eurostat (Survey of continual vocational training – CTVS) [13].

The situation where a university graduate works in a position that requires lower qualifications happens for three reasons. First, it can mean that higher education institutions were not able to provide sufficient abilities and knowledge required from employers to their graduates. Secondly, the reason can arise from a labour market that does not offer enough positions for these university graduates. Thirdly, university graduates may not be able to find a matching job position due to labour market imperfections and discrimination [16]. In other words, widening participation in education may lead to an increase in overeducation. Employers faced by a more qualified pool of candidates may have upgraded some traditionally non-graduate jobs. Alternatively, they may recruit graduates for jobs that have basically stayed the same and do not require graduate skills (de

facto qualification inflation) or since educational standards are commonly suspected to have decreased over-time, upgrade their qualification requirements to select candidates with the appropriate skills (grade-drift) [13].

Van Eijs and Heijke confirm that in cases of a non-optimal match, employers should provide more training to overeducated workers to bring their skills in line with the requirements of the job. This would be the case when the mismatch is minor, i.e. for apparently overeducated workers. Alternatively, human capital theory predicts that overeducated workers are less likely to get training as they compensate their lack of specific skills by an excess of education. Also, overeducated workers might have shorter tenure since they keep looking for a better match, therefore firms are less likely to invest in their training. This type of worker is genuinely overeducated. Hence, apparently overeducated workers receive more employer-funded training than genuinely overeducated workers do. The skill differential generates a difference in the productivity of the different types of graduates. Therefore, the earnings of an overeducated graduate are bound to be lower than those received by matched workers; furthermore it could be anticipated that the genuinely overeducated earn the least [13].

Job assignment theory proposes that even if we accept that the skills obtained in education contribute positively to productivity in general, the extent to which workers can use those skills may depend to some extent on productivity limits imposed by job characteristics. For overeducated workers, job constraints may allow only a limited use of their skills, which in turn limits their productivity and consequently their wages. This would suggest that overeducated workers underutilise their skills and vice versa undereducated workers overutilise their skills. For instance, Dolton and Vignoles, in analysing the early careers 1980 UK graduates, found out that 62% of male graduates who were overeducated in their first jobs remain in a sub-graduate position six years after graduation [4].

1.3 Overeducation, Required Education, Undereducation and Earnings

The incidence and wage effects of overeducation have been well established by empirical studies by e.g. Hartog [10], Sloane [25], McGuinness

and Bennett [21] and McGuinness [20]. Previous surveys have generally found that the larger the spread between education obtained and education required, the greater the pay penalty. A well-arranged study on the incidence and wage effects of overeducation was also typically introduced in the publication by [18]. He refers to two main issues from empirical studies resulting of overeducation effects on earnings. [10], [20], [24], [29].

First, people who work in jobs for which they are overqualified earn less than workers who have the same level of education, but who work in jobs that require that specific level of education. Secondly, overeducated people earn more than people who work in equivalent jobs, but have attained the level of schooling required for that job. This was confirmed by analyses conducted e.g. by [10], [20], [24]. Dolton and Vignoles [4] estimate the pay penalty for overeducated graduates to range between 4% and 17%. McGuinness [21] estimates an average overeducation penalty for graduates six years after graduation ranging from 11% to 17%. Many studies dealing with the topic of overeducation conclude that overeducated workers have also lower returns on their education [14].

Empirical analyses consistently show that (1) people who work in jobs for which they are overqualified earn less than workers who have the same level of education, but who work in jobs that require that level of education, and that (2) overeducated people earn more than people who work in equivalent jobs, but have attained the level of schooling required for that job (Sicherman [24], Sloane [25]). Many papers have aimed to explain these stylized facts (Duncan and Hoffman, Hartog and Oosterbeek, Sloane et al. and McGuinness) [18].

2. Data

For the aim of this paper two large sets of international data were chosen to show effects of educational mismatch. In the first part of this chapter selected results of PIAAC survey are presented. The second set of data of ESS 5 provides information about effects of educational mismatch on earnings and rates of returns.

2.1 The OECD's PIAAC Survey

The recently conducted international large-scale PIAAC (International Assessment of Adult

Competencies) assessment conducted by the OECD provides, besides other issues, reliable measurements of all the elements needed to evaluate the effects of education in connection with overeducation, required education and undereducation, i.e. wages, years of acquired and required schooling and direct measures for key information processing skills. As such, these data allow us to better distinguish between the various theoretical explanations for the relationship between educational mismatches and wages than any previous data set. Although the measured skills are not the perfect measure of all relevant abilities, and much skills heterogeneity will plausibly remain unobserved, these data can be used to establish whether the relationships between wages and overeducation, undereducation and required education can partly be attributed to skills heterogeneity. Furthermore, the cross-national character of the data allows for exploring the role of labour market institutions [18].

Data obtained from the PIAAC are used for more than just the connection with the level of

education. The main purpose of this survey was to gain data about human capital in connection with knowledge and skills. The results of this survey are available on a quantitative scale, which enables users to search for and quantify the relationships between different indicators. Data analyzed by Levels at al. [18] contained a total working sample of 26,322 respondents from 21 countries, including the Czech Republic. In order to calculate the results, the authors used the common ORU model explained above. The degree of overeducation is derived from the levels of education reached by the respondents and the education level required for their job. The authors used the operational definition of overeducation that is common in this type of study, and define overeducation as the extent to which individuals have attained an educational level that is higher than is required for the job they have. Selected descriptive statistics of data obtained from the PIAAC (21 countries) is shown in Table 1.

The level of education attained as measured by PIAAC is the nominal number of years

Tab. 1: Selected descriptive statistics of data used from PIAAC (21 countries) in 2013

	Minimum	Maximum	Mean	Std. Deviation
Monthly wage (US dollars)	512.9	213,198.31	3,490.01	3,497.65
Required education (years)	0	22	12.93	3.13
Overeducation (years)	0	18	0.89	1.78
Undereducation (years)	0	14	0.51	1.27
Age (years)	16	65	40.64	11.72
Work experience (years)	0	55	19.87	12.18
Number of working hours per week	36	80	43.89	7.53

Source: PIAAC, elaborated by [18]

respondents spent in formal education. The measure is derived from the reported highest level of education in national education systems, converted into nominal years of schooling by the PIAAC consortium and country experts. Required education in the PIAAC survey is based on the following question: “If applying today, what would be the usual qualifications, if any that someone would need to get this type of job?” According to the results, the measure ranges from 0 to 22 years, with a mean of 12.9

years. Overeducation is derived from what level of education the respondents have attained and the level of education required for their jobs. Undereducation is defined as the extent to which individuals have attained a level of education that is lower than is actually required for the job they have. For the working hour's criteria, the authors use only full-time workers (working more than 36 hours per week). To avoid outliers, the authors used 80 hours as the maximum value.

2.2 European Social Surveys

The ESS2 survey [5] collected data for the years 2004/2005 and according to calculations carried out by authors Lepic and Koucky [17] showed that around 15% of the respondents on the European labour market are undereducated and approximately 18% are overeducated. Of those, the highest rate of overeducation has a tertiary education. The distribution of required qualifications for different job positions in Europe currently has two main peaks. There is a surprisingly big share of respondents who believe that their jobs require a minimum of education or training and also a high number of respondents who believe they need between 3–5 years of education or professional training [17].

In the ESS2 and ESS5 surveys, the respondents were questioned about the qualification requirements and characteristics of their job descriptions. In parts F and G of these questionnaires, they were to answer questions that indicate the quantification of overeducation using this first method that was introduced above, i.e. the subjective method.

The ESS5 survey [6] collected data for the years 2010/2011 and was conducted in 26 countries and the overall number of respondents was 52,458. For our analysis, data from 21 EU countries were used (no relevant data were available for Austria, Italy,

Latvia, Luxembourg, Malta or Romania) and the number of respondents was reduced to 11,137; the self-employed and respondents who did not perform any economic activity, such as pensioners, students etc., were omitted. All country samples include only persons aged 15 and over, regardless of their nationality, citizenship or language. Individuals were selected by strict random probability methods by ESS5 researchers.

3. Methodology

For calculation the educational mismatch impact we use data collected by using a subjective indirect method. For the further analysis modified Mincer's earnings equation and OLS (ordinary least squares) regression were used. Results are provided in the following subchapter.

3.1 Educational Mismatch Incidence

For our paper, first we calculated basic educational statistics of our sample (11,137 respondents, 21 EU countries): means of years of education; means of age; means of experience and means of salary (all of them separately for males and females). A summary of descriptive statistics of our sample is presented in Table 2.

Tab. 2: Descriptive statistics for selected EU countries – means of relevant variables; standard deviations in parentheses

	Male	Female
S (years of education)	12.53 (2.430)	12.86 (2.431)
Age (years)	41.69 (11.874)	42.18 (11.445)
Experience (years)	20.77 (12.258)	19.52 (11.610)
Monthly salary (EUR)	2,300.26 (1,997.98)	1,635.77 (1,426.96)

Source: [6], own calculations

A proportion of adequately educated, overeducated and undereducated workers in our sample was calculated using subjective indirect method, as mentioned in the part 1.1 of the paper. Questions from the ESS5 survey (ESS5, 2010) focusing on data required for evaluating overeducation and undereducation were: F34a: "What training or qualifications are/ were needed for the job?", G23: "If someone were applying today for the job you currently

have, would they need any education or vocational schooling beyond a compulsory education?", G24: "About how many years of education or vocational schooling beyond a compulsory education would they need?" These data provide possibility to evaluate the level of education obtained by the respondents and also required for given jobs and thus to calculate extent of overeducation or undereducation of the respondents.

3.2 Educational Mismatch and Earnings

As Levels et al. [18] and many other authors (e.g. [8], [21] etc.) point out, a significant expansion of the classic Mincerian wage function proposed by Duncan and Hoffman enables researchers to use a model that evaluates earnings connected with individuals' attained levels of education and the levels of education required in their job. This model is also known as the ORU model (where O stands for Overqualification, R for Required and U for Underqualification). The ORU model is very often used to calculate the effects of over or undereducation on wages.

Using the ORU model, Levels et al. [18] found out that the relationship between the required number of years of schooling and wages is positive. The strength of the relationship indicates that each additional year of required schooling yields a wage premium of approximately 8%. The effect of overeducation is less than half that amount, with an estimated 3.3%. This means that each additional year of education yields a wage premium of approximately 3%. Undereducation is negatively related to wages and each year of undereducation yields a wage penalty of around 2%.

Levels et al. expanded the basic formula of the ORU model to indicate also the influence of numeracy skills on wages. Using the modified equation, they determined that there is indeed a considerable cross-national variation in the effect of numeracy skills on wages, ranging from a low of 0.052 in the Czech Republic to a high of 0.237 in the United Kingdom. They also found out that in the Czech Republic, skills contribute much less to the explanation of the relationship between required education and wages (only 6%) compared to the UK, where skills are an important factor used to explain the returns on required education (23%). In addition, for the returns to overeducation in the Czech Republic, barely any of this effect is explained by skills (8%), whereas in the US and Japan, it is more than 60%. The proportion of the wage effect of undereducation that is explained by skills in the Czech Republic is also very low (14%), which is contrary to Denmark (93%) and Japan (51%).

The findings of the Levels et al. survey from the PIAAC data (from 2013) confirmed results that are in line with earlier studies. They showed that overeducated workers earn less than workers who have the same level of education, but work in jobs that require their

level of education, and overeducated workers earn more than people who work in equivalent jobs, but have attained the level of schooling required for that job. They also proved that skills heterogeneity considerably contributes to the explanation of educational mismatch. The effect of numeracy skills on wages explains approximately one-sixth of the wage effect of required education, and little under one-third of the wage effects of overeducation and undereducation. They concluded that skills do matter when explaining the wage effects of education and educational mismatches, but that the extent to which this is the case also depends on institutional contexts [18].

We estimated the effects of overqualification and of underqualification on earnings (i.e. on returns to adequate schooling, over- and under-schooling) using a modified Mincer's earnings equation based on Cohn [2] and converted to the following equation:

$$\ln w_i = X_i \beta + \alpha_1 \text{ADSCH}_i + \alpha_2 \text{OVERSCH}_i + \alpha_3 \text{UNDERSCH}_i + \alpha_4 \text{AGE}_i + \alpha_5 \text{GEN}_i + \alpha_6 \text{EXP}_i + \alpha_7 \text{EXP}^2_i + u_i \quad (1)$$

where $\ln w_i$ is the natural logarithm of gross earnings, α are regression coefficients, ADSCH_i is the number of years of adequate schooling, **OVERSCH** and **UNDERSCH** are numbers of years of over-schooling and under-schooling (**OVERSCH** = **SCHOOL** – **ADSCH**, where **SCHOOL** is the number of years of actual education; similarly **UNDERSCH** = **ADSCH** – **SCHOOL**), **EXP** are years of experience, **GEN** is a dummy variable for the gender of the respondent, X_i is a set of other variables assumed to affect earnings and u_i is a disturbance term (index i is for individual i).

3. Results

The results of our calculations of educational mismatch incidence obtained by the subjective method and using data from ESS5 sample are in Table 3 and Table 4.

Results of our calculations of the OLS regression analysis using model (1) are in Table 5 and Table 6. Data from ESS5 was used for calculating natural logarithm of monthly wage in Euros as a dependent variable; independent variables were required education (Column Adeq. in Table 6), Overeducation (Column Over in Table 6) and Undereducation (Column Under in Table 6), age and gender of the respondent, working experience and experience square.

Tab. 3: Percentage distribution of adequate qualification, under- and overeducation, 21 EU countries

	All	Male	Female
Undereducated	29.34	32.40	26.43
Adequately educated	22.43	21.36	23.42
Overeducated	48.24	46.24	50.14

Source: [6], own calculations

Tab. 4: Means of over-schooling, under-schooling, adequate schooling, education, age, years of experience, 21 EU countries

		Years of over schooling	Years of under schooling	Years of education necessary for job	Years of full-time education	Age of respondent	Years of experience
All N=11,137	Mean (Std. deviation)	2.86 (1.63)	1.95 (1.29)	12.51 (2.58)	12.70 (2.44)	41.94 (11.66)	20.12 (11.94)
Males N=5,393	Mean (Std. deviation)	2.79 (1.58)	1.98 (1.38)	12.44 (2.61)	12.53 (2.43)	41.69 (11.87)	20.77 (12.26)
Females N=5,744	Mean (Std. deviation)	2.93 (1.66)	1.92 (1.18)	12.58 (2.55)	12.86 (2.53)	42.18 (11.44)	19.52 (11.61)

Source: [6], own calculations

Tab. 5: Summary of regressions for 21 EU countries – dependent variable lnW

Model		R	R-squared	Adjusted R-squared	Std. Error of the Estimate	
1		.364 ^a	.132	.132	.83224	
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	783.389	7	111.913	161.579	.000 ^a
	Residual	5,136.471	7,416	.693		
	Total	5,919.861	7,423			

a. Predictors: (Constant), Experience square, Years necessary for job calculated for full time education (ADSCH), Gender, OVERSCH, UNDERSCH, Age of respondent, Total number of years in full- or part time work (EXP).

Source: [6], own calculations of OLS regression

The results of OLS regression of model (1) in the Table 5 show that our model explains about 13% of variation in lnW for all selected countries together. The R-Squared and Adjusted R-Squared statistics are very close in magnitude since there are a large number of degrees of freedom (df = 7,416 for residual sum of squares).

In the Table 7, there are results of OLS regression of model (1) when we split our data to 21 individual countries blocks; explained part of lnW variation by our model is higher (between 13.8% for the Czech Republic and 55.1% for Portugal).

Using the model (1), we calculated returns on education from our data for individual EU

Tab. 6: Returns on adequate education, overeducation and undereducation in 21 EU countries together

Selected EU countries (21 countries, 11,137 respondents)	Unstandardized Coefficients		t	Sig.
	B	Std. Error		
Adequate schooling	.126	.005	26.811	.000
OVERSCH	.091	.006	14.418	.000
UNDERSCH	-.066	.010	-6.505	.000

Source: [6], own calculations

Tab. 7: Summary of regressions for 21 EU countries – dependent variable lnW

Country	R	R-Squared	Adjusted R-Squared	Std. Error of the Estimate
Belgium	.657	.432	.420	.35453
Bulgaria	.515	.265	.250	.38904
Cyprus	.618	.383	.344	.38838
Czech Republic	.394	.155	.138	.47571
Germany	.627	.393	.386	.53579
Denmark	.552	.305	.296	.39958
Estonia	.613	.376	.362	.51654
Spain	.597	.356	.338	.45844
Finland	.591	.349	.341	.36167
France	.659	.434	.425	.35580
United Kingdom	.567	.322	.310	.61694
Greece	.415	.172	.145	.49462
Hungary	.564	.318	.303	.40853
Ireland	.592	.350	.335	.55194
Lithuania	.451	.203	.176	.50579
Netherlands	.673	.453	.444	.37416
Poland	.569	.323	.310	.46212
Portugal	.768	.591	.551	.32021
Sweden	.610	.372	.364	.30187
Slovenia	.695	.483	.469	.38281
Slovakia	.593	.352	.336	.31678

Source: [6], own calculations

countries; results of OLS regression are in Table 8. It shows that returns of adequate education are between 7.7% (Bulgaria) and 17.5% (Slovenia). These results are comparable with the results from the meta-analysis by Groot and van den Brink [9], where there were analysed 25 studies of overeducation and undereducation in

the labour market. From these 25 studies, they obtained unweighted average rates of the return to the different educational component: 7.8% for years of education required for the job, 3.0% for years of overeducation and -1.5% for years of undereducation ([9], p. 153). It should be noted that in the above mentioned meta-analysis

Tab. 8: Returns on adequate education, overeducation and undereducation in 21 EU countries

Country	Adeq.	Std. error	t	Sig.	Over	Std. error	t	Sig.	Under	Std. error	t	Sig.
Belgium	.129	.011	11.584	.000	.105	.013	8.141	.000	-.083	.030	-2.791	.006
Bulgaria	.077	.010	8.048	.000	.064	.018	3.594	.000	<u>-.039</u>	<u>.029</u>	<u>-1.351</u>	<u>.178</u>
Cyprus	.106	.020	5.230	.000	.093	.022	4.190	.000	-.115	.026	-4.500	.000
Czech Republic	.101	.015	6.535	.000	.075	.021	3.643	.000	-.079	.036	-2.199	.029
Denmark	.092	.008	11.003	.000	<u>.027</u>	<u>.017</u>	<u>1.543</u>	<u>.123</u>	-.051	.014	-3.674	.000
Estonia	.155	.017	9.311	.000	.106	.016	6.592	.000	<u>-.087</u>	<u>.063</u>	<u>-1.387</u>	<u>.166</u>
Finland	.092	.008	11.484	.000	.068	.014	4.775	.000	<u>-.028</u>	<u>.017</u>	<u>-1.653</u>	<u>.099</u>
France	.109	.007	14.587	.000	.065	.012	5.332	.000	-.098	.015	-6.677	.000
Germany	.159	.013	12.341	.000	.071	.016	4.493	.000	-.129	.024	-5.357	.000
Greece	.080	.016	4.901	.000	.063	.019	3.307	.001	<u>-.072</u>	<u>.040</u>	<u>-1.808</u>	<u>.072</u>
Hungary	.140	.012	11.539	.000	.104	.023	4.422	.000	-.133	.026	-5.168	.000
Ireland	.170	.017	9.878	.000	.055	.019	2.842	.005	-.163	.033	-5.011	.000
Lithuania	.131	.020	6.633	.000	.069	.018	3.845	.000	<u>-.097</u>	<u>.096</u>	<u>-1.007</u>	<u>.315</u>
Netherlands	.131	.010	13.625	.000	.055	.012	4.528	.000	-.079	.019	-4.201	.000
Poland	.113	.010	10.870	.000	.095	.015	6.245	.000	<u>-.038</u>	<u>.024</u>	<u>-1.632</u>	<u>.104</u>
Portugal	.118	.015	7.945	.000	<u>.043</u>	<u>.024</u>	<u>1.763</u>	<u>.082</u>	-.158	.039	-4.069	.000
Slovakia	.096	.009	10.450	.000	.085	.012	6.874	.000	<u>-.001</u>	<u>.022</u>	<u>-.042</u>	<u>.967</u>
Slovenia	.175	.015	11.837	.000	.150	.048	3.104	.002	-.067	.026	-2.606	.010
Spain	.094	.012	7.836	.000	.051	.018	2.796	.006	-.084	.033	-2.553	.011
Sweden	.088	.007	12.414	.000	.060	.010	5.803	.000	<u>-.026</u>	<u>.014</u>	<u>-1.795</u>	<u>.073</u>
United Kingdom	.161	.017	9.632	.000	.065	.019	3.527	.000	<u>-.034</u>	<u>.036</u>	<u>-.956</u>	<u>.340</u>

Results not significant at 5% level are in bold underlined italics.

Source: [6], own calculations

Tab. 9: Returns on adequate education, overeducation and undereducation in 21 EU countries together

Selected EU countries (21 countries, 11,137 respondents)	Unstandardized Coefficients		t	Sig.
	B	Std. Error		
Adequate schooling	.126	.005	26.811	.000
OVERSCH	.091	.006	14.418	.000
UNDERSCH	-.066	.010	-6.505	.000

Source: [6], own calculations

were used studies with all types of educational mismatch definitions; the results in the Table 8 are similar to these studies in the meta-analysis where subjective definition was used.

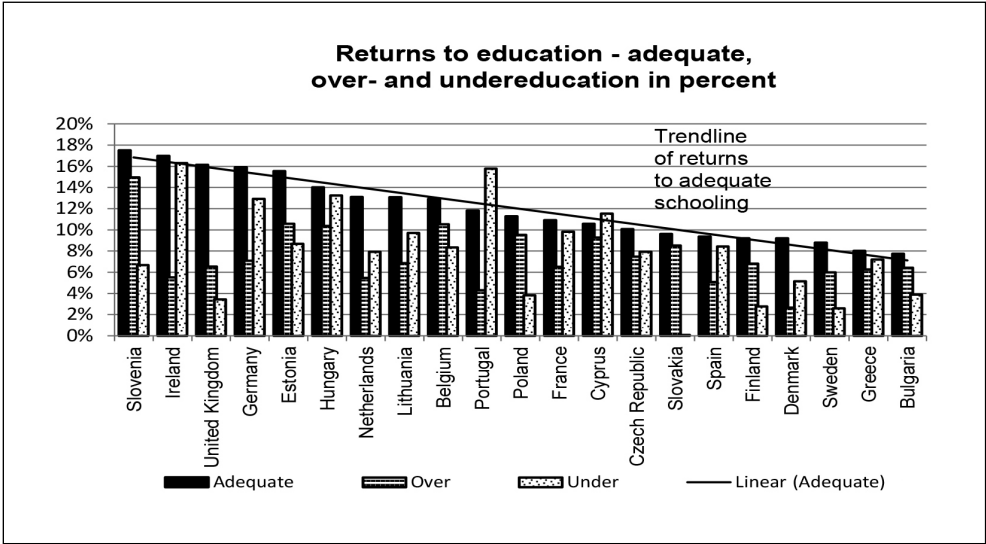
Similarly, calculated rates of return on overeducation are between 2.7% (Denmark – this result is not significant at the 5% level) and 15% (Slovenia). Returns on undereducation are all negative, between -0.1% for Slovakia (not significant at the 5 % level) and -16.3% for Ireland.

For all countries together, rates of return to required education, overeducation and undereducation are presented in the Table 9; the calculated results are also comparable with those in the meta analysis by Groot and van den Brink [9] and in the analysis of overeducation in the UK carried out by Dolton and Vignoles [4].

The differences between rates of return to different are presented in Figure 1 below.

The results presented above in Table 8 show that overeducation is a very important

Fig. 1: Returns on Education in 21 European Countries, ESS5



Source: [6], own calculations

issue in all developed countries and it is a great challenge to the relevance of more investment in education. If many workers have more than the required amount of education or qualifications, then continuing to expand secondary and higher education is inefficient. Research carried out in this part of the paper addressed questions connected with education and earnings and with returns on investment in education based on the theory of human capital.

Concerning the effect of schooling on earnings in Model 1 of Table 4, we obtain high rates of return to adequate schooling, lower

but positive rates of return to overschooling, and negative rates of return to underschooling. Although our analysis is based on excellent data from European Social Survey Round 5 [6] we recognize that our findings are limited by several issues of a theoretical and methodological nature. First, in our model specification we assumed that the workers in our sample are a homogenous group differentiated only by their age, gender and education attainment, without taking into account their different skill, personal abilities and other traits influencing their earnings. Next, we did not consider the issue of empirical bias associated with various

definitions and measures of overeducation and undereducation and we assumed that these various approaches to this question create broadly similar results [20]. Thirdly, from the theoretical point of view, we used the modified Mincer's equation based on decomposition of acquired educational years to years of required education, years of overeducation and undereducation [2]. We assume that such decomposition is consistent with original human capital theory and that it helps to explain overeducation and undereducation differences in earnings taking into account such circumstances as e.g. differences in informal human capital and skill of workers, their different abilities acquired in on-the-job training and also other overeducation and undereducation considered as a temporary phenomenon.

Conclusions

Today, many developed countries have to face problems with educational and skills mismatches. Background literature in the past proved the importance of investment into education both for individuals and society. This paper focuses only on educational mismatches, however compared to other authors; it differentiates between the terms educational and qualification mismatch. Comparing all data introduced in this paper, we have identified different results in the educational mismatch both in international and Czech data. The PIAAC data presented by Levels et al. show a relatively high proportion in educational matches [18]. In addition, as mentioned above, Groot and Van der Brink [9] estimate the average overeducation rate as measured by the self-reporting method to be 28.6% and the undereducation rate to be 15.5%. However, other studies confirm a higher amount of those who are overeducated. The same proportion was confirmed by our data presented in the ESS5 survey and its analysis.

For policy decisions should be also carried out examination of wage distribution in individual levels of education (basic, secondary, tertiary), also returns to education in specific fields of study and returns to specific skills and other types of working qualifications.

Even though the current situation in educational policies supports an increasing number of university graduates, both the graduates and employers have to face

a misbalance on the labour market and lower individual satisfaction. The data presented in this paper open a space for further discussion. They proved that educational mismatches have become a serious issue which needs to be solved not only by politicians, but also by the complexity of the entire system of public and private higher education.

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A COMPARISON OF EDUCATIONAL MISMATCHES ACROSS EUROPE

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Research undertaken during the last few years illustrates a major mismatch between educational systems worldwide and occupations in the labour market. The literature focuses both on educational and job mismatches however the aim of this paper is to compare only the situation concerning educational mismatches. For the aim of this paper, two large sets of international data were chosen to show effects of educational mismatch. In the first part, selected results of PIAAC survey are presented. In the analytical part, data from European Social Survey ESS5 collected in the years 2010 and 2011 in selected EU countries were used. The first part of the paper provides a literature background presented so far (e.g. Dolton, Galasi, Hartog, Chevalier, Levels, and McGuinness etc.) as well as methods used to identify this mismatch both by employers and employees. The European Social Survey data were used for modified Mincer's earnings equation in the second part of the paper and regression estimates proved that overeducation is a very important issue in all developed countries. The results also introduce data on returns on investment in education based on the human capital theory which helps to explain overeducation and undereducation differences in earnings taking into account different circumstances as e.g. variation in informal human capital and skill of workers, their abilities acquired in on-the-job training and also other overeducation and undereducation considered as a temporary phenomenon. It is a great challenge to the relevance of more investment in education. Even though the current situation in educational policies supports an increasing number of university graduates, both the graduates and employers have to face a misbalance on the labour market and lower individual satisfaction. The results confirm the findings of some of previous studies and offer a platform for further discussion of educational mismatch across Europe.

Key Words: Overeducation, educational mismatch, rate of return, European Social Survey, PIAAC.

JEL Classification: J21, J24, J31.

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ATTITUDES OF MANAGERS TOWARDS DISADVANTAGED GROUPS ON THE LABOUR MARKET IN THE SLOVAK REPUBLIC

René Pawera, Vladimíra Pazderová, Marian Šuplata

Introduction

The issue of equal opportunities in the labour market is a highly topical issue, requiring the public attention. Considering that the Slovak Republic is already more than ten years a member of the European Union, it is necessary to address the issue not only on the national but also on the supranational level. The institutions of the European Union, using various instruments and taking complementary actions are trying to ensure equal opportunities in the labour market of the EU. To help achieving this objective, it is, however, necessary to ensure enforcing equal opportunities, as well as efforts and actions taken by individual Member States. Despite some progress made in the area of equal opportunities in the EU labour market and gradually leads to elimination of discriminatory conduct based on common characteristics such as age, sex or disability, Slovak Republic significantly lags behind the EU average. Moreover, there are existing prejudices towards some groups in the Slovak labour market. The main reason for selecting this issue was their common interest was twofold. Firstly, to address the current situation of disadvantaged groups in the labour market of the Slovak Republic. Secondly, the authors wished to contribute to improving the current state of play that seems to remain to be an open-ended process.

The results of various studies clearly confirm that the phenomenon of discrimination on the labour market exists. This statement is justified not only by job-seekers, but also by employees as well as managers themselves. The reason for this discrimination can be various: health, racial or ethnic origin, sex, religious belief, age or others. It seems neither the society, nor the individual responsible authorities pay sufficient attention to deal with this problem in an efficient way.

So far it has been paid a very limited attention to complex and comprehensive surveys on

disadvantaged groups on the Slovak labour market that would in particular take into account the perception of these groups by the managers as representatives of potential employer of job seekers from the disadvantaged groups. Institutions as well as individual authors mostly focus on individual and group characteristics; however a complex look at this area is still missing. This perhaps might also be one of the reasons of the fundamental problem of perception of disadvantaged groups among the public. This is naturally reflected in perception, acceptance and persistence of discrimination.

The main aim of this paper is to reveal the current situation of selected disadvantaged groups on the labour market in the Slovak Republic from the point of view of managers of selected organisations, using the method of questionnaire survey. In the context of developments in selected research periods (2008, 2014) we tried to examine the attitudes of managers of organisations in the Slovak Republic in relation to selected disadvantaged groups and to verify the existence of discriminatory behaviour of managers against these groups.

1. Theoretical Aspects of the Topic

The Slovak legislation in the Employment Services Act no. 5/2004 [22] defines disadvantaged jobseekers as citizens who in respect to their age, length of their registration for job, lack of experience, state of health, loss of ability to carry out their previous employments, family reasons or position in the society have difficulties to find an employment on the labour market and this group undoubtedly needs increased attention of the society. The Article 8 [22] specifies fifteen disadvantaged labour market participants groups. The classification into these groups is based on the following factors: **the age, the impossibility**

of reconciling family and work life, long-term unemployment, disability, nationality, migration, education or imprisonment.

These factors negatively affect the chances of the disadvantaged people and undermine their position on the labour market in comparison to the majority population. These groups of disadvantaged people, with regard to their living and social situation, are less or completely unattractive to employers. [8]

Vagač [17] defines disadvantaged labour market participants as a group, facing major difficulties in finding a job, to remain in it, or, to achieve higher earnings, while being above-average risk of discrimination. The authors also present the key issues of the current approach to disadvantaged groups, such as: low efficiency of labour market policies, the discouraging effects of social benefits, the weak response of the education system to the demands of the labour market, low elasticity of labour legislation, high levy burden low-income groups and gaps in the practical application of anti-discrimination legislation.

According to Vágnerová [18], the labour market disadvantage is defined by the socio-demographic characteristics – age, sex, social group, and education.

This paper perceives the disadvantaged position on the labour market as a result of selected factors and qualities that significantly contribute to reducing the value of “human capital” by employers. This often leads to greater endangering of the persons concerned on the labour market. “Disadvantage” might also be perceived as the result of differentiation of selected groups and labour market participants.

Paprčka [7] argues that disadvantaged groups are marginalized, pushed aside to the edge of a group of people, often being subject to social and cultural isolation and various forms of discrimination. Before proposing our analysis of the state of play of selected aspects of disadvantaged groups on the labour market we see appropriate to define the term “discrimination”.

According to Arrow [2], discrimination in the labour market is defined as *“the valuation in the market place of personal characteristics of the worker that are unrelated to worker productivity. These personal characteristics may be sex, race, height, appearance, age, national origin,”* or *“indeed any other identifiable characteristic.”*

This definition is in principle shared by other authors. Baldwin [3] states that *“the employer hiring uncertainty results from the lack of predictability of worker productivity.”* Yinger [19] defines discrimination as *“the unfavourable treatment of a person based solely on the basis of that person’s membership in a protected class.”* According to Altonji and Blank [1], the employment discrimination *“is said to arise when two identically productive workers are treated differently on the grounds of the worker’s race or gender, race or gender when do not in themselves have an effect on productivity.”*

These definitions basically correspond to the perception of discrimination on the labour market as defined by the World Bank [20]: *“labour market discrimination is defined as the systematically different treatment reserved to members of a given group, just because they belong to that group”.*

Based on the definitions of discrimination and definitions of disadvantaged groups in the labour market of the Slovak Republic the most affected and at-risk people include people from groups based on the following characteristics: Sex; Ethnic / Racial origin; Age; Disability.

Following these characteristics we distinguish the following disadvantaged groups on the labour market: Women; Persons belonging to the Roma ethnic group; Persons younger than 26 years – graduates who have completed vocational training; Elderly (above 50 years); Disabled persons. The relation between the characteristics and the disadvantaged groups can be seen in Table 1.

The position of these groups on the labour market might be improved by ensuring equal opportunities on the labour market and by promoting non-discrimination principles. By equal opportunities the European Union [6] understands an equitable distribution of the possibilities of education, training, employment, career development among individuals without prejudice to discrimination because of sex, race, language, religion, economic or family situation, and so on.

According to Eger and Indruchová, diversity management has gradually become a topical and important issue in the field of the development and use of human resources, namely after the Czech Republic joined the European Union [5].

In terms of the Slovak Republic, the equal opportunity principle is enshrined in the

Tab. 1: Most disadvantaged groups in the labour market according to selected characteristics

General characteristics	Disadvantaged groups
Sex	Women
Ethnic/racial origin	Persons belonging to the Roma ethnic group
Age	Persons younger than 26 years – graduates who have completed vocational training
	Elderly (above 50 years)
Disability	Disabled

Source: own work

Constitution, which in the Article 12 states that: people are “*free and equal in dignity and rights*”. The fundamental rights and freedoms are guaranteed in the Slovak Republic to “*everyone regardless of sex, race, colour of skin, language, faith and religion, political, or other thoughts, national or social origin, affiliation to a nation, or ethnic group, property, descent, or any other status*”. As stated in the article 12, these rights are “*inviolable, inalienable, imprescriptible, and indefeasible*” [21].

Equal opportunities on the labour market stems from the equal rights of individuals, taking into account the prohibition of discrimination on the basis of the characteristics defined by the Law (age, sex, race, etc.). Equal opportunities, however, do not automatically constitute equal conditions on the labour market, because in relation to age, disability, or sex of the entrants to the labour market. Unemployment and social exclusion is a very strong negative externality [9]. It is necessary to provide a variety of factors aimed at the creation of equal opportunities on the labour market. Groups and individuals on the labour market are always unique and original. Therefore this concept of equal opportunities in the Slovak Republic does not have an aspiration of “the sameness”.

2. Objective and Methodology

This paper focuses on the current situation of the position of disadvantaged groups on the labour market of the Slovak Republic. By the method of questionnaire survey of selected employers, represented by their managers we were examining their attitudes towards selected groups on the labour market. Furthermore we examined their motives in relation to the employment of selected candidates pointing to the discriminatory or non-discriminatory

behaviour of managers on the Slovak labour market. The main aim of the research is to show the evolution of the labour market in terms of disadvantaged groups in order to identify whether any change of the situation of selected groups of participants on the labour market occurred. The purpose of our analysis is also to verify whether managers discriminate selected groups of participants on the labour market intentionally and whether there exists any shift in the perception of these groups by the managers.

In order to fulfil this objective we conducted a questionnaire survey focused on selected managers of organisations, in two reference periods: 2008 and 2014.

These periods were selected intentionally – the research was meant to show the difference at the beginning and the end of the programming period 2007–2013 of Cohesion policy. Slovakia is characterized by structural changes, large social disparities. It is lagging behind the EU average GDP per capita. It is particularly necessary to use allocations resources of the Structural Funds in order to maximize their impact on achieving the target problems and to approach the EU average. And the Slovak labour market is one of them. European Social Fund in Slovakia within individual regions promotes social inclusion of disadvantaged groups aiming at reducing unequal opportunities. Achieving the highest possible efficiency in the use of European Social Fund for the development of education and employment in the Slovak regions is a priority.

The questionnaire survey focused on managers of organisations was conducted within the Project 08/04-I / 3-1.2 - “The causes of discrimination in the labour market and the possibility of removing the European Social

Fund within the EQUAL Community Initiative in 2008.” This survey is followed by the empirical data collection from 2014 based on the questionnaire survey carried out by managers of organisations as the part of dissertation thesis *Equal opportunities in the labour market of the Slovak Republic*. In 2008 the research team, after examining the available sources and the relevant research already conducted in the area of discrimination on the labour market, prepared a detailed research plan and a questionnaire which was in a next stage individually and collectively consulted with the project management.

The main hypotheses the questionnaire was trying to verify were set as follows:

1. Employers currently perceive less discrimination against all disadvantaged groups in the labour market.
2. Employers’ prejudices against Roma have not changed compared to 2008 and companies continue to show reluctance to employ Roma.
3. Older women continue to represent a group in the labour market most at risk of discrimination.

The target group of the research was composed of both public and private companies that carry out their activities on the territory of the Slovak Republic during the period of conducting the research (2008, 2014). A brief description of respective companies involved is summarized in Table 2. In 2008 there were 173 organizations and in 2014 there were 263 organizations that participated in the survey.

The questionnaire was anonymous. First, it contained general information about the company (type, orientation activities, number of employees, region). This was followed by a general section that was dedicated mainly to their awareness of the Slovak and European anti-discrimination legislation and to their attitudes towards it. The questionnaire also included a separate section which focused on the following selected disadvantages:

1. Age;
2. Disability;
3. Sex;
4. Belonging to the Roma minority.

The data collection in 2008 was conducted during a period of several months. Qualitative and quantitative research was carried out

Tab. 2: Characteristics of companies involved in the survey (2008, 2014)

Type of organisation	2008	2014
Public	47%	63.5%
Private	53%	36.5%
Size of the company		
Small	49%	82.13%
Middle	30%	16.35%
Large	21%	1.52%
Region		
Bratislava	37.5%	17.11%
Trnava	5.8%	11.79%
Nitra	10.7%	7.98%
Trenčín	5.8%	19.77%
Banská Bystrica	10.7%	15.21%
Žilina	7.3%	12.17%
Prešov	12.2%	7.22%
Košice	10%	8.75%

Source: own research

from March to June of 2008. Before starting the regular research the questionnaire was tested on a sample of about 50 students. The data collection was conducted in two ways: directly, through direct personal interviews as well as indirectly, by means of electronic questionnaires, phone calls and e-mails.

In 2014, the data collection took place from March to April 2014 through an on-line questionnaire, which was distributed via electronic mail to the relevant organizations.

The questionnaire was composed of the following **types of questions: open, closed and specific** with the majority of the closed questions. Processing and interpretation of the results in query was executed through an addendum to the manual, which facilitated the work of the research team.

The main purpose of this paper was to show the current state of play as well as selected developments in employment discrimination. Therefore, the results of our own research from 2008 and 2014 were consequently compared. A comparison of the current and the previous status was made possible through the methods for collecting, evaluating and processing information on the state of job discrimination in the Slovak Republic. Subsequently, we conducted a detailed, comprehensive data analysis and information obtained and the choice of optimal resources. The following sources were used for the comparison of relevant research:

- Selected data from the European Commission (Eurostat);
- Selected data from the Slovak National Centre for Human Rights;
- Information from the Central Office of Labour, Social Affairs and Family of the Slovak Republic;
- Information from the Ministry of Labour, Social Affairs and Family of the Slovak Republic.

3. The Results and Discussion

The issue of discrimination of some groups or persons on the labour market in the Slovak Republic is a long-term problem. Despite some improvements in the legislative area in defining equal opportunities and legal prohibition on discriminatory behaviour the results of the survey clearly confirm that the implemented activities and measures do not have sufficient effects.

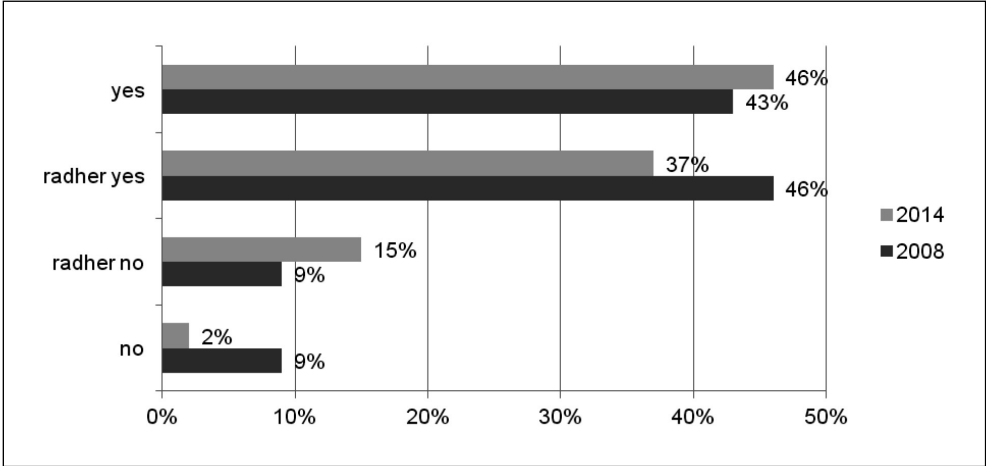
The survey results obtained in 2008 and 2014 point to the fact that the majority of managers of organisations in the Slovak Republic generally recognize the European and Slovak anti-discrimination legislation that defines the area of equal treatment on the labour market. When being asked a direct question „Do you know the Slovak and the European legislations regulating the principles of equal treatment that reflects the prohibition of discrimination on the labour market?“ 64% of managers in 2008 and 77% of managers in 2014 responded positively. The Slovak National Centre for Human Rights [15] also confirms that managers recognize the legislative definition of this area. A study *Starší vek a ľudské práva* [7] from 2011 indicates that 93.24% of managers are aware of the existing anti-discrimination legislation. That finding thus raises a question whether, in case of discriminatory practices on the labour market by managers, there is a deliberate violation of the legislation and discriminatory behaviour is so intentional and willing [11]. The answers to this question were indicated by attitudes of managers and by the comparison of results of further asked questions.

As shown in Figure 1, the managers perceived the existence of discrimination on the labour market in the two periods quite similarly. In general, as a result of improving equal opportunities on the labour market, we expected that the perception of discrimination by managers in the period of 2014 would be lower. However, it is important to take into account also external variables during the period that strongly affected the labour market, in particular the impact and consequences of the global economic and financial crisis that had an influence on the situation of equal opportunities on the labour market in the Slovak Republic.

Similar conclusions in a survey of employers in 2011 were presented also by Zozuláková [23]. As shown in her research, 79.73% of employers admit the existence of discrimination on the Slovak labour market. In most cases it occurs on the basis of age, race and ethnicity, sex, pregnancy and motherhood.

Our research has found out that managers of organisations (employers) perceive the age as the main cause of discrimination on the labour market. This is followed by disability and race or ethnic

Fig. 1: Attitudes of managers of organisations towards the existence of discrimination on the labour market of the Slovak Republic (2008, 2014)



Source: own research

Tab. 3: Comparison of attitudes of managers to the existence of employment discrimination on these grounds of the Slovak Republic in 2008 and 2014 (%)

Discrimination on ground of:	2008		2014	
	Yes / Rather yes	Rather no / No	Yes / Rather yes	Rather no / No
Age	92	8	92	8
Disability	75	25	85	15
Race / Ethnic origin	65	35	76	24
Sexual orientation	21	79	27	76
Sex	45	55	45	55

Source: own research

origin. As shown in Table3, both reporting periods show very similar results in attitudes of managers of organisations regarding the main causes of discrimination. These results point to the fact that the assumption of improving the situation of disadvantaged groups in the labour market was not confirmed. In 2014, managers perceived all grounds of discrimination as equal or more significant.

The results reveal relatively strong discriminatory practices on the labour market of the Slovak Republic. That is to say, **the executive managers, representing employers clearly confirmed that the discrimination is undoubtedly present in**

our contemporary society and has impact on their behaviour on the labour market.

The views of managers on the causes of discrimination directly correspond to the public opinion. The survey of Eurobarometer [4] conducted in 2008 assumes that 45% of respondents consider the age to be the most significant cause of discrimination on the EU labour market. It is followed by ethnic or racial origin (42%) and disability (41%). Taking into account the evolving situation of the disadvantaged groups on the labour market in the context of public opinion, the results of Eurobarometer (2006, 2008, 2012) also confirm that despite the fact that it is declared to be

one of the EU priority areas, there were no significant improvements in the area of equal opportunities on the EU labour market.

Citizens perceived the discrimination on the grounds of age more significantly in 2012 than in 2006 or 2008. Therefore, the assumption of a positive development in this area was not confirmed. The result was rather the contrary. The public perceives the negative trend and in their opinion there is a rise in discriminatory practices based on age. In terms of sex and sexual orientation as grounds of discrimination in the surveyed period, the EU citizens did not perceive any significant improvements. Activities and efforts to ensure gender balance in comparison to the other characteristics are much stronger, older and more complex on both levels – the European and the national ones. Nevertheless, neither the managers nor the public saw any significant improvements in relation to this characteristic.

Why are the positive trends neither observed nor statistically recorded in relation to disadvantaged groups on the labour market? As a matter of fact, the managers are the ones who have the power that can be used for the benefit of the labour market participants. How is it therefore possible that there is no significant improvement in fostering equal opportunities in practice despite the fact that legislation explicitly prohibits discriminatory behaviour on the labour market and the managers recognize the legal definition of discrimination and are aware of their obligations? Provided that managers are equally sensitive to the grounds of discrimination are they not equally tolerant to stereotyped perception of prejudices based on common characteristics?

All organizations are composed of people. Discriminatory behaviour is human behaviour against certain individuals or groups. People in organizations and managers are part of the society where some stereotypes and prejudices against certain groups and individuals might occur. Thus, if the public tolerates these prejudices, will not the managers as an important part of the society treat similarly also the participants on the labour market and thus promote the “culture of discriminatory practices”?

In view of the objective of verifying whether managers of organisations purposely discriminate against selected groups on the labour market in the Slovak Republic the research suggests that this is a tolerant

act. This statement might be emphasized by answers to the following questions:

1. *If you had a chance to choose from several candidates for the job, while all the candidates have meet the required qualifications and differ only by their age and sex, which of the following candidates would you prefer? [Options 1-4: 1. A young woman - a young man; 2. A woman in middle age - middle-aged man; 3. An elderly woman - an older man; 4. A distinction based on age is not important].*

2. *Would your company allow a member of your staff who just became disabled to remain at his job, provided that the disability would not prevent this disabled person to carry out his/her duties?*

3. *Do the Roma people have the same chances to succeed in the admission procedure for the vacant post in your organization like other people from the majority population?*

Managers in the questionnaires admitted that provided that they would be in a position to decide on employing a candidate solely on the basis of age and sex, they would clearly select **a middle-aged man**. When comparing the following pairs solely on the grounds of sex: “A young woman - a young man; A middle-aged woman - a middle-aged man; An older woman - an older man”; it is generally **a man that is the preferred option**. As confirmed by managers in both reporting periods (2008, 2014) **the least preferred option to managers is an older woman**. The above results show that when merging several characteristics into one single person-a participant on the labour market we may speak of multiple discrimination, based on both the grounds of the age and sex characteristics. If we take into account also examining the other characteristics, the research results might be found even more interesting. For example, taking into account the ethnic or racial origin, based on the obtained results of the research we can say that in particular **Roma women** are facing multiple disadvantages on the labour market.

The answer of the managers to question 2 whether their organisation would allow a member of their staff who just became disabled to remain at his job, provided that the disability would not prevent this disabled person to carry out his/her duties, there were some positive developments. While in 2008 59% of managers responded positively, in 2014 the number of positive answers increased

to 76%. It should be, however, pointed out to the relatively high percentage of managers who responded negatively. **These managers thus admitted that they purposely discriminate a potentially disabled employee.**

In terms of employment of disabled persons it should be emphasized their minimum involvement into the labour market in the Slovak Republic. According to Pufflerová, in 2008 [12] the employment of disabled persons was on the level of 9%, while as the consequence mainly of the economic crisis the employment rate of disabled dropped. The results of questionnaire surveys as well as the relevant statistics confirm that the disabled in the Slovak labour market are in a difficult position and that there still exists a certain gap between the labour market and its disabled participants.

In a long term, **one of the most disadvantaged groups on the Slovak labour market can be considered the Roma group.** The existing prejudices, vulnerability to poverty, social exclusion, lack of education,

frequent segregation and marginalization of this group certainly have a negative effect on the situation of the Roma in the labour market. The managers of organisations participating in the survey admitted that belonging to the Roma minority means a serious obstacle towards an employment access on the Slovak labour market. **The managers in both reference periods admitted that Roma job seekers at the selection procedure for the vacant post do not have the same chances as other non-Roma job applicants.** In 2008 this statement was confirmed by 30% of managers, while in 2014, admitted this fact a little less, i.e. 26% of managers. This development can therefore indicate some positive trends in the perception of the Roma on the labour market. On the other hand it must be highlighted that there is still relatively high percentage of managers who openly admitted discriminatory practices against some groups in the labour market, taking account the belonging of these groups to a particular race or ethnicity. The Table 4 shows the most frequent

Tab. 4: Most frequent causes for refusing to employ Roma applicants as stated by the managers in the Slovak Republic

Order	The cause
1 st	"Insufficient level of education and qualification";
2 nd	"Reputation of unreliable workers";
3 rd	"Reputation of workers without work ethics and/or discipline";
4 th	"Reputation of workers without motivation";
5 th	"Existence of racial prejudice against Roma";
6 th	"Reluctance of companies to employ Roma".

Source: own research

causes why the managers generally tend not to select the Roma job applicants.

The order of the above mentioned causes why the managers generally tend not to select the Roma job applicants is identical in both researched periods (2008, 2014). However it should be noted that the research results reveal slight improvements of the image of the Roma by managers and **this shows certain positive trends** in this area. These research results therefore respond to the research objective as mentioned in part 1 that aimed *"to show the evolution of the labour market in terms of disadvantaged groups in order to identify whether*

any change of the situation of selected groups of participants on the labour market occurred".

However, it is important to emphasize the **regional aspects** that play an important role in the interpretation of the results. While in 2008 more than 22% of the organizations involved were from Eastern Slovakia, in 2014 it was less than 16%. The perception of the Roma ethnic group in the respective regions of Slovakia significantly varies. **Our research conducted in 2014 showed that 50% of managers in the Eastern Slovakia generally consider the Roma citizens to be discriminated.** It is worth adding that the Eastern Slovakia is also

region with the largest Roma population as well as the segregation of this group in the Slovak Republic. The managers of organisations in Eastern Slovakia do not consider the following factors to be the most important grounds of discrimination of the Roma: level of education, qualification, and of long-term unemployment. The managers rather realize the impact of these factors on the real opportunities of the Roma minority in the region.

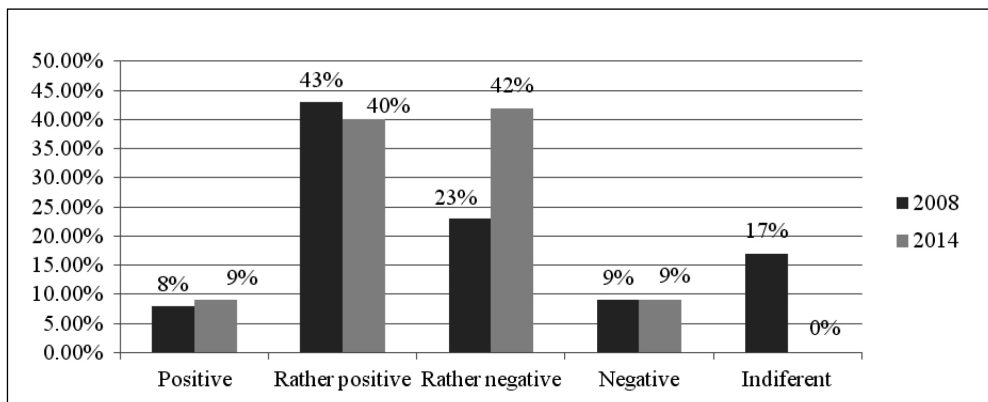
In the Bratislava region, 76% of managers claimed that Roma are discriminated on the labour market. In comparison to the region of Eastern Slovakia this represents a significant difference. That is why, the issue of Roma discrimination is perceived differently by the managers of organisations who are less likely to come into contact with this group as by those who have real practical experience with this group. Results from 2008 did not confirm this thesis, so the above mentioned statement should not be generalized. However, in the context of the findings of the Regional Centre for United Nations Development Program [13] which confirms the direct relation between level of education of the Roma and their employment rate it is possible to consider the existence of some relation. That is to say, the managers of organisations in the Slovak Republic often consider the low level of education and qualifications as the main cause of the disadvantaged position of the Roma on the labour market. Higher education, however, is

achieved by the Roma, provided that they are outside of segregated groups, freely dispersed among the majority population. The problems of the Roma group are quite differently perceived by managers of organisations in the region of the Western Slovakia, where Roma do not live in their own villages separated from others and at the same time differently by managers of organisations in the Eastern Slovakia, with much larger share of the Roma minority that is perceived to be less discriminated.

Based on the results of a questionnaire survey of managers and their mutual comparison it therefore should not be unambiguously stated that in comparison to the previous researched period there is a clear improvement in equal opportunities for selected groups on the labour market. Although the answers to some questions seem to be in favour of the disadvantaged groups, the others seem to be contradictory to positive developments. It is therefore necessary to look for reasons that are an obstacle towards the improvement of the situation of equal opportunities on the labour market.

In terms of legislative definition of the area of disadvantaged groups on the labour market the Slovak National Centre for Human Rights [13] and the Ministry of Labour, Social Affairs and Family [10] stated that Slovakia has comparable anti-discrimination legislation with most of the EU countries and it covers even several aspects of discrimination compared with the European directives. However, as

Fig. 2: Attitudes of managers of organisations in the Slovak republic towards the effectiveness of application of anti-discrimination legislation (2008, 2014)



Source: own research

confirmed by the research results shown in Figure 2, the organizations are considerably sceptical about the effectiveness of Slovak and European anti-discrimination laws.

Why is the anti-discrimination legislation in Slovakia not regarded by the managers as sufficiently effective? Is this currently a problem of legislation or is it due to a complicated procedure of introduction of legislative acts into practice? It should be acknowledged that one of the main problems in the Slovak Republic in relation to equal opportunities on the labour market remains weaker protection of temporary jobs in comparison to a strong protection of permanent jobs that is certainly lowering chances of disadvantaged groups to have a more stable employment. That is to say, the disadvantaged groups – young people, elderlies, the Roma, the disabled persons – work on temporary basis more frequently than other labour market employees who have much better chances to find a permanent job. The Slovak Republic lacks also the legislation ensuring sufficient flexibility among labour relations, in particular regarding the organization of work and the working time. This has the most negative impact particularly on the disadvantaged labour market participants.

Thus, if we consider the problems of the Slovak anti-discrimination legislation, we should reflect in a wider context and consider different aspects. However, despite some shortcomings, this area should not be judged as insufficiently legally defined or as a non-complex, rather the contrary. So what is the main cause that managers perceive the legislative definition of this area as insufficient and ineffective? The legislative acts in the field of equal opportunities in the labour of the Slovak Republic might be perceived to be only formal documents, which is a consequence of the lack of support in this area on the national level. Within the Slovak labour market conditions, the Government approach to the issue of disadvantaged groups is not explicit enough that is causing further problems and supports the persistence of discriminatory practices on the Slovak labour market. Within this area, we can, therefore speak of a certain "vicious circle". That is to say a lack of application of legislative measures through institutional mechanisms implies indifference or ignorance from the side of the organizations on equal and non-discriminatory approach. It has also

an effect on the persistence of handicaps and stereotyping and on the acceptance of the established prejudices. This is directly affecting the situation of some vulnerable groups or persons on the labour market and contributes to their exclusion from the formal labour markets.

Conclusions

The aim of this paper was to reveal the current situation of selected disadvantaged groups on the labour market in the Slovak Republic from the point of view of managers of selected organisations, using the method of questionnaire survey. In the context of developments in selected research periods (2008, 2014) we tried to examine the attitudes of managers of organisations in the Slovak Republic towards selected disadvantaged groups and verify the existence of discriminatory behaviour by managers against these groups. Some results point to increased tendencies of more negative perception of disadvantaged groups by the managers, we could consider the general deterioration of these groups on the labour market. In particular, the perception of causes of discrimination is stronger or equal in the period of 2014 in comparison to the same period of 2008 – for the following characteristics: age, disability, race / ethnicity, sex, sexual orientation. The most common discriminatory experience of Slovak citizens is the age discrimination.

On the other hand the answers of managers to questions regarding the knowledge of anti-discrimination legislation suggest some improvements in comparison to the previous reference period. Thus, if managers are familiar with the legislation in this field, the principle of equal treatment and non-discrimination definition, should it not lead to some tangible improvements in this area?

The achieved results could be well used for further researched on and/or implemented particularly in areas of management and education [14]. We fully share the view of Uramová and Hronec [16] who emphasize the necessity to remove "*barriers to better matching of economic education and labour market needs*". However we need to realize that the managers are those who can significantly influence the course of events in the labour market from the perspective of disadvantaged groups. They have the power that might and should be used towards continuous effort for inclusion of these

groups. Managers themselves are responsible for choosing whom they will engage; decide on how they will reward their workers, on the working conditions of the workers, on the promotion within the organization process, or on determining the remuneration system. Thus, if managers know they cannot, or should not, judge participants on the labour market solely on the basis of certain selected characteristics, some improvements can be expected. It should however be taken into account that managers are an important part of the society. And if there are existing prejudices, will the managers subconsciously not be less sensitive towards these disadvantaged groups on the labour market?

The familiarization with the issue of discrimination brings also its more sensitive perception in real life. It is therefore very important to promote any raise of discrimination awareness. Based on the conclusions of the research analysis, it is necessary to pay particular attention to raising awareness, and the associated sensitivity to issues relating to discriminatory practices on the labour market and the possibilities of protection against them. This activity should be carried out by both sides – the employees and the managers. From this perspective, it could be the most appropriate – in cooperation with the Slovak media – to initiate a continuous public discussion about the issues of discrimination.

The results of our research confirmed the presence of discriminatory behaviour on the labour market in the Slovak Republic. Managers openly admitted their discriminating behaviour and favouring certain groups or participants on the labour market. The results of this research have revealed the complicated situation of these groups on the Slovak labour market and that improvements in this area are very modest, or, almost none. The current economic situation, however, requires continuing in efforts to create an environment of respectful of individual freedom, responsibility, morality, private property and equality of opportunities. It is necessary to abandon the inefficient measures, the complex institutional mechanisms and acceptance of discriminatory behaviour, not only on the labour market but in all areas of the society. This is not the right way neither towards a truly “free and competitive market”, nor to greater equality of opportunities. It might be expected that in economic management processes as well as in case of hiring new employees completely different criteria should be fulfilled.

Within the European Union, the Slovak Republic belongs to the group of states where the equal opportunities on the labour market do not reach the EU objectives. Slovakia’s below-average level in this area is confirmed by the relevant statistics. Finding the causes of the situation is a demanding process. However, provided that some people are denied access to a certain employment, for which they are qualified, solely on grounds of their national origin, race or other irrelevant characteristics, it might be a sign that the society sacrificed equality in opportunities and therefore the freedom of all to the benefit of one or a few “selected” groups.

The current programming period 2014 – 2020 has just started, so Slovakia has the opportunity to show its great potential to draw EU funds successfully, and particularly in areas that are strategically important for Slovakia – primarily reduce long-term unemployment and regional disparities.

The authors are well aware of the sensitivity of the issue of discrimination that tends to be misused by individual pressure groups for their particulate intentions that might be in contradiction with the idea of the “common good” of the society. One of key responsibilities for all members of the society is to make a continuous effort in creating adequate conditions for overall development and for limiting tensions in the society. This principle is in direct contradiction with providing opportunities for creation antagonist groups based on stereotyped prejudices against natural diversity that existed since ever. Antagonism leads to segregation of vulnerable groups that can be hardly considered to be in the interest of a well functioning contemporary society.

On the other side it should be taken into account that the requirements of managers who are responsible for economic results and thus naturally seek to employ the candidate who matches the job requirements in the best way are fully legitimate. This priority of natural economic behaviour in a turbulent and highly competitive economic environment should not be underestimated. However it should be emphasized the need for balanced approach for both the managers and the disadvantaged groups, based on consistent respect of human dignity that allows both, the organisations to remain highly competitive as well as the disadvantaged groups to become gradually

more and more involved in the labour market. It is a moral imperative of a society based on true freedom and solidarity, without which the common Europe and the modern civilisation have no sustainable future.

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ATTITUDES OF MANAGERS TOWARDS DISADVANTAGED GROUPS ON THE LABOUR MARKET IN THE SLOVAK REPUBLIC

René Pawera, Vladimíra Pazderová, Marian Šuplata

Discrimination is a serious long-term problem, being faced by all parts of our society, including the labour market. This is particularly a case for some vulnerable groups who in search for an employment are facing serious problems.

The aim of this paper is to focus on the current situation of disadvantaged groups on the labour market of the Slovak Republic from the point of view of managers of selected organisations. By the method of questionnaire survey of the managers we were examining their attitudes towards selected disadvantaged groups on the labour market. Furthermore we examined the motives of the managers in relation to the employment of selected candidates pointing to the discriminatory or non-discriminatory behaviour of managers on the Slovak labour market. In our research we also focus on the evolution of the labour market in terms of disadvantaged groups in order to identify whether any change of the situation of selected groups of participants on the labour market occurred.

The purpose of our analysis also is to verify whether managers discriminate selected groups of participants on the labour market intentionally and whether there exists any shift in the perception of these groups by the managers.

In order to fulfil this objective we conducted a questionnaire survey focused on selected managers of organisations, in two reference periods: 2008 and 2014.

The target group of the survey was composed of both public and private companies that carry out their activities on the territory of the Slovak Republic during the period of conducting the research.

Key Words: *Discrimination, employers, labour market, managers, organisation, Slovak Republic.*

JEL Classification: J71, M14, M54.

DOI: 10.15240/tul/001/2015-4-003

THE INTENSITY OF THE EXPRESSION OF MOBBING IN EMPLOYEES' RELATIONS AT LITHUANIAN ORGANIZATIONS

Jolita Vveinhardt, Dalia Štreimikienė

Introduction

Observations of animal behaviour show the natural origin of mobbing phenomenon, which later has been compared with people behaviour, which later acquires rather sophisticated forms within people communities. Leymann [22] defined mobbing as specific conflict existing in organizations; the following three main criteria are characteristic for it: attack, attack intensity, attack duration. Mobbing is the phenomenon covering social relations, which influenced by socio-economic and cultural consistent patterns of society development. This is proved both by the researches performed some time ago and new researches. The society of Lithuania, which restored its independence in the beginning of the last decade of the 20th century, as well as most developing countries of the post-Soviet bloc experienced and are still experiencing economic, social and managerial culture transformations. The mobbing term is still new, it sounds 'exotically' enough for the society; however the researches being performed in the country have shown deep problems of organizations' management, which provoke mobbing conflicts. The main conflict takes place not in the level of employees' relations but in the planes of interrelationship and management culture, which are significantly influenced by national traditions.

Research relevance is as follows. Having analyzed modern researches, the following main accents, which should be surveyed deeper, become evident. So far it has not been clearly answered what influence the gender aspect makes upon the phenomenon's fixation; though the researches show that women accept mobbing much more frequently and more intense than men ([43], [44], [40], [41], [8], [34], etc.). Mobbing is analyzed as economic problem ([26], [6], [25], [20], [14], [33], etc.). Socio-cultural as well as society's social and economic development aspects remain

important, especially for developing countries where mobbing actions are not always understood adequately because reactions to aggressor's behaviour differ. These differences have been confirmed by the researches performed in different cultures recently ([1], [45], [8], [32], etc.). Undoubtedly, relations between employees, their quality are an integral part of such components as evaluation of employees [18], the stress they experience [31], etc. I.e., it is especially important to maintain the balance between various external and internal interferences, without creating favourable conditions for the development of destructive relations between the employees.

The research performed in Turkey [1] shows the danger, which is caused by socio-cultural particularity. The conclusion that the respondents answered insincerely was made. The outcomes of the research performed in Estonia [32] confirm socio-cultural dangers, which can cause certain error in similar researches. In addition, the cohesion between mobbing and physical environment, the meaning of managerial culture, which is related to unfavourable climate of the organization, has been confirmed ([29], [1], [37], [21], etc.). In Lithuania mobbing is most frequently analyzed as ethical problem ([39], [38]), functional outcomes of psychological terror for a body are emphasized ([17], [24], [30], etc.). Bultena [4] points out that mobbing is evident more in private than in public sector. However, more comprehensive researches, which would compare public and private sectors of Lithuania as post-Soviet developing country, are missing, especially in emphasizing managerial context of the problem.

In this article, there were set following hypothesis: "The expression of mobbing in Lithuanian organizations as management problem is more intensive in the sector of private activity." This hypothesis is based on

the researches performed in 2009–2015. The research was performed during economic recession when interpersonal relations were more intensively stimulated by internal and external reasons. Having evaluated socio-cultural context, the intensity of mobbing should be evident when the country overcomes the economic recession.

In this research the context of developing countries is purposely stressed as Lithuania as well as most post-Soviet countries experience not only economic but also social, mental transformations, which influence the cohesion of mobbing as specific harassment with organization's climate. Having estimated the influence of culture upon mobbing expression, the research performed in Lithuania can serve for deeper understanding of the phenomenon to develop, apply preventive and intervention mechanisms.

The research problem is formed by the following questions: what mobbing expression is in organizations of different sector and how the applied instrument diagnoses the expression intensity of mobbing in employees' relations.

In the world the researches on mobbing have been performed for a long time and the circle of researchers is large enough ([22], [23], [26], [43], [42], [4], [1], [12], [7], [28], [35], [36], [10], [11], [2], [3], [5], [8], [9], [13], [15], [16], [27], [32], [34], [37], [19], etc.).

In Lithuania the researches on mobbing in employees' relations have just been started, the researches have been performed more intensely during the last decade ([17], [39], [24], [30], [38], [44], [45], etc.).

There were used following research methods. Analysis and synthesis of literature, survey-in-written. MDS (Multidimensional Scaling). MDS analysis provided some additional scientific information. This method revealed the latent expression of the analysed phenomenon. Multidimensional Scaling method is also known as a cognitive map, because it reflects individual and subjective representations of the analyzed phenomenon. MDS model reveals statistically pure and theoretically significant complex structure of the analysed features. MDS model is analysed by assessing the vertical and horizontal axes separately. Multidimensional scaling method is intended to represent the objects in low-dimensional space, when objects are defined

by similarities/ dissimilarities, and the distances in image space represent dissimilarities. Multidimensional Scaling methods are designed as procedures of minimizing the representation accuracy criterion. Using the multidimensional scaling model two dimensions – z-estimate and variation range – were set; precedence and expression profile dimensions were addressed. The results of the research are reflected in a typical graph of MDS axes. This map of organisations of various areas of professional activity illustrates the relatively high and relatively low expression of mobbing in organisations. The levels of expression of mobbing, the organisations in certain areas of activity on the initial phase and those which reached the critical level are highlighted.

1. Research Methodology

The questionnaire presented in this paper consists of 21 questions and 47 items (Likert's scale), which were aimed to identify what character of sneering the mobbing victims had experienced.

The items of Leymann [22] make the basis of the items distinguished in the questionnaire (Scales 1–3). They are constructed by transforming (in linguistic sense) the items of H. Leymann presented in the LIPT inventory and formulating them in the first person. The items (in the original questionnaire's variant – in Lithuanian) have been adapted for specific cultural environment).

Out of 21 questions – 10 questions are of demographic character in order to form as vivid as possible portrait of a mobbing victim. Other 11 questions were aimed to find out harassment duration and frequency, a discriminator (a colleague, manager and so on), the reaction of the victim to harassment, the person who lent assistance, the means to stop harassment, outcomes against the discriminator and so on.

By means of concepts' operationalization three scales of the instrument have been formed: *Communication interferences in employees' relations*; *Formation of negative opinion and work character*; *Employees' physical state and outcomes*.

The first scale *Communication interferences in employees' relations* consists of subscales of *communication* and *isolation*. The second scale *Formation of negative opinion and work character* consists of subscales of *reputation* and *tasks*. The third scale *Employees' physical state*

and outcomes consists of subscales of *health* and *harm*. The subscales embrace 47 items (communication – 11, isolation – 5, reputation – 15, tasks – 8, health – 5, harm – 3 items).

The culture, in which the instrument has been checked, distinguishes in the social – historical experience (determined by the Soviet social engineering relevant for Central and Eastern Europe. Initiatives, perception of public decisions, publicity danger, reticence, which despite political and social transformations taking place remain important socio-cultural factors that influence different researches

being performed, are characteristic. In pursuing for precision the control questions that aim to evaluate openness of the respondents have been included into the questionnaire.

It is known from researches and practices of psychometrics that the test (diagnostic construct) can be successfully applied only when it meets certain qualities: first of all, reliability and validity. These characteristics are detected after having performed special research and psychometric calculations. The above mentioned psychometric characteristics can be high enough (see Tab. 1).

Tab. 1: Characteristics of dimensions' methodological quality of communication interferences in employees' relationship

Subscales	N items	Explained dispersion %	Cronbach alpha	Spearman-Brown	Factorial weight (L)			Correlation of whole unit (r/itt)		
					mean	min	max	mean	min	max
Communication	11	36.12	0.85	0.79	0.59	0.41	0.78	0.34	0.06	0.86
Isolation	5	59.17	0.89	0.88	0.77	0.67	0.81	0.58	0.25	0.82
Reputation	15	37.36	0.89	0.86	0.60	0.36	0.73	0.35	0.03	0.76
Tasks	8	46.05	0.88	0.78	0.68	0.58	0.79	0.45	0.08	0.82
Health	5	44.90	0.83	0.81	0.65	0.38	0.81	0.41	0.09	0.79
Harm	3	60.54	0.85	–	0.77	0.67	0.83	0.58	0.32	0.86

Source: own

The questionnaire was installed in the website <http://www.mobingas.lt> administrated by the article's author J. Vveinhardt. The website Mobingas.lt presents the information about the mobbing concept, reasons, outcomes and intervention. It presents scientific and journalistic articles of the author about mobbing phenomenon; the results of the previous researches are discussed. The data were compiled in the database <http://193.219.168.19/pqsql>; later they were exported in the Microsoft Excel 2000 file. The collected answers were transferred into the SPSS 21, by means of which the data matrix was formed and calculations have been performed. The security against abuses that could distort the research data.

2. Results

In the research 1,231 respondents representing 21 professional activity fields, which were distinguished referring to the *Classification of Economic Activities*, took part. The questionnaire presented 25 fields of professional activity; however, the sample involved 21. The respondents, who searched for the information about mobbing phenomenon in the website, took part in the survey voluntarily. Out of 1,231 respondents 867 respondents indicated that they had experienced mobbing. It has been indicated that other 364 participants of the survey have experienced nagging and sneering (referring to the criteria of sneering frequency,

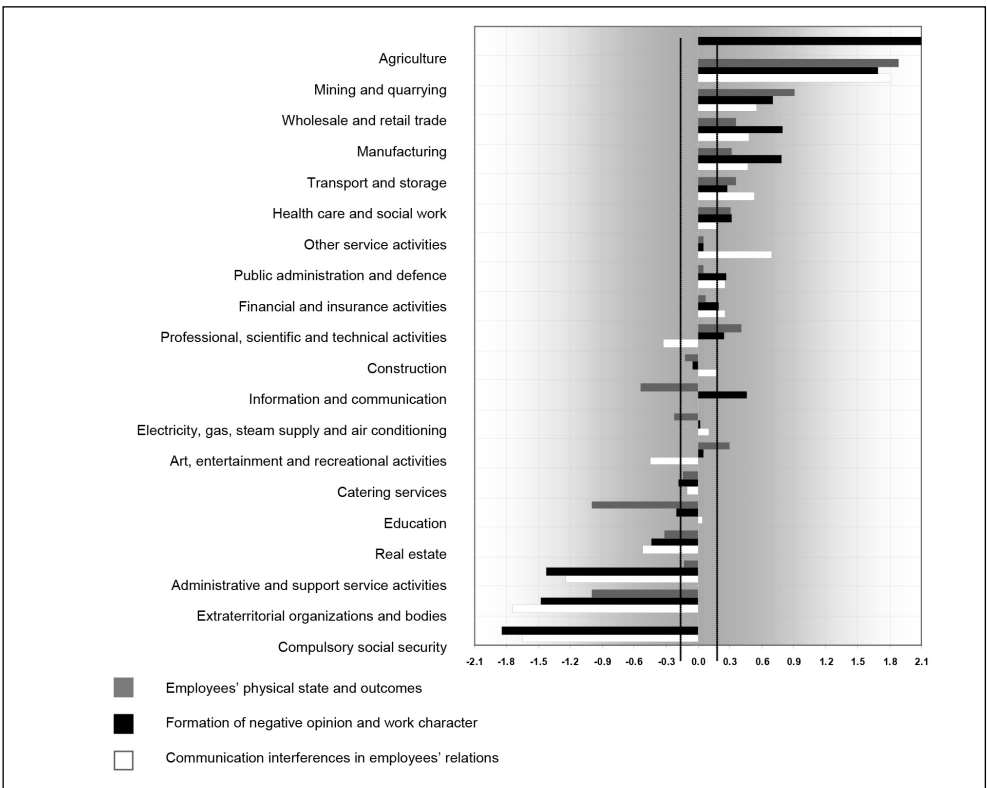
duration and action character). Thus it has been decided to present only the results of the survey on the employees who experienced mobbing.

Expression of mobbing in employees' relations in organizations of different activity type. In this research for the statistical data rationing the *z-estimations of the standard normal distribution* have been chosen. This measure, more precisely – the suitable scale (z-scale) – is very handy and easily enough interpreted. The concrete questionnaire has been formed so that it would disclose negative issues – actions of nagging and sneering as well as the crisis of social work relations in the organization. Thus the high test estimation, that acquires positive meanings of the z-scale, shows the existing and stronger expressed actions of nagging and sneering in the employees' collective, and negative estimations respectively show the non-

existing and weaker expressed such actions in the organization. For example, it is seen in Figure 1 that the expressions of the nagging and sneering actions most strongly manifest in the relations of the employees at the organizations of agriculture as well as mining and quarrying.

In this scale the mean of the rationing sample is always equal to 0, and the standard deviation is equal to 1. The testing results (i.e. – three dimensions according to all 45 primary features of the estimation of the nagging and sneering actions in the organization) are intercepted on the z-scale of the standard normal distributor in the diagram. In this scale the zero indicates the mean of the rationing sample. The dotted line shows the intercepted limits of the mean of the confidence interval, which fluctuate from *minus* 0.07 to *plus* 0.07 when the level of the statistical significance is $\alpha=0.05$.

Fig. 1: The rating of the organizations in different activity fields according to the expression of nagging and sneering actions in the organization



Source: own

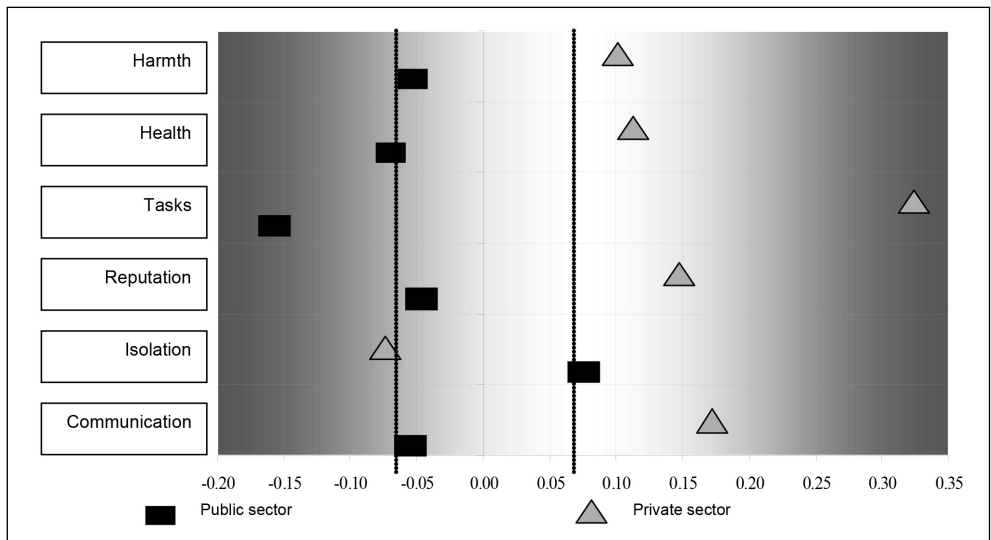
The rating starts with the organizations of 'Water supply, sewerage, waste management and regulation', 'Compulsory social security', 'Extraterritorial organizations and bodies', which expose the most favourably and which significantly transcended the organizations of other activity fields as well as the crisis features in which are expressed the most weakly and finishes with the organizations of 'Agriculture' and 'Mining and quarrying', in which the crisis features of the nagging and sneering actions have been expressed relatively the most strongly. The estimations of most organizations go beyond the limit of the confidence interval of the rationing sample mean and significantly deviate to the field of favourable or unfavourable estimations. There are only two organizations of 'Information and communication' and 'Construction', the estimation of which holds within the inside of the confidence interval and conforms the so-called 'the golden mean'. It is not hard to observe that according to the manifestation of the nagging and sneering actions in the organization the balance is held – there are almost equal number of the organizations of the different activity fields, the estimations of which overreach the limits of the confidence interval and deviates to the

field of unfavourable or favourable estimations. When inter-comparing the 'leading' and 'slow' organizations of the different activity fields according to the manifestation of the nagging and sneering actions, it is evident that the difference of the integrated estimations reaches even 3.8 of the z-scale point and this makes almost four standard deviations. Such difference can be named as effectively evident and allows stating that the experience of the manifestation of the nagging and sneering actions in the organizations of the different profile should be estimated as very miscellaneous.

The previous researches on mobbing have already identified that business organizations most frequently face pressure, other phenomena humiliating human dignity; here mobbing has been stronger expressed than in organizations of public sector. Figure 2 presents the group estimations of the dimensions of the nagging and sneering actions in the main organizations, which have been intercepted according to the rating.

The data presented in Figure 2 visibly show that according to the expression of the nagging and sneering actions in the organization the organizations of private sector, the estimation of which is positive almost in all dimensions

Fig. 2: The estimation of the nagging and sneering actions in the different organizations



Source: own

and passes the upper limit of the confidence interval, 'lead'. The diagram clearly shows that the group estimation of almost all organizations of public sector diverges to the field of negative estimations and drops below the bottom limit of the confidence interval. The greatest difference between the estimation of the organizations of public sector and the analogous estimation of the organizations of private sector has been identified according to the dimension of tasks and it reaches 0.48 of the z-scale point; and this makes almost half of the standard deviation. Thus the organizations of public sector better manage with the formation of negative opinion and work performance character than the organizations of private sector, to which these are the hardest problems. However, the organizations of public sector much more frequently than the organizations of private sector face the communication interferences in the employees' relations, particularly – isolation; however, according to this dimension the difference of the estimations is not so evident and does not reach a fifth of the standard deviation (0.14 of the z-scale point).

When interpreting the data, the *outliers-measure approach* is applied. According to the main testing results the table of the statistical outliers is formed (see Table 1). The enlarged attention is always paid to what might strongly deviate from the mean (the norm). The statistical outlier shows that the organization of the particular activity type significantly deviates from the norm due to its achievements. In other words, in most organizations the deviation from analogous achievements to better or worse side takes place.

The length of the confidence interval of most means is rather little due to big enough rationing sample. It reaches 0.14 z-scale items when the maximum tolerance is 5 percent. The values diverging from the rating mean by 0.50 z-scale item are treated as statistical outliers in this research.

So far the expression of nagging and sneering action in organizations of different activity type has been estimated and compared only according to the consolidated test value. It integrates primary features of the manifestation of the nagging and sneering actions. As it has been mentioned, the primary features according to the test methodology have been integrated into six dimensions. It is also meaningful to find out how the above-mentioned six dimensions

manifest in the organizations of different activity type. It is very important to know what particular actions of nagging and sneering and how strong they are expressed in the organization of different activity type. Tab. 1 reflects the results of such inspection. It presents the estimations of the organizations of every different type according to all six dimensions of the actions of nagging and sneering.

Table 2 shows that the nagging and sneering actions are the most weakly expressed in the organizations of 'Compulsory social security'. At first sight the table repeats the result, which has been reflected in the diagram of the rating of the organizations of different activity fields (see Fig. 1). However, the table data are more explicit. They show that in the context of these research results actually leading organizations of 'Extraterritorial organizations and bodies are on the top not according to all features. According to such important feature as 'Employees' physical state and outcomes' the organizations of such type hold only middle positions. In this viewpoint it is evidently passed by not only the leading organizations' activity type of 'Compulsory social security' but also by the organizations of 'Real estate' or 'Electricity, gas, steam supply and air conditioning'. Another opinion of the employees of the leading organization of 'Water supply, sewerage, waste management and regulation' has not been expressed on this aspect at all. The table also shows that such very unfavourable phenomenon as communication interferences in employees' relations that sharpens communication problems in the employees' collective is most common in the organizations of 'Mining and quarrying' and 'Public administration and defence'. It is necessary to note that in the organizations of 'Manufacturing' the crisis features of the actions of the negative opinion formation and work character, related to reputation and tasks, strongly manifest. Thus the application of the method of statistical outliers enables to identify and fix those undesirable cases of the rudiments of nagging and sneering actions.

In this research it has been decided not to restrict only by parameters of descriptive statistics and to perform the analysis referring to the multidimensional statistical method – particularly the MDS-model (Multidimensional scaling). The model involved two dimensions – the z-value and the variation size. So the model

Tab. 2:

The estimation of the separate dimensions of the nagging and sneering actions in the organization at the organizations of different types

Dimensions (subscales)	Scales	Agriculture	Mining and quarries exploitation	Manufacturing	Electricity, gas, steam supply and air conditioning	Water supply, sewerage, waste management and regulation	Construction	Wholesale and retail trade	Transport and storage	Catering services	Information and communication	Financial and insurance activities	Real estate	Professional, scientific and technical activities	Administrative and support service activities	Public administration and defence	Compulsory social security	Education	Health care and social work	Art, entertainment and recreational activities	Other service activities	Extraterritorial organizations and bodies
Communication	Communication interferences in employees' relations		1.57	0.56	0.63	-1.95	0.10	0.60	0.70	-0.39	0.07	0.14	0.30	0.21	-0.60	0.77	-2.15	-0.12	0.61	0.33	0.18	-1.46
Isolation			2.01	0.47	-0.43	-1.22	-0.57	0.44	0.01	-0.77	0.22	0.44	-0.09	0.37	-0.33	0.68	-1.22	-0.06	0.33	0.00	-0.04	-0.89
Reputation	Formation of negative opinion and work character	2.06	1.90	0.70	-0.43	-1.88	-0.05	0.65	0.46	-0.21	-0.02	0.29	-0.33	0.37	-0.53	0.54	-1.38	-0.09	0.32	-0.03	0.36	-1.03
Tasks			1.50	0.75	1.39		0.61	0.33	0.96	0.40	-0.04	0.20	0.03	0.28	-0.23	-0.31	-1.37	-0.23	0.10	0.17	0.03	-1.60
Health	Employees' physical state and outcomes		2.14	-0.87	-0.51		0.66	0.82	0.54	0.50	-0.52	0.09	-0.87	0.26	-0.40	0.30	-0.87	-0.21	0.72	0.09	0.34	-0.06
Harm			1.72	0.37	-0.41		0.30	0.70	0.24	0.24	0.16	-0.06	-0.94	0.04	-0.16	-0.02	-0.94	-0.06	-0.15	-0.35	0.25	-0.05

Source: own

Note: The standard z-estimations were used for rationing. The statistical outliers are marked in tones. The limit of the statistical outlier – is 0.5 of the z-estimation (i.e. 0.5 of the standard deviation). The negative statistical outliers are marked in the dark tone, the positive statistical outliers are marked in the lighter tone. The mean of the rationing sample is equal to 0.

MARKING:

- $z < -0.5$  Deviation to the field of favourable estimation.
 $z > 0.5$  Deviation to the field of unfavourable estimation.

has considered two issues – the expression of the actions of nagging and sneering (relatively higher or lower nagging and sneering being experienced) and the homogeneity of the opinion about the above-mentioned parameter within an organization (expression profile). The distances have been calculated referring to the data matrix; the chosen measure of the distance – the Euclid distance.

The levels of the mobbing expression have been identified; they show: where mobbing is expressed the most weakly; where mobbing expression is less than moderate level; where mobbing is expressed moderately; where mobbing expression is higher than moderate and strongly expressed mobbing in employees' relations.

The calculations of the MDS modelling are presented in Tables 3 and 4. The larger negative z value, the weaker mobbing is and vice versa – the larger positive z value, the more active mobbing expressions is the professional activity field being analyzed. In Tables 3 and 4 the reflected percentage of approval shows the mobbing expression according to three scales. It is evident that the differences are vivid and significant enough. The MDS modelling presents the means, which show the generalized intensity of mobbing expression. According to all three scales mobbing is the most weakly expressed in the field of compulsory health insurance, which belongs to public sector. Among organizations of private sector less than moderate level mobbing expression

Tab. 3: The weakest and very weak expression of mobbing

Expression of mobbing	Mobbing is expressed most weakly*		The mobbing expression is lower than average level**		
Scales Activities	Water supply	Compulsory social security	Extraterritorial organizations and bodies	Administrative and support service activities	Real estate
Communication interferences in employees' relations	-1.65	-1.74	-1.24	-0.52	0.04
Formation of negative opinion and work character	-1.85	-1.48	-1.42	-0.44	-0.21
Employees' physical state and outcomes		-1.00	-0.14	-0.31	-1.00
Mean	-1.75	-1.41	-0.93	-0.42	-0.39

* mobbing is expressed most weakly ○

** the mobbing expression is lower than average level ●

Source: own

Tab. 4: The strongest and very strong expression of mobbing

Expression of mobbing		The expression of mobbing is higher than moderate*						Mobbing is strongly expressed in employees' relations**	
Scales	Activities	Public administration and defence	Other service activities	Health care and social work	Transport and storage	Manufacturing	Wholesale and retail trade	Mining and quarries exploitation	Agriculture
		Communication interferences in employees' relations	0.69	0.18	0.53	0.47	0.47	0.56	1.82
	Formation of negative opinion and work character	0.06	0.32	0.28	0.78	0.79	0.70	1.69	2.10
	Employees' physical state and outcomes	0.05	0.30	0.36	0.31	0.35	0.91	1.88	
Mean		0.27	0.27	0.39	0.52	0.54	0.72	1.80	2.10

* the expression of mobbing is higher than moderate ●

** mobbing is strongly expressed in employees' relations ●

Source: own

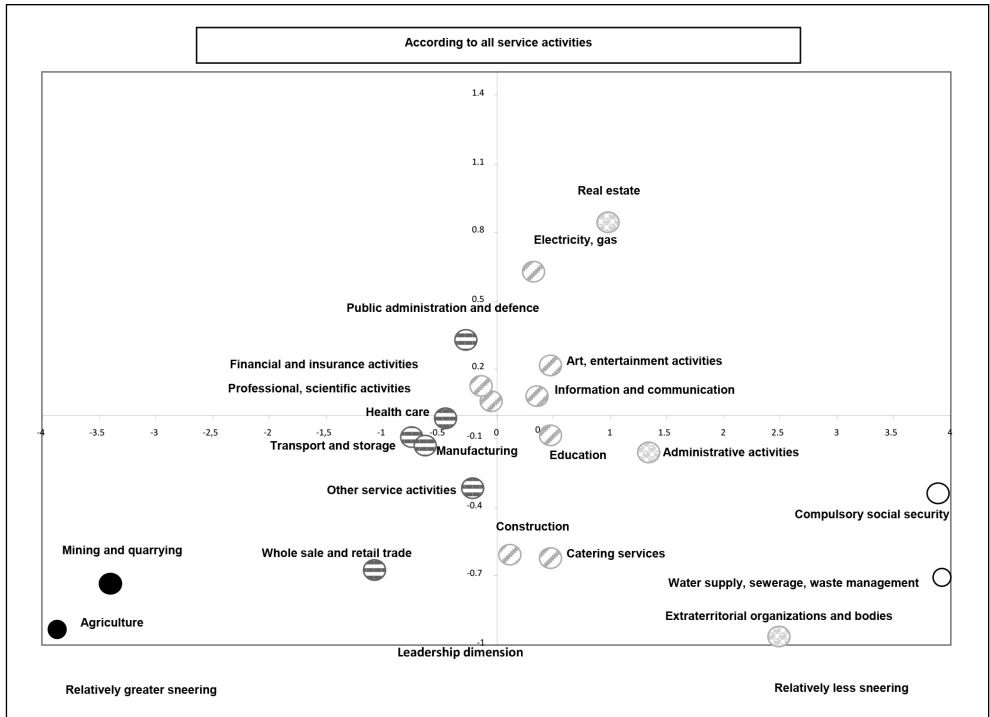
is observed in the organizations functioning in the field real estate operations, where attention should be paid to physical state of employees and its outcomes.

According to three scales mobbing is strongly expressed in the field of mining and quarrying. In the context of higher than moderate mobbing expression (private sector) the attention should be paid to trade,

manufacturing as well as transport and storage activities. The estimations of the field of people health care and social work could have been influenced by mobbing intensity in private sector; however, further researches should be performed in order to verify or deny the premise.

The results of the MDS modelling are presented in Figure 3.

Fig. 3: MDS model with the complete structure of the features



Source: own

The following levels of mobbing expression have been distinguished, they show where:

- mobbing is expressed most weakly
- ⊗ the mobbing expression is lower than average level
- ⊘ mobbing is moderately expressed
- ⊕ the expression of mobbing is higher than moderate
- mobbing is strongly expressed in employees' relations

It should be noted that the MDS model is so-called exploratory method, and its result is acceptable if it is possible to be meaningfully interpreted. The first dimension (Axis X) can be relatively defined as the dimension of the strength of the expression of nagging and sneering being experienced; the left side of the map presents the types of the organizations, which distinguish in relatively higher nagging and sneering. In the right side the positions are occupied by the organizations, which distinguish in relatively lower nagging and sneering. The types of the organizations, which distinguish in non-homogenous estimation of the actions of nagging and sneering, are focused in the top of the map; and the types of the organizations, in which the opinion about the actions of nagging and sneering disperses relatively less and is more homogeneous, are focused in the bottom. Thus the second dimension (Axis Y) denotes the homogeneity of the opinion about the expression of the actions of nagging and sneering. It is symptomatic that in the case of the MDS modelling the rating of the organizations' types according to the expression of the actions of nagging and sneering is once more proved; here the marginal positions on the left and the right of the map (according to the dimension of relatively higher / lower nagging and sneering) and the middle positions according to Axis Y (the dimension of the estimations' homogeneity) are occupied by the organizations of the same types as in the general rating.

Conclusions

The research has shown that the situation is the most favourable in the following fields of the activities of public sector organizations: 'Water supply, sewerage, waste management and regulation', 'Compulsory social security', 'Extraterritorial organizations and bodies'. In the organizations of 'Agriculture' and 'Mining and quarrying' the crisis features have been expressed relatively most strongly.

The previous researches performed in Lithuania have been essentially confirmed by intensive enough expression of mobbing in the fields of education, health care. The estimates of most organizations step over the limit of confidence interval of normality sample mean and significantly deviate to the field of favourable or unfavourable estimations. The estimate of the organizations in the activity fields of 'Information and communication'

and 'Construction' hold within the confidence interval.

According to the acceptance of attack in different organizations, the certain balance is noticed – the same number of the organizations of different activity fields, the estimations of which go beyond the limits of the confidence interval and deviates to the field of unfavourable or favourable estimations. When inter-comparing the relatively 'leading' and 'slow' organizations of different activity fields according to the expression of the nagging and sneering actions, it is evident that the difference of integrated estimations reaches even 3.8 of the z-scale point and this makes almost four standard deviations.

Such difference can be named as effectively evident and it allows stating that the experience of the manifestation of the nagging and sneering actions in the organizations of the different profile should be estimated as very miscellaneous.

The research has confirmed the results of the previous researches performed in Lithuania, that is, according to the expression of the nagging and sneering actions in the organization, the organizations of private sector, where the estimation exceeds the upper of the confidence interval almost in all dimensions, significantly distinguishes.

The nagging and sneering actions have been expressed the most weakly at the organizations of 'Compulsory social security'. The problem of the communication in the employees' interrelations becomes evident in the organizations of 'Mining and quarrying' as well as 'Public administration and defence'. It is necessary to point out that in the organizations of 'Manufacturing' the features of the crisis in the formation of negative opinion and work character actions related to reputation and tasks strongly manifest.

Leymann has defined mobbing as attacks, which happen not more infrequently than twice per week and last not less than half a year. However, it is possible to draw the premise that such purely statistical distribution is not axiomatic because psychosomatic reactions of people are different; thus employees can feel mobbing outcomes earlier than in half a year or suffer them for long years. It is necessary to estimate the democratic, pluralistic tradition and society knowledge about negative aspects of the mobbing behaviour (discriminating)

and its tolerance. The societies that have outlived the system of the totalitarian initiative, oppression that humiliates human dignity and value levelling feel fears and distrustfulness; this also impedes research and practical work. When performing researches, some mobbing victims might not formally get into the group of the people being surveyed on mobbing though they can experience all related outcomes; thus the statistical expression can reflect the real situation not quite precisely. In other words, it should not be ignored that mobbing can be much more intensive than results of researches show. The researches performed in different countries show that the cohesion not only between demographic but also between social-cultural aspects, which vary subject to the culture of country's organization management that could be interpreted as measure of management culture development, exists. Tambur and Vadi [32] emphasized the transition period of mobbing institutionalization in states' statute-books; however, the problem of mobbing legal definition exists in the leading economics as well.

Though mobbing most frequently gets into the scope of psychological researches, it is the important problem of managerial culture as corporate culture component as well.

The research results have confirmed the formulated hypothesis that mobbing is the relevant managerial problem, the expression of which is more intensive in organizations of the private sector. This is underlined by the following fields sensitive to management: tasks, communication, harm and others. The main reasons – the historical-cultural heritage, which greatly influences management culture, as well as the historical traditions of business organizations' property and management.

Discussion

Already in the ninth decade of the last century the initiatives of M. Gorbachev 'perestroika' (reorganization) legitimized business potential, the initial capital was accumulated, and initiative citizens became owners of newly created business. This period, involving the processes of the private initiative induced by the restoration of the independence, is defined as 'wild capitalism', which the state of Lithuania together with other European countries experienced in the end of the 19th century and in the beginning of the 20th century till the

occupation; however, subsequent repressions did not allow natural developing of national entrepreneurship culture.

After the restoration of the independence the decisive role was played not by org-managerial competence but by the ability to raise the capital in privatization processes; thus a lot of initiative people but without managerial education who in personnel management followed 'general understanding', 'competition' and 'strategies of survival', according to which the strongest wins. Differently than in private sector (except leading companies of national and foreign capital), in public sector the requirements for managerial competence are formulated by the state regulation mechanisms, which are supported by the programmes financed by the EU structural funds.

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Abstract

THE INTENSITY OF THE EXPRESSION OF MOBBING IN EMPLOYEES' RELATIONS AT LITHUANIAN ORGANIZATIONS**Jolita Vveinhardt, Dalia Štreimikienė**

The authors present general review of the literature, present the results of the empirical research on the expression intensity of mobbing in employees' relations in organizations. The expression of mobbing in employees' relations has been identified in the organizations of different activity type. The expression of mobbing in employees' relations has been identified in the organizations of different activity type. When comparing organizations of private and public sectors, the tendency that the expression of mobbing is more intensive in the private sector, especially in economical activities of agriculture and mining as well as querying, manifests. The hypothesis that mobbing is not only psychological but also managerial problem has been confirmed; it is more relevant for organizations of the private sector in Lithuania. This is influenced by poorly developed management culture and the lack of managerial knowledge, which is characteristic for management personnel. Lithuania as well as other post-Soviet countries has not performed the researches on mobbing phenomenon broadly and deeply by emphasizing managerial reasons of the phenomenon. The researches on mobbing disclose the 'sensitive' areas, which influence the internal climate of national capital's organizations, the development of their competitiveness and the improvement of the corporate country investment climate. The originality of this research is presupposed not only by the fact that the situation in private and public sectors has been surveyed but also that it has been tried to identify the spread of mobbing among different fields of professional activity. In the case of this research 21 fields of professional activity have been included. During the research higher than medium expression of mobbing has been identified in the field of people health care and social work, which consist of the organizations of both public and private capital (in which more significant mobbing intensity has been identified) in Lithuanian context. It would be relevant to elaborate the research in striving to disclose differences in the culture of organizations' management.

Key Words: Mobbing, behaviour, conflict, employee behaviour, employee relations, interpersonal relations.

JEL Classification: M12, M14, M19.

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COST-BENEFIT ANALYSIS: TOO OFTEN BIASED

Eliška Vejchodská

Introduction

In current political practice in many countries, cost-benefit analysis (CBA) is applied in evaluating public projects and regulatory instruments. In evaluation using CBA, the effort is to express the comprehensive effect of a project or a governmental regulation on social welfare. Social welfare can be affected by changing environmental quality, improving quality of life due to better healthcare, etc. Since many projects essentially affect environmental quality either positively or adversely, the effect of non-monetary costs and benefits derived from changing environmental quality is often involved in CBA in addition to financial costs and benefits. CBA is therefore an evaluation method widely discussed in neoclassical environmental economics, e.g. [13], [12].

What has enabled CBA to become one of the most widespread methods in political decision-making? Dryzek [6] offers an explanation in his environmental discursive analysis. According to him, methods such as CBA, risk analysis and EIA (environmental impact assessment) have penetrated political practice due to the overwhelming conviction that decision-making on political issues should be left to experts. That is why he believes expert agencies such as the US EPA (Environmental Protection Agency) and the United Nations Environment Programme have come into existence. CBA introduces this expertise to political decision-making. From the point of view of neoclassical economics, CBA is capable of answering the question whether a policy project or regulatory tool is beneficial or detrimental to society. According to neoclassical environmental economics, therefore, politicians should subject their crucial decisions influencing environmental quality to CBA. CBA advocates also see its application as a way to improve the efficiency of control over the meaningfulness of political action, increase

the transparency of regulation and diminish the influence of lobby groups, as discussed e.g. in [4]. Politicians' decisions are not random: political action is supported by CBA results [1].

In the USA since Reagan's era the requirement to decide based on CBA in regulatory impact analyses (RIA) was anchored in the legislation by Executive Order 12291 in 1981. All the governmental agencies, including EPA, employ CBA in their decision-making [1]. The basic requirement for a monetary expression of monetarily quantifiable effects, therefore the application of CBA in RIA, remains preserved till now in the USA (partial amendments by Clinton's Executive Order 12866 in 1993 and Obama's Executive Order 13536 in 2011). CBA is also in abundant use in the EU political decision-making, although RIA analyses across European countries vary in their methodologies used for impact assessment. The only country long insisting on CBA for RIA analyses has been the UK [23]. In major European countries including France, Germany, Spain or Italy, RIA does not contain a robust economic appraisal [5]. CBA has been largely used in EU countries as a basis for decisions concerning allocation of subsidies from Structural Funds and the Cohesion Fund.

Although neoclassical economists agree on the meaningfulness of using CBA in decision-making, they subject parts of its methodology to scholarly reflection. CBA as a method within neoclassical economics has therefore been evolving in some aspects. Its real-world applications make use of different procedures based on different arguments. Due to the disunited methodology employed in practical CBA execution, the results of studies may be misleading. Two different studies of the same thing based on different methodologies may arrive at fundamentally different conclusions. CBA results may also be deliberately distorted

by adjusting the method chosen to the required outcome. However, practical CBA may also involve other problems such as the degree of expertise of its performers (methodological problems of CBA for the Dutch case discussed in [20]).

This paper outlines the methodological disagreements in the performance of CBA. It further focuses on issues of practical CBA applications from the point of view of impartiality of CBA performers. We bring a criticism of the current setting of CBA execution. As an example, we use CBA performed for the purposes of applying for EU funding from Structural Funds in the Czech Republic. Our theoretical analysis shows that with the current setting of rules for the CBA performance for the purposes of EU funding, its performers cannot be expected to show expertise and impartiality. We support the theoretical analysis results with data from our own empirical survey among commercial CBA performers who offer consulting in the area of EU Structural Funds. There is no reason to believe that the Czech Republic is a mere exception in this sense and that CBA performance works any better in other countries.

The first section of the paper outlines the theoretical basis of CBA grounded in neoclassical economics. The next section presents critical arguments voiced from the neoclassical economic school. This discussion is followed by a section dealing with the issues of practical CBA application on the example of the Czech Republic. The final section of the paper presents suggestions for resolving the current unsatisfactory situation.

1. Theoretical Grounding of CBA

CBA is based in neoclassical economics, currently the mainstream of economic theory. Since CBA is widely applied in environmental protection, we shall make the introduction to its theoretical grounding using environmental CBA as an example. The introduction to neoclassical environmental economics may be found e.g. in [26]. CBA rests upon an anthropocentric valuation of the environment, that is, the humans' subjective valuation based on their individual preferences. Neoclassical economics is based on consumer sovereignty, sees consumer preferences as exogenous and respects any subjective consumer opinion. The question an economist solves is the optimum allocation of

resources based on these preferences [12]. In CBA, these preferences are then reflected in the monetary valuation of environmental goods and services as well as other non-traded goods. The value of environmental goods and services expresses an individual's willingness to pay for an improvement or a change to the quantity of the environmental goods and services, or willingness to accept monetary compensation for deterioration of the environmental goods and services. The total social value of a certain natural resource is then the sum of the subjective individual values attributed to it by the individuals within the society [16]. Environmental economics has developed a number of special methods in order to seek for environmental value (for more on environmental valuation methods, see, e.g. [9], [13], [30], [19]).

The purpose of CBA is to decide on the worthiness of a public investment or regulation (e.g. investment in a wastewater treatment plant) based on quantitatively expressed benefits and costs. Thus it seeks to bring the nature of the public sector decision-making closer to the situation common in the private sector. A company will also weigh the costs and benefits of its business plans. The recoverability of public funds is viewed in CBA in connection with balancing social benefits and costs. If a public investment brings no financial gains yet we maintain that it is socially beneficial, it has to bring other benefits than financial, such as environmental improvement and, through it, welfare increase of its users. When assessing the suitability of public plans from this point of view, a plan whose total benefits discounted to the present value outweigh its total discounted costs is justifiable. In the case of the wastewater treatment plant, CBA will balance the social benefits, which may be benefits derived from reduced watercourse pollution, against the social costs, which may be the capital investment and operating costs of the treatment plant and the adverse impact of the treatment plant on the local environment (odour near the plant, affecting the quality of housing, for example). The mainstream CBA methodology (not every CBA advocate identifies with the mainstream CBA method, as we will see below) is based on the Kaldor-Hicks compensation criterion. This criterion tests the possibility of those who have benefited from the project compensating for those who

have suffered a loss from it. According to this criterion, the public sector plan in question is welfare increasing if, after its execution, goods can theoretically be redistributed so that the situation after the redistribution of these goods is a Pareto improvement to the no-project situation [1].

It follows from the above that the result of CBA describes the effective demand for a public plan [13]. Not only does it show every person's voting on the matter but it can also discover the degree of their preference. The different voices for and against do not weigh the same in CBA. They are weighted according to the degree of preference, expressed here as the degree of willingness to pay or willingness to accept compensation.

2. Methodological Disunities of CBA

Although the CBA method is highly elaborated and widely recognised, there is no agreement in opinion among economists concerning its methodology. We shall focus on a discussion of the normative issues of equity, (re)distribution of wealth in society and mutual equality of people (discussion of other issues e.g. in [29], [7]). Gramlich [10] deals with the distribution issues connected with CBA in detail. He points out that two different projects – one bringing net benefit to the poor, the other bringing the same net benefit per dollar invested to the rich – are equal from the CBA point of view. According to the CBA result, it does not matter which of the projects is chosen. Still, the society may prefer a more desirable redistribution of wealth, normatively towards the poor. Mainstream CBA is nothing more and nothing less than a Kaldor-Hicks compensation test. Since no actual compensations are made in reality (actual compensations are not technically feasible due to enormous transaction costs), the project may result in a shift of wealth from the poor towards the rich, thus exacerbating inequalities in society. Even a project that brings an additional effect to the wealthiest social class to which the entire society contributes may increase the social welfare according to CBA. CBA does not examine who suffers a loss from a project (the poor or the rich) and who earns from it.

Moreover, as stated by Hanley and Spash [13], the relatively richer have a relatively stronger vote in CBA than the relatively poorer. Their willingness to pay or accept compensation will be higher in absolute terms than those of

the poor. The votes would weigh equally only under the condition of the equal distribution of wealth in society [13]. The CBA outcome is therefore dependent on the wealth distribution in society and will more likely unfold from the desires of the relatively richer social classes.

According to Adler and Posner [1], however, it is correct that CBA does not consider the distribution of wealth. They believe that economists dealing with economic efficiency and changes in total welfare have nothing to say on the wealth distribution in society. According to them, the wealth distribution in society is a purely political issue. If a government wishes to redistribute wealth, Adler and Posner [1, p. 186] consider that a more cost-effective way is "through taxes and transfers rather than by building dams in poor areas or toxic waste dumps in rich areas". Among others, also Frank [8] mentions tax progression as a solution to the problems of the poor. On the other hand, some economists see an opportunity to include equity issues directly in CBA by means of explicit distribution weights of votes. However, that would imply weighting individuals' willingness to pay based on the individuals' marginal utility of money. The discussion of distribution weight of votes is summed up in [1].

Sen [25] in his reflection of CBA focuses on methods for valuating public goods; defining them in accordance with Samuelson's approach as non-rival goods that cannot be excluded from consumption (for the summary of other Sen's comments to CBA, see [15]). They are evaluated in the same way as if they were private goods: individuals' willingness to pay for the provision of these goods is sought just as if the individuals were capable of paying for the goods individually, without the help of others. Sen [25] quotes the Exxon Valdez disaster as an example. In ordinary contingent valuation, the researcher asks how much you would be willing to pay to restore the environment to the state prior to the disaster. Say your reply as a respondent's is 20 dollars. However, that is an irrelevant scenario according to Sen. One cannot pay 20 dollars and believe that the disaster consequences will be removed thanks to one's payment. The personal sacrifice of the payment to which contingent valuation is bound changes very little in providing the good; the payment itself changes virtually nothing in a disaster of the Exxon Valdez dimensions. Sen compares an individual's decision-making

concerning the purchase of a private good to that concerning the individual's contribution to environmental protection. Whereas you are unaffected by other people's willingness to pay when buying a private good, such as a tube of toothpaste, you tend to be strongly influenced by whether and how much others are willing to pay when deciding about your contribution to environmental protection. Sen [25] highlights the need for a common effort to provide a public good. Instead of the usual valuation based on a market analogy, Sen believes the method should employ the social choice model, formulated by Arrow [3]. His idea is to confront respondents with realistic alternative solutions, including the explicit statement of possible responses by other members of society.

CBA advocates have been intensely discussing the discounting method and discount rate used in CBA, e.g. in [2]. Exponential discounting, working with a constant discount rate, is the norm. As summarized in [8], exponential discounting does not match people's decision-making patterns. Hyperbolic discounting, in other words a gradual reduction in the discount rate over time, would be a closer representation. Faced by the decision to accept 100 dollars today or 105 dollars in a week versus 100 dollars in a year or 105 dollars in a year and a week, most people will choose 100 dollars today in the former case and 105 dollars in a year and a week in the latter. In the latter case, deciding about an event that will occur a year from now, the perceived time value of money does not decrease as fast over a week as in the former case. One prefers to wait for an extra week to get a larger amount of money. This should correspond to a decreasing discount rate over time. Assuming a constant discount factor, the decisions should be identical: either the person should choose 100 dollars in both cases or 105 dollars in both cases, depending on the individual's discount rate [8]. The height of the discount rate is another aspect thoroughly discussed among economists. It may vary considerably from a rate close to zero to 20%. Also for these extreme discount rates a justification may be found as summarized in [22]. Some economists prefer to use a discount rate based on the opportunity cost of capital (higher rates of exponential discounting), some prefer to derive the discount rate from the pure rate of social time preference which discounts welfare of future generations (lower rates of

exponential as well as hyperbolic discounting). A valuable overview of the discussion of different concepts of social discount rent may be found in [14].

There is a fairly wide range of opinions on the correct CBA procedure among its advocates. Some insist on the application of the classic mainstream CBA based on the Kaldor-Hicks compensation criterion, exponential discounting, etc. Others tend towards the accurate application of a less commonly used CBA method, such as the use of hyperbolic discounting and distribution weights of votes. Yet others refuse mechanistic adoption of the CBA methodology from textbooks and call for a certain flexibility. As stated by Adler and Posner [1], who defend the need for flexibility in drafting CBA techniques for specific applications, practical executions of CBA have to provide room for deontological ethics, for instance. This means that CBA recommendations may in no case violate some ethical rules: theft must not be recommended even if its social benefits outweigh its costs. They also say that CBA analyses should always respect the specific distribution of wealth in a society.

The pliability of the CBA method is related to one of the fundamental questions of its application. The possibility of choosing the CBA method results in a situation in which one CBA performer proves the net social benefit of a measure while another disproves it. A famous recent example is the debate of the appropriateness of investing in prevention of global climate change. According to Stern [27], investing in preventive measures in climate change pays off very well to society. Nordhaus [21] refutes Stern's result. In his view, Stern's analysis only arrives at that conclusion due to its use of a very low discount rate which was in Stern's analysis derived from a very low pure rate of social time preference and a specific utility function.

3. Questions Concerning Practical Application of CBA in a Czech Republic Example

Currently, the Czech Republic sees a wide application of CBA although there is no legal obligation for governmental agencies to employ CBA in their decision-making. There has admittedly been an obligation for the supreme state administration bodies to apply RIA when deciding about the establishment and form of

any generally binding legal regulation in the Czech Republic since 2007. The Czech legal system does not impose any obligation to use a specific qualitative or quantitative analysis, such as CBA, as part of RIA. The choice is therefore up to the RIA performer (Government Resolution no 922/2011 Coll.). A large number of CBA are currently made chiefly for the purposes of obtaining subsidies from EU Funds. Applicants have frequently been required to elaborate CBA under the EU Structural Fund programming period 2007–2013 (see subsidy conditions of operational programmes and regional operational programmes of the Czech Republic). For an applicant to obtain a subsidy from the EU Funds, the CBA has to prove positive net social benefits of his project. In many programmes (e.g. Regional Operational Programmes and Operational Programmes Transport), the requirement to provide CBA has been derived from the project cost amount. A CBA has to be performed if project costs exceed a certain amount, typically tens or hundreds of millions of CZK (roughly units or tens of millions of EURO), depending on the conditions of each operational programme.

We demonstrate the chain of players in the Czech model of CBA performance for obtaining subsidies from EU Funds by the following scheme:

CBA performer → subsidy applicant →
→ officials processing subsidies → the public

Subsidy applicants are responsible for providing CBA for their projects on their own. They typically commission the CBA with commercial contractors offering such services. Subsidy applicants pay for the elaboration of CBA with their own funds. The CBA performer is therefore in a contractor-customer relationship with the applicant. The CBA client is a customer whose interest is to prove a positive net social benefit of the project in order to obtain the subsidy. It is in the interest of the contractor to accommodate the customer. The CBA performer can choose many ways how to do so. We showed methodological disunities which may affect the CBA result above. CBA results can be further affected, for example, by the method of predicting future benefits and costs, the choice of “significant” and “unimportant” benefits and costs, which either enter the CBA or not, or the definition of stakeholders [13].

CBA results are therefore relatively easy to manipulate. The opportunity for influencing CBA results is supported by the fact that few people understand its methodology. Reviewing the correctness of CBA procedures is thus made difficult.

In the Czech Republic, the CBA performer bears no liability for its potential incorrectness. Anyone may offer CBA performance. No licence whatsoever is required that could be suspended or revoked if deficiencies are found in elaborated CBA, as is the case with the driving licence if you fail to comply with set rules. This, however, leads to a concern about the impartiality and expert level of CBA performed for the purposes of applications for EU funding. For the officials deciding on the subsidy, as well as for the public, in whose interest is not to waste money on unjustified projects, it is theoretically possible to supervise CBA. However, the general knowledge of the CBA methodology is very weak. This can be inferred from the fact that CBA methodology is not included in the overwhelming majority of university economic curricula. In such a situation, conscious officials or conscious members of the public cannot be expected to perform an effective review. Moreover, taking into account the arguments of the public choice school, such as officials’ action to their own benefit, rational ignorance of voters, or the disadvantage of the public as a specific interest group consisting in its low level of organisation, an effective review and the discovery of potential errors in real-world CBA cannot be expected.

4. The Survey among Czech CBA Performers

In order to confirm our hypothesis of the low level of expertise and impartiality in performing CBA for purposes of EU subsidy applications, we carried out a survey among CBA performers. We addressed six randomly chosen commercial corporations which offer consulting in the area of EU Structural Funds including CBA performance on the Czech market (according to expert judgement there are tens of such corporations there). The survey method chosen was a questionnaire with open-ended questions joined with a face-to-face interview. We questioned a representative from each of these corporations who takes part in performing CBA. The rate of response return was 100%. We inquired about (i) the

expert background of addressed corporations concerning CBA performance, (ii) the methods used in CBA by their corporation, and (iii) the rate of CBA performed by their corporation proving a welfare increase.

The answers to (i) uncovered that employees pursuing CBA are not necessarily economists and therefore did not usually get in contact with CBA until in their job. If they are economists, they also often got in contact with CBA in their job for the first time. To be able to elaborate CBA, CBA performers in these companies use EU or national guides to CBA, visit additional training courses or learn about CBA from their colleagues.

As can be inferred from the answers to (ii), none of the addressed companies used an exact and reliable scientific method of CBA performance as known to economic theory and as presented in economic textbooks, e.g. in [13]. As the responses of corporation representatives show, these corporations did not discuss the choice of benefits and costs entering CBA thoroughly. The choice of CBA inputs for appraisal was executed by the CBA performer without any support for his or her choice in academic sources. These chosen benefits and costs were subsequently assessed with the utilisation of following data sources: clients of these corporations at the first place, less frequently existing statistical data (mainly from Czech Statistical Office), and own expert judgements. None of the addressed respondent collected data on his own and used standard methods for benefits and costs valuation described in economic textbooks, e.g. in [9], such as contingent valuation, or the hedonic price method. A typical procedure of the data formation and data processing in CBA performed by corporations in our sample may be demonstrated on a case described by one of respondents. The case deals with the calculation of benefits thanks to a school building reconstruction. The assumption of the performer was as follows: the school building reconstruction leads to a better learning environment and therefore better employment opportunities of graduates due to better learning outcomes. Better employment opportunities further lead to higher wages of graduates. The increase of wages is one of the project benefits. The CBA performer stated that to evaluate this benefit, he took the data of the number of school graduates from his client,

used statistical data about the average wage in the particular field of study, and performed an expert judgement about the increase of graduates' wages above the average due to the school reconstruction. Annual benefits equalled the sum of wage increases of graduates in a particular year. It is not clear however, if and to which degree a better school environment leads to higher education outcomes. The CBA performer did neither cite any study to prove his hypothesis, nor did he realise his own survey testing this hypothesis. This benefit may equal to zero and loses its validity. A similar situation in the approach to costs and benefits' appraisal occurred in other companies of our sample. The unavoidable consequence is the loss of information power of these CBA results.

The answers to the rate of CBA results proving a welfare increase (iii) ranged between 90% and 100%. It shows a high rate of CBA proving a welfare increase by assessed projects. A bias in favour of the client can be demonstrated on the following statement of a respondent. He stated that the costs and benefits valuation is just manipulation with numbers to prove beneficial effects of projects for his customers.

It can be inferred from this survey that at least a certain non-negligible segment of the commercial CBA performers processes CBA in an insufficient quality. At the same time, our findings lead us to conclude that CBA are not performed impartially and are frequently purely formal. The validity of our survey results may be supported in a broader context by the conclusion of the UK National Audit Office survey (cited in [23]) which was based on the assessment of performed RIA. According to this survey, the economic quality of English RIA using the cost-benefit appraisal is poor due to the poor quantification of benefits as well as poor transparency of data sources. In this context, the overall situation in the widespread use of CBA seems unsatisfactory.

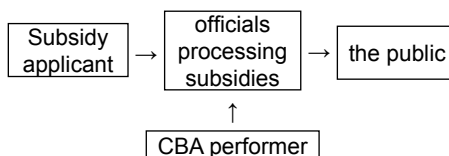
5. Deliberations on a Solution

The current way of applying CBA for the purposes of applying for EU funding often leads to mendacious, unreliable conclusions. In addition, a precisely performed CBA is costly and time consuming due to the need of expressing all the benefits and costs in monetary terms based on valuation methods discussed in economic textbooks, e.g. [9].

Therefore the application of less demanding alternative evaluation instruments from the point of view of their methodology, where feasible, appears to be the first possible solution to the unsatisfactory use of CBA. Among others, an alternative instrument is cost-effectiveness analysis (CEA) or cost-utility analysis (CUA), or other methods, such as discussed in [28]. CEA can be applied where a clear political goal is declared that can be reflected by a single measure of effectiveness and only the most effective path towards this goal is sought [18]. CEA enables to choose projects that generate the greatest effect per dollar spent. CUA is a close relative to CEA. It works with the preferences of individuals and seeks to choose a project, from which highest satisfaction of individuals per dollar spent is gained. This satisfaction is called utility. CUA works with a single measure or multiple measures of effectiveness [18]. Similarly to CEA, the outcomes of alternatives are not necessarily expressed in monetary terms in CUA.

CEA and CUA are widely used in healthcare [24] or education [18]. These areas are characterised by a very difficult expression of non-monetary effects in monetary terms. There is no reason why CEA or CUA could not be applied more frequently in other areas too, such as projects' selection for EU funding, for instance in environmental protection area. Air pollution may be taken as an example of an area which may profit from the use of these methods. Pollution limits for substances such as PM10 (fine dust particles in the air) are exceeded in many regions and their reduction can be part of policy objectives defined in Operational Programmes for EU funding. When a policy objective is set, the most cost-effective way towards its fulfilment is sought. Measures reducing the emissions of PM10 to the air frequently have additional outcomes too, such as a reduction in the emissions of sulphur dioxide and greenhouse gases. CEA would not take these side effects into account. CUA would take them into consideration by the assignment of specific weights to different pollutants. Neither CEA nor CUA are problem-free in their practical applications however. [17] bring ex-post evaluation of twenty four CE studies of cancer therapies and find considerable methodological flaws in a significant number of them. Similarly, [11] critically appraised fifty-four CU studies in child health with a similar conclusion.

Alternative methods cannot be applied to projects that are original by nature and whose necessity is not clearly defined by a political decision. CBA may appear as the only suitable criterion for decisions particularly in such cases. However, CBA results have to be trusted then. The results will only be trustworthy if the author's professionalism and interest in performing CBA impartial can be relied upon. CBA performers must not be answerable to EU funding applicants to decrease the bias. The chain of players for the CBA elaboration for obtaining subsidies from EU Funds needs to be changed accordingly to enable an unbiased review of the project by CBA. Therefore we propose the following mechanism:



The reliability of the analyses will also be supported by the strict publication of the full CBA procedures that will enable an expert discussion of the CBA methodology and inputs, thus a more effective control. The CBA procedure must not be a black box. The possibility of a more effective control may at least decrease the rate of the deliberate manipulation of the CBA results. The trustworthiness of CBA would be much helped if their performers were liable for clearly unprofessional CBA. This could be helped by publishing a kind of a blacklist of unprofessional CBA performers or certification of expert CBA performers if the certificate might be suspended or revoked upon the identification of clearly unprofessional CBA.

Conclusion

Generally speaking, there is an agreement among mainstream economists that in a certain form and circumstances, CBA is the best possible evaluation tool for public sector decision-making. CBA introduces a certain order to decision-making. The possibility of arguing based on its results improves the transparency of decision-making and allows more effective control over politicians' actions. Nonetheless, CBA faces considerable practical problems which may impose limitation on its use.

The paper deals with the question of trustworthiness of practical execution of CBA on

an example of CBA performance. Our concerns relate to the interest in bending the CBA results for one's own benefit. We present results of the survey among performers of CBA for purposes of EU subsidy applications. We examine the situation of the Czech Republic.

The person choosing the CBA performer for the purposes of project appraisal for EU funding is at the same time the subsidy applicant and thus with a clear interest in the optimistic result of the CBA. As our survey among commercial CBA performers shows, many entities performing CBA lack expert background for CBA performance and performed CBA are often biased and misleading. CBA performers are not required to obtain any certificates before performing CBA, meaning virtually anyone is free to offer CBA performance on the market. Another reason for inexpert CBA outcomes is the fact that the complicated CBA methodology prohibits a good awareness of it among the public, officials and politicians, rendering the effective review of CBA outcomes difficult. The relevance of the CBA results is questionable in such an environment.

Some conclusions and recommendations can be drawn from the above. Less demanding methods, such as CEA or CUA can be employed in decision-making instead of CBA, if feasible. We may wish to use CBA if other analyses cannot be applied in the given case. However, CBA results have to be trustworthy. The trustworthiness of CBA would be much helped if its performer was not answerable with the CBA result to the EU subsidy applicant and was liable for any unprofessional CBA. CBA performance makes sense only if we can rely on its results.

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Abstract

COST-BENEFIT ANALYSIS: TOO OFTEN BIASED**Eliška Vejchodská**

Cost-benefit analysis (CBA) is widely applied in many countries in evaluating public projects and regulatory instruments. It is employed, for example, as a basis for decisions within the European Union's subsidy policy. CBA enables to express the comprehensive effect of a project or a governmental regulation on social welfare and thereby to introduce expertise to political decision-making. However, its practical applications face many problems. Different methodological choices in performing CBA enable to obtain diametrically opposite conclusions. Moreover, the way how investors apply for EU Fund subsidies encourages CBA performers to adjust CBA results to requirements of subsidy applicants. The unavoidable consequence is frequently mendacious, unreliable and misleading CBA. The paper brings an overview of the flexibility in CBA methodological choices. It further focuses on analysing the CBA performance practice in the area of CBA project appraisal for the purposes of applying for EU funding. We examine the reasons for manipulating results using a theoretical analysis and support our findings by our own empirical survey among CBA performers. As our survey among commercial CBA performers uncovers, many entities performing CBA lack expert background for CBA performance and performed CBA are often biased and misleading. Our theoretical analysis shows its main reason: The person choosing and remunerating the CBA performer for the purposes of a project appraisal for EU funding is at the same time the subsidy applicant and thus with a clear interest in the optimistic result of the CBA. CBA performers are happy to oblige their customers. The remedy to this situation is to get rid of this unintentional alliance among CBA performers and subsidy applicants.

Key Words: Cost-benefit analysis, CBA, bias, reflection, Czech Republic.

JEL Classification: D61, Q38.

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DOES CONCENTRATION OF OWNERSHIP AND FAMILY CONTROL AFFECT SPECIALISATION/DIVERSIFICATION BUSINESS STRATEGIES?

Alejandro Hernández-Trasobares, Carmen Galve-Górriz

Introduction

Interest in diversification has largely focused on three topics: the way in which business diversification can be measured [19], [35], [48], [60], [69], the relationship between diversification and business results and the factors that determine diversification [4], [6], [11], [12], [17], [26], [27], [36], [41], [50], [58], [70], [71], [74], [72]. However, less attention has been paid to the impact of ownership structure (concentration and main shareholder) on degree of business diversification [13], [14], [16], [19], [30], [31], [63], [76]. Although some authors mention, in theoretical terms, the importance of concentration of ownership [2], [15], [30], [44] and the type of shareholder/s that effectively control the firm [19], [54] [55], [71], [75], in an analysis of business diversification, very few studies have analyzed empirically said impact, with exceptions focusing on the US, European and Asian corporations [3], [11], [15], [19], [25], [27], [29], [40], [58], [50], [74]. The results found in the literature regarding corporate diversification strategy are not conclusive, due to differences in the concept of diversification and measurements used for its study [5], [49].

This study shares the objective of learning more about corporate diversification strategies in relation to type of controlling shareholder or group, more specifically we study impact of ownership structure on degree and type of business diversification. The study differs in several ways, however, from previous research. First, we use data that is largely taken from the information supplied by firms to the Spanish Stock Market Commission (Comisión Nacional del Mercado de Valores). This should guarantee its reliability. Secondly, unlike most of the previous studies, in which the firm itself is the unit of analysis, our diversification study uses the pyramidal group of independent firms controlled by the same parent company; as most

of the determinant factors of diversification are similar to the factors that explain the existence of pyramidal groups of firms, we believe that it is more pertinent to study type and degree of business diversification in relation to the entire group rather than the parent company (Bertrand, Johnson, Samphantarak and Schoar [7], Bru and Crespi [9], and Hernández and Galve [33]). Thirdly, we present comparisons of the growth strategies (diversification versus specialisation) adopted by business groups controlled by a family, by foreign capital, by a bank or several shareholders, none of which have effective control of the firm.

The paper is organized as follows: section 1 refers to the theoretical development of diversification covering the analysis of diversification from a pyramidal group perspective and the influence of ownership structure. Section 2 deals with research method, including the sample, the variables measurement and the methodology. Finally, section 3 presents the results and conclusions.

1. Theoretical Development of Diversification: Group Pyramidal and Ownership Structure

1.1 Analysis of Diversification from a Pyramidal Group Perspective

Diversification implies a firm moving into a number of markets (sectors, industries or segment) it was not previously engaged in. For several decades, product diversification has been a highly popular strategy among large and growing industrial firms in the industrialized world. Firm uses three main strategies to diversify across product segment like vertical integration, related diversification and unrelated diversification.

Most of the studies on diversification have been focused on aspects such as the “extent” of diversification (i.e. less or more diversification), the “directions” (i.e. related or unrelated), and the “mode” (i.e. diversification via internal expansion or diversification via mergers and acquisitions of firms). Some empirical studies obtain that diversifying into related product-markets produces higher returns than diversifying into unrelated product-markets and less diversified firms performs better than highly diversified firms [64].

During the 60s and 70s, many companies used acquisitions of companies such as instrument for industrial diversification. The risk-averse firms minimized their risk by acquiring companies in other sectors, increasing their profits through greater economies of scale and scope. The success of diversification, using acquisitions as a means to diversify, is linked to a variety of factors such as company resources, legal and regulatory restrictions, and the macroeconomic environment. Moreover, the failure may be due to factors as diverse as the reason for purchase was not the acquisition of synergies but pursue personal interests of managers.

A review of the literature about factors explaining corporate diversification shows that most studies take the firm itself as their unit of analysis. As far as we know, there are very few studies that analyze pyramidal corporations. However, the development of international communications and information technologies in the last few years, together with the deregulation of economic and financial trade, has accelerated market and business globalisation, giving rise to a gap between firm size and the much larger size of the market. This need for a larger dimension in order to compete on increasingly globalised markets and the inability of firms to develop all the resources and capabilities required for success without help, leads firms to establish different arrangements with other firms in order to attain these targets. In such a changing situation, firms have become involved in complex processes of structural and organizational reforms, and there has been a heavy increase in pyramidal groups as organizations capable of finding balance between the flexibility provided by the market and the coordination and stability derives from activity insourcing.

Pyramidal groups are defined as organization in which legally independent

enterprises are controlled by the same entrepreneur (the parent company) through an ownership chain. This study, in order to avoid a biased view of business decisions related to diversification strategy, the unit used for our analysis of diversification is a pyramidal group of companies. The reason is that most of the factors that determine diversification are similar to the factors that explain the existence of pyramidal groups of companies, so we believe that it is more pertinent to study type and degree of business diversification in relation to business groups rather than their parent companies.

The reasons for the formation of business groups can be divided into a) group members can satisfy their financing needs by making use of internal funds available in the group, b) group members can also overcome the inefficiencies of factor or supplementary service markets when the group is of companies each of which is involved in at least one of the activities in the value chain, and c) the group also enables its members to make use of the know-how and capability of other members, to access new technologies and to reduce risks. Furthermore, groups can also be created for much more obscure reasons related to obtaining private profits (through tunnelling strategies), tax evasion and the exercise of market power [57].

1.2 Ownership Concentration, Family Control and Diversification: Theory and Research Hypotheses

There is not much literature analysing the relationship between concentration of ownership and familial nature of last owner and type of diversification [29], [41], [54] and it is more common to find studied that investigate the impact of different types of diversification on performance. There are different alternatives [64], [65] and the most common are related and unrelated. Diversification in related businesses makes better use of economies of scale and scope, increasing the value created by the firm [66] and enabling said businesses to benefit from the firm's core activity and customer base [59]; related diversification makes better use of the business's core resources and skills [8] is less complex and incurs less costs. Unrelated diversification, however, increases the firm's market power [56], reducing income variability and the likelihood of bankruptcy [42] and benefiting from an internal capital market [66].

Many researchers have attempted to

understand the applicability of several theories to approximate and explain firm's diversification behavior. The most commonly used approaches or theories in the study of diversification include:

- a) Transaction Cost Theory and Industrial Economy Theory, which sustain that diversification is for external and market reasons (search for new market opportunities, reduce transaction costs when they exceed the cost of insourcing certain activities, search for market power). According to Transaction Cost Theory firms diversify their activities in response to the existence of unutilized resources and nature of these resources.
- b) Resource and Capability Theory, according to which diversification is due to internal reasons (manager's ability to exploit commotions and discover new opportunities, availability of indivisible internal resources and public resources that can be used to obtain different products or provide services with the same efficacy).

In this paper we mainly use the Agency Theory approach, according to which diversification can be for efficiency, management or tunnelling reasons, depending on degree of concentration of ownership and type of controlling shareholder. Although there is evidence of the importance of ownership structure and family ownership in degree of diversification [3], [15], [16], [30], [31], [63], [71], results are by no means conclusive. Literature refers to both positive and negative effects of concentration of ownership and family ownership on degree and type of diversification.

The perspective of agency theory says that the greater concentration of ownership, the greater the risk assumed by said owners and the greater their interest in reducing said risk by diversification strategy [22], [73]. Other authors, however, believe that greater diversification with greater concentration of ownership is not to reduce risk but because the majority shareholders (who are in turn the firm's managers) are seeking greater profits and benefits even if it is at the expense of the wealth of minority shareholders (this is known as tunnelling, which is defined as the transfer of firm assets and profits to controlling owners) (agency problem type II) [15], [39], [43], [47], [74].

On the other hand, with regards to type of shareholder or controlling group, Shleifer and Vishny [69], Fama and Jensen [23] and Faccio,

Lang and Young [21] say that family firms have considerable incentives for minimising risk given the non-diverse nature of family investment. Corporate diversification is an attractive strategic option for family firms, as it enables them to mitigate risk, reducing income and result variability [20], [21], [71].

However, the studies conducted by Jensen [37], Jensen & Murphy [38] and Hoskisson and Hitt [34] show that diversification is undertaken for managerial reasons (agency problem type I); the managers of firms with no controlling shareholders have economic and personal incentives to apply diversification strategies, even if it is detrimental for shareholders. Shleifer and Vishny [67] say that concentration of ownership is the most direct way in which to align the residual rights and control of external investors, limiting managerial discretionality and eliminating tunnelling-induced inefficiencies [68]. On the other hand, when a firm's managers are also shareholders, the more shares they own, the more their interests are in line with those of other shareholders, so there will be less diversification in the firm [6], [12], [17], [30]. In the specific case of family firms, the interests of family shareholders who are also managers will be in line with those of minority shareholders, so less diversification is to be expected [4], [19], [30], [51], [55], [71]. Friedland, Palmer and Stenbeck [24] show that family firms have less incentive to diversify for social and financial reasons. Diversification can endanger close personal relationships among family members, which could affect a firm's survival, which is one of its primary objectives: "to guarantee the firm's survival and long-term family control". Gómez-Mejía et al. [29] sustain that diversification involves a reduction in familial socio-emotional wealth (the negative effect of diversification on socio-emotional wealth is greater than its positive effect on reducing the concentration of risk, so family firms diversify less than non-family enterprises). On the other hand, diversification requires financial resources, which would weaken family control and increase financial risk if the firm decides to borrow [18].

With regards to deciding on one type of diversification, since the pioneer study by Rumelt [65], the literature generally refers to superior performance and productivity with related over unrelated diversification, with the former having a positive impact on performance

[46], [61], while the later has a negative impact on results and productivity [6], [10]; Unrelated diversification is used by managers to satisfy personal interests and obtain higher income and greater prestige [68] to the detriment of maximisation of shareholder utility and the firm's value [17]. Some studies, however, consider that there are no differences between the two types of diversification [32], [41].

With regards to the impact of ownership structure on decisions concerning type of diversification, we have seen that the greater the concentration of ownership, the less discretionality that managers have [68], reducing investments in unrelated businesses in an attempt to reduce managers' personal risk [1] and the lower the agency costs involved [17], preferring related diversification strategies that have a positive impact on business performance and are more likely to create value [9]. On the other hand, depending on the type of controlling shareholder, family firms with significant concentration of ownership may prefer unrelated diversification, as it reduces the risks supported by the family [45] by reducing income and result volatility [21]. This strategy, however, requires the use of new resources and skills that makes it more difficult and complex [20]. Moreover, family firms attempt to maintain control over the business and to ensure its survival [54], so they tend to invest in activities associated to lower costs and less uncertainty, preferring related diversification strategies that preserve their socio-emotional wealth [28].

We also considered the possibility of firms preferring a mixed strategy, simultaneously combined related and unrelated diversification. Mixed diversification requires more resources and is more complicated from an organizational perspective, increasing agency and information costs [73], which have a negative impact on performance. In firms with non-family managers, they are expected to prefer mixed diversification, as this option enables them to spread out their personal risk and increase their power [1].

Therefore, the following hypotheses are contemplated:

H1: Concentration of ownership favours a preference for a specialisation strategy rather than a diversification strategy.

H2: Family-controlled firms show a greater preference for specialisation than non-family firms.

H3: Family firms show a greater preference for diversification the greater the concentration of family ownership.

H4: Concentration of ownership favours a preference for related diversification rather than mixed or unrelated strategies.

H5a: Family-controlled firms show a greater preference for related diversification than non-family enterprises.

H5b: Family-controlled firms show a lower preference for mixed diversification than non-family enterprises.

H6: Family firms show a greater preference for unrelated diversification the greater the concentration of family ownership.

2. Research Method

2.1 Sample

The study starts with an initial sample of firms that traded on the Spanish stock markets in 2000–2005, operating in different sectors (the financial and energy sectors not are including because they have special regulations). Selection period is justified in the first place to avoid no comparative data since in 2007 a new law on takeover bids of companies takes effect [77]. The most important aspects introduced by the new law are the disappearing public offerings of mandatory partial acquisition (although there may be a voluntary basis) and will launch a mandatory tender offer for 100 percent of the capital of a company when it acquires at least 30 percent of voting rights or when participation increased by at least five per cent in less than 12 months. Furthermore, 2006 is not considered to be an atypical year, characterized as the period of greatest growth in sale and purchase of businesses (The number of mergers and acquisitions increased by 45 percent between 2005 and 2006 and the volume increases by nearly 70 percent) [77].

After eliminating firms for which all the information required for the study is not available, the final sample comprises 99 firms (594 observations). Specialisation and different types of diversification are determined from the annual reports supplied by the Stock Market Commission and the SABI-Infoma database, which provides precise information about non-listed firms controlled by a listed parent company. Finally, the ownership information required to define a firm as a family firm or not, and to identify the last owner in non-family

organizations, was obtained from the Stock Market Commission website and the SABI-Infoma database, occasionally resorting to secondary sources such as the media and the websites of the firms in the sample.

2.2 Variables Measurement

To measure degree of diversification, most studies only consider firm activities [3], [29], [41]. This study, however, considers the activities performed by the listed firm and those performed by the group of companies that it heads. This provides a more objective view of degree of diversification, as other studies ignore the activities of the firms that form part of the parent company's global strategy. Another reason for this analysis is the large number of family business groups in Spain. The study will thus obtain greater degrees of diversification than would be found if it only considered the parent company [11].

Following the Spanish General Accounting Plan, group companies are defined as firms over which the parent (listed) company has or could have direct or indirect effective control. According to the Spanish General Accounting Plan, control is defined as "when a (dominant) company is related to another (dependent) in any of the following ways:

- (a) it holds a majority of voting rights;
- (b) it is able to appoint or dismiss most of the members of the administrative body".

After analyzing the companies in each group, we analysed their annual accounts, using the SABI-Infoma database when group companies are not listed. This information enables us to identify the activities of each firm, using the CNAE 93 Rev. 1 classification (Spanish Economic Activity Classification code that identifies and classifies company according to their economic activity; It is an adaptation of the European NACE and similar to the Standard Industrial Classification, SIC).

The study shows the possibility of combining different diversification strategies, considering three alternatives: specialisation, a single type of diversification (related or unrelated) and mixed strategies, which involve both related and unrelated diversification. Following are the diversification variables used in the study:

1. Specialisation (SPECIALISATION): dummy variable; value is one when the listed firm and its group companies perform the same/a single activity and zero otherwise (the company has diverse activities).

2. Pure related diversification (PURE REL. DIV.): dummy variable; value is one when the number of related activities performed by the listed firm and/or its business group is two or more and zero otherwise. Related activities are defined as activities with the same two digits in the CNAE 93 Rev. 1 classification, in which the last two are different; they are activities that require similar resources and capabilities.

3. Pure unrelated diversification (PURE UNREL. DIV.): dummy variable; the value is one when the number of unrelated activities performed by the listed firm and/or its business group is two or more and zero otherwise. Unrelated activities are defined as activities in which the first two digits are different, which do not require similar resources and capabilities and are not common activities that form part of the listed company's value chain.

4. Mixed diversification (MIXED DIV.): dummy variable; the value is one when the firm combines related (PURE REL. DIV.) and unrelated (PURE UNREL. DIV.) diversification strategies.

With regards to ownership variables, there are a significant number of different definitions used to define a family firm [52]. In this study, a company is a family firm (FAMILY) when the family owns (directly or indirectly) the largest share package and one or several family members are in key managerial positions and on the board of directors. Furthermore, to confirm a correct classification, we identified their last owners, analysing horizontal and vertical ownership chains to obtain the same results [43]. On the other hand, a firm's characterisation as a non-family enterprise also depends on the last owner's identity, distinguishing between three control groups:

a) Firms controlled by foreign capital (FOREIGN); the last owners are individuals or corporations that are non-residents in Spain.

b) Firms under financial control (FINANCIAL); the last owners are banks or investment funds.

c) Non effective control (NEC); an organization in which there is no single owner with effective control, as the shareholders own similar blocks of shares. A firm characterized as with non effective control (NEC) includes both a firm with multiple anonymous shareholders, none of whom hold a significant share, and a firm with a small number of shareholders with similar significant holdings.

Degree of concentration of ownership is measured by the percentage of shares owned by the five largest shareholders (OWNERSHIP).

In line with previous research on the topic [3], [11], [29] we included the following control variables for the diversification study. We first considered firm size, measures by the logarithm of the total assets of the listed company (SIZE). Secondly, the age of the firm was established as the logarithm of the difference between two thousand and the year when the listed firm was established (AGE). Thirdly, the leverage of the listed firm was measured as the ratio between its total debts and total assets (LEVERAGE). Fourthly, investment in research and development was measured as the ratio between total intangible assets and total assets (R&D). A dummy variable was also included, with a value of 1 when there had been a structural change in the listed firm, and 0 otherwise (SCD); this variable enabled us to control listed firms that had been involved in mergers and/or buyouts in 2000–2005, which could represent an important change in their degree or type of diversification.

2.3 Methodology

We first performed a descriptive study of the sample firms and the correlations between the different variables. Secondly, we examined the distribution of the firms in the sample according to diversification strategy, distinguishing between different types of firms attending to the nature of the shareholder of control. Finally, several binary logistic regression models were formulated for each of the dependent variables, to verify the validity of the models [62]. The SPSS 15.0 computer package was used throughout.

3. Results and Discussion

Table 1 shows the mean values, standard deviations and bilateral correlations between the variables used in the study. The data show that 24% of business groups prefer specialization, 20% prefer pure diversification strategies (18% diversify in unrelated and 2% in related businesses) and more than half (56%) prefer mixed diversification. These findings are consistent given that listed companies that are studied, which are characterized by a larger size and the employment of pyramidal groups to diversification. The bilateral correlations between the primary variables show that

concentration of ownership is positively associated to specialization and pure related diversification and negatively associated to mixed diversification and firm size. Family control is positively correlated to concentration of ownership, specialization and pure related diversification and negatively correlated to mixed diversification. Firms with financial control or no effective control are negatively related to specialization and positively related to mixed diversification. There are, however, no significant correlations in specialization/diversification preferences for firms controlled by foreign capital. Therefore, at first is observed as the highest ownership concentration and family character promote specialization and related diversification strategies, and decrease the likelihood of using mixed diversification strategies.

Table 2 shows the distribution of the firms in the sample according to diversification strategy, distinguishing between different types of firm with reference to type of controlling shareholder (last owner). The sample is dominated by family firms (58.08%), followed by firms without effective control (19.20%), financial firms (15.92%) and, finally, firms controlled by foreign capital (6.90%). The results show that, irrespective of who controls the company, 24% of the firms prefer specialization, more than half prefer mixed diversification (56.4%) and only 19.7% choose pure diversification (17.8% unrelated and only 1.9% related diversification). Secondly, in relation to the type of controlling shareholder, the data reveal differences, with family firms preferring specialization (32.5%) and pure related diversification (2.9%) more than non-family enterprises, and showing less preference for mixed diversification strategies (47.5%). Ten of the eleven firms that only use related diversification are family businesses. Thirdly, in relation to non-family firms, we found that firms with no effective shareholder control present greater levels of pure unrelated diversification (26.3%) and lower levels of specialization (7.9%). Firms controlled by foreign capital or banks use similar diversification strategies.

Table 3 shows the results of the different binomial logistic models that explain the impact of concentration of ownership and type of controlling shareholder (last owner) on specialization and diversification strategies (distinguishing between pure unrelated

and mixed diversification). There is no multicollinearity between the explanatory variables of any of the models [53].

When studying the impact of being a family firm on specialization/diversification, we not only considered family versus non-family enterprises, but also identified the last owner of the non-family organizations (distinguishing between firms controlled by foreign capital, under financial control and with no effective control), performing a more precise analysis of the Logit model. We also considered the interaction between family control and concentration of ownership in order to assess possible differences in the behaviour of families due to differences in concentration of ownership. The results of the specialization strategy models (models 1, 3 and 4) reveal a positive impact of concentration of ownership on choice of this strategy, confirming H1 (results similar to those obtained by Amihud & Lev [1] and Goranova et al. [30]). Ownership concentration allows aligning the residual rights and controlling external investors, limiting managerial discretionality (agency problem type I) [67].

On the other hand, with regards to type of principal shareholder, models 2, 3 and

4 show, firstly, that family-controlled firm use specialization (through their group of companies) more than non-family enterprises (controlled by foreign capital, by several shareholders none of whom control the firm alone and controlled by a bank), confirming H2 (results similar to those found by Anderson & Reeb [3]; Gómez-Mejía et al. [29]). The interest of family shareholders will be in line with those of minority shareholders, the agency problem type I (manager vs. shareholders) will be less important, and the employment of diversification strategies will be decreased [4], [19], [55], [71].

Secondly, family firms with greater concentration of ownership specialize less than those with less concentration of ownership, confirming H3 and showing different behaviour by family firms depending on concentration of ownership [3], [51]. This may be because the greater concentration of family ownership, the greater the risk assumed by family members, and diversification strategy allows reducing said risk. Furthermore, greater ownership concentration facilitates the minority shareholders wealth expropriation by family (tunneling), appearing an agency problem type II [15], [39], [74]. Finally, with regards to firm size and involvement in mergers/acquisitions, they

Tab. 1: Descriptive statistics and correlations between variables (rho de Spearman)

	MEAN	SD	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1. OWNERSHIP	57.24	24.78	1.00														
2. SIZE	11.95	1.58	-0.115**	1.000													
3. AGE	3.63	0.71	0.015	0.030	1.000												
4. LEVERAGE	0.37	0.22	0.059	0.463**	0.103*	1.000											
5. R&D	0.03	0.08	-0.030	0.280**	-0.003	0.185**	1.000										
6. DSC	0.22	0.41	0.038	0.580**	-0.034	0.203**	0.044	1.000									
7. FAMILY	0.58	0.49	0.242**	-0.324**	-0.103*	-0.030	-0.127**	-0.145**	1.000								
8. FOREIGN	0.07	0.25	0.098*	0.140**	-0.004	-0.079	-0.030	0.014	-0.321**	1.000							
9. FINANCIAL	0.16	0.36	-0.190**	0.190**	-0.033	0.040	0.053	0.090*	-0.510**	-0.118**	1.000						
10. NCE	0.19	0.39	-0.190**	0.140**	0.162**	0.052	0.130**	0.089*	-0.574**	-0.133**	-0.211**	1.000					
11. SPECIALISATION	0.24	0.42	0.234**	-0.524**	-0.008	-0.086*	-0.245**	-0.290**	0.236**	-0.044	-0.092*	-0.183**	1.000				
12. PURE DIV.	0.20	0.04	-0.010	-0.182**	-0.047	-0.176**	0.076	-0.173**	0.009	-0.035	-0.087*	0.092*	-0.278**	1.000			
13. PURE REL. DIV.	0.02	0.13	0.114**	-0.062	-0.115**	-0.025	-0.102*	0.017	0.091*	-0.037	-0.060	-0.035	-0.077	0.277**	1.000		
14. PURE UNREL. DIV.	0.18	0.38	-0.050	-0.167**	-0.008	-0.174**	0.115**	-0.186**	-0.023	-0.023	-0.070	0.108**	-0.261**	0.941**	-0.064	1.000	
15. MIXED DIV.	0.56	0.49	-0.194**	0.597**	0.045	0.216**	0.150**	0.388**	-0.210**	0.065	0.149**	0.084*	-0.637**	-0.563**	-0.156**	-0.530**	1.000

* p < .10. ** p < .05. *** p < .01

Source: own

Tab. 2: Diversification strategies according to firm's ultimate owner

	TOTAL		FAMILY		FOREIGN		FINANCIAL		NCE		Chi-squared
	N	%	N	%	N	%	N	%	N	%	
1. SPECIALISATION	142	23.9	112	32.5	7	17.1	14	14.9	9	7.9	35.205***
2. PURE DIV.	117	19.7	69	20.0	6	14.6	11	11.7	31	27.2	8.533**
2.1 PURE REL. DIV.	11	1.9	10	2.9	-	---	-	---	1	0.9	5.223
2.2 PURE UNREL. DIV	106	17.8	59	17.1	6	14.6	11	11.7	30	26.3	8.147**
3. MIXED DIV.	335	56.40	164	47.5	28	68.3	69	73.4	74	64.9	27.793***
TOTAL	594	100	345	58.08	41	6.90	94	15.82	114	19.20	

* p < .10. ** p < .05. *** p < .01

Source: own

Tab. 3: Binomial Logit: Specialisation, Mixed Diversification and Pure Unrelated Diversification

	SPECIALISATION				MIXED DIVERSIFICATION				PURE UNRELATE DIVERSIFICATION			
	(1) β -coef (wald)	(2) β -coef (wald)	(3) β -coef (wald)	(4) β -coef (wald)	(5) β -coef (wald)	(6) β -coef (wald)	(7) β -coef (wald)	(8) β -coef (wald)	(9) β -coef (wald)	(10) β -coef (wald)	(11) β -coef (wald)	(12) β -coef (wald)
CONSTANT	10.386*** (40.713)	10.575*** (36.732)	9.379*** (26.913)	8.924*** (23.712)	-11.421*** (64.513)	-12.331*** (66.298)	-11.443*** (55.269)	-11.513*** (54.681)	-0.826 (0.430)	-0.074 (0.003)	0.136 (0.010)	0.415 (0.086)
OWNER-SHIP	2.505*** (18.767)		2.110*** (11.300)	3.946*** (12.848)	-1.790*** (14.711)		-1.937*** (13.885)	-3.365*** (21.543)	-0.499 (1.177)		-0.281 (0.311)	0.940 (1.853)
FAMILY		1.362*** (10.026)	0.869** (3.881)	2.346*** (7.801)		-0.142 (0.231)	0.155 (0.264)	-1.521** (5.594)		-0.762*** (6.760)	-0.714** (5.468)	0.645 (1.132)
FOREIGN		1.842*** (8.802)	0.976 (2.194)	0.345 (0.232)		-0.249 (0.293)	0.406 (0.669)	0.788 (2.268)		-0.904* (3.116)	-0.815 (2.319)	-1.143** (4.154)
FINANCIAL		1.382** (6.435)	1.144** (4.155)	0.983* (2.755)		0.208 (0.295)	0.139 (0.126)	0.035 (0.008)		-1.032** (6.421)	-1.036** (6.433)	-1.017** (6.269)
OWNER-SHIP * FAMILY				-2.860** (4.442)				3.020*** (8.815)				-2.646** (6.604)
SIZE	-1.350*** (83.913)	-1.393*** (87.202)	-1.345*** (77.294)	-1.367*** (79.653)	1.095*** (84.530)	1.109*** (83.493)	1.084*** (76.555)	1.150*** (79.662)	0.010 (0.011)	0.017 (0.028)	0.005 (0.002)	-0.046 (0.192)
AGE	0.352 (2.691)	0.486** (4.926)	0.460** (4.229)	0.419* (3.389)	-0.036 (0.055)	-0.084 (0.281)	-0.019 (0.014)	0.017 (0.010)	0.079 (0.221)	-0.040 (0.055)	-0.031 (0.032)	-0.106 (0.354)
LEVERAGE	2.979*** (16.933)	3.220*** (21.151)	2.978*** (16.715)	2.982*** (3.389)	-0.472 (0.695)	-0.773 (1.964)	-0.425 (0.547)	-0.663 (1.308)	-1.869*** (9.613)	-1.894*** (9.927)	-1.831*** (8.973)	-1.733*** (8.023)
SCD	-2.300** (4.778)	-1.738* (2.758)	-2.213** (4.355)	-2.119** (4.038)	1.241*** (8.960)	0.822** (4.350)	1.322*** (9.508)	1.274*** (8.644)	-1.577*** (10.587)	-1.715*** (12.664)	-1.664*** (11.464)	-1.658*** (10.997)
R&D	2.433 (2.003)	2.440 (2.290)	2.905 (2.618)	3.680* (3.829)	-3.833** (6.441)	-3.134** (4.167)	-3.686** (5.896)	-4.683*** (8.708)	1.672 (1.873)	1.234 (0.975)	1.181 (0.873)	1.967 (2.330)
N	594	594	594	594	594	594	594	594	594	594	594	594
Likelihood Ratio	394.537	400.762	389.082	384.485	527.385	541.134	526.693	517.549	511.250	503.227	502.916	496.239
Chi-square	248.755***	242.531***	254.210***	258.807***	273.800***	260.052***	274.493***	283.636***	41.998***	50.021***	50.331***	57.009***
R2 Cox and Snell	0.347	0.340	0.353	0.358	0.374	0.359	0.375	0.385	0.069	0.082	0.083	0.093
R2 Nagelkerke	0.520	0.509	0.529	0.536	0.501	0.481	0.502	0.515	0.113	0.134	0.135	0.152
Corrected classified	85.1%	83.9%	85.4%	85.1%	81.7%	80.8%	80.7%	80.8%	82.2%	81.8%	82.0%	82.2%

* p < .10. ** p < .05. *** p < .01

Source: own

are negatively related to specialization (similar results to those obtained by Anderson & Reeb [3], Gómez-Mejía et al. [29] for size and by Miller et al. [55] for the merger/acquisition variable).

Table 3 also analyses the impact of concentration of ownership and family nature of business on diversification, with firms preferring pure (only one type of related or unrelated diversification) or mixed diversification (firms diversify their activities in related or unrelated manners). None of the firms that use pure related diversification are controlled by foreign agents or banks (Tab. 2), confirming partially H5a (is not possible to make a binomial logistic model). The results of the complete mixed diversification model (model 8) show a negative impact of concentration of ownership on the choice of this type of strategy, confirming H4. The greater ownership concentration, the less discretionality that managers have [68], reducing agency problem type I (lower agency costs [16]), and decreasing investments in unrelated businesses, preferring related diversification strategies that have a positive impact on business performance [9].

On the other hand, the data reveal that family firms prefer mixed diversification less than non-family enterprises (confirming H5b), because these strategies are associate to higher costs and more uncertainty, which can decrease socio-emotional wealth [28]. Moreover, mixed diversification strategies require the use of new resources and skills which may not own family firm [28].

However, family firms with greater concentration of ownership prefer mixed diversification strategies more than family businesses with less concentration of ownership (confirming H6). Family firms with significant concentration of ownership may prefer mixed diversification, as it reduces the risks supported by the family [45] by reducing income and result volatility [21]. Moreover, the higher family ownership the higher probability of occurrence of agency problem type II (majority shareholder vs. minority shareholder).

The models explain specialization and mixed diversification very well, although not unrelated diversification strategies, presumably due to the very small number of firms controlled by foreign capital (6) or banks (11) that choose this strategy.

Conclusion

This study aims to characterise and analyse the impact of ownership structure on specialization and diversification strategies (distinguishing between related, unrelated and mixed diversification), according to both concentration of ownership and type of controlling shareholder. The study is not only original because it studies diversification in relation to ownership structure, but because it also analyses diversification using corporate groups rather than parent companies. After selecting a representative sample of the leading companies trading on the Spanish stock exchange, we tested our hypotheses using binomial logistic regression and different statistical tests. Family firms represent more than half the firms in the sample, followed in order of importance by firms where no single shareholder has effective control (less than 25% in 2005), firms under financial control (around 12% of the sample) and firms controlled by foreign capital (less than 10%).

The results show the importance of the ownership structure on diversification strategy adopted by the business group [15], [19], [30], [31], [63], [76], [16]. We test how ownership concentration and family control have a positive impact on the decision to specialize. The higher ownership concentration decrease agency cost, due to alignment between majority shareholders and minority shareholders interest. Higher ownership concentration solves agency problem type I, that is, reduces discretionary power of managers and decrease diversification (increase specialization) [30], [34], [68]. Also family firms adopt specialization strategies due to diversification can damage socio-emotional wealth [29] or family firm does not have the resources needed to carry out new activities [10]. However, greater family control (higher ownership concentration) decrease specialization. This may be due to appearance of tunneling, where family shareholders are seeking greater profits and benefits even if it is at the expense of the wealth of minority shareholders (agency problem type II) [15], [39], [74].

When considering the type of diversification strategy, we found that ownership concentration presents a negative impact on mixed diversification. Lower ownership concentration increase manager discretionality, so managers will use mixed diversification strategies to decrease personal risk and

obtain higher income and greater prestige [68]. Higher ownership concentration will decrease manager discretionality and therefore mixed diversification strategies will be less used. Family firms use more related diversification strategies and less mixed diversification than non-family firms. Family firms try to ensure firm survival and select those strategies that maintain socio-emotional wealth and/or allow value creation [28], [55]. This causes a preference for related diversification, which generally has a positive impact on performance [61] with respect mixed and unrelated diversification. Unrelated and mixed diversification strategies require more resources and involve higher agency and information costs [73], which have a negative impact on performance. However, greater family control favors the use of mixed strategies that may be due to decrease family risk [42] or the appearance an agency problem type II and tunneling practices.

Also, firms not controlled by a single shareholder (SCD) present the greatest levels of diversification, particularly unrelated, and minimally choose specialization. These firms are characterized by higher manager discretionality (agency problem type I), therefore managers will adopt diversification strategies that will reduce managers personal risk and increase their power [1]. These organizations have the lowest levels of concentration of ownership. Finally, firms controlled by banks and/or foreign capital present intermediate values in the control variables and diversification strategies. Concluding, the higher differences in diversification strategies are established between family firms (higher ownership concentration) and firms not controlled by a single shareholder (lower ownership concentration). In family firms, when ownership concentration is high, it may appear an agency problem type II [70].

The study is a first approach to the relationship between ownership structure, family nature and diversification. The diversification variables are dummies and it would be interesting to use other alternative measures such as entropy [60], more appropriately weighting degree of total, related and unrelated diversification. This would also use more statistically advanced and precise methods that would be able to confirm the results obtained here. The models also show the importance of analysing the last owner of

non-family firms, as it can affect the significance of the results obtained (in this paper, it reaffirms the consistency of the models and results).

Future research should study the relationship between performance and productivity according to ownership structure and type of diversification, according to the last owner. There are very few studies [29], [41] and further research is required. Likewise, the development of a special type of diversification, vertical integration (performance of related value chain activities, before or after each other) could be considered; it has hardly been considered in the literature [41], [66] or it has been considered as a type of related diversification, a legal development with an impact on ownership structure and degree of diversification.

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Abstract

DOES CONCENTRATION OF OWNERSHIP AND FAMILY CONTROL AFFECT SPECIALISATION/DIVERSIFICATION BUSINESS STRATEGIES?

Alejandro Hernández-Trasobares, Carmen Galve-Górriz

The impact of family ownership on strategic decision-making and diversification in public corporations is an important but not clearly understood aspect of modern corporate governance. In many cases, large-block family owners of public corporations may have a great deal of input in strategic decision-making in large corporations. Previous literature investigates how ownership structure and diversification are connected, but conclusions are not homogeneous. Agency theory suggests that professional managers are fundamentally self-interested, and the public corporation diversifies because managers pursue their own interests, rather than the interest of shareholders. However in family firms, ownership and control use to coincide and family diversification decisions which causes a lower diversification. In this paper authors analyzes the impact of ownership concentration and the influence of ultimate owner's nature of business group (family or non-family) in diversification's decision: specialization, related diversification, unrelated diversification and mixed diversification (when a company uses both related and unrelated diversification) Based on a sample of ninety-nine Spanish listed companies during the years 2000–2005, and using the listed company and their subsidiaries (pyramidal group) as unit of analysis, this research finds: firstly, the highest ownership concentration increases the adoption of specialization strategies and reduce the mixed diversification; Secondly, attending to ultimate owner's nature, family firms adopt more strategies of specialization and related diversification, and less diversification strategies than non-family firms; Finally, results also show behaviour differences in family firms according to ownership concentration's degree: an increasing ownership concentration's degree in family firms rises the probability of diversification.

Key Words: Family firm, specialization, diversification, ultimate owner, corporate governance.

JEL Classification: M19, M20, G32, G34.

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THE INFLUENCE OF GENDER ON FINANCIAL DECISIONS: EVIDENCE FROM SMALL START-UP FIRMS IN SPAIN

**Carmen Maria Hernandez-Nicolas,
Juan Francisco Martín-Ugedo, Antonio Mínguez-Vera**

Introduction

The study of the characteristics of shareholders and managers and their effect on various variables related to the company, mainly its value, is extensive. Among the most analyzed characteristics are the shareholder structure [84], the composition of the board of directors [1], and the combining of the positions of CEO and chairman of the board of directors in the same person [10].

One of the characteristics that has been the focus of increasing interest for researchers is the presence of women on corporate boards of directors (for a comprehensive survey on the presence of women on corporate boards of directors, see [79]). However, the presence of women on the board has become an important topic, not only for academic reasons but also for social reasons. In recent years there has been pressure from society to include women on the boards of directors. As a consequence, the average number of women in boardrooms has increased in the European Union from 5% in 2001 to 8.1% in 2007, but it is still a small figure.

Focusing on 2007 data, even if the gap has been reduced in recent years [36], figures are larger for the United States (13.6%) and Canada (11.2%) than for Europe. Inside the European Union there are also important differences by country. For example, Portugal is the country that has fewest women on boards with only 0.7%. In contrast, Norway and Sweden have a higher proportion, with 37% and 21.3% of female directors, respectively. In Spain the presence of women in boardrooms (of IBEX-35 index firms – 35 top companies in capitalization) is about 3.1% of all directors, a figure that is similar to Italy (2.3%) and Japan (2%) [24].

To correct this situation several steps have been taken in Spain. In May 2006 the *Comisión Nacional del Mercado de Valores*, CNMV, (Spanish Securities and Exchange Commission)

passed the *Código Unificado de Buen Gobierno* (Unified Code of Good Governance). In Article 15, this Code recommends that the board of directors reflect the diversity of knowledge, gender and experience required to perform its functions with effectiveness, objectivity and independence. To achieve this objective, the Code suggests positive discrimination in order to balance figures for men and women on boards.

In March 2007 the Spanish parliament approved the *Ley de Igualdad* (Gender Equality Act). On the topic of the board of directors, this law suggests at least 40% of directors be women by 2015, but this quota is not mandatory and merely a recommendation. However, companies that do not comply with this quota will be unable to bid for public contracts. This law came into effect the 24th of March, 2007 and it applies to public and private firms with more than 250 employees.

The requirement that 40% of board members should be women is an imitation of a Norwegian law approved in January 2003. That law required the achievement of the quota of 40% female representation on boards in five years. Between 2003 and 2008 the percentage quadrupled to a value of 38% [37], and Norway is at the head of European countries for female representation on boards of directors.

All these rules made in Spain in the business field have focused on large companies. However, micro-enterprises and small enterprises are not only more numerous, but they are also the main engines of economic growth and employment. In Spain, on 1st January 2009, 99.88% of firms were SMEs (Central Companies Directory).

Another aspect that has attracted the interest of researchers in recent times is the presence of women as CEO [14]. Traditionally, this position has been filled predominantly by men. However, evidence has shown that firms

whose CEO is a woman have higher levels of returns on average [82].

More participatory management styles may lead to higher returns [5], as women are more prone to cooperate with other managers [38]. Another explanation of higher returns of companies whose CEOs are women is provided by Mohr and Wolfram [56]. According to these authors, commitment to the firm and employee satisfaction in the workplace strongly influences the performance of a firm. Communication with the employees is essential to create a positive climate of trust. According to Mohr and Wolfram [56], women are more effective communicators.

Based on previous arguments, it would seem that there should be larger number of women as CEOs. However, research shows that even if the numbers of men and women in management jobs in general are relatively close, this is not the case for CEOs ([15] and [18]).

Until now, most studies on this field have focused on analyzing the effect of gender diversity on the performance of large companies [25], [32]. According to Soltane [77], the more women are on the board, the better is the performance in the company. Other studies examined legal environments, environmental factors and processes that influence entrepreneurship among women [12], [13], [49].

Research on financial decisions and their relationship with the gender of managers is very limited, especially in the field of small enterprises. These companies are especially interesting for the study of the contribution of women as directors, given that their governing bodies tend to be smaller, less structured and less complex, so that each member has a greater capacity to influence decision-making [42].

Gender may influence the level of corporate debt, as well as its cost and maturity. There are two main arguments why this should be the case. On the one hand, women often prefer to accept lower levels of risk [23], [76]. On the other hand, there may be discrimination for reasons of gender on the part of the credit supply [12], [17].

This study has several novel features. First, the firms analyzed are small, unlike the firms that provide most of the previous empirical evidence. Second, we examine companies in their first year of life (star-up firms) where

the differences in preference for financing, discrimination on the part of the suppliers of funds and difficulty in accessing finance may be more evident. Finally, unlike previous papers, we discuss three variables relating to the financial structure: level of debt, debt maturity and debt cost. In addition, the Spanish market is generally thought to be part of the continental system or civil law system, in contrast with the American market, which provides most of the available evidence, and belongs to the common law or Anglo-Saxon system. The differences between the two systems are large, but can be summarised in three points: companies in the Anglo-Saxon system tend to have much more dispersed shareholder structures, there is more investor protection and the external control mechanisms are relatively strong [46], [47]. Because of these characteristics, the study of the composition of boards of directors may be more relevant in markets like Spain.

The results reveal a negative influence on firms' debt levels of the presence of women on the boards or as CEO. This negative effect can also be seen when boards are more gender-diverse. In addition, gender diversity drives toward lower costs and higher debt maturity. Therefore, it seems that risk aversion on the part of women is a better explanation for the results than discrimination on the supply side.

The rest of the paper is structured as follows. The Section One presents the theory and hypotheses. Section Two describes the sample, the data and the methodology. The results are presented in Section Three. Finally, we present the main conclusions.

1. Theory and Hypotheses

Financing and capital structure are one of the most examined topics in the financial literature. In 1958, Modigliani and Miller [54] published one of the most influential papers in the financial literature where they demonstrated that the leverage adopted by a firm is irrelevant in perfect capital markets [56]. After this paper, many others have examined the influence of tax considerations [26], [53], [55], financial distress [3], [6], [83], and information asymmetry and agency costs [30], [40], [59], [60]. As a consequence of these and many other papers, there exist two main non-excluding theories that attempt to explain existing firms' capital structures: trade-off theory and pecking order theory.

The trade-off theory considers that each firm has an optimal debt level that may be reached balancing the advantages and disadvantages of market imperfections (mainly taxes, costs of financial distress, and agency costs and information asymmetry).

Pecking order theory was first modelled by Myers and Majluf [60]. Myers and Majluf consider that the empirical evidence is not consistent with a financial policy that is determined by a trade-off of the advantages and disadvantages of market imperfections [60]. Rather, companies' financial policies seem to be better explained by the behaviour described by Donaldson [29]. He establishes a hierarchy describing company preferences for internal financial sources over external financial sources; in the case of external financial sources, a company prefers debt first, then hybrid instruments like convertible bonds, and finally equity issues.

However, trade-off and pecking-order are not the only relevant theories related to capital structure. Another influential theory is the financial growth cycle theory [7]. According to this theory, there are several variables that influence the level of information asymmetry in companies, and the age and the size are amongst the most important ones.

Normally, older companies are considered to have lower levels of information asymmetry. This is due to the fact that older companies are considered to be more consolidated and external investors know about the company's situation [27], [85]. On the other hand, young companies, and especially start-ups, present higher economic growth and opportunities. This could imply new investment projects and thus larger information asymmetry.

Size may also reduce the information asymmetry. This is because large companies are less risky, as they are usually more diversified [67], [69], [83]. Larger companies also produce more accounting and financial information for creditors and investors in general [31], so that it is less costly to control them.

Several papers, among which is the one by Berger and Udell [7], establish the explanation that companies finance themselves in different ways depending on the phase they occupy in their financial growth cycle. The main sources of external financing for small start-up firms are commercial credits and (short-term) bank loans. Some of the empirical implications of the

financial growth cycle have already been tested in the Spanish market [73].

Several papers that follow this line of study conclude that the size of a company is a factor that influences not only on the availability, but also the maturity and the cost, of credit for companies [65], [66], [74]. Small enterprises have more problems securing long-term and low-cost funds [80]. The problems arising from the existence of asymmetry of information mean that financial institutions cannot properly assess their borrowers' investment projects (adverse selection problem), or control their opportunistic behaviours (moral hazard problem).

In addition, large companies may negotiate favorable access to various types of financial sources, since they have more tangible assets that can be used as collateral [33]. This implies that small enterprises have trouble accessing finance, and are consequently left with the limited choices of self-financing [22], the investment of money of the owners (or family) [64], [72], [81] and (short term) borrowing.

Focusing on diversity, group diversity is defined as the variety of individual attributes within a group [8]. Most arguments related to information/decision-making theories predict a positive influence of diversity on group outcomes. Thus, Robinson and Dechant [70] argue that greater diversity in working groups implies a better knowledge of the market and a better identification with customers and employees, thereby increasing the company's ability to penetrate markets. Similarly, the more diverse a group is, the more different views and perspectives its members will have, as well as more alternative solutions to a problem, leading to more realistic decisions being taken [57].

However, there are also arguments that increased diversity may have negative effects on group outcomes. These arguments come from social identification and social categorization theories. According to these theories, individuals divide the group members into in-groups (individuals similar to themselves) and out-groups (individuals dissimilar to themselves), having a tendency to perceive the former positively and the latter negatively [61].

Gender diversity is part of group diversity and it may also have an influence on firm behaviour. As an example, Loden [50] argues that women are qualitatively oriented while men are oriented quantitatively, an argument which could support the belief that women are

more successful in some specific tasks. Thus, women directors may exert a positive influence on the firm in tasks related to corporate social responsibility and strategic control. In contrast, the presence of women on the board may have a negative influence, as they may have fewer relationships with boards of other firms [86], and are less likely to have business occupations [45].

With regard to financial decisions, the different level of risk aversion between men and women may be extremely important. Many papers provide arguments and evidence to show that women tend to prefer a lower level of risk [76], [41], [11], [23], [63], [20], [75]. As an example, it seems that women entrepreneurs tend to run smaller companies and their firms are more concentrated in the service sector [20], [44], [51]. They also tend to run firms that have lower debt levels, which may be because they try to reduce the costs of bankruptcy and are reluctant to provide the necessary guarantees to obtain a loan [19]. Romani et al. [71] also find that women invest less money in their businesses and expect lower returns than men.

However, lower levels of debt in enterprises run by women may also be explained by other factors related to gender such as discrimination on the part of credit suppliers [58]. There is evidence that the decisions of the banks about loan requests are different for men and women, even when businesses are similar in terms of liquidity and solvency. Buttner and Rosen [16] found that banks perceive that men have more probability of business success than women. Other papers show that gender discrimination not only appears in the final decision of granting of credit but also throughout the application and negotiation process, placing women at a disadvantage or discouraging them during that process [12], [75].

These arguments (greater risk aversion among women and discrimination on the part of the suppliers of credit) may influence not only the level of debt of firms, but also the cost and maturity of debt. Thus, a higher cost of debt in companies where women participate in management would be a clear sign of discrimination, while a lower cost could be seen as evidence that the participation of women in management reduces the risk to the company and thus the cost of financing. Similarly, a longer term of maturity of debt in companies

managed by women would be a sign of their greater risk aversion [62].

Although there are conflicting arguments, based on the discussion in the literature we present three hypotheses:

Hypothesis 1 (H1): Companies run by women and groups with gender diversity will have lower debt levels.

Hypothesis 2 (H2): Companies run by women and groups with gender diversity will enjoy a lower cost of debt.

Hypothesis 3 (H3): Companies run by women and groups with gender diversity will have debt that has longer terms to maturity.

2. Sample, Data and Methodology

2.1 Sample

The empirical study is carried out by using the SABI database (The Iberian Balance Sheet Analysis System created by Bureau Van Dijk). This database provides accounting information for Spanish and Portuguese companies, obtained from the annual published accounts. Companies belonging to the financial and insurance sectors are excluded.

The sample includes small firms, namely firms that have no more than 50 employees, an annual turnover not exceeding €50 million, and total assets not exceeding €43 million (recommendation 2003/361/CE of the European Commission, 6 May 2003). The initial database was filtered to eliminate companies that had negative equity and firms whose total assets or total liabilities were not equal to the sum of their components. In addition, given that our purpose is to analyze the influence of gender in financing, we also removed firms controlled by other companies from our sample. The final data base includes 12,376 start-up companies, founded in 2007, whose first year of life is 2008.

2.2 Data

The dependent variables considered are debt (DEBT), the cost of the debt (COSTD) and the maturity of the debt (MATUR). For the model of debt level, the dependent variable is calculated as the ratio of debt to total assets [74]. The cost of debt is computed as the ratio of financial expenses to total debt. The maturity of the debt

is calculated as the ratio of long-term debt to total debt [4].

To measure the presence of women and gender diversity we employ the following variables: A dummy variable, DWOMEN, which takes the value 1 when the CEO is a woman and 0 when it is a man; ADM, computed as the total number of women on the board divided by the total number of members of the board. Two indices are used to measure gender diversity. On the one hand, the BLAU index is defined as: $1 - \sum_{i=1}^n P_i^2$, where P_i refers to the ratio of women on the board. The values of this index range between 0 and a maximum of 0.5; the latter occurs when there is the same percentage of men and women on the board. On the other hand, the SHANNON index is defined as: $-\sum_{i=1}^n P_i \ln P_i$, where P_i is estimated as in the BLAU index. The values of this index range between 0 and a maximum of 0.69; The latter corresponds to the greatest possible diversity [35], [78].

The control variables in relation to the debt model are the following: firms' returns on assets (ROA), measured as the earnings before taxes and financial expenses divided by total assets [39]; the firm size (SIZE), calculated as the natural logarithm of total assets [33]; the tangible assets ratio (FIXED), measured as net tangible assets divided by total assets [33], [68]; the economic risk (ECRISK), computed as the square of the difference of the annual returns of a company and the annual profitability of all businesses, multiplied by the sign of such difference [34]; and the liquidity ratio (LIQ), measured as the working capital divided by total assets [2]. In addition, we consider debt maturity (MATUR) and debt cost (COSTD) which are defined above.

Thus, for the analysis of the debt level we define the following model:

$$\begin{aligned} DEBT_i = & \beta_0 + \beta_1 GEN_i + \beta_2 MATUR_i + \\ & + \beta_3 ROA_i + \beta_4 SIZE_i + \beta_5 FIXED_i + \\ & + \beta_6 ECRISK_i + \beta_7 LIQ_i + \beta_8 COSTD_i + u_i \end{aligned} \quad (1)$$

where $i = 1, \dots, n$, denotes the company and GEN is one of the alternative measures of gender diversity defined above.

The second model examined focuses on the cost of debt (COSTD). It includes as control variables, the firms' size (SIZE); the firms' returns on assets (ROA); the growth

opportunities (GROWP), computed as the depreciation of assets divided by total assets [74]; the debt level (DEBT); the debt maturity (MATUR); and the solvency ratio (SOLV), which determines the ability of the company to meet their commitments in the long term, measured as cash flow divided by total assets.

The cost of debt model is defined as follows:

$$\begin{aligned} COSTD_i = & \beta_0 + \beta_1 GEN_i + \beta_2 SIZE_i + \\ & + \beta_3 ROA_i + \beta_4 GROWP_i + \beta_5 SOLV_i + \\ & + \beta_6 DEBT_i + \beta_7 MATUR_i + u_i \end{aligned} \quad (2)$$

where $i = 1, \dots, n$, denotes the company and GEN is one of the alternative measures of gender diversity defined above.

The third model focuses on the debt maturity (MATUR). It includes, as control variables, the tangible assets ratio (FIXED); the sales rotation ratio (ROTAT), computed as total sales divided by total assets [2]; the debt level (DEBT); the firms' returns on assets (ROA); the growth opportunities (GROWP); the firm size (SIZE); the liquidity ratio (LIQ); and the cost of debt (COSTD).

The maturity of debt model is defined as follows:

$$\begin{aligned} MATUR_i = & \beta_0 + \beta_1 GEN_i + \beta_2 DEBT_i + \\ & + \beta_3 ROA_i + \beta_4 GROWP_i + \beta_5 FIXED_i + \\ & + \beta_6 SIZE_i + \beta_7 LIQ_i + \beta_8 ROTAT_i + \\ & + \beta_9 COSTD_i + u_i \end{aligned} \quad (3)$$

where $i = 1, \dots, n$, denotes the company and GEN is one of the alternative measures of gender diversity defined above.

Descriptive statistics are presented in Table 1. The mean level of debt (DEBT) is 74.8%, exceeding 60%, the average figure for Spanish companies. The mean of the cost of debt (COSTD) is 3.5%. It must be highlighted that the sample examined includes micro and small firms that usually get their funds from bank credit [7], their own finance or from family and friends and, especially, microcredits. The mean of the debt maturity (MATUR) is 21.3%, confirming that these firms largely employ short term debt. This may be due to the optimism of the entrepreneur or the greatest risk that the banks run when lending money to such companies [48].

Tab. 1: Descriptive statistics

Variable	Mean	Median	Standard D.	Minimum	Maximum
DEBT	0.748	0.837	0.246	0.000	1.000
COSTD	0.035	0.016	0.234	0.000	12.561
MATUR	0.213	0.053	0.283	0.000	1.000
DWOMEN	0.210	0.000	0.428	0.000	9.000
ADM	0.190	0.000	0.356	0.000	1.000
BLAU	0.060	0.000	0.158	0.000	0.500
SHANNON	0.079	0.000	0.216	0.000	0.693
ROA	-0.144	0.028	1.797	-92.059	20.263
SIZE	5.149	5.108	1.397	0.065	10.610
FIXED	0.238	0.153	0.245	0.000	1.000
ECRISK	-3.015	0.030	117.926	-8,448.367	416.438
LIQ	-0.177	0.015	1.989	-106.740	1.000
SOLV	0.121	0.071	0.274	0.000	20.653
GROWP	0.038	0.020	0.266	0.000	1.112
ROTAT	2.897	1.823	20.441	0.000	2,149.829

Source: [2]

Regarding the variables of gender, 21% of the firms have a woman as CEO. The proportion of women on the board is high, 19%, compared with large companies where the corresponding figure is only close to 5% [52]. These figures may be related to self-employment as well as to family businesses.

2.3 Methodology

The methodology employed is Three Stage Least Squares (3SLS). This methodology controls the endogeneity of the variables, using a system of simultaneous equations [21]. This methodology has been used because of the peculiar characteristics of the sample, composed, as it is, of start-up firms with only a year of life. This circumstance makes it impossible to use a more powerful methodology such as panel data.

3. Results

The results of the estimation of Models 1, 2 and 3 are presented in Tables 2, 3 and 4, respectively.

In Table 2 it can be seen that a woman as CEO or the presence of women on the board exerts a significant negative influence on the

level of a firm's debt. The same influence is observed when employing diversity indexes (Blau and Shannon indexes). Therefore, the Hypothesis 1 is confirmed: *Companies run by women and groups with gender diversity will have lower levels of debt*. These results are consistent with most previous research. It may well be that women have greater aversion to risk [64], [9], [75], [41] which influences the firm's debt level. Following the same reasoning, it should be noted that there is a major difficulty for heterogeneous groups to reach agreement. The need to seek consensus often leads to less risky strategies [41]. However, this result could also be explained by discrimination on the supply side, which might result in banks lending less money to companies run by women.

With regard to the control variables, all of them are significant and have a negative relationship with the debt level, with the exception of the risk and the maturity of the debt, which have a significant positive relationship with the debt level. Debt may be used in order to secure tax advantages [67], but there are other tax deductions such as depreciation of fixed assets [26] which could lead to a negative relationship between tangible assets (FIXED)

Tab. 2: Estimation of model 1 – debt level

MODEL DEBT	DWOMEN	ADM	BLAU	SHANNON
Constant	0.195***	0.935***	0.926***	0.926***
	(16.78)	(76.93)	(74.62)	(77.14)
GEN	-0.030***	-0.040***	-0.108***	-0.078***
	(-4.24)	(-5.14)	(-6.32)	(-6.46)
MATUR	0.904***	0.887***	0.882***	0.885***
	(91.11)	(93.98)	(90.58)	(93.85)
ROA	-0.043***	-0.024*	-0.027*	-0.026**
	(-2.86)	(-1.67)	(-1.87)	(-1.85)
SIZE	-0.006**	-0.003***	-0.007***	-0.006***
	(-2.32)	(-3.62)	(-3.05)	(-2.84)
FIXED	-0.719***	-0.750***	-0.742***	-0.748***
	(-59.21)	(-64.65)	(-62.37)	(-64.65)
ECRISK	0.004***	0.003***	0.003***	0.003***
	(5.66)	(4.26)	(4.15)	(4.44)
LIQ	-0.0675***	-0.704***	-0.696***	-0.701***
	(-64.47)	(-71.08)	(-68.50)	(-70.89)
COSTD	-2.163***	-1.924***	-1.862***	-1.929***
	(-41.35)	(-39.83)	(-38.85)	(-40.02)
R2	-2.278	-1.613	-1.583	-1.621
X2	11,306.62***	12,295.33***	11,518.00***	12,299.31***
Obs.	6,782	7,316	6,906	7,316

z-Statistic in parenthesis

* Significant at the 90% level, **Significant at the 95% level and *** Significant at the 99% level.

X2-Test of explanatory variables

Source: [2]

and the debt level that we find in Table 2. Firm size [80] and liquidity also leads to reduced levels of debt.

In Table 3 the results related to the cost of debt can be found. We find a significant negative influence of the different variables relating to the presence of women and gender diversity on the cost of debt. This result does not support the argument that there is possible discrimination on the part of those who offer funds to women. On the contrary, it would support the argument that the presence of women in decision making may reduce risk that the firm is exposed to, leading to a lower cost of debt [62]. Therefore, Hypothesis 2 (H2) is confirmed: *Companies run by women and groups with gender diversity will enjoy a lower cost of debt.*

Regarding the control variables, we observe a negative influence of firms' returns on assets and the maturity of debt on the cost of the debt. Normally, longer terms of debt maturity lead to lower interest rates [7] and larger returns. On the other hand, we observe a positive effect of debt level, firm size and solvency ratio on the cost of debt. This last result may be consequence of the fact that more solvent firms have increased access to debt [81] and, therefore, bear higher costs.

In Table 4 we observe that the presence of women on the board or as CEO leads to longer terms of debt maturity. We also observe that gender-diverse boards use longer term debt. Therefore, Hypothesis 3 (H3) is confirmed: *Companies run by women and groups with*

Tab. 3: Estimation of model 2 – cost of the debt

MODEL COSTD	DEWOMEN	ADM	BLAU	SHANNON
Constant	0.195***	0.191***	0.194***	0.187***
	(16.78)	(17.08)	(16.63)	(166.99)
GEN	-0.016***	-0.021***	-0.108***	-0.043***
	(-3.04)	(-3.45)	(-6.32)	(-4.45)
SIZE	0.002	0.003*	0.003**	0.004**
	(1.02)	(1.67)	(1.97)	(2.18)
ROA	-0.377***	-0.289***	-0.279***	-0.292***
	(-11.11)	(-8.57)	(-7.94)	(-8.68)
GROWP	-0.062	0.056	0.071	0.051
	(-1.31)	(1.17)	(1.41)	(1.07)
SOLV	0.391***	0.300***	0.288***	0.302***
	(11.10)	(8.56)	(7.90)	(8.65)
DEBT	1.803***	1.617***	1.660***	1.614***
	(29.20)	(26.94)	(26.19)	(26.93)
MATUR	-2.219***	-2.212***	-2.296***	-2.217***
	(-36.82)	(-37.35)	(-36.86)	(-37.47)
R2	-0.203	-0.178	-0.176	-0.178
X2	2,607.64***	2,466.64***	2,341.10***	2,475.17***
Obs.	6,782	7,316	6,906	7,316

z-Statistic in parenthesis

* Significant at the 90% level, **Significant at the 95% level and *** Significant at the 99% level.

X2-Test of explanatory variables.

Source: [2]

gender diversity will have debt that has longer terms to maturity.

In terms of the control variables, the level of debt, the tangible assets, the size of the firm, liquidity and the cost of debt have significant positive influence on the debt maturity [43], [28]. The influence of the growth opportunities [59] and sales rotation is negative.

Conclusions

Gender and its influence on different variables of the firm have been attracting the attention of researchers. Several papers have indicated differences in the way that men and women run businesses and the influence of gender diversity in working groups. Most of these studies have examined the influence of gender diversity on firm value or firm risk. However, there are not many studies examining the influence of

women on the financial decisions of the firm, especially for small companies. Small firms are characterized by having very limited access to funding sources, and depending heavily on bank financing.

Research on gender diversity has been increasing in recent years. The emergence of gender equality laws in many countries, including Spain, has helped this phenomenon. Several laws have been adopted in Spain to provide equal opportunities to women. The *Código Unificado de Buen Gobierno* (Unified Code of Good Governance) recommends positive discrimination for women in Article 15, in order to balance the numbers of men and women on boards. The *Ley de Igualdad* (Gender Equality Act) requires a 40% female representation on boards of directors of companies with more than 250 employees,

Tab. 4: Estimation of model 3 – maturity of the debt

MODEL MATUR	DWOMEN	ADM	BLAU	SHANNON
Constant	-0.943***	-0.965***	-0.959***	-0.957***
	(-70.10)	(-77.63)	(-75.37)	(-77.81)
GEN	0.025***	0.034***	0.081***	0.059***
	(4.49)	(5.48)	(5.94)	(6.10)
DEBT	0.957***	0.953***	0.955***	0.954***
	(106.18)	(111.55)	(107.35)	(111.41)
ROA	-0.007	-0.019*	-0.014	-0.018*
	(-0.61)	(-1.86)	(-1.28)	(-1.69)
GROWP	-0.430***	-0.419***	-0.418***	-0.423***
	(-11.76)	(-11.74)	(-11.30)	(-11.86)
FIXED	0.871***	0.903***	0.903***	0.905***
	(81.84)	(90.71)	(87.92)	(90.93)
SIZE	0.012***	0.016***	0.015***	0.015***
	(6.47)	(9.24)	(8.49)	(8.44)
LIQ	0.808***	0.837***	0.835***	0.837***
	(81.94)	(90.56)	(87.53)	(90.48)
ROTAT	-0.002***	-0.001**	-0.001**	-0.001**
	(-3.08)	(-2.18)	(-2.21)	(-2.36)
COSTD	1.737***	1.504***	1.454***	1.508***
	(36.04)	(34.32)	(33.13)	(34.40)
R2	-0.686	-0.309	-0.298	-0.313
F	15,337.66***	17,765.38***	16,556.80***	17,717.96***
Obs.	6,782	7,316	6,906	7,316

z-Statistic in parenthesis

* Significant at the 90% level, **Significant at the 95% level and *** Significant at the 99% level.

X2-Test of explanatory variables

Source: [2]

if they are to bid for public sector contracts. However, these and other rules have focused on large companies and not on small firms, which are more numerous and generate most of the employment in Spain.

This article examines the influence of gender on some financial decisions of Spanish micro and small start-up enterprises. These firms have larger problems securing funding and the characteristics of the owners and managers are crucial to obtaining financing, as well as the characteristics of specific projects. In contrast with previous papers, the present study examines not only the level of debt but

also two other relevant finance variables: the cost of the debt and the maturity of debt. All this is examined in the Spanish context, characterized by a dominant presence of bank financing.

For the sample examined, only 21% of CEOs are women and the percentage of female directors is 19%. These values are far to the objective of gender equality on top management positions of small start-up enterprises but are much larger than the figures for Spanish listed firms. The family ties and the greater possibility of create micro firms by women may explain these values.

The results show that the presence of women, as CEOs or as members of boards of directors, leads to lower debt financing. The results also show that the presence of women influences the companies in such a way that they have lower debt cost and higher debt maturity. These results are also seen where the boards are more gender-diverse. All this evidence supports the hypothesis that women are more averse to risk, while suggesting that there is little discrimination on the part of suppliers of credit.

This study can present both theoretical and empirical implications. We provide arguments relative to the effects of gender diversity not only on debt behavior but also on other financial decision as debt cost and maturity. Therefore, we show that gender diversity can affect to the management of small firms. In this way, it can be interesting to extend the recommendations about equality to this type of firms. We find that gender diversity reduces the debt ratio and the cost of the debt and increases the debt maturity. So, women can improve the financial situation and the firm stability in a crisis context. In this way, to promote women to top management positions of firm is not only adequate for ethical reasons but also for effectiveness.

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Abstract

THE INFLUENCE OF GENDER ON FINANCIAL DECISIONS: EVIDENCE FROM SMALL START-UP FIRMS IN SPAIN

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Antonio Mínguez-Vera**

The presence of women in management positions in companies is one of the topics that have generated the most interest and controversy over recent years. This has also been the case in Spain, where several legal initiatives have promoted the presence of women on decision-making bodies of companies. These important and pioneering legislative initiatives focus on the recommendation of positive discrimination in favour of women in large firms. This measure is justified not only for reasons of ethics or social justice, but also for the purposes of efficiency and rational economic behaviour. These laws have created an open debate in Spain and in other countries where they have been enacted and they have attracted the attention of researchers. In this context, the majority of the studies have attempted to analyse the effect of gender diversity among top managers on corporate performance of listed firms. On the contrary, this paper analyses the influence of gender on some financial decisions, using a sample of 12,376 Spanish small and micro start-up firms. Unlike previous papers, this manuscript examines not only the level of debt but also the cost and maturity of the debt. To control the endogeneity of the variables, a system of simultaneous equation with Three Stage Least Squares methodology is employed. The results show that companies run by women and boards with gender diversity tend to borrow less, have lower costs for debt and longer term debt, reinforcing the hypothesis that females are more risk averse. These results are robust for diverse measures of gender diversity (the presence of a woman as CEO, the percentage of female directors and Blau and Shannon diversity indexes).

Key Words: Gender, financial decisions, small firms, start-ups.

JEL Classification: G32, J16, M00.

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PERSPECTIVES OF TALENT MANAGEMENT: EVIDENCE FROM CZECH AND SLOVAK BUSINESS ORGANISATIONS

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Introduction

Talent management has recently emerged as one of the key issues facing organizations and will undoubtedly continue being an important challenge for management [11], [21], [29]. The consensus among the academic community is that the management of talent represents an important source of competitive advantage for organizations worldwide and that the prosperity of an organization depends on its ability to manage its talents effectively [4], [24]. Thus, organisations striving to survive in the current highly competitive and uncertain business environment must consider talent management as a key organisational and management issue.

Despite the growing popularity of talent management in the literature, the current conceptualisation of talent management remains narrow and limited [9]. The lack of empirical research on applications of talent management in different contexts [8], [32] is a serious limitation. Although there is a wide range of external and internal factors that influence the use of talent management practices, the awareness of talent management in different types of organisations and national contexts is weak [21]. Thus, some authors [34], [39] call for a broader approach to talent management and a consideration of the importance of context.

The current conceptualisation of talent management strongly focuses on multinational companies and large domestic organizations [21], [25]. However, human resource management and talent management are becoming increasingly important in small and medium-sized enterprises (SMEs), and talent management in SMEs is different from that in large organisations [22].

This study aims to contribute to the research on talent management through an empirical investigation of talent management practices in business organisations in the

Czech Republic and Slovakia. Specifically, the study explores the extent to which differently sized organisations in these countries engage in talent management. We thus provide needed empirical evidence on talent management that may differ from the current models and thus advance the conceptual and empirical grounding of this area.

This paper begins with a brief overview of the current views on talent and talent management. Then, the methodology and findings of the empirical study are presented and discussed. The paper concludes with a summary and a the study's limitations and suggestions for further research.

1. Talent and Talent Management: Existing Perspectives

This section reviews briefly the current understanding of the concepts of 'talent' and 'talent management'. To determine the concept of 'talent management', it is important to discuss the meaning of 'talent'. To make talent management effective, organisations need to know whom to regard as a talent [42], [24]. There is no unanimous definition of 'talent', and many interpretations and approaches to talent have been taken in the business context (e.g. [3], [8], [9]). According to Thunnissen, Boselie and Fruytier [35] without a consensus on the meaning of 'talent', talent management research cannot be advanced. On the other hand, talent management in organisations is clearly largely determined by the definition of 'talent' itself, which is strongly influenced by the organisational context [6], [20]. This inspires two questions: Can the definition of 'talent' be truly universal, and to what extent does the lack of a universal definition of 'talent' really matter [34]. We argue that a balanced approach to the definition of 'talent' is needed in order to consider different theoretical approaches to it as well as specific organisational contexts for it.

Based on a review of the talent management literature the authors [9] have grouped theoretical approaches to talent into 'object' approaches (where talent refers to human characteristics, such as talent as a natural ability, mastery; commitment; or a fit) and 'subject' approaches (where talent refers to people). Within the subject approach, they have identified the inclusive approach (where talent is understood as concerning all employees) and the exclusive approach (where talent focuses on a select group of high-performing and/or high-potential employees). Different combinations of these approaches generate different talent management models [36], [9]. According to authors [33] a 'hybrid' approach is most commonly used in organisations. In our survey, talent generally refers to employees (using the subject approach).

Although talent management has received much attention from practitioners and academics in recent years, the clarity of its definition, scope, and overall goals is lacking [3], [36]. Lewis and Heckman [18] add that finding a precise meaning of 'talent management' in the talent management literature is difficult. Four main views concerning talent management co-exist in the organisational context [2]: talent management as a collection of typical human resource department practices, functions, or activities; talent management as a set of processes designed to ensure an adequate flow of employees into jobs; and talent management focusing on talent generically [18]. The above three perspectives tend to focus on one aspect of talent management [7], [36]. To go beyond this single approach, Collings and Mellahi [3] added a fourth stream emphasizing the identification of key positions able to differentially impact firms' competitive advantages. This view represents a strategic perspective on talent management. According to the authors [10] talent management cannot be isolated from business strategies. Silzer and Dowell [30] stress that talent management ought to be strategically driven and integrated with other organisational programs and systems.

For purpose of our study we adopt the definition proposed by Silzer and Dowell [30, p.18] "Talent management is an integrated set of processes, programs, and cultural norms in an organisation designed and implemented to attract, develop, deploy, and retain talent to

achieve strategic objectives and meet future business needs."

It is also important to note that the implementation of talent management varies among organisations and is heavily influenced by internal and external factors specific to each society and organisation (e.g. [2], [28], [33]). The key factors affecting talent management are changes in economics, the world of work, demography, culture, and politics [12], [29]. Similarly, Bersin [1] identifies the following factors affecting corporate talent management: rapid business changes, a shift towards emerging markets, the borderless workplace, new job types and career models, and intense competition for talent. The internal factors are related to the internal environment and may encompass organisational strategy, organisational structure, organisational culture, management involvement, employee values, or workforce policy [17], [30]. Thus, organisations must consider and understand both the external and internal factors in order to be able to manage talent effectively and efficiently. With Thunnissen, Boselie and Fruytier [36] we also argue that talent management needs to be studied in isolation as well as across different contexts.

2. Methodology

The purpose of this study was to investigate and compare talent management practises among differently sized enterprises in the Czech Republic and Slovakia. Since talent management is still perceived as a new phenomenon in the Czech Republic and Slovakia, the descriptive (initial mapping of the field) and exploratory (clarifying differences in talent management implementations in differently sized enterprises) research approaches have been chosen.

The background investigation was important in order to identify the characteristics and factors influencing the successful implementation of talent management in differently sized enterprises.

2.1 Research Questions and Hypotheses

This study provides an answer to the following central research question: What is talent management today in Czech and Slovak enterprises?

In addition to the central research question, the following specific research questions, based on the desk research results, were formulated:

- What approaches to talent management do enterprises in the Czech Republic and Slovakia adopt?
- Which talent management practices are used by enterprises in the Czech Republic and Slovakia?

Based on the literature review and given the specific research questions, the following data-collection questions and hypotheses were formulated:

(1) What approach with respect to their size do the enterprises adopt to define 'talent'?

Hypothesis No. 1:

Hypothesis 1a: Small and medium-sized enterprises adopt the inclusive approach to talent.

Hypothesis 1b: Large enterprises adopt the exclusive approach to talent.

(2) Is the size of an enterprise a determinant of its strategic approach to talent management?

Hypothesis No. 2: The strategic approach to talent management is determined by the size of an enterprise.

(3) Are there any differences in the implementation of talent management practices between large enterprises and SMEs in the Czech Republic and Slovakia?

Hypothesis No. 3:

Hypothesis H_0 : There are no differences in the implementation of talent management practices between large and small and medium-sized enterprises in the Czech Republic and Slovakia. Hypothesis H_A : There are differences in the implementation of talent management practices between large and small and medium-sized enterprises in the Czech Republic and Slovakia.

2.2 Research Method and Tools

Selective survey as a method to gather primary data was used. According to Munk et al. [23] the selective survey means that the chosen data are only part of basic file and therefore the accuracy of results is limited. The selective file was determined randomly. A scale questionnaire (both print and internet mediated versions) of the author's own construction was used as a tool of data collection. It contained 41 items divided into the following five areas: talent management and the overall business strategy (nine items), identification and recruitment of talent (11 items), talent assessment (seven

items), talent development (seven items), and talent retention (seven items).

The individual items were accompanied by a 5-point Likert scale with options ranging from 1 (definitely disagree) to 5 (definitely agree) for all items. In order to reduce any noise in the data "not applicable options" was also included in the response scale. This added point allowed respondents to indicate that they do not have an opinion on a particular issue concerning TM.

2.3 Validity and Reliability of the Questionnaire

The questionnaire was first tested by three experts and then by a small group of participants. The reliability of the questionnaire was statistically assessed by using Cronbach's coefficient alpha for the areas of the questionnaire. The areas, number of items, and the calculated result are as follows: Talent management and the overall business strategy (nine items), Cronbach $\alpha = 0.979$; Identification and recruitment of talent (11 items), Cronbach $\alpha = 0.790$; Talent assessment (seven items), Cronbach $\alpha = 0.827$; Talent development (seven items), Cronbach $\alpha = 0.701$; Talent retention (seven items), Cronbach $\alpha = 0.775$; Total reliability, Cronbach $\alpha = 0.929$.

2.4 Testing the Research Hypotheses

Owing to the character of the collected data, non-parametric statistical methods were used. To verify the existence of statistically significant differences between the individual groups of respondents (depending on a particular factor; see the classification units), the Mann-Whitney, Kruskal-Wallis, and Jonckheere-Terpstra tests were used. The Mann-Whitney test is a non-parametric alternative to the t-test. The Kruskal-Wallis test is a non-parametric parallel of a one-way analysis of variance (ANOVA). The aim of the tests is to determine whether the differences of the medians found in the sample of the individual groups are statistically significant (meaning there is a relationship between the variables) or coincidental (meaning there is no relationship). A null statistical hypothesis with parity among all the medians is tested. If the p-value is lower than the chosen level of significance (traditionally 5% = 0.05), the null hypothesis is rejected, meaning that the difference between at least one pair of the medians calculated from the sample is too large to be a result of only random selection

(i.e. it is statistically significant, as there is a relationship between the variables). If the p-value is equal or higher than the chosen level of significance, the null hypothesis cannot be rejected, meaning that the difference between each pair of the medians calculated from the sample can be a result only of random selection (i.e. it is not statistically significant, as there is no relationship between the variables; [23]). To test the existence of a statistically significant difference, suitable methods of 'post hoc testing' were used (i.e. Tukey's HSD test). To examine the differences within categorical variables (research question 1), we used a chi-square test of goodness-of-fit.

2.5 Sample Characteristics

A quantitative research study encompassing 174 enterprises (68 from the Slovak Republic and 106 from the Czech Republic) was conducted between June and August 2013. Regarding enterprise size, the intervals of the number of employees corresponded to the EU's enterprise size typology (SME definition adopted by the Commission, 2003). Each business subject was represented by one respondent, an owner of an SME or a manager or HR specialists of an SME or large enterprise – in other words, those responsible for HRM and who are most familiar with the business situation of their enterprises.

Tab. 1: Size of the enterprise

	Slovak Republic		Czech Republic	
	Count	%	Count	%
small (10–50 employees)	32	47	25	24
medium (51–250 employees)	19	28	28	26
large (over 251 employees)	17	25	53	50
total	68	100	106	100

Source: own

3. Findings and Discussion

Question No. 1:

What approach with respect to their size do the enterprises adopt to define 'talent'?

Hypothesis No. 1:

Hypothesis 1a: Small and medium-sized enterprises adopt the inclusive approach to talent.

Hypothesis 1b: Large enterprises adopt the exclusive approach to talent.

To answer research question 1 and verify hypothesis 1, we tested the attitudes of respondents to questionnaire items 8 and 12 ('We search for talent in every single person that has just been employed' and 'We are currently identifying talents among all the workers employed in our company' respectively). Both items clearly indicate that there are no differences in approaches to employees with regard to the search for talent and its identification. Therefore, we assume that respondents taking the inclusive approach

will tend to agree with statements in items 8 and 12. To determine what approach is adopted in small and medium-sized enterprises, we used the size of the enterprise as a grouping variable (there were three categories: small, medium, and large enterprises). The results are presented in Tab. 2 to 5. Not all of the respondents expressed their attitudes towards the statements in the individual items, hence the differences in the total number of respondents in items 8 and 12.

As the results show, the small and medium-sized enterprises adopt the exclusive approach, while the large enterprises adopt the inclusive approach. This result was confirmed by the chi-square test of goodness-of-fit (see Tab. 3 and 5). Thus, hypotheses 1a and 1b were not confirmed.

Therefore, we conclude that small and medium-sized enterprises in the Czech Republic and Slovakia adopt the exclusive approach to define 'talent' and that large enterprises adopt the inclusive approach.

Tab. 2: Respondents` attitudes – item 8

		I_8					Total
		1	2	3	4	5	
Size	small (10–50 employees)	17	7	12	12	5	53
	medium (51–250 employees)	8	10	13	10	3	44
	large (over 251 employees)	4	10	12	26	11	63
Total		29	27	37	48	19	160

Source: own

Tab. 3: Results of Chi-Square test – item 8

	Value	df	P
Pearson Chi-Square	20.37	8	0.01*
Likelihood Ratio	20.70	8	0.01*
Linear-by-linear Association	12.36	1	0.00*
N of Valid Cases	160		

* indicates statistical significance at significance level 0.01

Source: own

Tab. 4: Respondents` attitudes – item 12

		I_12					Total
		1	2	3	4	5	
Size	small (10–50 employees)	11	13	12	14	2	52
	medium (51–250 employees)	10	8	15	8	4	45
	large (over 251 employees)	9	8	5	26	12	60
Total		30	29	32	48	18	157

Source: own

Tab. 5: Results of Chi-Square test – item 12

	Value	df	P
Pearson Chi-Square	23.64	8	0.00
Likelihood Ratio	24.58	8	0.00
Linear-by-linear Association	8.85	1	0.00
N of Valid Cases	157		

* indicates statistical significance at significance level 0.01

Source: own

This suggests that SMEs base talent on a segmentation of the workforce, whereas large companies take a more humanistic approach, in which all employees have the opportunity to be a talent [14]. These findings are not in line with the results of earlier surveys (e.g. [8], [29], [32]). On the other hand, the findings support the notion that talent is a context-driven concept determined by numerous internal and external factors [17]. For Czech and Slovak organisations, factors such as type of business, key organisational priorities, organisational specifics, company culture, owner/manager knowledge, experiences, values, and attitudes to staff may play an important role.

Question No. 2:

Is the size of an enterprise a determinant of its strategic approach to talent management?

Hypothesis No. 2:

The strategic approach to talent management is determined by the size of an enterprise.

There were seven items in the questionnaire dealing with the strategic approach to talent management:

Item 5: We have a clearly defined talent management strategy.

Item 6: Talent management strategy is connected with strategic goals of our organization.

Item 9: A formulated talent management strategy is easy to realize in our company.

Item 18: We know what talents we are going to need in the future.

Item 19: We know how many talented people we are going to need in the future.

Item 31: We develop talents thanks to the plans we implemented.

Item 35: We successfully retain talented people.

We assumed that the respondents working in an enterprise taking a strategic approach to talent management would agree with the statements in the questionnaire items and that the average scores of these items would be higher than 3 (indicating a neutral attitude). Therefore, first, we simply calculated the average scores of each individual questionnaire item dealing with the strategic approach to talent management. The attained scores are seen in Tab. 6.

Tab. 6: Items dealing with the strategic approach to talent management – average scores

	I_5	I_6	I_9	I_18	I_19	I_31	I_35
N	161	158	135	166	153	158	158
Mean	2.63	2.78	3.22	3.11	2.39	2.64	2.94

Source: own

Out of seven questionnaire items dealing with the strategic approach, only two reached an average score higher than 3. Most of the average scores were below 3, indicating that the respondents tended to disagree with the statements in the questionnaire items. These results suggest that the strategic approach to talent management is not clearly developed or, at least, is not clearly developed within some groups of enterprises. To examine the reason for this result in detail, we evaluated the influence of the size of the enterprise on the attitudes of respondents to the strategic approach to talent management in their enterprises.

The size of the company should be considered a strong determinant of the respondents' attitudes. There were statistically significant differences in four questionnaire items out of the seven. The differences were confirmed by the Jonckhere-Terpstra test. To evaluate the mean rank differences between individual size groups of enterprises, we applied Tukey's HSD test (see Tab. 7).

There were statistically significant differences in the attitudes of respondents working in large and small enterprises in items 5 and 31. In item 5, the average score of the large enterprises was 2.94 while the average score of small firms was 2.25. In item 31, the

Tab. 7: Items dealing with the strategic approach to talent management – results of Tukey's HSD test

Dependent Variable	(I) SIZE	(J) SIZE	Mean Difference (I-J)	Std. Error	P	95% Confidence Interval	
						Lower Bound	Upper Bound
I_5	Large	Small	0.688*	0.229	0.009	0.147	1.230
		Medium	0.310	0.247	0.415	-0.271	0.898
I_6	Large	Small	0.746*	0.232	0.005	0.197	1.295
		Medium	0.592*	0.247	0.047	0.007	1.177
I_31	Large	Small	0.849*	0.227	0.001	0.311	1.387
		Medium	0.490	0.236	0.097	-0.068	1.052
I_35	Large	Small	0.771*	0.201	0.001	0.295	1.246
		Medium	0.700*	0.213	0.004	0.195	1.205

* indicates statistically significant difference

Source: own

average score of the large enterprises was 3.04. The average score of the small enterprises was 2.17. The differences between the attitudes of the respondents working in large and small or medium enterprises in items 6 and 35 were even clearer. The average score of the large enterprises in item 6 was 3.18 (2.43 for small and 2.59 for medium); in item 35, it was 3.37 (2.60 for small and 2.67 for medium). These results show that the respondents working in large enterprises expressed a more positive attitude towards statements in the questionnaire items dealing with the strategic approach to talent management while the respondents working in small or medium enterprise tended to disagree. Thus, hypothesis 2 was confirmed.

First, we argue that the strategic approach to talent management is determined by the size of the enterprise. The results clearly indicate that large organisations tend to developed talent management strategies that align consistently with their overall strategies and goals, unlike SMEs, where the strategic approach to talent management is limited. Various explanations have been offered for why small and medium-sized enterprises do not develop strategic approaches to talent management. In theoretical terms, a talent management strategy needs to be aligned with the company strategy and human resource strategy. Therefore, we argue that the starting point of formulating and

performing a talent management strategy is the existence of the organisation and its human resource strategies. Generally, the application of strategic management in the Czech and Slovak business environments is still very weak [31]. Furthermore, most SMEs in both countries prefer short-term planning based on intuition and improvisation. According to Piszczur [27] 44.5% of Czech and Slovak SMEs have not developed a company strategy. According to another surveys [37] 65% of Czech SMEs have not developed a human resource strategy, and 46.4% have not developed a company strategy development plan [15].

Second, the lack of planning skills in SMEs and their limited knowledge of strategic planning create significant barriers to the strategic approach. Owners' and managers' limited knowledge prevents the application of planning techniques and formal planning instruments. According to a survey [13] a lack of knowledge and awareness of talent management is one of the most frequent causes of the weak application of talent management in Czech organisations.

Third, most owners do not perceive strategic planning as being able to improve corporate performance ([31], [41]). From their perspective, strategic planning constrains flexibility and their ability to improvise, which represents the key characteristic of SMEs. Similarly, we argue that the main obstacles to

strategic planning are lack of know-how, lack of time, conservative thinking, and the fear of change. However, we argue that the strategic approach is an important precondition for talent management success. Furthermore, consistent with prior findings [30], we argue that an explicit alignment needs to be made among company strategy, human resource strategy, and talent strategy. However, the specific characteristics and conditions must be considered.

Question No. 3:

Are there any differences in the implementation of talent management practices between large enterprises and SMEs in the Czech Republic and Slovakia?

Hypothesis No. 3:

Hypothesis H_0 : There are no differences in the

implementation of talent management practices between large and small and medium-sized enterprises in the Czech Republic and Slovakia. Hypothesis H_A : There are differences in the implementation of talent management practices between large and small and medium-sized enterprises in the Czech Republic and Slovakia.

Hypothesis 3 was verified by a Kruskal-Wallis test (the assumption of normality was violated). As shown in Tab. 8, the highest share of differences was confirmed in the field of talent assessment (seven items out of seven), the talent development field (six items out of seven), and in the field of retaining the talent (six items out of seven). In the field of the identification and recruitment of talent, the share of differences was smaller (six items out of 11).

Tab. 8: Verification of the differences – size of the enterprise

Identification and recruitment	I_10	I_11	I_12	I_13	I_14	I_15	I_16	I_17	I_18	I_19	I_20
p value	0.673	0.002	0.003	0.022	0.128	0.017	0.908	0.001	0.039	0.578	0.640
Assessment	I_21	I_22	I_23	I_24	I_25	I_26	I_27				
p value	0.001	0.001	0.010	0.030	0.000	0.003	0.000				
Development	I_28	I_29	I_30	I_31	I_32	I_33	I_34				
p value	0.002	0.000	0.012	0.001	0.005	0.000	0.426				
Retaining	I_35	I_36	I_37	I_38	I_39	I_40	I_41				
p value	0.000	0.871	0.000	0.006	0.001	0.004	0.000				

Source: own

Based on the results of the Kruskal-Wallis test, we reject the null hypothesis and conclude that there are differences in the realization of talent management practices between large and small and medium-sized enterprises in the Czech Republic and Slovakia. The differences have been revealed mainly in talent assessment, talent development, and talent retention – in other words, in all surveyed areas except for identification and recruitment. These findings may be attributable to the differences in the SMEs' characteristics and the specifics of their human resource management. We believe that the level of human resource management represents one of the most significant factors in the degree to which organisations implement and perform talent

management practices. We argue that human resource management is still not a priority in many Czech and Slovak companies. It is also important to note that, despite the significant influence of foreign companies' HRM practices on the human resource practices of local firms, the development of modern HRM remains challenging [14].

Some authors (e.g. [16], [40]) argue that HRM in SMEs focuses on operational needs and is more informal. For instance, a survey [37] conducted among Czech SMEs revealed that 84% of small enterprises and 75% of medium enterprises provided informal assessments and that only 34% of the small and 54% of the medium enterprises provided formal assessments. According to Parry, Stavrou and

Lazarova [26] HR practices consist mainly of record keeping and staffing rather than motivation, assessment, development, and retention. The weak attention to these areas in Czech and Slovak SMEs may also reflect the traditional resistance within organisations to investing in human capital [16].

Another important factor in the context of talent management practices in SMEs is the economic situation in both countries. Czech and Slovak SMEs were more severely affected by the crisis than were large enterprises. For instance, because of the crisis, many Czech SMEs failed and employment by them remains below pre-crisis levels. Due to this economic situation, SMEs lack the financial resources to invest in human resources, particularly in talent management. On the other hand, the Talent Shortage Survey [19] shows that most organisations in both countries are experiencing no problems filling jobs (with the exception of candidates with technical competencies). According to the survey, employers in the Czech Republic report fewer difficulties with talent shortages and filling positions than do employers in other countries.

However, we can assume that talent management will remain one of the key priorities for organisations and that organisational success will largely depend on firms' ability to manage talent effectively.

Conclusions

This paper is one of the first to empirically explore the implementation of talent management in business organisations in the Czech Republic and Slovakia. Its purpose was to investigate and compare talent management in differently sized enterprises operating in these countries in order to explore the extent to which those organisations engage in talent management. Overall, the survey clearly indicates that talent management is not of primary concern for most organisations and remains in its infancy. This is in line with the assumption that talent management is a new concept in Central and Eastern Europe [38]. Another major finding is that the size of an enterprise is a relevant determinant of its approach to and implementation of talent management.

Three hypotheses were formulated in this study. They allow us to conclude that there is a direct relationship between the size of an organisation and its talent management

practices in the Czech and Slovak contexts. In hypothesis H1, we assumed that small and medium-sized enterprises in the Czech Republic and Slovakia adopted the inclusive approach to talent management and that large enterprises adopted the exclusive approach. The results, however, show different conclusions. According to the earlier surveys, the inclusive approach is consistent with the philosophy followed by most SMEs, according to which all employees are valued and have the opportunity to be a talent, which motivates them to remain. By contrast, large firms, which are mostly performance-orientated, tend to adopt high-performance and high-potential approaches. Therefore, our results are surprising. Further research dealing with the specifics of talent management in transition economies is necessary. In hypothesis H2, we assumed that large organisations tended to use talent management strategies that align with their company strategy, unlike SMEs, which adopt an ad hoc rather than strategic approach to talent. Hypothesis H3 confirmed that there are differences in the implementation of talent management practices between large and small and medium-sized enterprises in the Czech Republic and Slovakia. Talent management is preferred as a modern approach to HR management by large enterprises, where the need for talented individuals is objectively greater than in smaller enterprises. Most differences concerned talent assessment, talent development, and talent retention. We assume that there is a relationship between talent management practices and SMEs' specific features and human resource management levels. Moreover, the economic situations in both countries are an important factor affecting the implementation of SMEs' talent management.

These findings are not particularly surprising, as talent management is not a key issue for most Czech and Slovak organisations, particularly SMEs [13], [16]. Nevertheless, talent management is a crucial challenge for all organisations aiming to enhance their competitive advantages.

The research survey raises a number of important issues that ought to be considered by enterprises during their engagement in talent management. These findings contribute to a better understanding of talent management implementation in different types of enterprises and may also provide a useful platform for future research in this area.

Research Limitations

This study has several limitations that call for further research. First, its sample was relatively small. The number of participating organisations was insufficient for generalising the findings to all organisations. Nevertheless, we argue that the finding add to our understanding of the current TM situation for companies in both countries. Another limitation is that the target group consisted only of owners, CEOs, and HR managers. Although they are expected to play a key role in implementing talent management, other target groups (such as employees) could be included in future research for a better understanding of talent management issues. Third, the narrow scope of talent management issues represents another limitation. Our survey focused on talent management practices (the 'how') rather than on 'who' is considered talented or 'why'. The latter talent management issues will have to be analysed.

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Abstract

PERSPECTIVES OF TALENT MANAGEMENT: EVIDENCE FROM CZECH AND SLOVAK BUSINESS ORGANISATIONS**Dana Egerová, Drahošlav Lančarič, Ludvík Eger, Radovan Savov**

Despite the growing attention being paid to talent management in the literature, little empirical research has been conducted on applying talent management in various organisations, particularly in small and medium-sized enterprises. Therefore, our empirical survey examines talent management practices from the perspective of different sized enterprises in the Czech Republic and Slovakia. The findings are based on data collection from 174 enterprises in the Czech Republic and Slovakia. Overall, the survey indicates that talent management is not of primary concern to most organisations in the Czech Republic and Slovakia. These findings are not particularly surprising, as talent management is not a key issue for most organisations, particularly SMEs. Nevertheless, we argue that talent management is a crucial challenge for all organisations aiming to enhance their competitive advantages. This study's major findings prove that enterprise size is a relevant determinant of approaches to talent management and its practice within the enterprises. Several important differences between SMEs and large organisations were found. First, SMEs adopt a more exclusive approach to talent than do large firms, where an inclusive approach dominates. Furthermore, SMEs' strategic approach to talent management is limited, with most adopting an ad hoc approach to talent management practices. Thus, the shift towards holistic and strategic approaches to talent management constitutes one of the most important challenges for those organisations. The research survey raises a number of important issues that should be considered by enterprises when they engage in talent management. The survey has added to our understanding of the talent management implementation in different types of enterprises.

Key Words: Talent management, small and medium-sized enterprises, large organizations, Czech Republic, Slovakia.

JEL Classification: M12, M14.

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SIGNIFICANCE AND POSSIBILITIES OF MAJOR ACCIDENT INSURANCE

Pavla Jindrová, Radim Jakubínský

Introduction

The development of human society places continuously increasing demands on its production. This brings to the society not only positive but also negative effects. Along with the development of industrial production, people have to face associated risks. Industrial accidents, which have occurred recently, still have a negative impact on human life, health, the environment and the economy.

Major accidents are defined as events resulting from uncontrolled developments during an industrial activity, such as a serious leakage, fire or explosion, which may immediately or subsequently lead to serious threat to individuals in or outside the premises, or to the environment, in which one or more hazardous substances are involved.

This article deals with different aspects and issues of major accidents with focus on the prevention of their occurrence and possible consequences. Since the risks of major accidents take catastrophic proportions, the quality legislation on this issue is needed. Overview of legislative actions is in the separate chapter of article. This legislation imposes to industrial companies with the risk of major accident the obligation of liability insurance for damages caused by the realization of these risks. The main objective of the article is to present the possibility of loss distribution of major accidents and simulation of potential extreme losses which are necessary for determining the premiums.

For the sake of illustration have been selected the major accidents and their consequences since the early twentieth century. The experience gained from these and other disasters have played a significant role in the development of legislation in relation to the prevention and liquidation of consequences of major accidents.

Minamata, Japan (1932–1968): The Company producing fertilizers released a total

of 27 tons of mercury compounds into the sea. The result was a mass poisoning of local residents called Minamata disease. In the wake of this event, 2,000 to 3,000 people died. [6]

Seveso, Italy (1976): An explosion of a chemical reactor in the chemical plant of Givaudan company. The company's management announced that it had been a common accident and they failed to provide information about the leakage of toxic substances. It was as late as seventeen days after the accident that the factory management admitted that about two kilograms of dioxin leaked in the air, an amount of poison capable of killing 19,000 people. [5]

Bhopal, India (1984): Bhopal disaster is considered to be the worst industrial accident in the world. It started in a plant of the U.S. Company Union Carbide India Limited, producing pesticides, where deadly hydrogen cyanide gas and methylisocyanate (MIC) escaped. To this date, more than 20,000 people died and approximately 500,000 were injured as a result. [1]

Cubatão, Brazil (1984): An explosion in a petrochemical plant of Petrobras resulted in a fire in local slums. The amount of demises was due to the complete burning of some sites never precisely determined; it is estimated to be approximately 500.

San Juan Ixhuatepec, Mexico (1984): A series of explosions in the large warehouse LPG Company Petroleos Mexicanos destroyed part of the city. About 500 people died.

Sandoz, Switzerland (1986): A fire in the agro-chemical company Sandoz warehouse caused the release of toxic agrochemicals into the air, but also about 30–40 tons of these chemicals escaped into the Rhine River. Mixture of substances in the river contained pesticides, dioxins, mercury, chlorine compounds, fluorescent dyes, organophosphates and others. Ciba-Geigy, chemical company found

close to this site, attempted to make use of this situation releasing 400 litres of atrazine into the river, believing this will not be revealed. Chemicals immediately caused the death of aquatic animals in the river. 100 tons of fish were killed and pollution of the Rhine reached as far as the Netherlands. [3]

Baia Mare, Romania (2000): Many experts believe that it is Europe's worst environmental disaster since the Chernobyl explosion. A dam holding back 100,000 cubic meters of contaminated water burst contaminating drinking-water supplies for more than 2.5 million Hungarians. Due to the toxicity of cyanide in water, especially around the basin of the Tisza, virtually all living organisms perished along the river. Further southwards, in the Serbian part, approximately 80% of aquatic life was killed. Two years after, the ecosystem began to return to its original state, although still far from the level before the disaster. [5]

Enschede, The Netherlands (2000): Fire at S.E. Fireworks caused a subsequent explosion of fireworks that the company had produced. Numerous explosions ensued within the following 30 minutes, devastating an area of 5 km². The fire spread to a neighbouring brewery. The resulting cloud of smoke from the two companies was seen at a distance of 60km. In this disaster, 22 people lost their life, including four fire-fighters, and over 940 people were injured. It destroyed approximately 500 apartments, 1,500 homes, 60 businesses. [5]

Toulouse, France (2001): Explosion in the AZF chemical factory. It was equivalent to 20–40 tons of TNT, it caused a tremor of 3.4 on Richter scale and was heard up to a distance of 80km. The explosion caused a total of 29 deaths, 2,500 serious injuries and 8,000 minor injuries. Damages paid out to insurance claims exceeded € 1.5 billion. [5]

West, Texas (2013): Ammonium nitrate exploded in a fertilizer factory. As a result 15 people died, nearly 200 people were wounded and 150 buildings were destroyed or damaged. The essential information, however, is the fact that the company had liability insurance for damages only in the amount of one million dollars, but the total damage exceeded one hundred million U.S. dollars. With respect to the total damage, it may sound inadequate that the company was fined \$ 118,300 aggregately. In many states, including Texas, there is no legal obligation for the company to conclude liability

insurance for the damage with the insured sum corresponding with the range of possible damages.

1. Development of the Number of Accidents

Human society is also exposed to the action of natural causes, often in the form of natural disasters. The number and consequences of man-made disasters is increasing with the development of human society. Development of industrial production also brings about the risk of major accidents.

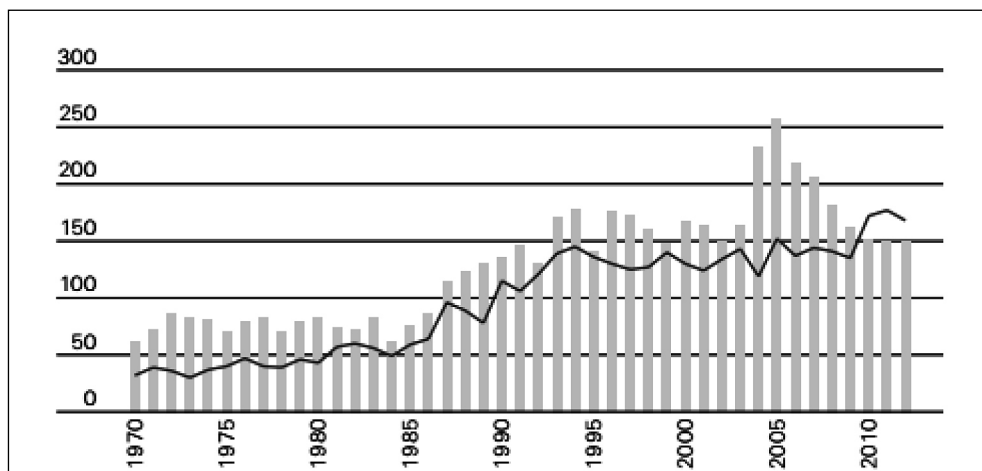
Figure 1 shows the development of the number of disasters caused by human influence, compared to natural disasters between 1970 and 2012. This data shows a long-term growth of both types of catastrophic events. The chart shows that from 1970 onwards, the year 2010 is the first year where a higher occurrence of natural disasters appeared more than man-made disasters. This is also one of the alarming signals for the society to protect themselves and their environment from the effects of man-made disasters.

The primary challenge for the company is to take such measures so that no major accidents occur. However, people must be adequately prepared for possible explosions, fires, spills, and other serious faults. For this reason it is advisable to use emergency scenarios. Damages arising from industrial disasters can reach extreme values of billions of Euros. If a company should be able to bear the financial consequences of major accidents, it is necessary to have insurance that covers possible damages in an adequate amount. At this point it should be noted that the insurance company itself, however, cannot bear the risks in such volumes that are typical of these risks. It is therefore necessary to negotiate ensuring of each insurance contract.

2. Legislation at Issue Prevention of Major Accidents

The need for legislation for operators of industrial facilities and organisations, which are threatened by major accidents, was established immediately after the first occurrence of serious events.

Urgent talks on a new EU directive on whole regulatory framework in ensuring the safety of hazardous installations started after

Fig. 1: Development of the number of disasters 1970–2012

Source: own

the explosion of cyclohexane in the factory NYPRO Ltd. in Flixborough (UK, 1974). Over the next two years in the European Community framework occurred three additional serious chemical accidents: Beek (Netherlands, 1975), Manfredonia (Italy, 1976) and Seveso (Italy, 1976). [5]

In the light of these catastrophic accidents, it was clear that new legislation to improve the safety of industrial sites, planning for emergencies off-site accidents and dealing with the aspects of broader regional and cross-border industrial safety is needed. Directive Seveso, prepared in February 1977, which was adopted by the Council of Ministers of the European Community on 24 6th, 1982, is the result of those efforts. The following measures have to be adopted by individual Member States no later than January 8th, 1984. [18]

The Directive applies to the prevention of major accidents which may be caused by certain industrial activities, and to limit their consequences for a man and the environment. It focuses on the convergence of the measures taken by the Member States in this area. Article 1 defines terms such as industrial activity, operator, major accidents and hazardous substances.

The Directive was modified twice, in 1987 Directive 87/216/EEC of 19 March 1987 (Official Journal No L 85 of 28 March 1987) and

the 1988 Directive 88/610/EEC of 24 November 1988 (OJ L 336 of 7 December 1988). Both amendments aimed to extend the scope of this Directive, largely in order to include the storage of hazardous substances. [18]

Changes occurred in response to a major accident in the Union Carbide factory in Bhopal, India in 1984 and accidents in the Sandoz warehouse in Basel, Switzerland in 1986.

Seveso I does not apply to nuclear facilities and plants processing radioactive substances and materials, military equipment, production and separate storage of explosives, gunpowder and ammunition, mining and other mining operations, equipment used for the disposal of toxic and hazardous waste, which are subject to Community law, if their aim is to prevent major accidents.

As the Council of Europe and representatives of the Governments of the Member States sitting in the Council stressed the need for a more effective implementation of Directive 82/501/EEC and called for a review of the directive which, if necessary, included a possible extension of the province scope of Directive and a greater exchange of information in this field between Member States. Also the need for improved management of risks and accidents was stressed. In addition, the accident in Bhopal and Mexico highlighted the danger posed by the proximity of residential

buildings and dangerous areas. Last but not least, from the importance and benefits of informing the individual Member States was on December 9th, 1996, a new Directive 96/82/EC accepted, known as the Seveso II. [6]

Due to severe industrial accidents in Toulouse, France, in Baia Mare, Romania and Enschede, in the Netherlands and conclusions of studies on carcinogens and substances dangerous to the environment was Seveso II extended by Directive 2003/105/EC. The new Directive requires Member States to ensure a very detailed appraisal of risks by using possible accident scenarios that cover risks arising from storage and processing activities in mining, storage of pyrotechnics and explosives storage of ammonium nitrate based fertilizers [5]

The main reason for replacing the Seveso II Directive is a change in the system of classification of dangerous substances established by the European Directive No. 1272/2008 of December 16th 2008, about classification, labelling and packaging of substances and mixtures. It was also necessary to clarify and update certain parts of the directive, to improve the implementation and enforcement of the Directive. In total, in the Seveso III (2012/18/EU) is listed 32 reasons. This Directive was adopted on July 4th, 2012, published July 24th, 2012, coming into force on August 13th 2012, to be implemented by May 31st, 2015 with the exception of the implementation of the Article 30, with the latest date February 14th, 2014. This part applies to heavy fuel oils.

Seveso III Directive is extended to onshore underground gas storage facilities. The Seveso II directive defines 8 concepts: plant, equipment, operator, hazardous substances, major accident hazards, risks and warehouse. The new Seveso III Directive defines 19 concepts, including 7 from the previous directive (excluding concept store).

The Seveso I, II and III, which are gradually released by the European Economic Community, the European Community and the European Union, are incorporated by individual Member States into their national legislation. In the Czech Republic, the law No. 59/2006 Coll is being addressed. The legislation also includes access to risk assessment, emergency scenarios and plans, the need for insurance, public access to information and many other serious measures.

According to Law No. 59/2006 Coll., about the prevention of major accidents, a severe accident is defined as an abnormal, partially or totally uncontrollable, spatially and temporally bounded event, such as a major leakage, fire or explosion, which occurred or the origin is imminently threaten in the context of with the use of the building or facility in which the hazardous substance is manufactured, processed, used, transported or stored, and leading to serious danger or serious impact on the lives and health of people, livestock and the environment or harm to property. [17]

This law pertained to approximately 150 industrial companies in the Czech Republic and established basic obligations for operators of these objects. It can be said that this law represented a significant contribution to the prevention from major accidents in the Czech Republic. However, it is clear that most companies were not sufficiently prepared to fulfil obligations stemming from this law; therefore the safety documentation was in large numbers repeatedly returned for reprocessing [1].

Law No. 59/2006 Coll. was partially amended several times and by the 1st of March in 2010 came into effect the law No. 488/2009 Coll. that amends the law No. 59/2006 Coll., about the prevention of major accidents caused by dangerous chemicals or chemical preparations and about amending the law No. 258/2000 Coll., about the protection of public health and amendment to some related laws. [17]

Legislation of liability for damages incurred as a result of major accident is newly found in § 12. The operator is obliged to conclude new insurance within 100 days from the entry into force of the decision on the approval of the security software or security reports. The limit of indemnity must reflect the range of possible impacts of severe accidents, which are currently listed in the approved security program or in an approved safety report. [17]

In the new legislation are specified individual administrative offenses in a separate § 36, which is used in § 37, which deals with fines, while in the previous law, the individual administrative offenses are listed right at the individual level of fines.

The legislation of major accidents in the Czech Republic uses a total of five instruments of protection, namely:

- Inclusion of an object or device.

- The obligation of the operator to prepare a list of hazardous substances; propose categorization to group A or B, or handle the protocol on non-inclusion.
- Risk analysis, security program and report.
 - The obligation of the operator to perform analysis and evaluation of risk of a major accident and on its basis to process safety program for prevention of major accidents for the group A, group B, then a safety report.
- Plan of the physical protection of the building or facility.
- Internal and external emergency plan.
- Liability insurance. [8]

3. Major Accident Insurance

For insurance of major accidents in the Czech Republic it is compulsory to conclude contractual insurance, with respect to the Law No. 59/2006 Coll. For serious industrial accident insurance, § 12 of Law No 59/2006 Coll. must be abided by, where the limits for insurance are set. The level of limit of insurance benefit must reflect the range of possible impacts of severe accidents, which are currently listed in the approved security program or in an approved safety report. The level of limit of insurance benefit agreed by the operator for the testing of the operation stage should reflect the range of possible impacts of major accident based on the results of risk analysis and assessment, submitted to the Regional Office. [17]

Total insurance premium is determined by the relation:

$$CP = ZP * K_{SP} * K_{RM} + DN, \quad (1)$$

where:

CP is the total insurance premium,
 ZP is the basic insurance, including participation,
 K_{SP} is the coefficient of participation,
 K_{RM} is the risk factor,
 DN are additional costs.

For calculation of the risk factor, a partial risk analysis need be carried out, the result of the evaluation is h , wherein:

$$1 \leq h \leq 5, \quad (2)$$

while 1 is the best rating and 5 the worst rating; corresponding with the highest possible risk.

Subsequently, the overall coefficient of the risk factor K_{RM} is set, where:

$$0.3 \leq K_{RM} \leq 6. \quad (3)$$

The total insurance premium increases when increasing the sum and increasing relative participation decreases the total insurance premium. The basic problem in determining the premium according to (1) is correct identification of the basic premium. For this aim, the insurance company needs to know the extent of damage probability models including information about possible extreme losses. In the next section, the issue of modeling and simulation of extreme damages is dealt with.

3.1 Modelling and Simulation of the Extreme Losses

Serious industrial accidents are often classified as extreme, catastrophic damages with the insurance claims amounting to billions of euros.

Extreme values theory is used to assess the risks of highly improbable events. To such events belong serious industrial accidents and also various natural disasters (hurricanes, floods, earthquakes, fires, etc.) and man-made disasters, including nuclear accidents and terrorism.

As already shown in figure 1, the amount of catastrophic events has a tendency to increase. The total insurance benefit of insurance companies is made up of 80% payment of damages from such events, while their share in the total number of insurance benefit is approximately 20%. Insurance companies are forced to innovate and continually evaluate their approaches to risk assessment and individual insurability of risks associated with the design of insurance products. Both these facts are of course significantly reflected in the prices of insurance.

To be able to model and simulate the extreme losses of major accidents, the following sections provide a theoretical procedure for practical use of quantile function and order statistics for the simulation of extreme losses. More details about catastrophic risk management and about modeling catastrophic losses you can find in [14] or [16].

3.2 Quantile Model

In the portfolios of serious industrial accidents insurance is the probability of occurrence of the extreme losses higher in comparison with conventional insurance portfolio. These claims have a large financial impact on insurance companies, so it is important for the insurer to know the probability model that adequately describes the insurance losses also in the right-hand tail.

For the extreme losses modelling the long or heavy tailed probability distributions are used. The Pareto distribution is often used as a model for claim amounts needed to obtain well-fitted tails [12]. Random variable X has a distribution with the heavy tail, if applicable:

$$\lim_{x \rightarrow \infty} e^{\lambda x} P(X > x) = \lim_{x \rightarrow \infty} e^{\lambda x} \bar{F}(x) = \infty, \quad \text{for } \lambda > 0. \quad (4)$$

Quantile functions application is one way of modelling the claim amounts and subsequent simulation of extreme losses.

When respecting specific basic rules, advantageous features of quantile functions allow to combine and edit functions in such a way that the resulting shape is non-decreasing, quantile function again, with statistically interpreted parameters [7], [15].

Quantile function $Q(p)$ is defined for each real p , $0 \leq p \leq 1$ by relation:

$$Q(p) = x_p, \text{ for which } F(x_p) = p. \quad (5)$$

Quantile function $Q(p)$ is then defined as the inverse to the distribution function $F(x)$. The value x_p is called p -quantile. By differentiating the function $Q(p)$ by p we obtain the quantile density function:

$$q(p) = \frac{dQ(p)}{dp}, 0 \leq p \leq 1. \quad (6)$$

Order statistics play a key role in modelling using quantile functions. A more detailed explanation quantile models can be found for example in [4], [13] and [15].

3.3 Simulation of the Extreme Values

When simulating extreme values, it is primarily necessary to use the program for generating pseudorandom numbers. Basic pseudorandom numbers are within the interval $<0, 1>$ and represent a random observation from

a continuous uniform distribution on this interval. Quantile function of a uniform distribution on this interval $<0, 1>$ is expressed as:

$$S(p) = p \text{ for } 0 \leq p \leq 1. \quad (7)$$

If using a random number generator, we can generate independent values from a uniform distribution on the interval $<0, 1>$. In this way, the generated pseudo-random numbers and their use in the probabilistic model of any type is called simulation [7].

The basis of such simulations is Q -transformation rule. If $z = T(x)$ is a non-decreasing function of x and $Q(p)$ is the quantile function, then also $T(Q(p))$ is a quantile function [7]. If is a non-decreasing function of $T(x)$ a quantile function $Q(p)$ of any distribution, the applications of Q -transformation rule for the case of uniform distribution quantile function $S(p) = p$ we can simulate the value of x from distribution with quantile function $Q(p)$ as:

$$x_i = Q(u_i) \text{ for } i = 1, 2, \dots, n, \quad (8)$$

where $u_1, u_2, \dots, u_n$ are simulated values from a uniform probability distribution on the interval $<0, 1>$. Substituting u_i to quantile function $x_i = Q(u_i)$, we obtain the arranged values $x_{(i)}$, that guarantee a non-decreasing shape of the function $Q(u)$.

The great advantage of simulation using the quantile function is that it also allows to simulate only the highest values in upper tail without necessity of simulation the central values of random variable.

We assume the right-hand tail of the probability distribution. By [7] and [13] it is possible to simulate the highest value as:

$$x_{(n)} = Q(u_{(n)}), \text{ where } u_{(n)} = v_n^{\frac{1}{n}}, \quad (9)$$

while v_n is a random number from the interval $<0, 1>$. If the sequence of the transformed variables is defined in the form:

$$\begin{aligned} u_{(n)} &= v_n^{\frac{1}{n}} \\ u_{(n-1)} &= (v_{n-1})^{\frac{1}{n-1}} * u_{(n)} \\ u_{(n-2)} &= (v_{n-2})^{\frac{1}{n-2}} * u_{(n-1)} \\ &\vdots \\ &\vdots \\ &\vdots \end{aligned}$$

where v_i , for $i = n, n-1, n-2, \dots$, are a plurality of values generated as a random selection from a uniform distribution, then by definition values u_i , for $i = n, n-1, n-2, \dots$, we get an increasing sequence:

$$u_{(i-1)} < u_i. \quad (11)$$

Values $u_{(i)}$ form an ordered sequence of values from a uniform distribution. If we get one value $u_{(n)}$, the relation for the simulation has the form:

$$u_{(m)} = (v_m)^{\frac{1}{m}} * u_{(m+1)}, \text{ for } m = n-1, n-2, \dots \quad (12)$$

The largest observations of variable X are then simulated as:

$$\begin{aligned} x_{(n)} &= Q(u_{(n)}), \\ x_{(n-1)} &= Q(u_{(n-1)}), \\ x_{(n-2)} &= Q(u_{(n-2)}), \\ &\vdots \end{aligned} \quad (13)$$

3.4 Simulation of Extreme Losses of Major Accidents

In this part, theoretical knowledge about quantile function is applied on the data acquired from information about major accidents

from the previous chapter and applied to simulate extreme losses. In total, 27 damages calculated in euros have been selected from the information systems of major accidents (EMARS, ZEMA, ARIA and PZHP). All of them took place over the years 2008–2010 and they are ordered in Table 1.

Using the statistical package STATGRAPHICS Centurion XV by the Kolmogorov-Smirnov test we have found four long tailed probability distributions well fitted to data in Table 1. Results of this test show Table 2.

According to p -values, the losses are best fitted by Pareto distribution model in the European form [12]:

$$p = F(x) = 1 - \left(\frac{a}{x}\right)^b \quad (14)$$

By the STATGRAPHICS Centurion output, parameters of this probability model are determined as $a = 2,000,000$; $b = 0.774826$. The aim is to simulate the highest five losses, considering twenty major accidents that have happened. For this, the simulation of extreme values through quantile function will be used.

Quantile function of Pareto distribution can be defined as a function inverted to the distribution function (14) in the form:

$$x_p = Q(p) = \frac{a}{(1-p)^{\frac{1}{b}}} \quad (15)$$

Tab. 1: Individual financial range of serious industrial accidents (in euro)

2,000,000	2,000,000	2,120,000	2,500,000	2,650,000
3,000,000	3,000,000	3,400,000	3,500,000	4,000,000
4,000,000	4,500,000	5,000,000	5,100,000	6,000,000
7,090,000	8,400,000	10,000,000	12,000,000	12,000,000
14,000,000	14,500,000	15,000,000	21,050,000	32,000,000
36,000,000	435,000,000			

Source: the information systems of major accidents

Tab. 2: Results of the Kolmogorov-Smirnov test

	Loglogistic (3-Parameter)	Lognormal	Lognormal (3-Parameter)	Pareto (2-Parameter)
DN statistics	0.203818	0.137538	0.110012	0.084416
P-Value	0.212352	0.686701	0.899466	0.990618

Source: own calculations

The statistical software STATGRAPHICS Centurion randomly generated five numbers within the interval $<0, 1>$ from an even distribution. The following calculations were done in MS Excels, using the formulae (10), (12) and (13). The result of simulation of the highest five losses out of twenty indemnities given, including the procedure, is provided in Tables 3 and 4.

Figure 2 shows the simulated damage $x=Q(u)$, further just for each order statistics $X_{(20)}, X_{(19)}, \dots, X_{(16)}$ and also their median values

$x_{0.5}$ and quantiles $x_{0.005}$ and $x_{0.995}$. In [7] and [13] is derived the calculation of the stated quantiles including beta inversion function, which is why acquired outcomes are presented only.

Table 4 makes it clear that the highest amount of claim is from the interval $<13,127,418.93 \text{ €}; 88,829,890,943.26 \text{ €}>$ with the probability $\alpha=0.99$, while the median of the highest damage reaches the value of 156,773,540.72 €.

These results are useful for the purposes of insurance and reinsurance.

Tab. 3: Simulation of top five damages in twenty insurance indemnities

v	n	1/n	$v^{1/n}$	u(n)	Q(u(n))
0.6489213	20	0.050000	0.978610	0.978610	285,810,153.50 €
0.2682335	19	0.052632	0.933086	0.913127	46,829,591.89 €
0.7592468	18	0.055556	0.984815	0.899261	38,682,768.63 €
0.3568497	17	0.058824	0.941186	0.846373	22,437,953.57 €
0.4219863	16	0.062500	0.947504	0.801942	16,165,793.88 €

Source: own calculations

Tab. 4: Quantiles of ordering statistics

$Q(\text{BETAINV}(0.5;r;n-r+1)) = x_{0.5}$	$Q(\text{BETAINV}(0.005;r;n-r+1)) = x_{0.005}$	$Q(\text{BETAINV}(0.995;r;n-r+1)) = x_{0.995}$
156,773,540.72 €	13,127,418.93 €	88,829,890,943.26 €
50,049,792.19 €	8,804,780.17 €	1,732,291,027.22 €
27,432,632.79 €	6,806,971.44 €	366,468,591.03 €
18,216,901.58 €	5,613,897.44 €	147,262,811.20 €
13,353,730.93 €	4,810,419.62 €	78,297,378.84 €

Source: own calculations

3.5 Reinsurance of the Largest Claims

Extreme risks, simulated in the previous chapter, need to be ensured through a combination of numerous reinsurance types. One of the most used combinations includes a reinsurance when the application of the insurance company's own retention is followed by quota reinsurance. A higher tier is ensured through non-proportional WXL/R reinsurance, and also alternative forms of reinsurance can be use.

As shows Figure 1, man-made disasters have been increasingly extensive lately. Their modelling and simulation is beneficial to risk-management policies of insurance companies

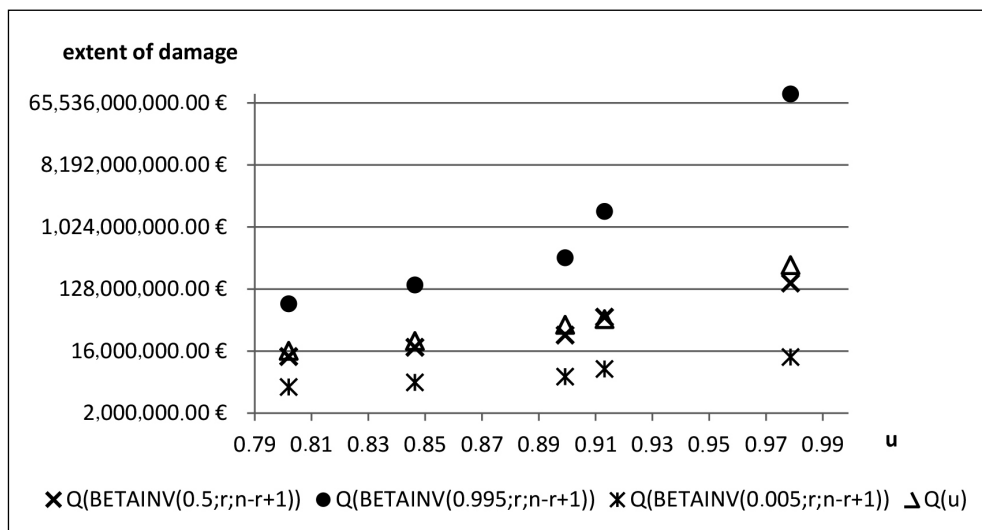
and tackling crucial issues of their insurance and reinsurance.

Extreme-value simulation is generally used in non-proportional largest claims reinsurance LCR(p) or ECOMOR(p) reinsurance [13].

Conclusion

This article is devoted to the analysis of major industry accidents. The risks of major accidents and their consequences reach catastrophic dimensions. That is a reason to require a quality legislative modification focused on the prevention and liquidation of the consequences. The SEVESO directives No. I, II and III were sequentially released

Fig. 2: Graphic form of the extreme losses simulation



Source: Own calculations

by the European Economic Community, the European Community and the European Union are implemented by individual member states into their national legislations. In the Czech Republic they are enshrined in the Act No. 59/2009 Coll. at this juncture. For the member states of the EU, OECD and UNECE there is an information system called EMARS. This system collects data about operators subject to the relevant laws and about major accidents. EMARS provides basic information about past accidents also for the general public.

For the companies in the EU area there is a legal obligation to take out liability insurance with insured sum that has to correspond to the extent of the possible damage. In the Czech Republic this obligation is established by Act No. 59/2006 Coll. It is necessary to secure every insurance contract, because the possible damage can reach catastrophic dimensions. Since there are big risks in such cases not only the classical protection but also a combination of the alternative risk transfer methods need to be used. Among the ART methods that can be used to hedge the risk of major accidents belongs the securitization of insurance risks.

In the article is used data relating to 27 major accidents for the application of the

extreme damage simulation and modelling methods. With the statistic programming system STATGRAPHICS Centurion XV by using Kolmogorov-Smirnov test the Pareto distribution in European form was established as the best model of goodness of fit and also the parameter values of this distribution were estimated. Knowing the probability distribution of the amount of damages will enable the insurance company to determine the basic premium and to decide for the optimal ensuring.

Owing to catastrophic damages of major accidents, the concluding part deals with modelling and simulation of possible extreme damage. In this part was used quantile function of Pareto distribution in the European form. Simulation using quantile function enables estimation of intervals of the highest damages. This can be used in deciding about appropriate types of disproportional reinsurance and for insurance company's catastrophic risks management.

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Abstract

SIGNIFICANCE AND POSSIBILITIES OF MAJOR ACCIDENT INSURANCE**Pavla Jindrová, Radim Jakubínský**

The development of human society is placing ever increasing demands on their production. This action brings the company not only positive but also negative impacts. Along with the development of industrial production, people have to face the risks posed their activity brings. The accidents, which occurred in the recent past, they still have a negative impact not only on humans but also on the environment and the economy. In this paper, we address the issue of major accidents. Major accidents are meant only accidents caused induced by human activities. The paper presents the best known major accidents since the beginning of the 20th century. They have come in the European Union to modify the legislation that is valid for the all EU Member States. In the Czech Republic, these rules are enshrined in Act No. 59/2009 Coll., on the prevention of major accidents. For human society is a necessary protection against the effects arising from major accidents. One of the possibilities is the insurance of major accidents. Since in major accidents frequently occurs very high damage is therefore utilized modelling and simulation of extreme values. One of the options that can be used is modelling using the quantile function. The paper recalled model and process simulation of extreme values. It is possible to estimate the values of the damage amounts thanks to the help of the simulation of the quantile function, and it is also possible to estimate the maximum limit of the interval of damage. This knowledge can be used in deciding on the appropriate type of non-proportional reinsurance and also for the management of catastrophic risk insurance.

Key Words: Major accident, probability models, quantile function, extreme values, simulation, insurance.

JEL Classification: C13, C15, C16, G22.

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AN EVALUATION OF SELECTED ASSETS AND THEIR IMPACT ON THE DECLARATIVE CHARACTERISTIC OF RATIO INDICATORS IN FINANCIAL ANALYSES

David Pur, Helena Jáčová, Josef Horák

Introduction

The current state of the economy often places managers in the position where they have to determine how to best adjust criteria in order to measure success and define the required objectives. The current economic situation is marked by permanent changes, emerging new obstacles and opportunities. The main objective pursued by the majority of companies over the long-term horizon is increasing or maximizing their market value through their corporate strategy. The aim of this paper is to show concrete results of Czech firms to inventory valuation using their own expense or through direct costs may affect the explanatory power of certain indicators of financial analysis. At the same time article discusses the issue of the use of derivatives and their impact on the valuation of assets and the consequent influence the results of the financial analysis. The last part of the contribution includes the results of the survey related to the analysed issue. The research was conducted on business entities located in the Czech Republic that are interested in industrial production.

The question is what approach should actually be employed to measure the performance of a particular company and what methods should be used. This issue has been addressed by numerous economists worldwide. There is a wide range of approaches and methodologies that can be used to evaluate performance that measurement performance from both the financial and non-financial points of view. [19] A company's performance is a fairly common concept today, yet there is no single accurate definition of what it means. The term company performance is used in connection with determining the merits of a company's existence, its success and ability to survive. The purpose of measuring and evaluating a company's performance is to assess the company's actual condition, which is essential

for its owners and executive managers to be able to make future decisions; it is also a vital prerequisite for continued successful management of a company. Performance is mostly associated with efficiency, which refers to a company's ability to achieve certain objectives. This background can be used when determining a company's performance as its ability to best utilise and increase the funds that have been invested into the business's operations. When associated with a company, the meaning of the term performance appears to be even clearer, yet performance needs to be precisely defined so that it can be evaluated. Unfortunately, there is no harmonised definition for this term, which is why the term performance can be interpreted in several ways. Performance is the scope of results achieved by individuals, teams, organisation and processes. [3]

Performance is mostly defined as the ability of a company (business entity) to best increase the value of investments made into its business activities. [20] A company's performance is generally associated with the growth of market value, which is the effort to pursue efficient utilisation of the equity and loan capital leading towards maximisation of the company's market value over the long-term horizon, which relates to making profits or at least establishing conditions suitable for the future generation of profit. [16]

A basic requirement imposed on the scales (indicators) that show a company's performance is to have an accurate evaluation of the current situation in a particular company and these results should then be used to correctly interpret the company's actual performance. A company's performance is typically determined over a longer period, e.g. one-half of a year or a year.

There have been many criteria developed to determine a company's performance. These criteria are based on both theoretical knowledge as well as practical experience.

Tab. 1: An evaluation of methods and models for measuring performance

Approach of the measurement	Characteristics and application	Advantages	Disadvantages
Traditional approach (financial analysis)	used to identify positive and negative trends in a company	simplicity	keeps to an accounting system that is based on accrual principles
	provides feedback for strategic management purposes	comprehensibility	does not consider any changes in the market value of assets
	the indicators obtained help to assess progress with respect to cash-flow, income, etc.	elimination of subjectivity when selecting indicators	information about causal occurrence of problems is missing
	works mainly with data obtained from financial accounting		
The modern approach (EVA, MVA, CFROI)	the methods are based on value management	simple and comprehensible expression of a company's success	complicated calculation of indicators
	can be also used for certain complex managerial models	can be used to link operative and strategic management	demanding identification of input data
		market-recognized value	results gained through the work of managers not always clearly differentiated from the results caused by other circumstances
Complex managerial models (e.g. BSC, TQM, EFQM, Six Sigma, Benchmarking and other)	an evaluation of a company's overall performance	an evaluation of overall performance	time-consuming to perform
	focused on financial and non-financial indicators	used for strategic management	costly implementation
	not limited just to measuring performance, these can also be used to manage factors that affect performance	identification of causes, relationships and consequences	potential occurrence of problems with formulating a strategy and transferring it into operative management

Source: own based on [11], [13], [17], [20], [22]

The methods used for measuring a company's performance can be divided into three, which are briefly characterised in Table 1.

- Traditional criteria for measuring a company's performance,
- Modern criteria for measuring a company's performance,
- Complex managerial models.

The information that is given in Table 1 is obtained from the study of literature and the experience of the authors of this paper. Individual characteristics, advantages and disadvantages of the methods and models used for performance measurement are based on the acquired knowledge.

Further attention will be paid to the traditional approach of evaluating a company's

performance in this paper. The traditional criteria used for measuring a company's performance are mainly based on a financial analysis of the company concerned, as this is a vital analytical tool. The principle of financial analysis is based on a mutual comparison of the data obtained. The information obtained serve not only for evaluating the overall situation of the particular company, it also helps to identify the company's strengths and weaknesses. There are various methods and approaches to financial analysis described in technical literature and employed in practice. The disadvantage is that neither the approaches nor the terminologies are amended in legal terms. That is why comparing companies can be very difficult, as is assessing a specific company's progress over time. The input data for most indicators used in financial analysis come from accounting records, which is also a cause for criticism in this respect. These data are not corrected in terms of risk factor or inflation; they do not consider any impacts of time on the value of money or opportunity costs. Other disadvantages can be seen in the fact that information obtained in such a way only reflects the company's economic situation; the evaluation does not include the company's market position, there is no reflection on the effect brought on by competitors or on the image of its products and innovations, no attention paid to the quality of employees or the employees achieving their objectives. The main problem with the traditional indicators for measuring a company's performance is that these cannot function without additional information. The information refers to the progress of the company's liquidity, solvency, indebtedness, property and financial structure. This additional information is also obtained from a financial analysis of the company.

Financial analysis indicators cannot be expected to reveal all financial problems. The advantages of financial analysis include its comprehensibility and availability of data from the company's accounting records.

The traditional indicators of a company's financial performance include indicators showing the company's absolute profit value, which can be expressed in various forms. Other traditional indicators are indicators of return that express the efficiency of invested resources and cash-flow indicators.

Despite there being several critical comments against financial analysis, it still

remains a very important tool in financial management. Financial analysis provides an evaluation of the past and existing progress of operations from various points of view and provides input needed for future decision-making [2], [8], [16], [17], [22].

1. The Importance of Evaluation in Accounting in Accordance with the Czech Legislation

The principle of evaluation in accounting deals with assigning values to individual assets or liabilities. Expressing assets and liabilities in terms of value has a significant impact on the information about a company's financial situation. That is why the method of evaluation has extensive influence not only on accounting records and on the evaluation of the company's financial situation, but also on the determination of the company's value [1]. Fireš states the following: *"This is a substantial issue addressed in every financial accounting system, especially because the method of evaluation applied defines the content and informative utility of basically every basic financial value identified through accounting records."* [6] The impact considered therefore concerns total assets and liabilities, as well as the amount of equity capital and profit or loss. The main issue is in selecting the correct evaluation basis to proceed upon when evaluating the assets and liabilities in a company's accounting records in order to clearly show a particular accounting unit's economic status. Most of the new approaches strive towards implementing paradigms aimed at changing from historical costs to values for a better description of the economic avail of items subject to evaluation. [4], [12]

The issue of valuation of inventories is regulated by the Act on Accounting and Czech accounting standards that determine the value of specific assets and debts. It is important to distinguish to what time is the value determined. Following text is based on the various provisions of law mentioned above. Valuation of inventories takes place in two time levels:

- the moment of execution of the accounting transaction,
- evaluation to the end of balance sheet date.

For inventory valuation is used in both cases following price bases:

- purchase cost,
- replacement purchase cost,
- cost price.

In the event that the market value of inventories is lower than their initial price, it is necessary to make adjustment for these inventories.

Provisions of the said law continue the preceding stipulations and define the steps to be taken in case it is determined that the actual price differs from the accounting value. If the sales price of inventory after deducting the costs associated with the sale is less than the book value, the evaluation will be carried out using only the lower value. The same situation occurs when the value of liabilities obtained is greater than or lower than the book value - the evaluation will then be carried out using only the newly-established value [24].

The provisions also contain an enumerative description of the method for evaluating selected items using the real value:

- securities – except for securities held-to-maturity,
- derivatives,
- assets and liabilities in cases to be evaluated using the real value pursuant to special regulations,
- part of assets and liabilities secured by derivatives,
- receivables acquired by the accounting unit to be traded.

The real value applied can be the market value, an appraisal pursuant to a professional estimate or even by expertise. If the of market value professional estimate options cannot be applied, the evaluation process shall run in accordance with special legal regulations.

Kovanicová responds to conditions implied by legislation as follows: *“In compliance with international norms, Czech accounting standards also evaluate certain assets and liabilities using the real value applied at the end of balance sheet date. However, revaluing long-term assets to the real value is not acceptable. The nature of certain assets and liabilities implies the use of specific techniques for evaluating as of the balance sheet date.”* [12]

Another document that refers to the Accounting Act and the relevant regulations is the Czech Accounting Standards, which are issued by the Ministry of Finance in order to achieve compliance with the application of accounting methods in individual companies and to ensure better comparability of final accounts. Their main task is to approximate and harmonize accounting methods and procedures.

The contents of individual standards focus on the following: accounts and principles of bookkeeping on accounts, opening and closing of accounting books, capital accounts and long-term liabilities and costs and revenues. The evaluation agenda is not listed separately, rather it is included within specific standards relating to assets and liabilities. Examples include long-term tangible and intangible assets, long-term funds, derivatives and inventory with an exact determination of particular items and their entry with reference to the Accounting Act and the relevant regulations.

Special attention needs to be paid to the evaluation of inventory-produced internally, as these items have a significant effect on profits and losses. The mentioned legislation mainly differentiates the levels of cost price that is comprised of either the actual cost amounts or the costs defined by operative (planned) calculations, if identified under conditions for the technical preparation of production. Internally-produced inventory can be also evaluated differently depending on the duration of production cycle as follows:

- a) **In production with a short-term uninterrupted cycle** with wages charged against products or semi-products, only for direct material cost items (direct materials, semi-products),
- b) **In mass or large-scale production**, using direct costs only (direct materials, semi-products, direct wages and other direct costs),
- c) **In small-scale and unit (custom) production with a long-term cycle**, using items evaluated by two methods: direct costs or direct costs increased by production or administrative overheads (this item is absolutely evaluated only in exceptional cases where the production cycle duration exceeds one year). [7]

2. The Impacts of Evaluation on a Company's Performance Assessment

Impacts of valuation of assets are reflected in the company's performance, which is demonstrated on the example of the business entity operating in the Czech Republic. This entity is governed by the laws and regulations valid in this country. Furthermore, there are characteristics of the impact of valuation on the company from the perspective of Czech scientists.

The method of evaluation will be projected into the amount of assets and liabilities, which subsequently affects the amount of profit or loss, the values listed in accounting records and the indicators calculated in the financial analysis. Mařík states: *"As these values represent the starting point for various calculations and indicators that characterise the financial status of a company and its ability to generate income, including the rate of return on investment, the financial analysis of a company and conclusions derived from such analysis depend on the method of evaluation selected"* [13].

Financial analysis is one of the basic instruments used to assess a company's financial condition and performance. Most companies still use these indicators for making decisions and directing the focus of their future operations and activities. Results obtained from these indicators serve as background for making decisions about which measures to implement in order to achieve medium- and long-term objectives.

Professionals concerned with financial analysis and the relevant informative utility of accounting records on a long-term basis have agreed that books using historical costs represent a serious problem. Knápková, Pavelková, and Šteker commented that, *"An evaluation of assets using historical costs does not consider changes to the market prices of assets, ignores the changes of purchasing power of particular monetary units and therefore distorts the figures referring to profit and loss over a regular year"* [11]. This statement can be deemed true with regard to inflation, which is not reflected in the traditional concept of accounting. However, as far as selected assets and liabilities are concerned, one needs to respect the legislative measures that define the duty to write long-term assets off and to re-price other items in the records as of the balance sheet date in order to establish their real value. These steps help a company maintain the principle of safety and approximate the value of assets and liabilities to real values, because the process is still based on prices that can be documented, retrieved on objective basis and related to a specific item.

Referring back to the issue of accounting data from the financial analysis point of view, one may state that the informative utility of accounting records is actually a bottleneck of financial analysis.

This problem is further discussed by Kislingerová, who states, *"...the source for assessing a company's performance and other relevant analyses is represented by accounting records that need to be reflected"* [10]. The accounting standards, legislative amendments and measures are meant to ensure a precise and truthful presentation of accounting data. If this fact were not reflected in the accounting system, the system for arranging financial statements would most likely change. The main drawback of all the mandatory procedures lies in their failure to reflect inflation, especially with regard to long-term assets.

There are very frequent expressions of criticism aimed at the indicators of a company's performance, because these do not take various factors into account, i.e. the risk, the impact of inflation, the value of money over time and opportunity costs. That leads to critical comments addressing the level of profit and loss declared in books and their transformation into final income. It has to be emphasized here again that this issue not primarily due to indicators, but rather the input data being the actual accounting information.

3. The Fundamentals of Financial Analysis

Financial analysis is one of the instruments used by corporate management. It deals with assessing the financial and economic situation using specific procedures and methods. *"Financial analysis serves for making a complex assessment of the financial situation in the particular company."* [11]

Outputs generated by financial analysis are utilised not only by managers in the relevant company, but also by future investors, business partners, financial institutions, government institutions, employees, auditors, competitors, professionals, etc. *"The actual target client group for financial analysis needs to be considered carefully, as each interest group prefers different information"* [10]. The processing of specific indicators is based on in-house records that can help outline future progress trends. *"An essential source of data is a company's financial statements - the balance sheet, the profit and loss report, cash-flow, the review on changes of equity and the appendix to final accounts"* [11].

Financial analyses have to be processed with respect to certain principles in order to

ensure the correct informative utility of specific results. The data identified and used for comparison over time must be obtained using the same methodology. Identifying the progress trend followed by a particular company requires processing financial analyses over time with a simultaneous comparison of entire accounting periods.

3.1 Specific Methods and Calculations of Financial Analysis Indicators

The processing of financial analysis can be based on elementary and advanced methods. Elementary methods of financial analysis include the analysis of absolute, differential and ratio indicators, together with the Du Pont analysis. Other indicators include the credit and bankruptcy models. [5]

The primary materials used to process financial analysis are financial statements. *"The balance sheet contains data referring to a company's status as of a certain date (status indicators); the profit and loss report shows the revenues and costs over a specific time period (flow indicators). The difference between status indicators can be used to obtain the differential indicators. When setting up a ratio using the data processed, these values are called ratio indicators"* [11].

The main category of indicators for financial analysis is comprised of ratio indicators, most often used for comparing progress, comparisons

against competitors and a pre-defined plan. The basic and most important indicators in this category include profitability, activity, liquidity, indebtedness and capital market indicators, and last but not least, instruments represented by indicators based on net working capital and operating cash-flow. [7], [23]

Table 2 presents the main significance of the selected indicators of the financial analysis.

The return on equity should correspond at least to the return on risk-free assets. *"Measuring the return on equity helps to express the return on capital invested by the company's owners. The positive difference between interest on savings and return is defined as the risk premium. This is the reward to owners, who bear the risk"* [11].

However, there is a certain level of indebtedness that is useful for the company, because loan capital is cheaper than equity capital. That is due to the fact that interest costs incurred by loan capital reduce the company's tax burden, because cost interest is a cost category and reduces taxable profits (i.e. the tax effect or tax shield)" [11].

4. Survey Results

This chapter deals with the analysis and presentation of the results of the survey, which was carried out among selected business entities operating in the Czech Republic in February and March 2014. The aim of the

Tab. 2: The essence of selected indicators of financial analysis

Type of indicators	Significance
Return	evaluates the efficiency of the company
	ability to generate profit
	ability to increase the value of invested capital
	represents an important indicator for shareholders
Activity	express the period of capital fixed to selected assets or liabilities
	measure the company's efficiency when handling its assets and liabilities
Liquidity	define a company's solvency
	express ability to transform different assets into money
Indebtedness	presents the scope of risk borne by the company
	present the relationship between equity and debts
	the increase of indebtedness can lead to the growth of profitability (ie. leverage), but also increases the risk of financial stability

Source: own based on [9], [11]

survey was to find out what methods are used for measurement of the financial performance of the company in the case of companies that operate in the Czech Republic. Selected findings are presented in the following text.

4.1 Research Methodology

The methodology of the research is based on the survey. For the purpose of this article an electronic survey was implemented back in February and March 2014 in companies situated in the Czech Republic. The vast majority of analysed companies were located in the Central and North-East part of Bohemia. The research team received one hundred of completed questionnaires. The survey consisted of 3 main parts: first part contained basic information about a business entity, second part was focused on evidence of environmental costs in these companies and the last part analysed financial management. The main goal of the survey was to monitor present situation in practical use of performance measurement systems, mainly with focus on innovated approaches of strategic management. The survey was prepared in the electronic form and it contained 38 questions. To obtain relevant information about the analysed companies, both closed and open questions were used. The task of the respondents was to answer open questions with no options available. These answers were selected by companies at their sole discretion. Closed questions included some options to be used by respondents. Within the scope of the survey, 137 companies were contacted and

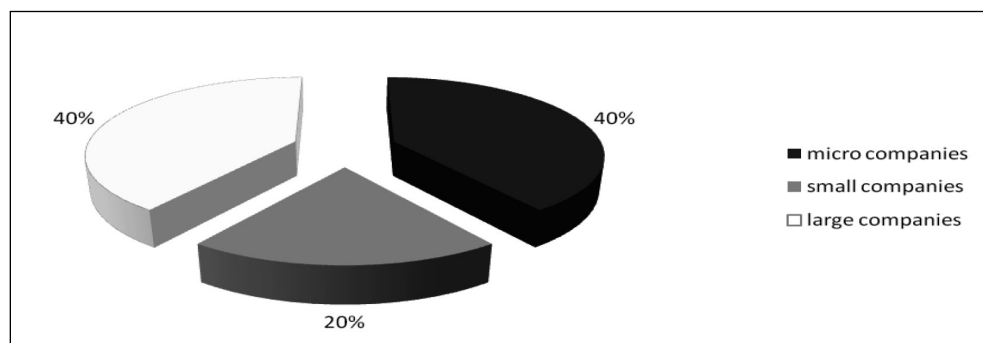
we obtained 117 completed questionnaires back. 110 of them were usable. There was a certain risk that respondents may understand the questions wrongly, which could affect the results of the survey. The data collected by questionnaires were subject to a thorough analysis. These data were processed with the help of an Excel spreadsheet application.

Figure 1 shows the structure of the companies addressed arranged by size in accordance with EU criteria. Micro companies are characterised by assets/property or turnover/income up to EUR 2 million. These limits are raised to EUR 10 million for small companies. Medium companies have assets/property worth up to EUR 43 million and turnover/income up to EUR 50 million. Large companies exceed these limits.

The questionnaire survey revealed the current approach to financial analysis to determine whether it was a common and frequently applied tool for assessing a company's financial status. Out of all the companies addressed, 69% of them used financial analysis in their regular reporting and 31% used this assessment tool on an irregular basis. Furthermore, 73% of the respondents process their financial analysis independently. Figure 2 shows the percentage of companies that evaluate their FA using in-house information systems.

The last, yet still very important piece of information obtained, is that 78% of the companies addressed do not process any bankruptcy or credit models. 13% of the

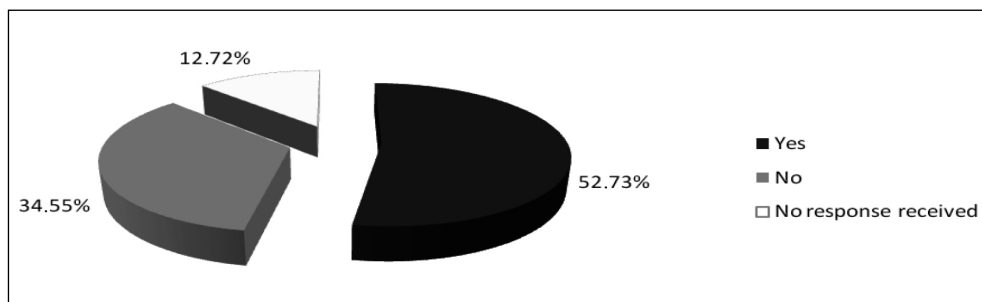
Fig. 1: The structure of companies, arranged by size



Source: own

Fig. 2:

The percentage of companies performing financial analysis using in-house information systems



Source: own

companies assess their overall financial status using the Altman model, 5% of respondents use the IN index and 4% of them use the Quick Test.

Figure 3 presents the utilisation of credit and bankruptcy models when performing a financial analysis.

5. The Outputs of Financial Analysis with Different Methods for Evaluating Selected Asset Items

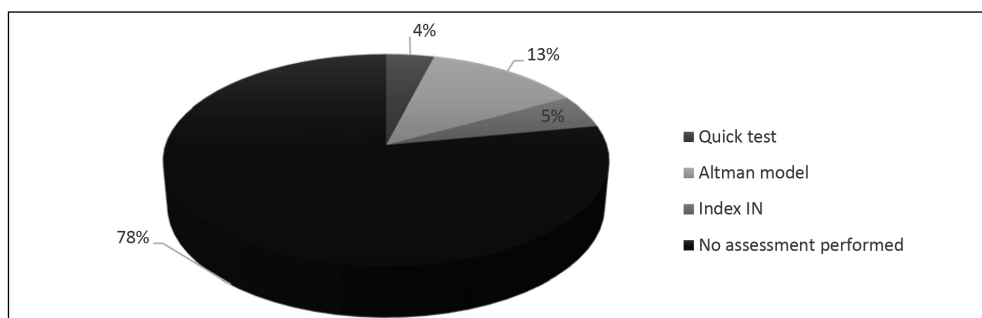
Current legislation allows the employment of different methods for evaluating assets and liabilities in certain cases. If the change of evaluation basis as such is left out of consideration and the evaluation based on purchase cost is considered, there are currently two main areas with potentially serious impact on the amount of profit and loss, the structure of assets and capital, etc. These are the

evaluation of internally-produced inventory using either direct costs or cost prices, including production overheads. The second problematic area deals with the revaluation of derivatives as of the balance sheet date to establish their real value; these are kept by accounting units to accommodate the exchange rate risk. This issue concerns local enterprises who export most of their production abroad who therefore face the deviations of exchange rate as well as the risk involved with the distortion of accounting records and the profit and loss declared regardless of whether transactions associated with the application of derivatives have been completed or not.

Further attention will be paid to the impacts of different evaluations of internally-produced inventory and the revaluation of derivatives to establish their real value up to the amount of

Fig. 3:

The utilisation of credit and bankruptcy models when performing a financial analysis



Source: own

Tab. 3: Basic details of quantities, sales, change of inventory and profit/loss

line	Item	Product 1	Product 2	Total
1	Direct costs (CZK)	0.68	50.42	X
2	Production overheads (CZK)	0.97	71.92	X
3	Total costs (CZK)	1.65	122.34	X
4	Sales price (CZK)	1.91	141.62	X
5	Total production quantity (thousands of pcs)	29,466.00	3,118.00	32,584.00
6	Total quantity sold (thousands of pcs)	29,547.00	2,832.00	32,379.00
7	Change in inventory (thousands of pcs), (l. 5 - l. 6)	-81.00	286.00	205.00

An evaluation of inventory using direct costs

8	Revenues (thousands of CZK), (l. 6 x l. 4)	56,435.00	401,068.00	457,503.00
9	Costs of quantity produced (thousands of CZK), (l. 5 x l. 3)	48,619.00	381,456.00	430,075.00
10	Costs of quantity sold (thousands of CZK), (l. 6 x l. 3)	48,753.00	346,467.00	395,219.00
11	Inventory level change (thousands of CZK), (l. 7 x l. 1)	-55.00	14,420.00	14,365.00
12	Profit or loss (thousands of CZK), (l. 8 - l. 9 + l. 11)	7,761.00	34,032.00	41,793.00
13	Tax rate (%)	19.00	19.00	19.00
14	Tax (thousands of CZK), (l. 12 x l. 13/100))	1,475.00	6,466.00	7,941.00

An evaluation of inventory using cost prices

15	Revenues (thousands of CZK), (l. 6 x l. 4)	56,435.00	401,068.00	457,503.00
16	Costs of quantity produced (thousands of CZK)	48,619.00	381,456.00	430,075.00
17	Costs of quantity sold (thousands of CZK), (l. 6 x l. 3)	48,753.00	346,467.00	395,219.00
18	Inventory level change (thousands of CZK), (l. 7 x l. 3)	-134.00	34,989.00	34,855.00
19	Profit or loss (thousands of CZK), (l. 15 - l. 16 + l. 18)	7,682.00	54,601.00	62,283.00
20	Tax rate (%)	19.00	19.00	19.00
21	Tax (thousands of CZK), (l. 19 x (l. 20/100))	1,460.00	10,374.00	11,834.00

Source: own

assets, liabilities, income and into calculations to generate financial analysis indicators. All presented information in the following text is based on data of the real Czech company. This international company is focused on the production of glass and glassware and it is one of the major glass producers in the Czech Republic. From the view of the criteria of the European Union, it is a large company. The company was chosen because of its willingness to provide internal information to which it was possible to process the relevant analysis. On the basis of specific data, it is possible to present the impact of inventory valuation not only on the explanatory power of accounting but also financial analysis.

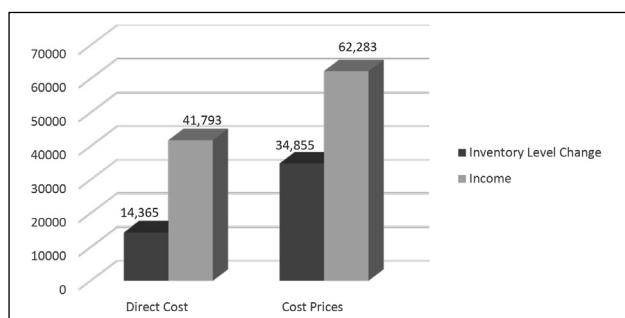
5.1 The Impact on Financial Results

The first step outlines the impact of evaluating internally-produced inventory on the financial

results of a particular company. For details on quantities produced and sold, information on costs and sales price, refer to Table 3. If the company opts to evaluate its internally-produced inventory at the direct cost level, its financial result will reach CZK 41,793,000. However, if the company keeps the current method of evaluation using cost price, see Table 3, the financial result achieved will equal CZK 62,283,000. The impacts of different methods when evaluating internally-produced inventory on the total quantity of inventory and profit/loss are presented in Figure 4.

The selected method for evaluating internally-produced inventory has a substantial effect on profit and loss with consequences affecting the results obtained for return indicators. Impacts on changes to the inventory level will also affect the resultant stock turnover period, stock turnover and regular liquidity.

Fig. 4: The impacts of different methods when evaluating internally-produced inventory on the total quantity of inventory and profit/loss (thousands of CZK)



Source: own

Evaluations using direct costs then distort the exact figure defining the amount of funds fixed in inventory.

Another important factor affecting the informative utility of financial statements and the profit and loss achieved is the use of derivatives for securing against the exchange rate risk. The issue of derivatives relates to companies exporting most of their production abroad. Similarly to the impact of inventory evaluations, the model example of the impact of derivatives was demonstrated using a joint-stock industrial company from the Czech Republic that exports most of its production to countries in South America and the EU. *"The Czech crown has*

been highly volatile since 1997. Business entities must deal with this volatility accordingly" [18]. The main instruments include derivatives. *"Certain risks can be counter-balanced by trading options, futures and some financial instruments"* [1], [15], [21].

The application of security is also affected by decision-making in compliance with financial policies and other policies [12], [21]. Modigliani and Miller stated, *"...with fixed investment policy and with no contracting costs or taxes, corporate financing policy is irrelevant"* [14].

The current legislation implies that accounting units are obliged to re-price their derivatives to their real value as of the balance

Tab. 4: Revaluing derivatives to the real value as of the balance sheet date (CZK) – Part 1

Line	Liability (derivative)	USD	EUR	Total
1	Derivative amount	2,500,000.00	1,000,000.00	X
2	Derivative price rate agreed upon with the bank	19.000.00	25.000.00	X
3	Initial derivative value (l.1 x l. 2)	47,500,000.00	25,000,000.00	72,500,000.00
4	Price rate as of the balance sheet date	20.072.00	25.735.00	X
5	Real derivative value (l.1 x l. 4)	50,180,000.00	25,735,000.00	75,915,000.00
6	Revaluation difference	2,680,000.00	735,000.00	3,415,000.00

Summary after revaluing internally-produced inventory using direct costs

7	Total revaluation difference (thousands of CZK)			3,415.00
8	Total revenue gained when using the derivative (thousands of CZK)			471,868.00
9	Total costs incurred when using the derivative (thousands of CZK)			430,075.00
10	Revenues from revaluing securities and derivatives (thousands of CZK)			3,415.00
11	Other receivables (thousands of CZK)			3,415.00
12	Income gained using the derivative (thousands of CZK) (l. 8 – l. 9)			41,793.00
13	Income tax assessed when using the derivative (thousands of CZK) (l. 12 x l. 20/100)			7,941.00
14	Total revenue gained without using the derivative (thousands of CZK)			468,453.00
15	Total costs incurred without using the derivative (thousands of CZK)			430,075.00
16	Revenues from revaluing securities and derivatives (thousands of CZK)			0.00
17	Other receivables (thousands of CZK)			0.00
18	Income without using the derivative (thousands of CZK) (l. 14 – l. 16)			38,378.00
19	Income tax assessed without using the derivative (thousands of CZK) (l. 18 x l. 20/100)			7,292.00
20	Tax rate (%)			19.00

Summary after revaluing internally-produced inventory using cost prices

21	Total revaluation difference (thousands of CZK)			3,415.00
22	Total revenue gained when using the derivative (thousands of CZK)			492,358.00
23	Total costs incurred when using the derivative (thousands of CZK)			430,075.00
24	Revenues from revaluing securities and derivatives (thousands of CZK)			3,415.00

Tab. 4: Revaluing derivatives to the real value as of the balance sheet date (CZK) – Part 2

Line	Liability (derivative)	USD	EUR	Total
25	Other receivables (thousands of CZK)			3,415.00
26	Income gained using the derivative (thousands of CZK) (I. 22 – I. 23)			62,283.00
27	Income tax assessed when using the derivative (thousands of CZK) (I. 26 x I. 34/100)			11,834.00
28	Total revenue gained without using the derivative (thousands of CZK)			488,943.00
29	Total costs incurred without using the derivative (thousands of CZK)			430,075.00
30	Revenues from revaluing securities and derivatives (thousands of CZK)			0.00
31	Other receivables (thousands of CZK)			0.00
32	Income without using the derivative (thousands of CZK) (I. 28 – I. 29)			58,868.00
33	Income tax assessed without using the derivative (thousands of CZK) (I. 32 x I. 34/100)			11,185.00
34	Tax rate (%)			19.00

Source: own

sheet date. Evaluation differences may be reflected in both balance sheet accounts, as well as revenues and costs, which influences profit and loss. Impacts brought by revaluing derivatives at the selected company are shown in Table 4 and the input data follow the basic values shown in Table 3.

When processing a financial and business plan for fiscal year 2013 with projections into 2014, the company's managers decided to secure their business transactions at USD 2.5 million and EUR 1 million, which had to be re-priced to the real value at the end of the fiscal year 2013 (the accounting period from 2012-04-01 to 2013-03-31). The profit gained through the accounting period was equal to CZK 62,283,000.

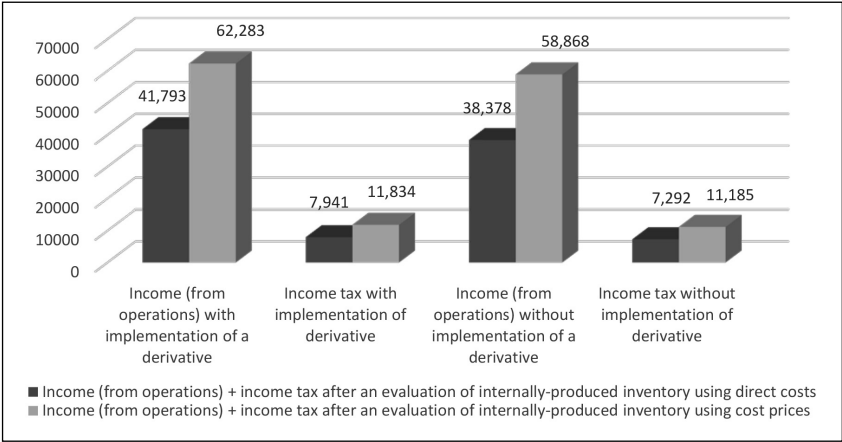
Changes in the exchange rate helped the company gain an additional CZK 3,415,000 of profit by the end of the accounting period, even though the volume of transactions secured by the agreed-upon derivative fell by one half over the same period. A clear illustration of the impact on the company's income and the amount of tax are shown in Figure 5.

If the company were to evaluate its internally-produced inventory using direct costs

without any derivative in place, its profit would be CZK 38,378,000. The difference obtained by using a different method of evaluation is equal to CZK 23,905,000, as shown in Figure 6.

If the company proceeds with evaluating its stock and opts for utilising a derivative for security against exchange rate risk, its income over the particular accounting period will reach of CZK 62,283,000. If the company keeps the derivative and evaluates its inventory using direct costs, its income will drop to CZK 41,793,000. On the contrary, if the company keeps evaluating its inventory using the cost price and avoids using a derivative and its compulsory revaluation, its income will reach CZK 58,868,000. Should the company decide to distort its financial statements by evaluating the inventory using direct costs in order to reduce its tax liability without using any derivatives, its income would reach CZK 38,378,000. As the company may not declare different amounts of income within a single accounting period depending on the bookkeeping methods selected, one needs to have a clear illustration of the impact such steps have on the financial analysis results.

Fig. 5: The impact of derivative revaluation on the income and tax due to the evaluation of internally-produced inventory using direct costs or cost prices (thousands of CZK)



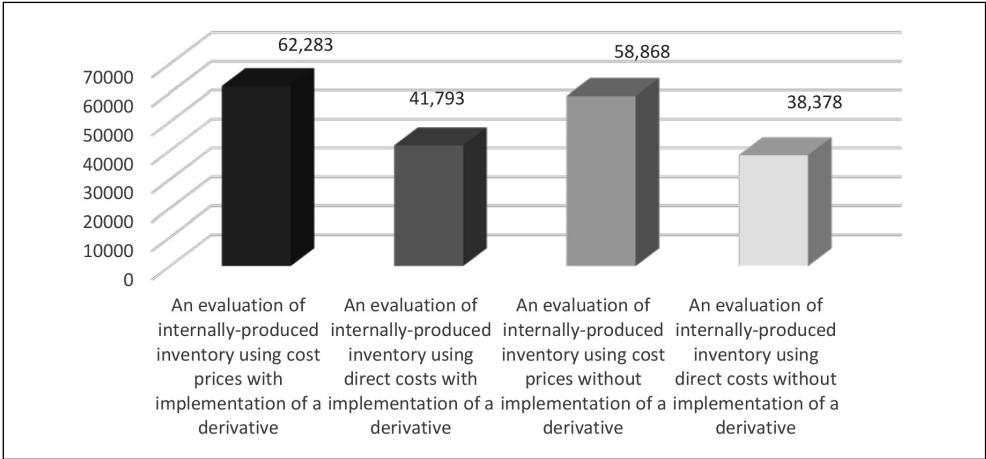
Source: own

5.2 The Impact on Results of Ratio Indicators

Financial analysis should serve not only for assessing the overall financial status of a particular company, but also help to focus on its future development. It is also an instrument used for making mutual comparisons of multiple companies. To ensure that the informative

utility of these data is as accurate as possible and provides correct information for making decisions regarding future steps and the company's focus, it is important to keep the accounting methods unified, both within and outside of the company. A basic prerequisite for comparing a company with other competitors in the area requires all the companies subject to

Fig. 6: A comparison of impacts generated by evaluating internally-produced inventory with/without any derivatives on the company's income (thousands of CZK)



Source: own

Tab. 5: Input data for financial analysis (CZK)

Item	Results of FA after evaluating internally-produced inventory using cost prices using a derivative	Results of FA after evaluating internally-produced inventory using direct costs with a derivative	Results of FA after evaluating internally-produced inventory using cost prices without a derivative	Results of FA after evaluating internally-produced inventory using direct costs without a derivative
Total assets	470,653,007.00	450,163,007.00	467,238,007.00	446,748,007.00
Long-term assets	192,921,330.00	192,921,330.00	192,921,330.00	192,921,330.00
Current assets	277,186,709.00	256,696,709.00	273,771,709.00	253,281,709.00
Inventory	34,855,000.00	14,365,000.00	34,855,000.00	14,365,000.00
Short-term receivables	80,891,144.00	80,891,144.00	77,476,144.00	77,476,144.00
Long-term receivables	0.00	0.00	0.00	0.00
Disposable funds	242,034,664.00	242,034,664.00	238,619,664.00	238,619,664.00
Cash	161,143,519.00	161,143,519.00	161,143,519.00	161,143,519.00
Equity	507,558,745.00	487,068,745.00	504,143,745.00	483,653,745.00
Short-term liabilities	61,706,753.00	61,706,753.00	61,706,753.00	61,706,753.00
Total loan capital	66,166,870.00	66,166,870.00	66,166,870.00	66,166,870.00
Interest expenses	2,034,562.00	2,034,562.00	2,034,562.00	2,034,562.00
Revenues	457,503,000.00	457,503,000.00	457,503,000.00	457,503,000.00
Revenues/365	1,253,433.00	1,253,433.00	1,253,433.00	1,253,433.00
Profit or loss / Income	62,283,000.00	41,793,000.00	58,868,000.00	38,378,000.00

Source: own

comparison to use identical procedures so that all the effects described above are eliminated. The impacts of different evaluations up to the income amount have been outlined; their projection into individual ratio indicators is shown in Table 6, whose input data was obtained from the financial statements contained in Table 5.

The results of ratio indicators are obtained when the company evaluates its inventory using cost prices or direct costs with or without simultaneously using a derivative. If the inventory were evaluated using direct costs without a derivative, the return on equity and total capital would be reduced. This indicator provides "... *an assessment of a company's economic efficiency and its ability to generate profit that expresses the scope of the company's ability to increase the value of invested capital*" [6].

The results of financial analysis imply that the method for evaluating inventory using cost prices or direct costs with or without using a derivative mainly affect the resultant values of return, activity, liquidity and interest earned.

To proceed with inter-company comparisons, the company needs to know more details about its competitors so that the managers can assess the results to get an idea that these results are either good or bad with respect to competitors.

6. Discussion

The results of our survey have confirmed that companies mainly use financial analyses to measure their performance and management efficiency. The output then corresponds to the size and legal form of each company, as most of the companies addressed were joint-stock companies or limited companies. These companies typically use financial analyses as financial management tool. The survey further showed that assessing performance based on financial indicators still prevails and the use of financial analysis in the future is still very likely.

The conflict between a company's need to remain competitive over the long run and having a rigid financial accounting model has opened up some space for implementing some

Tab. 6: Impact of different evaluation of internally produced inventory with/without implementation of derivative on results of financial analysis

Indicator	Results of FA after evaluation of internally produced inventory using cost prices with implementation of derivative	Results of FA after evaluation of internally produced inventory using direct costs with implementation of derivative	Results of FA after evaluation of internally produced inventory using cost prices without implementation of derivative	Results of FA after evaluation of internally produced inventory using direct costs without implementation of derivative
ROA (%)	10.72	7.52	10.21	6.96
ROE (%)	9.94	6.95	9.46	6.43
Stock turnover period (days)	27.81	11.46	27.81	11.46
Stock turnover (times)	13.13	31.85	13.13	31.85
Turnover of receivables (days)	64.54	64.54	61.81	61.81
Turnover of receivables (times)	5.66	5.66	5.91	5.91
Fixed asset turnover (times)	2.37	2.37	2.37	2.37
Immediate liquidity (%)	261.14	261.14	261.14	261.14
Quick liquidity (%)	392.23	392.23	386.70	386.70
Current liquidity (%)	449.20	415.99	443.67	410.46
Total indebtedness (%)	14.06	14.70	14.16	14.81
Debit ratio (%)	13.04	13.58	13.12	13.68
Interest earned (times)	30.61	20.54	28.93	18.86

Source: own

of the new modern methods and models for assessing a company's performance that have developed in recent decades. These models are characterised by a complex company management approach and respect the risk assumed by the company when generating value not only of for its owners, but also for its stakeholders. These reasons necessitate the need for assessing companies, even with respect to non-financial indicators. Using suitable scales to assess performance improves the competitive strength of companies. Improved competitive strength brings benefits not only to the owners, but also to employees, contractors and government authorities. One associated problem lies in the fact that many of these approaches define areas to be handled by managers. However, they do not determine specific indicators to be observed.

Conclusion

The current range of approaches used to assess financial performance in various companies is fairly broad. Methods based on assessing financial data, i.e. a financial analysis, are the oldest and still most-frequently applied. Evaluating a company's performance using financial indicators is the typical practice and it is well-founded beyond any doubt. These approaches are simple and clear; however, they have proven to be insufficient following changes in the business environment, as they often do not provide an explicit analysis of causal relations, nor do they cover any qualitative aspects of features and relationships within the corporate system. However, this does not reduce their significance in any way. Each company needs to be monitored and assessed on systematic basis.

In the case that the company uses for inventory valuation own direct costs or cost prices it will affect the costs, structure of assets and liabilities and, last but not least, also affects the profit including income tax expense. As these above mentioned items enter as a source data for processing financial analysis they also affect different results of the financial analysis. A similar situation affecting their own individual results of the financial analysis occurs even if the company decides to use derivative transactions to ensure stable input inventories. Again in derivative transactions must be taken into account the valuation of inventories, direct costs or cost prices.

If a company is to be compared to its competitors, the average within its industry or even the leader in a particular industrial segment, one needs to realise the lack of detail concerning such companies and the uncertainty surrounding the factors that affect the input values used to calculate financial indicators, as described in this paper. That is why managers need to treat such comparisons with great care.

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AN EVALUATION OF SELECTED ASSETS AND THEIR IMPACT ON THE DECLARATIVE CHARACTERISTIC OF RATIO INDICATORS IN FINANCIAL ANALYSES

David Pur, Helena Jáčová, Josef Horák

A company's financial performance is essential when investors compare its competitive position to determine how attractive it is. That is why performance needs to be evaluated from both the qualitative and quantitative points of view. The classical financial approach to measuring a company's performance based on past results is no longer sufficient; it needs to be complemented with a non-financial measurement method. This paper focuses on financial analysis, which is one of the tools used for assessing the performance and financial status of companies. The current individual financial analysis indicators must be processed taking into account the influences that potentially affect and distort the results, as well as with their comparability over time and within a single accounting unit or among individual companies. As far as financial analysis is concerned, attention has to be paid to the method used for evaluating assets and liabilities, as this issue greatly affects the informative utility of financial statements and the final data relevant to income from operations, which are the input data for processing individual financial indicators. After that the paper deals with the research that was focused on companies located in the Czech Republic. The aim of the research was to analyse the methods of measurement of financial performance use the Czech companies. Another important task is to plot the approach used by companies to conduct financial analysis in the Czech Republic. It should illustrate whether companies process such analysis independently and regularly using their in-house information systems and identify the most commonly- assessed indicators. It is important that companies process their financial statements so that they can subsequently be assessed and compared over time while maintaining adherence to the same accounting procedures.

Key Words: Financial analysis, financial performance of company, inventories, survey, valuation.

JEL Classification: M41, G32, G17, G12.

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THE EFFECT OF THE EXCHANGE RATE ON INDUSTRY-LEVEL TRADE FLOWS IN CZECHIA

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Introduction

The relationship between exchange rates and international trade belongs among the topics that have attracted considerable interest in both academic research and policy making. An extensive body of literature has been published, particularly since the collapse of the Bretton Woods system, which brought about floating exchange rates of the major world currencies and increased exchange rate uncertainty. The effects of exchange rate on international trade can be examined from various perspectives. Traditionally, the studies concerning this issue have focused on the effects of exchange rates' variability. More recently, principally due to the emergence of global economic imbalances, the attention in research and policy debates has shifted towards the effects of sustained exchange rate depreciation and exchange rate misalignments. Nevertheless, the global financial crisis and its subsequent developments caused the effects of exchange rate volatility to regain importance. This contemporary research concept is also applied in the present paper as we concurrently address both aspects of exchange rate development.

In theory, the effect of exchange rate levels and their changes can be analyzed in terms of price and volume effects on exports and imports. Because the depreciation of the currency results in the reduction in the price of exports, the demanded quantity for them will increase. At the same time, the price of imports will rise, and their demanded quantity will decrease. A positive effect of currency depreciation on trade balance is, however, conditioned by the validity of the Marshall-Lerner condition, which states that the sum of export and import demand elasticity has to be at least one. This condition is usually not met in the short run. Therefore, the short-run deterioration and long-run improvement of trade balance after

depreciation graphically resembles the letter "J" and is known in literature as the J-curve phenomenon.

A classic theoretical view supported by many studies published throughout the 1970s and 1980s holds that increases in exchange rate variability will have adverse effects on the volume of international trade. They argue that if changes in the exchange rate are unpredictable, it indicates uncertainty about companies' profits and reduces the benefits of international trades. Hence, the main target of attention was the channel through which the uncertainty generated by short-run and long-run volatility is transmitted to the decision to trade, its expected profitability, and eventually the allocation of resources between tradable and non-tradable goods and services [4]. Furthermore, the relationship between exchange rate volatility and the volume of international trade can be affected by many other factors, such as the degree of competition, the role of invoicing currency, the absence of imported inputs, the aversion to risk, the commodity and geographical structure of trade or the availability of exchange rate hedging instruments.

In this paper, we investigate the nature of the relationship between the exchange rate and international trade in Czechia. The Czech economy seems to be attractive and suited for such an analysis for many reasons. Czechia is a small, open economy with intensive involvement in foreign trade activities. The ratio of international trade to GDP has been increasing over time and exceeded 150% in 2013. A substantial part of Czech trade is done with other EU member countries and, hence, is denominated in the euro. Moreover, the Czech economy is largely owned by foreign investors. The weight of foreign controlled companies in the Czech economy varies between 45% and 60%, according to the indicator used. Czechia

has been applying a floating exchange rate regime since 1997, and in November 2013, the exchange rate of Czech koruna vis-à-vis the euro was adopted by the Czech National Bank as a regular monetary policy tool. The Czech National Bank was motivated by the ambition to prevent deflation in an environment of the zero interest rate and impossibility to lower it even further.

Although the aforementioned characteristics have already motivated other researchers to publish several similar studies, our paper extends the research in a new direction. We fully address the criticism of using aggregate international trade data (see e.g. [35]), and this paper represents the first study for Czechia that applies disaggregated data at the industry level. Therefore, the main purpose of the paper is to reveal the effect of exchange rate development on industry level trade flows in the context of the Czech economy. This study contributes to the current evidence by showing differences in the relationship between the exchange rate and international trade across the industries in a small open economy with strong trade connections to the EU and the euro area. The topicality of this research is underlined by the recent devaluation of Czech koruna driven by interventions of the Czech National Bank. Therefore, the findings of this paper can help to assess effects of the devaluation rigorously. To this end, the next section reviews relevant literature published in the examined field. The following section introduces the empirical model and data used in estimation. The next section presents and discusses the empirical results. Finally, the last section makes concluding remarks.

1. Review of Relevant Literature

The literature review section is structured in accordance with our research purpose to examine the relationship between the exchange rate and international trade from two viewpoints. First, we review studies that relate the trade volume to the exchange rate level, and second, we focus on papers that analyze the effects of exchange rate volatility on trade balance.

1.1 Exchange Rate Levels and Trade

The theoretical assumption that currency depreciation temporarily worsens a country's trade balance and improves it later (J-curve

effect) has not been conclusively validated by empirical research. The findings are mixed and depend on the country (region) and period under estimation and on the data and methodology used. Many studies have even confirmed a negative relationship or no long-term relationship at all. We refer to Bahmani-Oskooee and Ratha [13] for an excellent in-depth review of the J-curve literature. According to Baek [5], the literature concerning the J-curve issue tends to fall into one of the following categories.

- Studies that used aggregate trade data (e.g. [7], [21], [29]).
- Studies that employed disaggregate trade data at a bilateral level (e.g. [42], [1], [14]).
- Studies that used disaggregate trade data at the industry/commodity level (e.g. [9], [11], [10]).

The first-type studies suffer from a substantial aggregation bias of data. Those studies usually employ data on trade balance between a country and the rest of the world along with an effective exchange rate. Furthermore, one needs to construct a proxy for the world income, which can also be partly misleading [35]. The second-generation studies, therefore, use bilateral exchange rates and bilateral trade balance data between a country and its major trading partners. However, these studies still do not address the issue of different responses of trade balance on exchange rates across the industries and/or commodity groups. Hence, the third-type studies, which represent the most recent works, disaggregate the data to the industry level, as well. In other words, a greater availability of more precise data allows researchers to use exchange rates and industry/commodity-level data on a bilateral basis and simultaneously treats exports and imports separately to assess the relationship between exchange rate and trade balance accurately.

Although many studies on the J-curve effect have been published, few of them focus on Central and Eastern European (CEE) countries and Czechia in particular. Bahmani-Oskooee and Kutun [12] is the most comprehensive study of the J-curve phenomenon in emerging Europe. Based on data from 12 countries covering the period 1990–2005, they found empirical support for the J-curve effect in Bulgaria, Croatia and Russia. By contrast, no evidence of the J-curve effect was revealed for Czechia.

More recently, Nusair [30] applied a similar methodology of autoregressive distributed lag (ARDL) cointegration and a corresponding error correction model on data from 17 emerging and transitioning countries over the period 1991–2012. In empirical estimations, an aggregate trade balance data and effective exchange rates are used. Although the J-curve effect was present in Armenia, Georgia and Ukraine, the Czech economy remained free of the J-curve effect.

Two studies confirmed the existence of some characteristics associated with the J-curve effect on a bilateral basis. Hacker and Hatemi [23] tested the J-curve for Czechia, Hungary and Poland in their bilateral trade with Germany. They came to the conclusion that trade balance deteriorates within a few months after depreciation and then rises to a long-run equilibrium value higher than the initial one. The J-curve effect in bilateral trade between Czechia and Germany was also empirically confirmed by Šimáková [23], who applied a traditional methodology comprised of Johansen's cointegration and error correction model. Moreover, Šimáková [36] also found the J-curve in Czechia's trade with Poland.

On the contrary, Hsing [25] examined the J-curve for the bilateral trade of six CEE countries, including Czechia and the USA, and found no evidence of this effect in any of the analyzed states. This inconsistency can be related to the relatively insignificant share of the USA in the international trade of the CEE countries. For example, during the period 1993–2013, the USA was the twelfth most prominent trading partner of Czechia with a share of 2.2%. This share is considerably less than Germany, which is the most important trading partner of Czechia with a share of 31.5%.

1.2 Exchange Rate Volatility and Trade

The question of whether exchange rate uncertainty reduces incentives to trade internationally has been of permanent research interest, particularly since the early 1970s, when major currencies quit the fixed exchange rate regime and started to flow. A classical model that explains how exchange rate volatility affects trading firms was introduced by Clark [18] and later refined by Hooper and Kohlhagen [24]. The model assumes a small firm in a perfectly competitive market producing a single output entirely for export. The product

contains no imported input, and the firm is completely paid in foreign currency with limited access to currency hedging. Therefore, the firm has an open exchange rate exposure, and the uncertainty about future exchange rates is fully reflected in the uncertainty about future revenues in the domestic currency. As a result, the exchange rate volatility reduces the firm's output and export as the firm is forced to curtail its exposure to exchange rate risk. In summary, this basic model establishes a rather negative relationship between exchange rate volatility and international trade.

Although studies published during the 1970s and 1980s broadly support the view of this classical approach, subsequent research inspected the assumptions thoroughly and relaxed them gradually. This paved the way to more sophisticated models with a multi-country and multi-currency environment and diversified firms, in which the relationship between exchange rates, the supply of goods, and the decision to trade became more ambiguous [4]. Some models introduced in the late 1980s and early 1990s focus on hysteresis in global trade and come to the conclusion that the high volatility of exchange rates and the related uncertainty can contribute to the decision to enter or exit international trade in the presence of sunk costs. In this situation, the responsiveness of firms to short-run exchange rate fluctuations would be limited, and firms would prefer a wait-and-see attitude. Some other models overlook the effects of exchange rate volatility on the volume of trade and emphasize the effects on the composition of international trade. In such a model, exchange rate risk reduces net trade, which is the difference between gross trade and intra-industry trade [28].

As is evident from the review of theoretical approaches, there is no consensus among the models on the effects of exchange rate volatility on trade. Furthermore, vast empirical research conducted in support of theoretical models' considerations provides no less ambiguous evidence on this issue. One can illustrate this lack of consensus by the conclusions formulated in Taglioni [38] or Ozturk [31], which hold that if the presumed adverse effect of exchange rate volatility on trade flows exists, it is certainly not large. This finding is shared by Rajan [33], but he discovered that the exchange rate volatility is more likely to reduce international trade if the research focuses on bilateral trade instead of aggregate trade.

The empirical literature examining the effect of exchange rate volatility on trade in Czechia is even rarer than the literature that examines the effect of exchange rate levels. The effect of exchange rate volatility on trade is often analyzed with a gravity model and an estimation of the respective gravity equation, which is also the case of three papers cited here.

Ferto and Fogarasi [22] explored the effect in a balanced panel of six CEE countries including Czechia over the period 1999–2008. They focused on trade with agricultural products and found a negative effect of exchange rate volatility on exports when the Pseudo-Maximum-Likelihood estimator method was applied. A similar conclusion is drawn in Šimáková [37], who tested the effect of exchange rate volatility on bilateral trade flows between Czechia and its 17 major trading partners in 1997–2012. Šimáková [37] applied an enhanced methodology compared to Ferto and Fogarasi [22] and used an extended gravity model that controls for other factors likely to determine bilateral trade. The estimation of the panel regression led to the conclusion that a doubling of exchange rate volatility reduces trade by 3%.

In accordance with Šimáková [37], a significant and negative effect of exchange rate volatility on trade was revealed by Babecká Kucharčuková [6]. She alternatively applied static and dynamic versions of the gravity model on a panel dataset that contained 38 trading partners of Czechia from 1999–2008. The magnitude of the exchange rate volatility effect is greater in the dynamic model. A 100% increase in bilateral exchange rate volatility leads to a decrease in trade of 2.9–3.1% in the dynamic model (similar to findings of Šimáková [37]) and 0.6–1.2% in the static model.

In addition to gravity models, the exchange rate volatility effect can be examined by other methods. For instance, Tomanová [41] used a volatility series obtained from a GARCH model in ARDL cointegration and error correction modelling for bilateral export flows between CEE countries and the euro area over the period 1999–2013. No significant result was found, and the effect of exchange rate volatility turned out to be ambiguous.

2. Models and Data Specification

Following recent studies (e.g. [12], [25]) equation (1) is adopted in the empirical modelling of the

long-term relationship between exchange rates and trade balance. We apply the cointegration procedure developed by Johansen [26] to avoid the main criticism of early studies, whose results could suffer from a spurious regression problem because of non-stationary data.

$$\ln TB_{p,t} = \alpha + \beta \ln Y_{d,t} + \gamma \ln Y_{f,t} + \lambda \ln ER_{f,t} + \varepsilon_t, \quad (1)$$

where TB_p is a measure of the trade balance in time period t defined as the ratio of exports of the Czech Republic to country f over the Czech imports from country f in a selected product group p . Y_d is measure of the Czech industrial production (proxy for monthly Czech income) set in index form to make it unit free [8]; Y_f is the index of industrial production in trading partner f , and ER_f is the nominal bilateral exchange rate. The exchange rate is in a direct quotation, i.e., defined in a manner such that an increase reflects a depreciation of the CZK. ε_t represents an error term.

Because an increase in foreign income Y_f is expected to increase the Czech exports to a certain country, an estimate of γ is expected to be positive. An increase in Czech income Y_d is assumed to increase the Czech imports; therefore, an estimate of parameter β is expected to be negative. Finally, we expect the parameter λ to be positive because the trade balance of an industry should improve due to CZK depreciation.

To test the short-run relationship, a short term dynamic is incorporated into the long-run model. In accordance with Hsing [25], we apply the following modified error correction model (2), where α , ω , β , γ , and λ are parameters of the model, EC is the disequilibrium term and $\mathcal{G}_k EC_{t-1}$ represents the error correction mechanism:

$$\begin{aligned} \Delta \ln TB_{p,t} = & \alpha + \sum_{k=1}^n \omega_k \Delta \ln TB_{t-k} + \\ & + \sum_{k=1}^n \beta_k \Delta \ln Y_{d,t-k} + \sum_{k=1}^n \gamma_k \Delta \ln Y_{f,t-k} + \\ & + \sum_{k=1}^n \lambda_k \Delta \ln ER_{f,t-k} + \mathcal{G}_k EC_{t-1} + \varepsilon_t \end{aligned} \quad (2)$$

To estimate the effect of exchange rate volatility on foreign trade, we apply a gravity

model. A frequent criticism of this approach for insufficient theoretical foundations has been eliminated in recent years. The model has a lineage that goes back to Tinbergen [40] and Pöyhönen [32], who specified the gravity model equation as follows (3):

$$X_{df} = \delta \frac{Y_d^{\beta_1} Y_f^{\beta_2}}{D_{d,f}^{\theta}} \quad (3)$$

where δ , $\beta_{1(2)}$ and θ are the parameters of the modified equation, X_{df} is the bilateral trade between countries, and D_{df} is the distance between these two countries. Trade in the gravity equation is predicted to be a positive function of income (because countries with larger economies tends to trade more in absolute terms) and a negative function of distance. According to Arvas [3], the distance can be a proxy for transport costs and an indicator of the time elapsed during shipment; it can be correlated with the cost of searching for trading opportunities and considered a proxy for culture differences connected to different consumer patterns.

The basic gravity equation is frequently extended to incorporate other factors that stimulate or reduce bilateral trade flows. One of the most frequently used factors is the population size of the respective countries. Generally, the coefficient for a country's population is expected to be positive because a larger market in the recipient country is expected to demand more goods, and the population of the export country is expected to be able to supply more as the population grows in size. Recent models also include many dummy variables that should have an effect on transaction costs. For example, common borders, languages and memberships in custom unions are supposed to decrease transaction costs and promote trade [2]. For the purpose of this paper, we incorporate exchange rate volatility and the existence of a common border into the model. Regarding methodology, we follow Tichý [39] and Baldwin et al. [16] and employ the following augmented gravity equation (4):

$$\begin{aligned} \ln X_{p,df} = & \alpha + \beta_1 \ln Y_d + \beta_2 \ln Y_f + \\ & + \beta_3 \ln POP_d + \beta_4 \ln POP_f + \beta_5 \ln D_{df} + \\ & + \beta_6 \ln V(ER)_f + \beta_7 \ln CB_{df} + u_{ij}, \end{aligned} \quad (4)$$

where $POP_{d(f)}$ stands for the population of country $d(f)$ participating in bilateral trade and dummy variable CB_{df} represents a common border (it equals 1 if the trading partner shares a common border with a domestic country and 0 if not), $V(ER)_f$ is the exchange rate volatility, α and β_k are the unknown parameters of the model, and u_{ij} is the error term. X_p represents the total trade turnover between the pair of countries in an individual product group.

To measure the exchange rate volatility, we used the GARCH model in following form (5):

$$\sigma_t^2 = \alpha_0 + \sum_{i=1}^m \alpha_i e_{t-i}^2 + \sum_{j=1}^s \beta_j \sigma_{t-j}^2, \quad (5)$$

where σ_t^2 is the conditional variance, parameter $\alpha_0 > 0$ and the constraints $\alpha_i \geq 0$, $\beta_j \geq 0$ are needed to ensure σ_t^2 is positive [17]. The variance of the disturbance term for each period is modelled as a function of the errors in the previous periods.

As Arvas [3] states, standard gravity models usually employ cross-sectional data to estimate trade patterns in a given year, or averaged data. We employ a panel data regression to avoid the risk of choosing an unrepresentative year and to monitor unobservable individual effects between trading partners. This can provide additional insight into trading relationships. In addition, the use of panel data is particularly suggested for estimating the relationship between international trade and exchange rate volatility.

Before estimating ordinary least squares regression on panel data, it is necessary to determine dataset effects as random or fixed. Fixed effects are present when the heterogeneity in the model is unobservable but correlated with any variable included in model. Per contra, the heterogeneity in random effects is also unobservable, but it is not correlated with any other variable. In this case, we follow Tichý [39] and use the Breusch-Pagan Lagrange multiplier test. We calculated the test criteria from equation (6), where T is the length of time series, n is the number of units in the cross-sectional dimension, and e_{it} is a residual term.

$$LM = \frac{nT}{2(T-1)} \left[\frac{\sum_{i=1}^n \left(\sum_{t=1}^T e_{it} \right)^2}{\sum_{i=1}^n \sum_{t=1}^T e_{it}^2} - 1 \right] \quad (6)$$

All time series used for estimation are on a monthly frequency and cover the period from 1993 to 2013. The data of industrial production and nominal bilateral exchange rates were obtained from the OECD iLibrary statistical database. The data of import and export flows were obtained from the Czech Statistical Office. The product groups used in estimations are determined on the basis of SITC classification:

- T0: Food and live animals;
- T1: Beverages and tobacco;
- T2: Crude materials, inedible, except fuels;
- T3: Mineral fuels, lubricants and related materials;
- T4: Animal and vegetable oils, fats and waxes;
- T5: Chemicals and related products;
- T6: Manufactured goods;
- T7: Machinery and transport equipment;
- T8: Miscellaneous manufactured articles; and
- T9: Commodities and transactions not classified elsewhere in the SITC.

Table 1 shows the average share of individual product categories on Czechia's total international trade during the period 1993–2013. Table 1 also includes percentage changes of the product groups' shares from 1993 to 2013. Almost half of total trade falls into product category T7, and two more product groups (T6 and T8) represent an additional 20% and 10% of international trade, respectively.

The time series for the population were acquired from Eurostat. The data on the distance between Czechia and its trading partners were taken from the GeoDist database. The bilateral distances are measured using city-level data. The capital city is considered to be the economic center in all trading countries included in the estimations.

3. Empirical Analysis and Findings

In the empirical estimation, we work with the six largest trading partners of Czechia: Austria (AT), Germany (DE), France (FR), Italy (IT), Poland (PL), and Slovakia (SK). Their shares on Czechia's total

Tab. 1: Commodity structure of Czechia's international trade (in %, 1993–2013)

	T0	T1	T2	T3	T4	T5	T6	T7	T8	T9
Share	3.95	0.66	2.88	6.14	0.19	8.59	19.61	46.49	10.85	0.63
Change	-31.76	-38.13	-100.18	-26.27	-13.25	-19.54	-23.42	55.12	-9.37	-77.58

Source: authors' calculations

international trade volume are presented in Table 2 in the row labeled TT. Furthermore, we report the shares of these countries on international trade in each of the product categories.

It is evident from the reported indices that Germany is by far the most important trading partner of Czechia with an average share of 31.47% of the total trade. Moreover, the Germany's share has been increasing over time. Slovakia and Austria are Czechia's second and third largest partners with shares of 8.62% and 4.96%, respectively. However, both countries lost a substantial part of trade during the period 1993–2013. The shares of the remaining partners are similar to that of Austria and oscillate between 4% and 5%. Although the shares of Poland and France on Czechia's trade increased over the period analyzed, Italy's share dropped by almost 23%.

The dominant position of Germany in the total trade is also mirrored in the majority of the product categories. The only exceptions are groups T1 and T3 in which Slovakia takes over the position of major trading partner. Austria shows an above-average share in the category T2 (12%), Italy excels in the T1 group (9%), and Poland trades intensively with Czechia in groups T0 and T4 (10–11%). There is no apparent specialization of France; its share in any product category does not significantly surpass the share of total trade.

One can observe several extraordinary changes and shifts in Czechia's international trade structure. For example, the share of Poland of trade with T4 products increased by 1,843% from 1993 to 2013, and its share in the T0 category increased by 490%. Furthermore, France's share in trade with T1 goods raised

by 543%, and Italy's share in the same product category increased by 453%.

Logarithmic transformation was performed to reduce skewedness and heteroscedasticity and to stabilize variability. The stability of regressors is needed in empirical estimation. The integration of time series was determined by the augmented Dickey-Fuller test. Each individual time series was tested for the presence of unit roots, and the first-difference stationarity was found for all variables.

Because the choice of lag orders of the variables in the vector error correction model specification can have a significant effect on the inferences drawn from the model, we sequentially determined the appropriate lag length for each variable. The literature typically shows lags centered around two years for many countries, but the exact number can differ across the trading partners due to the different character and elasticity of trading goods and time lags in the consumers' search for acceptable, cheaper alternatives [4].

The optimal lags for each estimated trading partner within different product groups determined on the basis of Schwarz information criterion are reported in Table 3. In the same table, one can see results of the Johansen cointegration test on the number of existing cointegration equations. The product groups T4

and T9 were excluded from the analysis due to data inconsistency.

As observed from Table 3, the lag structure differs more across different product categories than across different trading partners. In general, higher lags are typical for groups of manufactured goods, machinery and transport equipment and miscellaneous manufactured articles. These categories of goods are supposed to be purchased under long-term contracts, and it usually takes more time to adapt to new price conditions.

We run 48 cointegration estimations (trade in 8 product groups with 6 countries) but did not reveal cointegration equations in all cases. No long-term relationship with exchange rate development was found, particularly for product groups T3 and T6 traded with Austria, T6 traded with Italy and T8 with France. As a next step, we proceeded with assessing the long-term coefficient estimates for the models with evidence of a cointegrating relationship. Detailed results can be observed in Table 4.

The theoretical expectations of the positive effect of foreign income and the exchange rate and the negative effect of domestic income on trade balance are not convincingly confirmed across the dataset. The expected signs were revealed for 59% of coefficients of domestic income and foreign income and for 66% of

Tab. 2: Territorial and commodity structure of Czechia's international trade (in %, 1993–2013)

	AT		DE		FR		IT		PL		SK	
	μ	Δ	μ	Δ	μ	Δ	μ	Δ	μ	Δ	μ	Δ
TT	4.96	-44.47	31.47	11.16	4.12	65.28	4.37	-22.98	4.87	152.25	8.62	-60.27
T0	4.19	19.11	20.27	22.36	3.50	69.69	4.12	54.47	10.13	490.51	15.18	-16.67
T1	3.72	-18.61	12.82	-4.17	3.31	542.82	8.98	452.8	5.76	152.20	23.94	-55.44
T2	12.00	-32.97	25.60	-11.32	1.90	11.51	4.99	1.42	5.65	169.68	8.13	-16.93
T3	8.40	-28.89	14.32	75.20	0.26	140.26	0.49	-89.75	7.37	61.31	14.59	-2.63
T4	5.92	30.95	29.30	-59.81	1.22	33.48	2.50	10.27	10.74	1843.2	19.10	-25.61
T5	4.39	-49.04	28.17	12.17	5.12	22.44	5.20	-29.67	6.87	69.03	10.73	-69.37
T6	5.48	-25.97	33.86	13.90	3.36	70.73	5.24	-12.16	6.82	246.63	1.33	-61.51
T7	3.82	-57.47	34.56	2.10	5.30	67.14	4.19	-30.98	2.93	163.88	5.56	-68.02
T8	5.23	-38.92	35.15	-3.89	3.17	29.11	4.85	-32.37	4.13	227.59	6.93	-64.30
T9	6.84	166.60	35.69	58.28	1.62	-81.49	2.49	80.40	3.61	516.70	12.80	15.19

Note: μ is the average share and Δ is the change of the share over the sample period

Source: authors' calculations

Tab. 3: Number of lags and cointegration equations

	AT		DE		FR		IT		PL		SK	
	lags	equat.	lags	equat.	lags	equat.	lags	equat.	lags	equat.	lags	equat.
T0	3	1	4	2	4	1	4	2	2	2	2	1
T1	3	1	4	1	2	1	4	1	2	1	2	1
T2	3	1	4	1	4	1	4	1	2	2	2	1
T3	3	0	5	1	5	1	4	1	2	1	2	1
T5	3	1	4	1	5	1	13	1	2	1	1	1
T6	13	0	13	1	13	1	13	0	2	2	17	2
T7	13	1	13	2	13	1	15	1	2	1	17	2
T8	13	1	13	1	15	0	15	1	2	1	12	1

Source: authors' calculations

Tab. 4: Estimated long-run coefficients of trade models

	AT			DE			FR			IT			PL			SK		
	Yd	Yf	ER	Yd	Yf	ER	Yd	Yf	ER	Yd	Yf	ER	Yd	Yf	ER	Yd	Yf	ER
T0	15.6 (3.57)	-2.77 (2.31)	1.08 (0.29)	9.91 (3.09)	-1.16 (3.92)	1.24 (4.78)	24.84 (6.20)	-19.7 (9.53)	6.73 (6.73)	3.97 (0.75)	-0.25 (0.89)	0.92 (0.10)	8.44 (2.43)	-1.51 (1.28)	1.51 (0.21)	-3.06 (0.78)	1.99 (0.65)	-1.38 (0.64)
T1	-0.32 (0.48)	-1.03 (0.39)	-1.01 (0.02)	12.14 (1.76)	-14.97 (2.51)	-0.21 (0.07)	-0.7 (1.22)	3.07 (2.02)	0.12 (0.11)	-4.81 (0.55)	7.01 (1.31)	0.25 (0.08)	-2.07 (2.16)	0.16 (1.18)	0.46 (0.07)	-7.6 (1.34)	5.53 (1.12)	0.63 (1.09)
T2	-2.32 (0.98)	5.99 (1.45)	0.82 (0.21)	-0.31 (0.29)	0.46 (0.51)	0.09 (0.04)	4.11 (0.73)	6.62 (1.83)	2.87 (0.45)	0.96 (0.12)	1.44 (0.28)	0.81 (0.04)	1.87 (0.47)	-0.82 (0.29)	0.77 (0.06)	1.07 (0.36)	-1.03 (0.29)	0.38 (0.29)
T3	-	-	-	1.23 (0.81)	1.76 (1.23)	0.09 (0.02)	-1.19 (0.53)	6.13 (1.51)	0.14 (0.05)	6.69 (0.75)	-1.25 (2.14)	-0.02 (0.10)	-0.09 (2.45)	-0.57 (1.31)	-0.10 (0.08)	0.89 (1.08)	-2.29 (0.90)	1.61 (0.89)
T5	-2.09 (0.32)	0.46 (0.28)	-0.93 (0.03)	-8.68 (2.23)	10.41 (3.37)	0.91 (0.18)	-1.26 (0.57)	0.29 (0.84)	0.25 (0.12)	3.16 (0.75)	0.94 (0.75)	-0.94 (0.15)	-0.12 (0.51)	-0.00 (0.26)	0.23 (0.04)	-1.82 (0.32)	0.68 (0.27)	-0.16 (0.26)
T6	-	-	-	-1.11 (1.57)	2.14 (1.96)	0.03 (0.30)	0.14 (0.31)	0.81 (0.44)	0.05 (0.11)	-	-	-	-0.59 (0.39)	0.48 (0.21)	0.28 (0.05)	1.71 (0.61)	-1.87 (0.51)	0.28 (0.15)
T7	-8.14 (1.61)	3.99 (1.22)	-1.57 (0.16)	-3.03 (0.67)	3.01 (0.98)	-0.49 (0.87)	-3.78 (0.24)	2.91 (0.69)	-0.60 (0.13)	-4.85 (0.68)	-2.92 (1.01)	-0.57 (0.20)	10.98 (2.38)	-6.67 (1.49)	1.74 (0.30)	-1.78 (0.39)	0.87 (0.37)	0.47 (0.43)
T8	-4.41 (0.59)	1.60 (0.46)	-1.14 (0.06)	4.49 (1.95)	-10.76 (2.87)	0.14 (0.23)	-	-	-	-4.53 (0.66)	-0.72 (1.03)	-0.55 (0.21)	-2.45 (0.75)	0.82 (0.49)	-0.57 (0.09)	-1.02 (0.48)	0.42 (0.40)	2.29 (0.39)

Note: Standard errors in parentheses

Source: authors' calculations

exchange rate coefficients. From the country-level perspective, the highest concordance with theoretical assumptions was found in trade with France (76% of coefficient signs match the expectations). By contrast, the lowest conformity with theory was revealed in trade with Italy (only 43% of coefficients correspond with expectations). Germany, as the largest trading partner of Czechia, demonstrates

a 62% conformity with theoretical assumptions. On the industry level, trade with T6, T1 and T5 products seems to be very close to the theory, with more than 70% of coefficients signs in accordance with expectations. On the contrary, international trade with products falling into product groups T0 and T3 demonstrates very low conformity with expectations, with only 39% and 46% of correctly signed coefficients.

Although a positive effect of CZK depreciation on trade balance prevails in the results obtained, it can be observed in Table 4 that many coefficient for the largest trading partners and the most important product groups suggest an opposite effect. For instance, the depreciation of CZK worsens the trade balance with Germany in group T7. Because the T7 group accounts for 46.5% of Czechia's international trade and

Germany's share in this product group is 34.6%, the negative effect of CZK depreciation relates to 16% of Czechia's total international trade. A similar conclusion can be drawn for T7 trade with Austria, France and Italy or for T8 trade with Austria, Italy and Poland. All the mentioned cases of the opposite-than-expected effect of CZK depreciation jointly comprise 23.5% of total trade, which cannot be considered negligible.

Tab. 5: Estimated short-run coefficients of exchange rate level – Part 1

	$\Delta 1$	$\Delta 2$	$\Delta 3$	$\Delta 4$	$\Delta 5$	$\Delta 6$	$\Delta 7$	$\Delta 8$	$\Delta 9$	$\Delta 10$	$\Delta 11$	$\Delta 12$	$\Delta 13$	$\Delta 14$	$\Delta 15$	$\Delta 16$	$\Delta 17$
T0																	
AT	0.13	-0.02	0.08														
DE	-0.01	0.05 ^a	0.02	0.01													
FR	0.11	-0.05	-0.02	0.04													
IT	0.07	0.03	-0.05	-0.02													
PL	-0.07	-0.01															
SK	0.02	-0.01															
T1																	
AT	0.19	0.08	-0.14														
DE	-0.04	-0.08	-0.08 ^a	-0.06 ^a													
FR	-0.05	0.01															
IT	0.04	-0.14 ^a	-0.15 ^a	-0.09													
PL	0.20	0.20															
SK	-0.19 ^b	-0.05															
T2																	
AT	0.23	0.19	0.02														
DE	0.07	0.05 ^a	0.07 ^a	0.02													
FR	0.01	0.01	-0.07	-0.01													
IT	0.08	0.08	-0.07	0.12 ^a													
PL	-0.09	0.01															
SK	-0.01	0.02															
T3																	
DE	0.04 ^a	0.03 ^a	0.02 ^a	0.04 ^a	0.04 ^a												
FR	0.14 ^b	0.10	0.13 ^b	0.42 ^b	-0.09 ^b												
IT	-0.01	-0.11	-0.07	-0.11													
PL	0.03	-0.01 ^a															
SK	0.06 ^a	0.01															
T5																	
AT	-0.20	-0.14	0.06														
DE	-0.01	-0.08	-0.01	-0.01													
FR	0.23	0.39	0.13	-0.34	-0.02												
IT	-0.22 ^b	-0.18 ^a	-0.17 ^a	-0.13 ^b	-0.17 ^b	-0.08	-0.11 ^b	-0.05	-0.12 ^b	-0.19 ^a	-0.18 ^a	-0.00	-0.11 ^b				
PL	-0.14 ^b	-0.04															
SK	-0.05																

Tab. 5: Estimated short-run coefficients of exchange rate level – Part 2

	$\Delta 1$	$\Delta 2$	$\Delta 3$	$\Delta 4$	$\Delta 5$	$\Delta 6$	$\Delta 7$	$\Delta 8$	$\Delta 9$	$\Delta 10$	$\Delta 11$	$\Delta 12$	$\Delta 13$	$\Delta 14$	$\Delta 15$	$\Delta 16$	$\Delta 17$
T6																	
DE	-0.01	-0.02	0.04	0.02	-0.00	0.01	0.04	-0.00	0.00	0.06	0.04	0.05 ^b	0.03				
FR	0.04	-0.06	-0.05	0.13	0.19	0.15	0.19	-0.06	0.03	0.05	0.06	0.12	0.26				
PL	-0.03	-0.01															
SK	0.38	-0.49	0.56	-0.11 ^a	-0.74 ^a	1.00	-0.27 ^b	-0.24	0.23	-0.31	0.43	-0.18	-0.69 ^b	-0.93	0.02	-0.79	-0.23
T7																	
AT	0.16	0.25	0.01	-0.01	-0.15	-0.22	-0.22	-0.17	-0.13	-0.17	-0.33 ^b	-0.16	0.12				
DE	0.03	0.03	0.01	0.02	0.01	-0.03	-0.02	-0.00	0.01	0.00	0.04 ^b	0.04 ^b	-0.01				
FR	-0.08	-0.03 ^a	0.11	0.10	0.13	-0.01	0.04	0.05	0.08	0.03	0.18	0.15	0.20				
IT	-0.08	-0.32 ^a	-0.22 ^a	-0.11	-0.20 ^b	-0.17 ^b	0.01	0.01	0.02	-0.03	-0.07	0.06	-0.06	-0.03	-0.07		
PL	0.05	-0.01															
SK	0.07	0.14	0.09	-0.04	-0.07	0.04	0.08	0.08	0.07	0.24	0.20	0.18	0.22	0.04	0.14	0.18 ^b	0.12
T8																	
AT	0.30	0.33	0.09	-0.01	0.15	0.11	0.09	-0.06	-0.12	-0.17	-0.11	0.06	0.13				
DE	0.07	0.07	0.06	0.04	0.03	0.01	0.05	0.04	0.03	0.06	0.05 ^a	0.06 ^a	0.03				
IT	-0.00	-0.18 ^a	-0.23	-0.07 ^b	-0.19 ^b	-0.12 ^b	-0.21	-0.07	-0.04	-0.01 ^a	0.00	0.20	0.00	0.00	0.01		
PL	0.06	-0.01															
SK	-1.48	-0.45	0.21	-0.13	-0.20	1.05	-0.37	-1.49	0.15	-0.05	-0.77	0.54					

Note: ^a, ^b denote significance level at the 5% and 10% level, respectively.

Source: authors' calculations

An ambiguous effect of exchange rate can be explained by several characteristics of Czechia's international trade. Czechia's exports and entire economy rely extremely heavily on imports. The share of imported goods on GDP was 66% in 2012, which put Czechia at fifth place in the EU (the EU average is 32%). Only 27% of total imports are used for final consumption. The remaining 73% of imports represent semi-finished products or goods used in further production processes. In other words, a 100 CZK of new value added produced in the Czech economy in 2012 required 73 CZK of imported goods and services. For comparison, the demand for import was only 60 CZK per 100 CZK of new value added in 2002 (an increase of 21.5%).

Another typical feature of the Czech economy is a strong presence of foreign direct investment (see e.g. [34]). Many foreign-owned companies with production facilities in Czechia belong to multinational corporations with operations in various countries. Therefore, they are also involved in intensive export/import transactions within the multinational company or with related enterprises. Kiss and Schusztler

[27] also discuss the pros and cons of corporate financing through loans in foreign currencies. Hence, all the mentioned attributes lead to the fact that a substantial part of international trade in Czechia is associated with natural hedging. Čadek et al. [19] analyzed the hedging behavior of Czech exporting firms and found that most exporters use natural hedging; i.e., they balance incoming and outgoing payments in foreign currency and foreign currency assets and liabilities. In 2009, almost 60% of hedged exports were hedged using natural hedging, and the rest were covered primarily by financial derivatives. Čadek et al. [19] also revealed that 88% of exports in 2009 were hedged by any type of hedging strategy. Moreover, Czech exporters typically use hedging instruments with a maturity of between three months and one year. In summary, one can identify many factors in the Czech economy that cause the pass-through of exchange rate changes into the trade balance to be weaker and less straightforward than the theory suggests.

As indicated before, the short-run effects of depreciation are reflected in the coefficient

estimates obtained for the lagged value of the first differenced exchange rate variable (Tab. 5). The J-curve approach allows us to distinguish the short-run effects from the long-run effects. The traditional J-curve is confirmed if the estimate of the coefficient for the exchange rate is significantly negative at lower lags and is followed by a significantly positive coefficient at longer lags. Simultaneously, the J-curve can be represented as negative short-run coefficients, followed by a positive long-run coefficient.

In this study, only some short-term coefficients are statistically significant. The most statistically significant coefficients are revealed for trade with Germany. These coefficients

show a positive short-term relationship between exchange rate and trade balance in T2, T3 and T8 product groups. On the contrary, significantly negative coefficients can be found for groups T1, T5, T7 and T8 traded with Italy and in T6 traded with Slovakia. The short-run significant negative coefficient in T1 traded with Italy and T6 traded with Slovakia are associated with a positive long-run relationship and jointly confirm the only examples of the J-curve pattern found in this paper. For other cases examined, the J-curve phenomenon is not supported by the estimated coefficients of exchange rates. These findings are similar to the conclusions of other studies analyzing Czechia (e.g. [12], [30]).

Tab. 6: Estimated coefficients of gravity model

	T0	T1	T2	T3	T5	T6	T7	T8
Y_d	2.14 (0.06)	3.61 (0.12)	1.51 (0.06)	1.74 (0.11)	1.98 (0.04)	2.06 (0.05)	2.06 (0.06)	2.06 (0.07)
Y_f	0.76 (0.05)	2.61 (0.09)	1.67 (0.05)	0.66 (0.09)	0.71 (0.03)	1.42 (0.04)	0.93 (0.05)	0.95 (0.06)
POP_d	-0.29 (0.16)	-1.78 (0.30)	-2.42 (0.16)	-1.53 (0.29)	0.24 (0.09)	-1.46 (0.12)	1.45 (0.17)	1.54 (0.13)
POP_f	1.13 (0.12)	-0.46 (0.23)	-1.55 (0.13)	-0.50 (0.22)	1.27 (0.07)	0.01 (0.09)	3.35 (0.14)	3.14 (0.13)
$V(ER)_f$	-0.46 (0.08)	0.72 (0.15)	1.75 (0.08)	0.54 (0.14)	0.24 (0.05)	0.93 (0.06)	-0.11 (0.08)	-0.20 (0.11)
D_{df}	-1.29 (0.37)	-0.43 (0.69)	4.88 (0.38)	2.69 (0.66)	-2.19 (0.22)	1.48 (0.28)	-7.14 (0.41)	-6.21 (0.32)
CB_{df}	0.65 (0.22)	1.31 (0.42)	4.87 (0.23)	5.23 (0.40)	0.15 (0.13)	2.74 (0.17)	-2.74 (0.25)	-2.33 (0.14)

Note: Standard errors in parentheses

Source: authors' calculations

In the second part of the empirical section, we estimated the extended gravity model to examine the effect of exchange rate volatility on foreign trade. We apply the least squares method for panel data in the model estimation. The dependent variable in the model is the total trade turnover between Czechia and its selected trading partners within individual product groups. We have included 6 cross-sections (trading partners) and 251 periods (monthly data from January 1993 to November 2013). Therefore, we yielded in total 1,506 panel observations for each product group. The results of the estimation are summarized in

Table 6. Most of the parameters obtained from the panel regressions are highly significant. The few exceptions are coefficients D_{df} (T1), CB_{df} (T5) and POP_f (T6). Across the product groups, we can observe a positive effect of both domestic and foreign income on foreign trade. Notably, the estimated influence of the domestic effect seems to be generally larger than the effect of foreign income (except the T2 product group). The estimated effect of population size is not as uniform. The theoretical expectations of the positive effect of the population size are empirically confirmed only for product groups T5, T7 and T8. For the same commodities,

we revealed a negative effect of the distance between economic centers on trade turnover. However, a common border decreases the trade turnover in product categories T7 and T8.

Regarding the effect of exchange rate volatility, our results are not completely in conformity with existing literature. Whereas Šimáková [37] and Babecká Kucharčuková [6] apply aggregate data and validate the theoretical assumption of the negative effect of exchange rate volatility on Czech foreign trade, the present study with disaggregated data discovers a variable effect of volatility depending on the product group. A negative effect on trade was detected in the groups T0, T7 and T8. These groups jointly account for 61.3% of Czechia's foreign trade. By contrast, a higher exchange rate volatility seems to increase foreign trade turnover in T1, T2, T3, and T5 product categories (18.3% of total foreign trade). Such diversity in the estimated coefficients of exchange rate volatility can also be found in papers applying disaggregated data to countries other than Czechia [15], [10].

Conclusions

The paper sheds some new light on the relationship between exchange rates and foreign trade in Czechia. We particularly examine the effect of exchange rate levels on trade balance and the effect of exchange rate volatility on foreign trade turnover. Whereas the former issue is analyzed by cointegration and vector error correction model, the latter is examined by the extended gravity model with panel data. Because the present paper represents the first study to focus on Czechia and employ disaggregated industry-level data of bilateral trade with largest trading partners, the greatest contribution of this study are the more detailed results.

We found that the effect of the exchange rate on trade balance is ambiguous. Although most of the estimations indicate that the depreciation of Czech koruna improves the trade balance, the empirical findings for the largest trading partners and most important product groups show an opposite effect. As the most typical example of the negative effect of koruna depreciation, one can mention the trading of machinery and transport equipment with Germany, Austria or France. A similar conclusion can also be drawn for the product group of miscellaneous manufactured articles.

The J-curve effect, i.e., the temporary worsening and later improvement of trade balance after depreciation, was empirically confirmed only for the trading of beverages and tobacco with Italy and for the trading of manufactured goods with Slovakia. The theoretical assumptions are not entirely met even in the case of the effect of exchange rate volatility on foreign trade. We found evidence that higher volatility increases the turnover of foreign trade with beverages and tobacco, crude materials, mineral fuels, lubricants, chemicals and manufactured products. By contrast, the textbook expectations of the negative effect of volatility are validated for the remaining product groups, including machinery, transport equipment, food and animals.

In summary, the results based on disaggregated data clearly demonstrate that the role and effect of exchange rates on Czechia's foreign trade are not definite. One cannot simply assume that the depreciation of Czech koruna will boost exports, reduce imports and, hence, improve the trade balance. It cannot be taken for granted, either, that increased exchange rate volatility automatically reduces foreign trade turnover. This conclusion can be associated with the fact that Czech exporters and importers intensively hedge their foreign trade activities, Czech exports are significantly dependent on imports, and Czech companies are largely owned by foreign investors and belong to multinational corporations. Therefore, product groups and trading partners should be carefully distinguished when considering exchange rate effects on foreign trade. The results obtained can also be taken into account by the Czech National Bank when assessing the potential outcomes of the current exchange rate policy targeted on devalued koruna and allowing interventions on the foreign exchange market.

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Abstract

THE EFFECT OF THE EXCHANGE RATE ON INDUSTRY-LEVEL TRADE FLOWS IN CZECHIA**Jana Šimáková, Daniel Stavárek**

This paper is the first study to use the disaggregated data of the Czech foreign trade to examine the effect of exchange rate levels and volatility on trade flows. Czechia is the appropriate economy to study this phenomenon because it is heavily involved in foreign trade predominantly owned by international investors and has been applying a floating exchange rate arrangement for many years. We analyze the period from 1993 to 2013 and disaggregate the data according to trading partner and product category. While the effect of exchange rate level is examined by a modified vector error correction model the effect of exchange rate volatility is analyzed through an extended gravity model. The detailed results obtained from empirical estimations clearly show that the relationship between exchange rates and foreign trade in Czechia does not completely correspond with the theoretical assumptions. We revealed that domestic currency depreciation worsens in the long-term trade balance in substantial parts of the Czech foreign trade, such as in the trade of machinery and transport equipment with Germany, Austria and France. The classical J-curve effect was confirmed only for the trading of beverages and tobacco with Italy and for the trading of manufactured goods with Slovakia. We also found that an increased exchange rate volatility does not necessarily reduce foreign trade turnover, as the results for crude materials, fuels, chemical and manufactured products indicate. By contrast, the theoretical expectation of negative impact of volatility was validated for machinery, transport equipment, food and animals. Therefore, although Czechia is a small, open economy, the exchange rate effects on foreign trade significantly differ in magnitude and direction across the trading partners and product groups.

Key Words: Exchange rate, industry-level data, trade balance, cointegration, vector error correction model, gravity model.

JEL Classification: F14, F31.

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FINANCING CRAFT ENTERPRISES ASSOCIATED IN THE POLISH CRAFT ASSOCIATION

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Introduction

Small and medium enterprises (SME) sector has a key role in economic growth, employment and poverty alleviation [1], [4], [17]. In Europe is about 20 million SME and they play an important role in the European economy. These are mostly micro-enterprises and in 2012 employed approximately 86.8 million people. This represents 66.5% of all European jobs for that year. Almost 5.1 million enterprises operate in the manufacturing and the construction sectors; of these, 99.6% are SMEs [9], [10]. Beck et al. [2], [3], [8] presented a positive relationship between the share of SMEs in manufacturing and gross domestic product (GDP) per capita growth.

According to Central Statistical Office of Poland (CSO) data, SME sector enterprises operating in Poland generate almost three fourth of Polish GDP. Result at a level of 71.8% in 2011, after a small drop in share in 2010, can mean a return to an upwards trend observed during the years 2006–2009. If we look at the enterprises' GDP share structure, it turns out that SME generate every second zloty (47.3%), including the smallest enterprises – every third (29.4%). Medium entities' share is three times smaller (10.1%) than the one of micro enterprises, whereas, in case of small enterprises – almost four times (7.8%). In 2011, in comparison with 2010, the share of big companies in creating enterprises' GDP increased, whereas, the one of micro and medium enterprises – dropped, and in case of small ones – remained at a similar level [22].

The aforementioned results of the SME sector enterprises' influence, including micro enterprises, on the structure and level of Polish GDP, constitute grounds for detailed research in various areas of its functioning.

According to the CSO data, one can state that in majority (estimated level of 90%), craft

enterprises remain micro ones. Micro and craft (-type) enterprises in Europe are not only the main source of job creation in the EU, but they are active in many rather traditional professions that are essential for the prosperity and wellbeing of both urban and rural areas [6]. In compliance with the definition, craft is an independent business activity on a small scale, of a production – service character, conducted to the benefit of the workshop's owner and with his personal work input [13]. Craft enterprises can be also defined as a unique form of small and medium-sized enterprise (SME) and represent an combination between the manufacture of products and the fulfilment of artistic vision [30].

In comparison with the meaning of the notion "craft" binding until the end of 1972, provisions of the industrial law of 1927 extended its generic scope that at that time covered some types of service and production activities, until then not considered as craft. In compliance with the industrial law, craft would refer only to these types of activities that have been enumerated in the list of crafts [11]. Article 1 of the Act of 8 June 1972 on performance and organization of craft that entered into life as of 1 January 1973, defined craft as professional performance of production and service economic activities by natural persons, on their behalf [13].

The definition of the craft in accordance with the Act on performing and organizing craft of 1972 [13] includes an element stating that craft is performed by natural persons, thus, it requires personal work of a craftsman. However, this provision did not exclude employing in limited scope contract employees, if it resulted from economic conditions or requirements of service or production processes. The principle of personal performance of the craft resulted in limiting the possibility to perform craft by registered partnerships, limited liability companies and public limited companies constituted by legal persons acting pursuant to

the provisions of commercial code. Companies of this type conducting craft activity as of the act on performance and organization of craft of 1972 entered into life could have been run in the hitherto prevailing form not longer than until the end of 1974. The provisions of the act did not limit the possibility to perform craft together by two or more craftsmen, who set up a company in compliance with the provisions of the civil code [12]. Craftsmen, who intended to run craft activity together had to possess license to perform craft as well as professional qualifications if these were required with regard to a particular type of craft.

During the process of political-economic changes in 1989, also legal regulations concerning craft were passed. Article 2.1. of the act of 22 March 1989 on craft [14] defines the notion of craft with the following words: "craft means professional performance of economic activity by a natural person or company's partners with qualified own work input, on their own behalf and to their benefit with employment of up to 50 employees". A craftsman is a person performing given economic activity. This act similarly as the previous one, does not define trade and transport activities, hotel services, services performed within liberal professions, medical services (with an exception of orthotic services) as well as production and service activities performed by visual artists and photographers as craft. The majority of these craft companies are family micro and small enterprises. As of today, there are 121 craft professions, in which qualifications can be confirmed at a level of apprentice and master before examination committees of craft chambers. The list of these professions is subject to changes, since, as a result of technical and technological development, new professions are continuously being created. Some professions are so specific that they are performed only in particular regions of the country, for example, professions such as: young shepherd, shepherd, fish processing worker or amber processing worker.

Researchers conducted all over the world and in our country proved that in the market economy, small and medium enterprises constitute one of fundamentals of local and global economy constituting a significant group of its enterprises (level of approximately 90%). Their establishment, development and functioning has a significant meaning for the development

of local, regional, country and foreign markets as well as on the global market. It should be also added that development on the global market primarily constitutes a dynamic development of ICT technologies and thus, virtualization of their functioning. Craft enterprises typically have insufficient resources, inadequate access to specialised expertise and limited opportunities to make an impact on the marketplace [30]. One of the way to improve the competitive position of craft enterprises is by forming networks, cooperation, clusters [26], [30] and strengthening by innovation [26]. Innovation is nowadays a key factor for entrepreneurial activity [16], [28]. Innovation performance is higher in SMEs that are proactive in strengthening their relationships with innovative suppliers, users, and customers. Moreover SMEs will have better new product development results if they improve their relationships with laboratories and research institutes [19]. R&D is no doubt a major resource for innovation. Innovation is progressively seen by analysts as an "interactive" and "distributed" process [29]. An increasing number of studies [7], [18], [20], [21], [25], [32] show that firms must increase their number of interactions with other market base actors (i.e., customers and suppliers) or research institutions (i.e., universities and research centers).

1. Tools, Instruments and Conceptions of Financing Activity of Craft Enterprises

Selection and availability of relevant forms of financing activity of craft enterprises constitutes an incredibly important aspect in their development process. Effective implementation of financing instruments optimal for particular types of craft enterprises determines their long-term position on particular national and foreign markets. Each sector has own characteristics (e.g. regarding product, technology, processes, relations with environment and others) which is reflected in types and manners of implementing tools and instruments for financing.

This article is aimed at identifying tools, instruments and conceptions for financing craft enterprises functioning on the Polish market. A supplementary aim of the study is to identify barriers in using tools and instruments and selected conceptions in financing functioning of craft enterprises. For the purposes of this study, financing of craft enterprises' functioning within

investment as well as operational sphere was defined.

Taking into consideration only the investment activity of SME sector, in compliance with the Report on its condition of 2013 [22], one can quote, as follows:

1. An increase in investment outlay in SME sector in 2011, in comparison with previous year amounted to 13% and obtained over PLN 80 billion (approximately EUR 20.0 billion), with PLN 161 billion (approximately EUR 41.0 billion) of investment of whole enterprises sector.
2. An increase in outputs in SME sector on a company in 2011, in comparison with previous year by PLN 4 thousand (up to the level of PLN 45.4 thousand).
3. An increase in investment outlays in 2011, in: micro – by 13.8%, medium – by 14.1% and big enterprises – by 13.9%, in comparison with 2010.
4. 50% of investment outlays are born by the SME and 50% – by big enterprises.
5. Investment outputs of service companies – 35% and industrial companies – 31% in total SME sector outputs constitute 2/3 of SME sector outputs.
6. Own resources constitute financing source of 2/3 investments realized by the SME sector in 2011.
7. In 2010, enterprises in Poland increased outputs on fixed assets by approximately EUR 1 thousand, whereas, the majority of European enterprises significantly limited outputs in comparison with the year 2009 [22].

SME sector's participation in investments of enterprises sector was ranging during the years 2003 – 2011 between 44% and 50%, whereas, in last two years it insignificantly exceeded 50%. One should also note that whole SME sector contributes value of resources to investment activities that is comparable to the one of big enterprises. The value of SME investment outputs in 2011 amounted to PLN 80.8 million, whereas, in case of big enterprises – PLN 80.4 billion and was bigger by 13% in case of SME sector and by 14% in case of big enterprises, in comparison with previous year [22].

The motion presented in the report is very interesting, as it concerns the amount of revenues in particular types of SME sector enterprises on the investment activities, "and thus, as a rule, one can note that along with the

increase of the size of enterprise the amount of investment outputs in revenues increases, although differences between particular categories of sizes of enterprises are not as big, and in micro enterprises it amounts to 3.72%, in small – 3.61%, in medium – 4.39%, and in the biggest ones – 4.98%" [22].

In the quoted report, the investment activities of enterprises in selected European countries in 2010 have been characterized and are as follows: „in comparison with other countries, investments in fixed assets of an average company in Poland (EUR 23.4 thousand) are significantly lower than the ones of its equivalent from more developed European countries – Switzerland (EUR 248.23 thousand), Norway (EUR 116.96 thousand), Austria (EUR 104.51 thousand), or even Latvia (EUR 29.29 thousand), Croatia (EUR 30.32 thousand) and Spain (EUR 31.52 thousand). With regard to the amount of fixed assets per 1 enterprise, Poland is on the 19th place among presented EU states, coming before states such as: Lithuania (EUR 22.93 thousand), Portugal (EUR 21.44 thousand), Bulgaria (EUR 20.90 thousand), Hungary (EUR 19.70 thousand) and the Czech Republic (EUR 19.55 thousand). One should note that a year before, i.e. in 2009, only Hungary had lower result than Poland. In 2010, Poland was included among a small group of countries (Norway, Ireland, Germany, Great Britain, Sweden, Romania, Cyprus, Italy, Spain) that experienced an increase of outputs on fixed assets of an average company in comparison with 2009. Despite an improvement in the level of investment outputs of enterprises in enumerated countries in 2010, these are still lower than the results from 2008 – on average by 31% for all presented countries.

Poland was included among countries (Norway, Austria, Ireland, Germany, Sweden, Cyprus, Hungary and the Czech Republic), where 20% of drop in outputs, in 2010, was noted in comparison with 2008, therefore, with time, the biggest economic slowdown in euro zone and the USA. Countries where the biggest drops in outputs were noted in comparison with 2008 are as follows: Slovakia (86%), Latvia (64%), Bulgaria (54%), Slovenia (45%), Luxemburg (44%), Estonia (43%), and Croatia (443%). Italy was the only country that experienced an increase in investment outputs per one enterprise in comparison with 2008 (by 6%) [22].

While analyzing contemporary structures of assets, one can clearly notice a shift in the direction of assets of intangible assets' character. One can enumerate such valued positions as: brand, know-how, licenses and others. In contemporary enterprises (in particular, in big international corporations) one can notice in the structure of assets a dominance – both, with regard to the structure and value of particular intangible assets' position, including intangible assets – with regard to the value of tangible assets. Recognizing this aspect in SME sector's enterprises, including craft enterprises, is extremely interesting. A separate aspect constitutes studying a level of awareness of this type of possible intangibles in assets structure in SME sector, including craft enterprises. Currently, a literary query does not allow any stipulation of trustworthy data regarding this extremely interesting area of SME sector enterprises' functioning, including craft enterprises. This aspect can turn out significant for contemporary markets (both in real and digital environment) in financing investment as well as all activities of SME sector enterprises, including craft ones.

Furthermore, the aforementioned report presented very interesting results of researches related with sources for financing SME sector enterprises on the Polish market. Sources for financing were defined as follows: „In 2011, similarly as in previous years, domineering source for financing SME sector investments in Poland were own resources – 63.4%. Second place was taken by resources coming from national credits and loans – 17.5%, and third place – by foreign resources – 9%. Significantly lower meaning was attributed to remaining sources such as: budget resources – 3.6%, other sources – 5.3% or unfinanced outputs – 1.2%” [22].

The bigger the enterprise, the bigger the engagement of own resources for financing investments (small companies – 59.44%, medium – 65.58%, and big – 73.72%), what is decided by their economic potential. National budget resources are mainly used by big enterprises (4.72%), then small (3.68%) and medium ones (3.34%), which means that big enterprises more frequently use public resources than small ones, whereas, the investment scale in big companies is higher. On the other hand, small enterprises are a leader in using credits and loans (small –

19.26%, medium – 16.3%, big – 5.99%) and foreign resources (small 10.81%, medium 7.98% and big 5.62%). The biggest changes in the structure of financing investments in comparison with 2010 can be observed in small and big enterprises. Small companies in 2011, to a bigger extend financed investments from credits and loans (an increase by 2.61 p.p.), whereas, they used foreign resources to a lower extend (a decrease by 3.53 p.p.). Simultaneously, other sources input increased (by 2.52 p.p.) in their financing structure. Big companies to a bigger extend than in the previous year used their own resources (an increase by 2.34 p.p.), resigning in exchange from financing from national credits and loans (a decrease by 2.38 p.p.) and using to a bigger extend other sources (an increase by 2.83 p.p.) [22].

Another important issue is the output structure in compliance with fixed assets groups. In the quoted report, this issue was characterized in the following manner: „structure of investment outputs in compliance with fixed assets groups in SME, in 2011, had a tendency to remain at a similar level to the one in 2010. SME allocate the majority, i.e. half of the resources intended to investment, into buildings and construction (50.8%). On the other hand, one third of investment resources is allocated to machines and equipment (30.9%), whereas, there is a downwards tendency noticeable in this category (a decrease from 44.4% in 2006). In case of remaining groups of fixed assets, e.g. means of transport, it is difficult to determine trends. The smaller the enterprise, the bigger the share of outputs on buildings and construction (micro – 54.6%, small – 62.1%, medium – 41.0%, big – 39.9%) and means of transport (micro – 23.7%, small – 11.1%, medium – 18.0%, big – 9.0%). It is caused by a smaller economical potential of small entities and the cost scale related with this type of investments. Therefore, smaller entities can allocate to the equipment such as machines and devices relatively less resources (micro – 27.1%, small – 25.6%, medium – 40.5%, and big – 49.9%), which causes their technological underinvestment” [22].

A separate and extremely important issue related with financing the activity of SME sector enterprises, including the craft ones, apart from investment activity comprises in financing current operations, e.g. as purchase

of materials and raw materials necessary to produce services, energy and others. Another crucial issue related with functioning and financing activities of enterprises of this sector, including craft ones, comprises in e.g. market (clients) dictate, where they locate their products and services by forcing long payment terms (granting commercial credits). Additionally, SME sector enterprises, including craft ones, generate the need for financial resource filling in the gap resulting from financing their clients.

Moreover, the article defines the area related with availability of selected tools, instruments and conceptions for financing functioning of craft enterprises.

2. Research Methodology

Research results presented herein are based on the information collected as a result of a survey conducted among craft enterprises. The territorial area of researches of craft enterprises' functioning covered all voivodeships. Currently, in Poland there are approximately 330,000 craft enterprises registered in the Polish Craft Association. On the grounds of this number, a research sample was defined at a level of 1,422 craft enterprises. The research sample was selected at random. During conducting research, two research layers were considered. First, territorial one (covering all territory of Poland, since all voivodeships are basically correlated with craft chambers); second one: a form of conducted activity (very important from the point of view of obtaining selected tools and instruments for financing craft enterprises). The period of conducting researches among craft enterprises associated in the Polish Craft Association covers all year 2013.

The tailor-made survey, used to conduct the research, included a set of orderly questions corresponding to the goal of the research. At the beginning of the survey a register characterizing the enterprises that participated in the survey was placed.

The authors decided to use this form of research due to the fact that the survey questionnaire is a useful tool to receive the respondents' opinion. The information obtained from the respondents by means of questionnaires provided the team with valuable information which enabled to reach proper conclusions.

Survey research is one of the most frequently used and the most commonly quoted

type of public opinion research. As a matter of fact, due to two elements i.e. simplicity and usefulness, it is the only tool used on a wide-scale in the scientific projects, also worldwide. It is extremely useful during the research conducted among companies since it enables segmentation, construction of an enterprise profile as well as provides information about the opinions and preferences of the respondents.

The survey, if skillfully used, gives enormous possibilities to conduct basic analysis and provide comprehensive insight.

The survey questionnaire was prepared in a classical (paper) version as well as electronic one. In order to execute researches with the use of a survey questionnaire in a classical version, craft chambers functioning in each voivodeship in the territory of Poland, guilds associated within particular craft chambers and the Polish Craft Association associating all craft chambers and guilds in Poland were asked for cooperation.

Furthermore, within virtualization of functioning of craft enterprises and institutions associating them (guilds, craft chambers, the Polish Craft Association), an electronic version of a survey questionnaire was also prepared. Unfortunately, this form of conducting researches failed. A return of sent survey questionnaires reached a level of 3%. The result being a consequence of a lack of or a low degree of using digital environment in functioning of craft enterprises inclines to conclude on the necessity to conduct detailed researches on this element of functioning of craft enterprises operating in dynamically developing digital environment – the Internet. The return of survey questionnaires prepared in a classical form amounted to approximately 90%, which gives 1,280 responses.

A method of participant observation was applied in researches on craft enterprises. Two co-authors of the article work or co-work with craft chambers and with the Polish Craft Association. This method proved to be particularly useful while formulating and verifying motions.

The survey questionnaire included 11 questions – open and closed. In order to obtain the fullest picture of researched craft enterprises, the questions concerned: a form of conducted business activity, net income for the previous year, a number of employed persons and characteristics of an enterprise. Second group of questions concerned the area related

with financing craft enterprises, among others, referring to using such instruments, tools and conceptions for financing enterprises, as: credit, leasing, factoring, loan or subsidy. What is more, the survey questionnaire included questions allowing defining barriers in using them by the craft enterprises. It also contained questions on European Union funds as a source of financing, as well as questions regarding using help of institutions supporting entrepreneurs from so-called business environment.

3. Research Results

Enterprises associated in the Polish Craft Association participating in the research represent 26 crafts enumerated below:

- painter-decorator – 31,
- carpenter – 84,
- butcher-meat processing technician – 17,
- bricklayer – 109,
- motor vehicles mechanic – 161,
- motor vehicles electro-mechanic – 32,
- vehicle whitesmith – 46,
- varnisher – 33,
- confectioner – 131,
- baker – 134,
- hairdresser – 156,
- tailor – 13,
- electrician – 39,
- tire fitter – 11,
- watchmaker – 3,
- wood worker – 36,
- roofer – 49,
- locksmith – 19,
- floorer – 17,
- goldsmith-jeweler – 24,
- upholsterer – 12,
- water and sanitary devices fitter – 36,
- gas devices fitter – 26,
- chimney sweeper – 14,
- construction finishing works process engineer – 44,
- blacksmith – 3.

Researched craft enterprises had various legal forms, starting from natural persons conducting economic activity, through civil partnerships, registered partnerships and limited liability companies. From among associated enterprises the majority, i.e. 65.55% of surveyed companies, were made by natural persons conducting economic activity.

In order to learn more about research craft enterprises, the survey also included a question

concerning a number of persons employed in an enterprise.

The number of employed persons in researched craft enterprises associated in guilds was as follows:

- up to 10 persons are employed by 839 from among research companies, which constitutes 65.55%,
- 11–50 persons are employed by 441 from among research companies, that is, 34.45%.

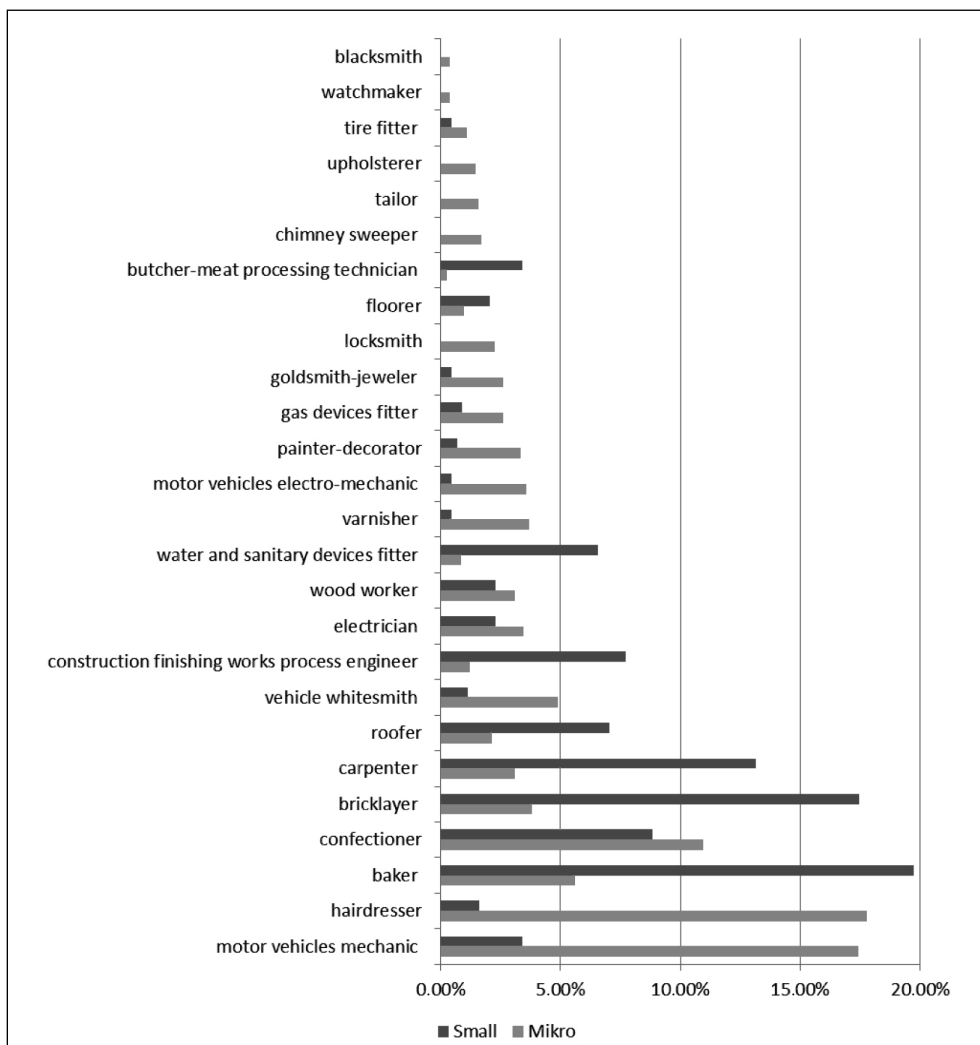
The size of companies broken down by the type of craft is presented in Fig. 1. Fig. 1 presents data of micro-enterprises as well as small enterprises taking into account each group of respondents as 100% (separately for micro-enterprises and separately for small enterprises). Fig. 2 presents enterprises divided in accordance with the represented craft including all enterprises regardless of their size (1,280 companies).

3.1 Using Instruments of Support for Enterprises, such as: Credit, Leasing, Factoring, Loan, Subsidy and Others

As a result of analyzing the information from survey questionnaires it was stated that a majority of researched enterprises – 45.00% (including 23.20% of micro enterprises and 21.80% of small enterprises) used a credit as a manner of financing activity regarding investment as well as operations (Fig. 3). Presented result is identical as the one presented in other sources. Craft enterprises did not indicate any type of credit, its hedging or purpose, e.g. investment or operational.

Leasing as a form of financing (in the layer of fixed assets) was used by 27% of researched companies (including 20.78% of micro enterprises and 6.25% of small enterprises). In a prevailing part, respondents pointed to operational leasing as a basic type of used leasing – a way of financing investments – fixed assets. Among others, the use of lease back in craft enterprises regarding tangible and intangible fixed assets was not noted in the research. A lack of using such a conception for financing increases the risk of craft enterprises' functioning on the Polish market.

The results of researched craft enterprises show that 12.03% of enterprises used borrowing (10.63% micro and 1.41% small). It came as

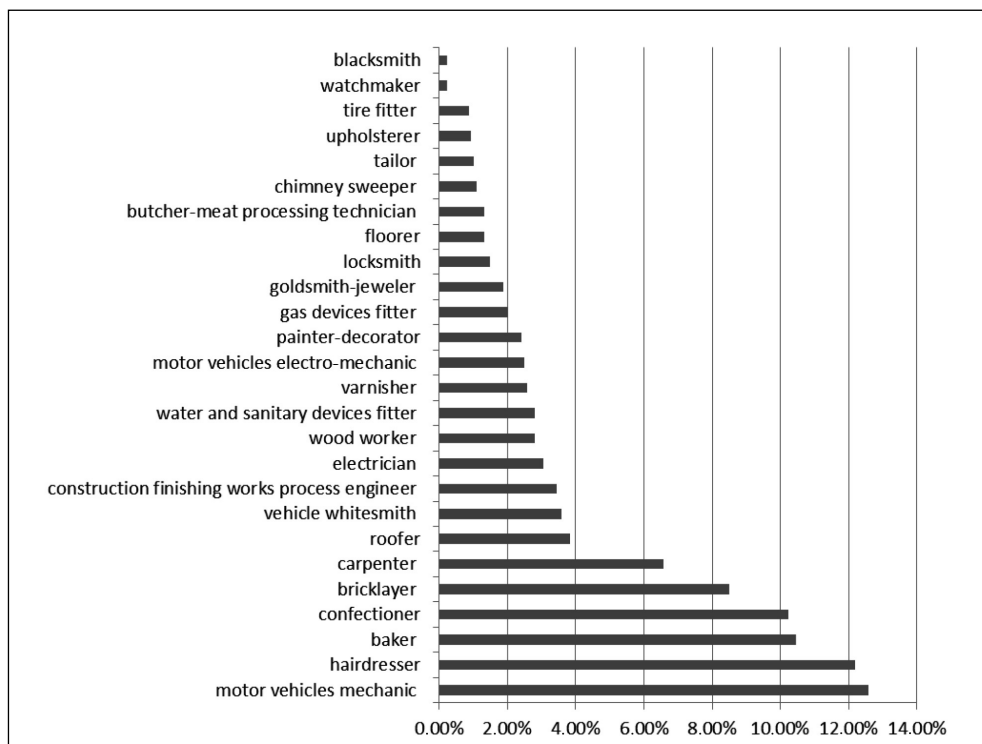
Fig. 1: Craft types broken down by the company size

Source: own

a huge surprise that only one enterprise used factoring. Due to big payment gridlocks occurring on the Polish market, it might seem that factoring is a conception that allows: speeding up trading, lowering the risk of enterprise's functioning (the bank acts as an analyst of risk of SME sector enterprises' clients), maintenance of solvency at a relevant level. Among reasons for the aforementioned situation one can definitely define the following factors:

1. Availability of the service aimed at enterprises and offered by the banks and their boundary conditions.
2. Education of the craft enterprises' owner on the advantages and disadvantages of using factoring.
3. Economic-financial results for craft enterprises (a level of necessary payments for the enterprise – particularly important with a low profitability of provided products and services).

Fig. 2: Types of craft in the analyzed enterprises (including both micro enterprises and small enterprises)



Source: own

Using subsidies was reported in total by 52 enterprises, which constitutes 4.06% of the surveyed entities. Subsidies were allocated to:

- establishment of a new workplace – in case of 17 enterprises,
- setting up an enterprise – in case of 35 enterprises.

No surveyed enterprise enumerated other support instruments that could be used by them. The results showed that 15.45% of micro enterprises did not indicate any form of support, however 8.75% of small companies does not use any of the enlisted support instruments.

3.2 Using National, European Union Funds

Question 4 included in the survey questionnaire was as follows: Did the enterprise use or has been using national, European Union funds or did the enterprise apply for them?

Only 189 (that is: 14.77%; 8.91% micro and 5.86% small companies) from among researched enterprises associated in guilds answered this question affirmatively. Remaining enterprises never used and do not use any such funds and never applied for them. This result shows a very negative phenomenon confirmed in conducted researches implying functioning of craft enterprises particularly in the context of an "old" (2007–2014) perspective of financing with European Union resources. It also points to a big challenge in this aspect, in a new perspective of financing projects with European Union resources (2014–2020). Among reasons for such a situation, one can, among others, define to following factors:

1. Competence barrier in drawing up a relevant motion to an institution financing projects.
2. Addressing priorities and terms and conditions of announced contest improperly.

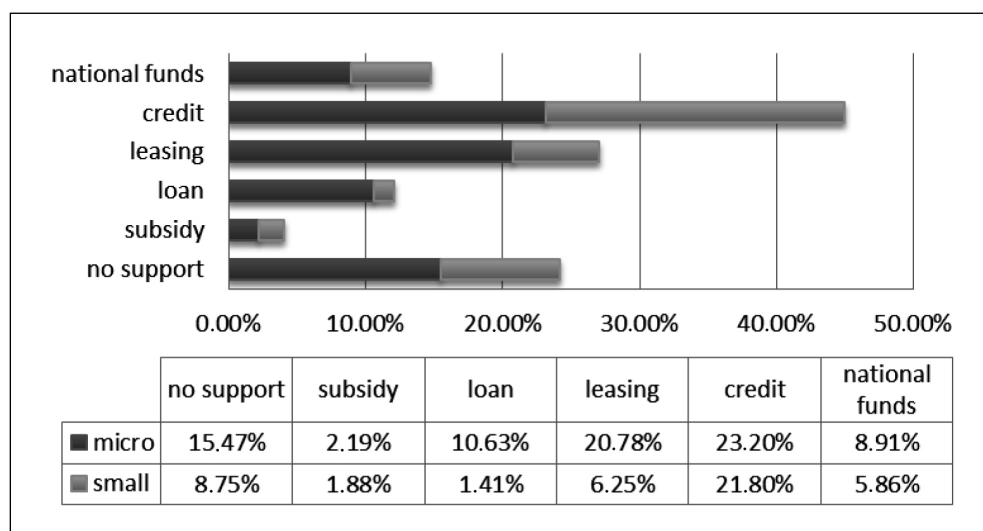
3. Economic-financial barrier for craft enterprises (big fees paid "in advance") for drawing up projects.
4. Improper structure of announced contests on so-called soft projects and so-called hard – investment projects.
5. A long period of time in possibility of commercial use of realized projects (3 or 5 years depending on a level of subsidy).
6. A long period of drawing up, assessment and taking decisions for projects.

3.3 Subject of Funding

Another question included in the survey questionnaire regarded a subject of funding from among enumerated support forms. As an answer, 10 propositions were made and a possibility to give other answers was also given.

Most often researched craft enterprises allocated obtained financing to construction and renovation – according to answers given by as many as 320 respondents, which amounts to 25% of researched enterprises

Fig. 3: Support instruments for companies



Source: own

(Fig. 4). This result is slightly different from the one presented in a report on the SME sector situation, where 50% of micro enterprises allocate obtained funds to investments in buildings and constructions. In case of craft enterprises functioning, as a rule, for several years or several dozens of years (in majority, family enterprises), managed to establish during many years of activity a proper level of fixed assets, including in a form necessary for production and services provided for buildings and constructions.

Next in terms of size subject of funding craft enterprises were machines and devices, which was indicated by 269 enterprises (19%). From the point of view of innovative behaviors

and limitation of risk of craft enterprises' functioning on the Polish market, this result is unsatisfactory. However, it should be noted that the view in this aspect is unclear, among others, with regard to using all types and varieties of leasing. Also common use of outsourcing (according to different types, functions, products, services and conceptions) allows an access to the newest technical-technological solutions and, therefore, an access to modern machines and devices without a need to buy them, at the same time limiting a risk of such an investment.

Among researched craft enterprises, 20% allocated obtained financial resources to buying means of transport.

Purchasing real estates was indicated by 9% of craft enterprises. Very disturbing results were stated in the area of craft enterprises' financing for new technologies (know-how), where only 4% among the researched entities confirmed purchasing them with obtained financial resources. In order to raise competitiveness and, at the same time, to decrease the risk of craft enterprises' functioning, it is necessary to drastically increase a share of financing purchases of know-how, licenses and other intangible assets. Other aspect functioning in correlation with this area is the use of franchising.

Research result at a level of 6% in using financial resources by craft enterprises to conduct trainings for employees is commensurate to the situation of training market in Poland. Generally, the market is overregulated with an immense number of offered trainings, including free trainings proposed within so-called "soft" projects financed with European Union resources. A huge misunderstanding in

this area comprises in e.g. a ban on conducting trainings certified with European Union funds, e.g. regarding health and safety at work – necessary and extremely important for functioning of each enterprise, including SME sector enterprise and thus, craft enterprise.

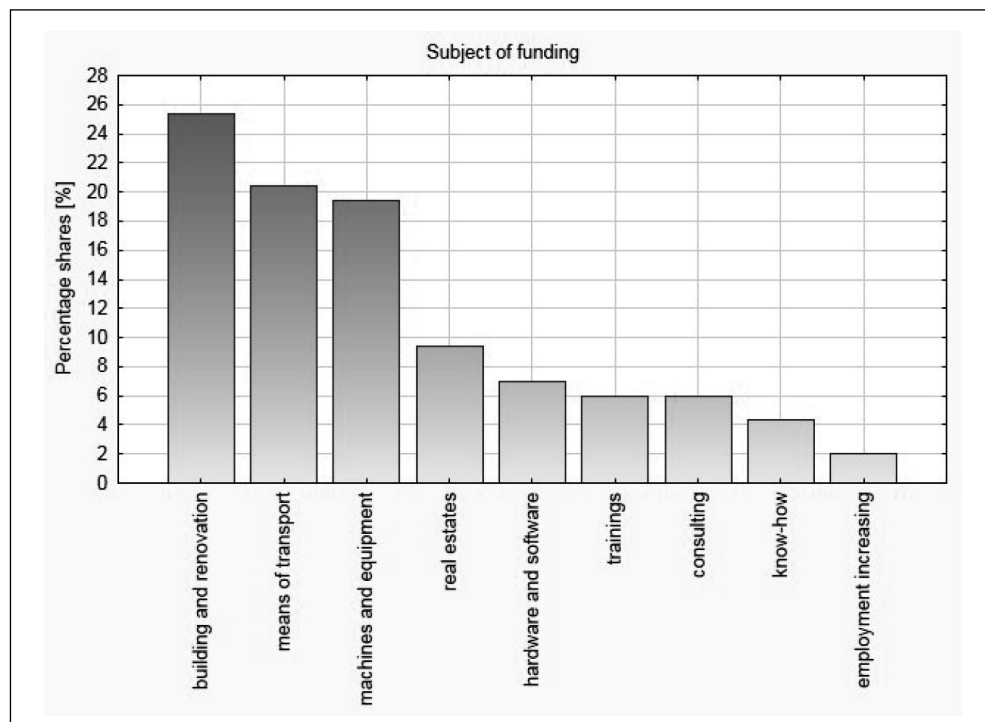
Purchase of hardware and software was confirmed by 68 enterprises. 23 enterprises, which constitutes a little more than 2% of respondents, allocated obtained financial resources to increasing employment. 53 enterprises allocated obtained resources to counseling services.

No researched enterprise allocated obtained resources to implementing certification in the enterprise. No respondents marked any other subject of funding than the ones enumerated.

3.4 Barriers in Using Services

Question no. 6 in the survey questionnaire regarded existing barriers in using services in

Fig. 4: Subject of funding in given enterprises



Source: own

the subject of funding craft enterprises' activities. As a closed question seven possibilities and an answer "other (please enumerate)" were given. Respondents could have also circled several answers. Among barriers defined by craft enterprises the following were enumerated:

1. Too complex bureaucracy was indicated by as many as 1,139 respondents, that is 88.98% (57.42% micro and 31.56% small).
2. Unsatisfactory hedging was indicated by as many as 39.06% (29.14% micro and 9.92% small) of researched companies.
3. Poor economic-financial results of craft enterprises were pointed to by 18.98%, that is, 243 enterprises.
4. A lack of own shares – 16.02% (10.08 micro and 5.98% small) pointed to this barrier.
5. Complicated provisions – 13.98% (8.91% micro and 5.08% small) of research subjects pointed to this barrier.

The results of the analysis are presented in detail in Fig. 5

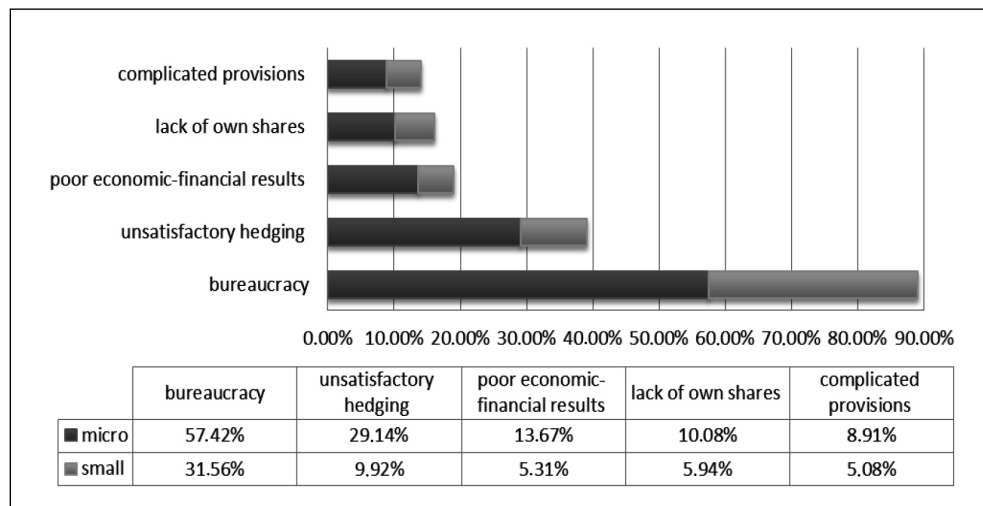
A result of a research on barriers in using financing craft enterprises' activities, where a barrier related with bureaucracy is enumerated in the first place, constitutes a very disturbing phenomenon. The research results presented herein remain in correlation with the results presented by the Report drawn up by Bank PKO SA for all SME sector published in

2014. Among barriers indicated in this report, "bureaucracy burden" took fourth place in the list of the biggest influence (in 2012 – 3.51) and in 2013, a result of 3.27 (where, 1 stood for a lack of barrier, and 5 – a very important barrier). In the same report, a barrier in form of "an access to external financing" took eleventh place on a list of the biggest influence with a result (in 2012 – 2.62) and in 2013 – 2.34. It is a clear signal for:

1. Polish legislator.
2. Banks.
3. Other financial markets' institutions.
4. Business environment institutions.
5. Local self-governments, in particular of a voivodeship level.
6. Employers' associations (including Craft Guilds and Chambers and the Polish Craft Association).

Bureaucracy as well as complicated procedures are one of the main obstacles in cooperation of small and medium enterprises with institutions offering external sources of financing. The problem is clearly observed in small and medium enterprises, and at the same time, it also is observed by institutions supporting entrepreneurship. According to the authors and entrepreneurs who participated in the research, the procedures concerning the required documents shall be simplified and the

Fig. 5: Barriers in using services



Source: own

requirements before and after receiving the financial support shall be relaxed.

For the enumerated institutions and others these results constitute a serious signal for working over changing strategy regarding bureaucratic burdens in general, including burdens related with obtaining external financing for enterprises, including also craft ones. Among directions for changes one can definitely enumerate the following:

1. Increasing the use of digital environment (the Internet).
2. Bigger use of outsourcing by craft enterprises (in particular, regarding focusing on basic activity).
3. A change in the philosophy of the activity of business environment institutions from the area of consulting and trainings to the area of drawing up and implementing particular applications for example for: credits, leasing contracts, franchising contracts, outsourcing projects contracts and others with a minimum fee or, in selected cases, without fee.

3.5 Assistance of Institutions Supporting Entrepreneurs

Question regarding assistance of supporting institutions was as follows: Does the enterprise use the assistance of institutions supporting entrepreneurs? Two forms of answers were proposed: affirmative and negative. In case of an affirmative answer, one should have enumerated these institutions and described a scope of assistance.

Respondents from enterprises associated in organizations of craft economic self-government many times used services of these organizations and indicated in their answers cooperating, among others, with institutions, such as:

- regional economic chambers,
- regional financing institutions,
- consultation points.

Support areas comprised in areas such as:

- environmental protection,
- public procurement,
- health and safety at work,
- labor law,
- training juvenile employees,
- financial forms of supporting craft activities,
- structural funds.

Another question concerned an assessment of hitherto cooperation between craft enterprises and these institutions. The

results were as follows:

1. 57.97% respondents described the cooperation as very good,
2. 43.44% – as good.

The researches results show that within the area of relations and cooperation with business environment institutions (craft enterprises) many things should be supplemented and improved. This refers in particular to bureaucratic burdens defined in the context of research on barriers.

Tenth research question included in the survey questionnaire concerned an intention to use assistance of organizations and institutions supporting entrepreneurs in the future. 100% of surveyed associated enterprises answered this question affirmatively, which seems obvious, since they remain members of various craft guilds. Such a result of researches is on one hand very interesting, among others, due to:

1. The possibility to network craft enterprises, including defining clusters.
2. Strong representation ("voice" in discussion and implementation) in defining and implementing projects eliminating e.g. bureaucratic barriers.
3. The use of a synergy effect, e.g. in creating intangible assets, creating and hedging intellectual property of particular craft enterprises as well as their employees.
4. Effective competition on the global market in spite of functioning on a local market.
5. Optimization of a risk of conducting activity by craft enterprises.

On the other hand, it provides new requirements in co-operation (e.g. direction of the development of co-operation through clusters) between craft enterprises, their relation with closer and further environment institutions, as well as creating new competences both, as a craft enterprise and its particular employees, e.g. in the aspect of using virtual space.

3.6 Micro vs. Small Craft Enterprises – Statistical Differences

Additionally, statistical analysis for the purposes of statistical hypothesis verification was conducted:

„Is the difference between the craft enterprises employing up to 10 employees and enterprises employing from 11 to 50 employees statistically relevant?“

For this purpose, 11 characteristics defined for micro enterprises and small enterprises were taken into consideration. The variables included

the following data: using support instruments such as credit, leasing, loan or grant as well as not using any forms of support, using national funds, barriers hindering financing services such as bureaucracy, insufficient security measures, weak economical and financial results, lack of equity contribution and complicated regulations. For this purpose structure index (statistical test for two structure index; partial tests of proportions between small and micro enterprises) was used.

This test assume: tested feature X in the two populations has a distribution two-point (zero-one) with unknown parameters p_1 and p_2 , respectively. We have two samples with frequency $n_1, n_2 > 100$ and we assume $\alpha = 0.05$.

H: $p_1 = p_2$

K: $p_1 \neq p_2$

The test results showed:

A. Support instruments for companies:

True hypothesis K: $p_1 \neq p_2$. Index p_1 and p_2 are statistically different for: 1. credit, 2. leasing, 3. loan.

Micro and small enterprises differ significantly from each other in case of "credit", "leasing" and "loan" as a one of support instruments for companies.

True hypothesis H: $p_1 = p_2$. Index p_1 and p_2 are not statistically different (they are the same) for: 1. subsidy, 2. no support, 3. using national funds.

Micro and small enterprises does not differ significantly from each other in case of "subsidy", "no support" and "using national funds" as a one of support instruments for companies.

B. Barriers in using services in financial subject:

True hypothesis K: $p_1 \neq p_2$. Index p_1 and p_2 are statistically different for: 1. bureaucracy 2. unsatisfactory hedging 3. poor economic-financial results.

Micro and small enterprises differ significantly from each other in case of "bureaucracy", "unsatisfactory hedging" and "poor economic-financial results" as barriers in using services in financial subject.

True hypothesis H: $p_1 = p_2$. Index p_1 and p_2 are not statistically different (they are the same) for: 1. lack of own shares, 2. complicated provisions.

Micro and small enterprises does not differ significantly from each other in case of "lack of own shares" and "complicated provisions" as barriers in using services in financial subject.

3.7 The Knowledge of Possibilities of Financial Support from European Union Funds

This question was posed in the following way: Is the enterprise familiar with possibilities of financial support from European Union funds? Three possible answers to this question were proposed:

- Yes.
- No, but I am interested in learning about such an offer.
- No, since we shall not be applying for such a form of support.

The results of researches show that as many as 63% of craft enterprises pointed to option b).

Such result is surprising, considering the period and number (including, in particular, the number of trainings and other "soft" projects theoretically providing knowledge on the aforementioned researched topic) of realized European Union projects and even projects realized before accession and a number of engaged institutions and enterprises. This result shows, that on the Polish market there is a problem with the quality (effectiveness) and type of projects defined within contests on using European Union funds, including using funds for drawing up particular projects, including the ones addressed at craft enterprises.

Conclusions

Identification of sources for financing activity (both, in the investment and operational aspect) of craft enterprises constitutes a complex process. Decisions related with obtaining financing in particular for SME sector enterprises, including the craft ones, are of a strategic character. Consequences of wrong decisions can turn out disastrous not only for the development, but also for further functioning of the enterprise, its "survival" on the market. Criteria that can be used for selection thereof include:

- development strategy,
- a level of the need for resources,
- cost and general terms and conditions of obtaining resources,
- preferences of the owner with regard

to the type of allocation e.g.: buildings, constructions, machines, equipment, know-how and others,

- a level of the enterprise's indebtedness,
- local financial infrastructure (in a form of functioning subsidiaries, branches of various financial markets' institutions e.g. banks, factoring enterprises, leasing enterprises and others),
- SME development support system, provided, predominantly, by institutions of closer or further environment thereof.

Preferences for particular sources decide on the choice between internal and external capital [28]. From the point of view of the enterprise's development, the ownership structure of the capital, including own and foreign capital, has a significant meaning while selecting a financing source. It has a crucial meaning in the context of possible decisions taken by the enterprise in order to obtain external financing sources, credit rating assessment and others.

A literary query conducted within this scope shows that own resources, credits, leasing and loans are used as a financing form for craft economic activity of enterprises associated in organizations of craft economic self-government.

The results of conducted researches confirm that craft enterprises at a level of 45% use credits as a source of financing their operative as well as investment activity. Financing conceptions such as: leasing, loans, outsourcing, factoring, sale of shares, issue of bonds and others are enumerated as next ones.

Small number of craft enterprises use national and European Union funds. Thus obtained capital was allocated by the craftsmen mainly to constructions and renovations, machines and equipment, means of transport and real estates.

The results of researches presented herein remain in correlation with the results of researches presented among others in reports:

- from 2013, on the situation of SME sector drawn up by PARP,
- from 2014, on the situation of SME sector enterprises issued by Bank PKO SA.

The research results are in correlation with the data included in the scientific publications. The vast majority of small and medium companies uses self-financing for the purposes of current and investment activities. With

reference to foreign capital, an expensive and inaccessible credit is the most popular form of financing.

Enterprises have preferred to finance their investment from their own sources for many years, what is confirmed by the research conducted by the National Bank of Poland and the Central Office of Statistics [15], [31]. It is a structural factor limiting the credit demand among enterprises.

In many cases craft enterprises are family-owned ones with a tradition of many years (or even several hundreds of years) and they conduct diversified and determined by their specific character policy of obtaining sources for financing comprising in:

- using defined (determined with e.g. many years of cooperation) sources of financing, what in selected cases results even in sole dependency on a particular institution of financial market, even at the expense of the effectiveness of used financial instruments,
- limited trust in modern instruments for financing activity, such as, e.g.: factoring, outsourcing and others,
- significant criterion for this type of enterprises remains a limited risk in using financial instruments,
- precise estimation of the risk of family enterprise's functioning (of a craft enterprise) with the basic criterion – the functioning time of the enterprise for future generations,
- higher awareness of family enterprises, including craft ones, in comparison with other enterprises, also the SME sector, to the required by financial markets institutions co-financing in particular instruments e.g. own participation in loans, national and foreign (e.g. European Union) subsidies and others,
- higher awareness of family enterprises, including craft ones, in comparison with other enterprises, also the SME sector, of the consequences of obtaining external sources for financing operational and investment activities, e.g. in the context of granted credit's hedging.

Results of researches presented, among others, in quoted, periodical reports (issued by PARP and Bank PKO SA) show that in many cases, family enterprises, including craft ones of such character, prefer using sources, such as:

- Owner's own resources,
- owner's family resources,
- loans from friends,

with all related consequences, e.g.: economic-financial, tax, legal and social, many times negative ones.

Irrespective of reasons for such type of behaviors, they bring about essential benefit comprising in engaging in economic activity resources that have been put aside for so-called a rainy day [5].

According to the report on the situation of micro and small enterprises, the year 2012 (Report issued by Bank PKO SA) brought about an increase in new credits for enterprises. Own resources remained the most frequent source for financing investment in companies. Banks sharpened credit policy in the enterprise segment, predominantly with regard to margins and required hedging [22], [23], [24]. 2013 was a year that characterized with a low speed in increase of enterprises' credits and companies once again most frequently financed new investments with own resources. In 2013 enterprises applied for a credit less frequently than in 2012. The most frequent reasons for rejecting applications for credits comprised in a lack of credibility or credibility inadequate with banks' requirements [16]. This study includes results of researches conducted on a very important area and presents them both, from the point of view of craft enterprises and stakeholders from their closer and further environment, that is, it defines barriers in obtaining resources for financing operational and investment activities of these enterprises.

Craft enterprises pointed to some barriers, among others:

- as the main barrier – too complicated bureaucracy,
- the second – unsatisfactory hedging (a lack of own share) that craft enterprises must be at a disposal of.

Further, defined barriers with the biggest share in their structure refer to both, craft enterprises (predominantly, with regard to the economic-financial condition), and, predominantly, indicate much too big imperfection of relations with institutions of their closer and further environment. Many of the aforementioned institutions should, as a rule, eliminate defined barriers in a direct form, e.g.: through organizing low interest-bearing loan funds together with banks from

European funds. In this aspect, accepting and dividing risk related with financing particular projects in craft enterprises remains extremely valuable and, to same extend, bureaucracy should be limited to an essential and necessary extend.

The fact that craft enterprises show a low level of using modern instruments and conceptions for financing their investment and operations activities, including e.g.: factoring, lease back, outsourcing and others, should be strongly underlined. Nevertheless, mainly institutions functioning on financial markets must consider such business partners as craft enterprises at the same time assuming in the initial phase of cooperation that they shall have to incur bigger outputs to draw up particular projects predominantly due to a low level of specialist competences of craft enterprises. In the long run the result for institutions of financial markets (among others, as a consequence of mutual trust) shall comprise in the fact that the cooperation with craft enterprises shall generate an increase in revenues due to sales of own products both, with regard to the value and to the quality.

Due to the meaning of SME sector, including craft enterprises, in the economy of each country, elimination or limitation of defined herein barriers in obtaining financial resources both, on the operational and investment activity, as a consequence, contributes to survival and development of enterprises. The above situation translates into: generating new work positions, innovative behaviors of craft enterprises, including their employees, increasing craft enterprises' incomes, increasing state incomes and local community incomes.

The results of the conducted tests (structure index) showed that there are statistically relevant differences between the craft enterprises employing up to 10 employees and the enterprises employing from 11 to 50 employees in case of: "credit", "leasing", "loan", "bureaucracy", "unsatisfactory hedging" and "poor economic-financial results". The results of the conducted tests showed that there are not any statistically relevant differences between the craft enterprises employing up to 10 employees and the enterprises employing from 11 to 50 employees in case of: "subsidy", "no support", "using national funds", "lack of own shares" and "complicated provisions".

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Abstract

FINANCING CRAFT ENTERPRISES ASSOCIATED IN THE POLISH CRAFT ASSOCIATION

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This article concerns functioning of small and medium enterprises and in particular: craft ones. In the sector structured European Union, the abovementioned stand for 80–95% of the existing companies and moreover, they generate the biggest number of job positions and the national income. The article focuses on a selected part of SME sector: craft enterprises and especially, on financing their activities. This financing relates to both, financing craft businesses' investments and their current operations. In the first part of the text one presents a literary query concerning the definition of a craft enterprise and the resulting from its characteristic functioning: conception and tools for financing investments and current operations of craft enterprises. In the second part, one demonstrates the results of researches on the conception and the tools for financing craft enterprises functioning on the Polish market. In the summary of the article one demonstrates conclusions concerning the ways of maintenance and (in many cases innovative) changes of the conception and the tools for financing craft enterprises. The element congruous with the basic topic of the article relating to the current functioning of a craft enterprise in the real environment (both: inner and outer one), is its functioning in the digital surrounding (including with regard to the conception of financing activities), which correlates with the dynamic development of ICT technologies. The aforementioned development together with digitalization determines many aspects of craft enterprises' functioning; also the ones connected with financing tools and conceptions. Referring to the things stated, it is clear that ICT technologies should be taken into account in enterprise's current activities and in other aspects of its functioning e.g. communication, as well as eservices it provides and receives.

Key Words: SME sector, craft enterprise, financing, financing tools, management methods, financial engineering, outsourcing, virtual space.

JEL Classification: G2, G3.

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AN APPROACH TO MEASURING WEBSITE QUALITY IN THE RURAL TOURISM INDUSTRY BASED ON ATANASSOV INTUITIONISTIC FUZZY SETS

Dragisa Stanujkic, Edmundas Kazimieras Zavadskas, Jolanta Tamošaitienė

Introduction

Tourism is a very important industry in today's global economy. Tourism also stimulates other industries significantly. The analysis of south-eastern European countries provides the initial framework for benchmarking the tourism performance of different countries, and determination of objectives and strategies for improving tourism competitiveness [48]. The quality aspect leads to the success of tourism development in any destination [26]. It is one of the sustainable tourism development [22].

In many rural areas in Serbia tourism has been recognized as one of the important segments that should ensure their sustainable economic development; this being the case with similar areas in other countries [3], [7], [9], [16], [17], [40], [41], [42]. One of these areas is Timocka Krajina (Timok frontier) located in eastern Serbia, on the border with Bulgaria and Romania. This region abounds in natural beauties such as mountains (Rtanj, Stol and the Stara Planina-the Old Mountain), gorges (Djerdapska Klisura – the Iron Gates of the Danube and Lazarev Kanjon – Lazar's Canyon), and caves (Lazareva Pecina – Lazar's Cave and Rajkova Pecina – Rajko's Cave). Also worth mentioning is a natural stone bridge called the Vratnjanske Kapije (gates).

The importance of tourism potentials in Timocka Krajina has also been recognized in the project Stara Planina (the Old Mountain or the Balkan mountain range is an extension of the Carpathian mountain range, separated from it by the Danube River. This range runs 560 km from eastern Serbia eastward through central Bulgaria to Cape Emine on the Black Sea (Visit and meet Stara planina 2014) – New Network, which is co-funded by the EU through the Bulgaria-Serbia IPA Cross-border Programme.

A large number of websites contain all the necessary information regarding the natural beauties of the Stara Planina and its tourism potential, as well as other attractive locations in Timocka Krajina. There is a considerable diversity in these websites, which is probably the consequence of different purposes they have, then different amounts of funds available for their development and maintenance, as well as different levels of knowledge, skills and enthusiasm on the part of their webmasters.

The importance of the Internet and websites in the hotel and the rural tourism industry is discussed in a number of studies, such as: [4], [23], [45], [46], [47]. In a series of papers Law [30], [31], [33] considered the importance of the websites in the hotel industry, and proposed a fuzzy multiple criteria decision-making model for their evaluation. Akincilar & Dagdeviren [1] proposed the Multiple Criteria Decision Making (MCDM) model for evaluating hotel websites based on the AHP and PROMETHEE methods. A similar approach, based on AHP and VIKOR methods, was proposed by [18].

It is also important to note that Haile [19] states that an average visitor do not spend more than 15 seconds actively on the website, or even less than 10 seconds. It is also significant that the number of such visitors is not negligible, and that according to Haile [19] it is a staggering 55%.

Therefore, developing a MCDM model that allows us to determine how much first-time visitors are really satisfied with the quality of a website or what the satisfaction level of their expectations really is could be of great significance. Using such a model, a webmaster could achieve the following: timely determine the quality of the website, compare the website with competitive websites, and identify weaknesses of the website.

In order to more realistically collect attitudes of the respondents, the planned model should provide an easy way to collect as much realistic attitudes of surveyed respondents as possible.

Intuitionistic fuzzy set is a very useful tool to depict uncertainty. Lots of multi-criteria group decision making methods under intuitionistic fuzzy environment have been developed [50]. Intuitionistic fuzzy prioritized operators and their application in multi-criteria group decision making are presented [12], [53], [54]. Data envelopment analysis is a non-parametric and linear programming based approach to appraise the relative efficiency of a set of congruent units [50]. For the fuzzy environment the intuitionistic trapezoidal fuzzy numbers density aggregation operators can be used [35], [49]. For the data analysis the comparison of accuracy in ranking alternatives performing generalized fuzzy average functions are used [29]. Chen [13] presented the Interval-Valued Atanassov's Intuitionistic Fuzzy Environment Inclusion-Based LINMAP method for Multiple Criteria Decision Analysis for efficiency evaluation under uncertainty. Therefore, in this approach, the proposed MCDM model is based on the use of Atanassov Intuitionistic Fuzzy Sets (IFSs) together with DEA method [20].

Due to the reasons mentioned above, the rest of this paper is organized as follows: Section 1 considers some basic definitions and notations related to IFSs. Section 2 considers the criteria for evaluating the quality of websites with special emphasis on the criteria that can be used in the hotel and rural tourism industry. Section 3 proposes the MCDM framework for evaluating the quality of websites from the first-time visitors' point of view. Finally, Section 4 offers a numerical example with the aim of explaining the proposed methodology in detail. After that comes the conclusion.

1. Preliminaries

This section considers some basic concepts of IFSs, Intuitionistic Fuzzy Numbers (IFNs) and linguistic variables, which are relevant to the proposing a framework for evaluating websites from first-time visitors' point of view.

1.1 Basic concepts of Intuitionistic Fuzzy Sets

Fuzzy sets (FS) theory was first introduced by Zadeh [51] and this theory, unlike classical sets theory, allows partial membership to a set.

Let X be universe of discourse. Then a fuzzy set $\tilde{A}$, can be defined as follows

$$\tilde{A} = \left\{ \langle x, \mu_A(x) \rangle \mid x \in X \right\}, \quad (1)$$

where: $\mu_A : X \rightarrow [0, 1]$ is a membership function, and $\mu_A(x)$ denotes the degree of membership of the element x to the set $\tilde{A}$ [51].

In addition to belonging to a set, in IFSs theory Atanassov [5] also introduced not belonging to a set. Therefore, an IFS $\tilde{A}$ in X can be defined as follows:

$$\tilde{A} = \left\{ \langle x, \mu_A(x), \nu_A(x) \rangle \mid x \in X \right\}, \quad (2)$$

where: $\mu_A(x)$ and $\nu_A(x)$ denote the degree of membership and the degree of non-membership of the element x to the set A , respectively; $\mu_A : X \rightarrow [0, 1]$ and $\nu_A : X \rightarrow [0, 1]$; $0 \leq \mu_A(x) + \nu_A(x) \leq 1$.

In addition, a very useful parameter, called the degree of indeterminacy of x to A , is defined in the IFSs theory, as follows

$$\pi_A(x) = 1 - \mu_A(x) - \nu_A(x), \quad (3)$$

under the following condition

$$\pi_A(x) \in [0, 1]. \quad (4)$$

Basic operations on IFSs. The operations of addition and multiplication on IFSs were defined by Atanassov [6]. Let $\tilde{A} = \langle \mu_A, \nu_A \rangle$ and $\tilde{B} = \langle \mu_B, \nu_B \rangle$ be two IFSs. Then, the basic operations on IFSs can be defined as follows:

$$\tilde{A} + \tilde{B} = \langle \mu_A + \mu_B - \mu_A \mu_B, \nu_A \nu_B \rangle, \quad (5)$$

$$\tilde{A} \cdot \tilde{B} = \langle \mu_A \mu_B, \nu_A + \nu_B - \nu_A \nu_B \rangle. \quad (6)$$

Score function of IFSs. Chen and Tan [11] introduced a Score function to provide a method for comparing IFSs. Let $\tilde{A} = \langle \mu_A, \nu_A \rangle$ be an IFS. Then,

$$S_A = \mu_A - \nu_A, \quad (7)$$

where S_A denotes value of Score function, and $S_{\tilde{A}} \in [-1, 1]$.

Ranking of IFSSs. Let $\tilde{A} = \langle \mu_A, \nu_A \rangle$ and $\tilde{B} = \langle \mu_B, \nu_B \rangle$ be two IFSSs. Then, the ranking of IFSSs on the basis of Score function can be made as follows:

$$\begin{aligned} \tilde{A} > \tilde{B} & \text{ if } S_A > S_B \\ \tilde{A} &\equiv \tilde{B} & \text{ if } S_A = S_B \\ \tilde{A} < \tilde{B} & \text{ if } S_A < S_B \end{aligned} \quad (8)$$

Intuitionistic Weighted Arithmetic Mean of IFSSs. Let $\tilde{A}_j = \langle \mu_{A_j}, \nu_{A_j} \rangle$ be a collection of IFSSs. The Intuitionistic Weighted Arithmetic Mean (IWAM) of dimensions n is a mapping $IWAM: R^n \rightarrow R$ that has an associated weighting vector $W = (w_1, w_2, \dots, w_n)^T$ with $w_j \in [0, 1]$ and $\sum_{j=1}^n w_j = 1$, such as

$$\begin{aligned} IWAM(\tilde{A}_1, \tilde{A}_2, \dots, \tilde{A}_n) &= \sum_{j=1}^n w_j \tilde{A}_j = \\ &= \left(1 - \prod_{j=1}^n (1 - \mu_{A_j})^{w_j}, \prod_{j=1}^n (\nu_{A_j})^{w_j} \right) \end{aligned} \quad (9)$$

1.2 Intuitionistic Fuzzy Numbers

As with the FSs theory, the IFSSs theory also proposes several shapes of IFNs. The significant shapes are the triangular and trapezoidal ones when the linear membership functions are used, while with the bell-shaped ones the non-linear membership functions are preferred.

In addition to the above mentioned shapes, the singleton shape can be pointed out as a characteristic one. A singleton IFN $\tilde{A}$, $\tilde{A} = \langle a, a' \rangle$, shown in Figure 1, is defined with the membership $\mu_A(x)$ and non-membership $\nu_A(x)$ function, respectively, as follows:

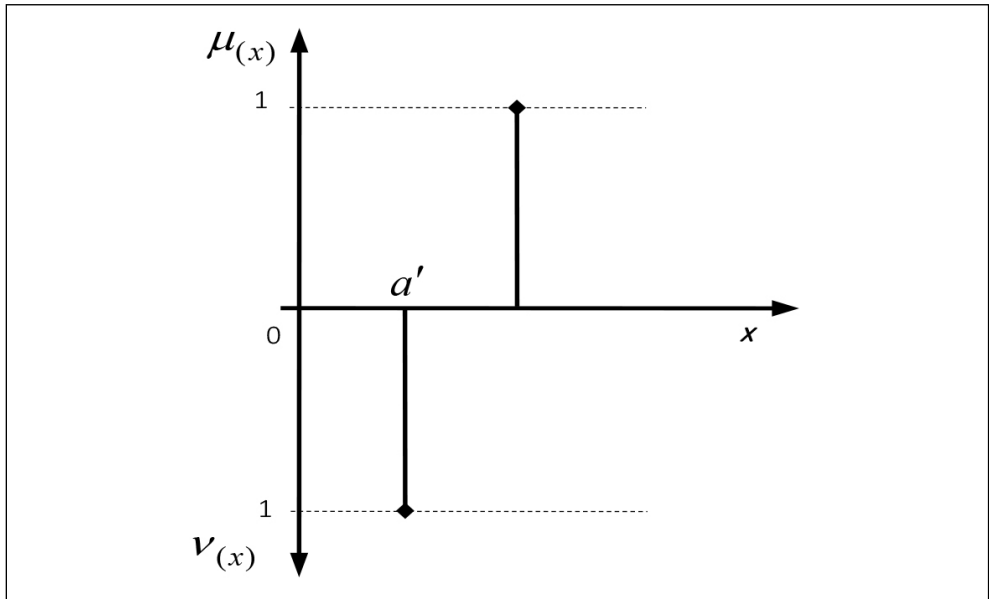
$$\mu(x) = \begin{cases} 1 & x = a, \\ 0 & \text{otherwise;} \end{cases} \quad (10)$$

$$\nu(x) = \begin{cases} 1 & x = a' \\ 0 & \text{otherwise;} \end{cases} \quad (11)$$

where: parameter a indicates the most promising value that describes belonging to a set, parameter a' indicates the most promising value that describes not-belonging to a set.

Basic operations on IFNs. Let $\tilde{A} = \langle a, a' \rangle$ and $\tilde{B} = \langle b, b' \rangle$ be two IFNs. According to

Fig. 1: A singleton IFN



Source: own processing

Eq. (5) and Eq. (6), the operations of addition and multiplication on IFNs are as follows:

$$\tilde{A} + \tilde{B} = \langle a + b - ab, a'b' \rangle, \quad (12)$$

$$\tilde{A} \cdot \tilde{B} = \langle ab, a' + b' - a'b' \rangle. \quad (13)$$

Score function of IFNs. Let $\tilde{A}$ be a singleton IFN. Then, the score of $\tilde{A}$ is as follows

$$S_{\tilde{A}} = a - a', \quad (14)$$

where $S_{\tilde{A}} \in [-1, 1]$.

As in the case of IFSSs, the Score function can be used to rank the IFNs, as it is previously shown.

Intuitionistic Weighted Arithmetic Mean of singleton IFNs. Let $\tilde{A}_j = \langle a_j, a'_j \rangle$ be a collection of singleton IFNs. According to Eq. (9), the IWAM of singleton IFNs is as follows

$$IWAM(\tilde{A}_1, \tilde{A}_2, \dots, \tilde{A}_n) = \left(1 - \prod_{j=1}^n (1 - a_j)^{w_j}, \prod_{j=1}^n (a'_j)^{w_j} \right). \quad (15)$$

1.3 Intuitionistic Fuzzy Linguistic Variables

The linguistic variables have been extensively used by many authors for solving various decision-making problems, and as a result, numerous linguistic scales, as well as variables,

are also proposed. In this approach, a specific linguistic scale adapted to work with singleton IFNs is proposed. The proposed linguistic scale is shown in Table 1.

In this approach, the same linguistic variables are used for expressing a level of satisfaction and a level of dissatisfaction. In order to satisfy the condition (4), i.e. the condition according to which the degree of indeterminacy should be less than or equal to one, the acceptable combinations of linguistic variables that can be used for expressing satisfaction and dissatisfaction levels are shown in Table 2.

2. Criteria for Evaluating Websites

A large number of studies, published in many scientific and professional journals, have been devoted to website quality evaluation. The approach proposed by Boyd Collins in late 1995 can be identified as the first formal approach of this type. His model, intended for librarians, was based on six criteria developed by combining evaluation criteria for printed media, and considering what was relevant for websites [38]. The criteria proposed by Collins are: Contents, Authority, Organizations, Searchability, Graphic design and Innovation use.

A very important approach to website quality evaluation was also proposed by Kapoun [27]. According to him, the following criteria are identified as crucial: Accuracy, Authority, Objectivity, Currency, and Coverage. Based on the proposed evaluation, the Kapoun approach has the acronym AAOCC.

Tab. 1: Linguistic variables for expressing satisfaction and dissatisfaction levels

Linguistic variable	The corresponding numerical values
Completely (C)	0.995
Very high (VH)	0.875
High (H)	0.750
Moderate high (MH)	0.625
Moderate (M)	0.500
Moderate low (ML)	0.375
Low (L)	0.250
Very Low (VL)	0.125
Insignificantly Little (IL)	0.005

Source: own

Tab. 2:

Acceptable combinations of linguistic variables

Satisfaction level	Dissatisfaction level and degree of indeterminacy								
	C	VH	H	MH	M	ML	L	VL	EL
Completely (C)									0.000
Very High (VH)								0.000	0.120
High (H)							0.000	0.125	0.245
Moderate High (MH)						0.000	0.125	0.250	0.370
Moderate (M)					0.000	0.125	0.250	0.375	0.495
Moderate Low (ML)				0.000	0.125	0.250	0.375	0.500	0.620
Low (L)			0.000	0.125	0.250	0.375	0.500	0.625	0.745
Very Low (VL)		0.000	0.125	0.250	0.375	0.500	0.625	0.750	0.870
Insignificantly Little (IL)	0.000	0.120	0.245	0.370	0.495	0.620	0.745	0.870	0.990

Source: own

Alexsander and Tate [2] and some librarians [8] confirmed the usability of the Kapoun approach while some other librarians slightly modified it. For example, Lydia [36] proposed the following six criteria: Authority, Accuracy, Objectivity, Currency, Coverage, and Appearance, which are to be applied when evaluating the quality of a website.

However, there are some librarians who have much more radical attitudes. Librarians at the California State University of Chico [10] proposed the use of the so-called CRAAP test, which contains a list of questions that are to determine whether the information on a particular website is reliable or not. Similarly to the Kapoun approach, the CRAAP test is also an acronym, i.e. it stands for the following criteria: Currency, Relevance, Authority, Accuracy, and Purpose.

It should be noted that there are views according to which the Kapoun approach is not suitable for evaluation of all types of websites [15]. Therefore, due to their specific characteristics and features, different websites are to use different evaluation criteria.

2.1 Criteria for Evaluating Websites in the Tourism Industry

In the literature can also be identified some studies that are devoted to measuring the quality of websites in tourism, i.e. in the hotel industry, and to defining a set of relevant evaluation criteria.

Law et al. [34] provided a comprehensive overview of the website evaluation in the tourism industry. According to Han and Mills [21] commented that the use of the websites in tourism marketing began in 1995, and that Murphy et al. [39] conducted a pioneer study that attempted to evaluate tourism and hospitality websites in an early stage of web development.

The approach proposed by Chung and Law [14] is one of the first approaches proposed for evaluating the quality of the websites in the hotel industry. This approach is based on the use of the following evaluation criteria: Facilities information, Customer contact information, Reservation information, Surrounding area information, and Management of websites; as well as the use of their sub-criteria.

Law and Cheung [32] identified five criteria that are important when determining the quality of hotel websites, i.e., Reservations information, Facilities information, Contact information, Surrounding area information, and Website management. On the basis of the conducted survey of Greek hotels websites, Zafropoulos and Vrana [52] identified the following six criteria relevant to the hotel website quality measurement: Facilities information, Guest contact information, Reservation and prices information, Surrounding area information, Management of the website and company profile. For each of these criteria, Zafropoulos and Vrana [52] also identified the relevant sub-criteria.

Herrero and San Martin [23] identified the following three key attributes (criteria) important for tourism websites: information, interactivity, and navigability.

2.2 Criteria for Evaluating Websites Devoted to the Promotion of Tourist Destinations from the First-Time Visitors' Point of View

Unlike world famous tourist destinations, the less-known ones have to make a far greater effort in order to attract new visitors. If we assume that there are undecided tourists who use the web searching for new tourist destinations, then we can argue that the website's capability to catch and retain a first-time visitor in just a few seconds is one of the important roles that website has.

In order to more precisely determine the impression the first-time visitors have, it is of essential importance that respondents understand the meaning of the evaluation criteria clearly. Therefore, this approach suggests the use of a smaller number of evaluation criteria.

There is also the second reason for using a small number of criteria and that is a short period of observation, which is the time the respondents have to look at the website before carrying out their evaluation in relation to the selected set of criteria.

Due to the above mentioned reasons, this approach proposes the following criteria to be used in assessing the overall impressions first-time visitors have, i.e. the impression first-time visitors gain when visiting a website:

- **Web page Environment.** The adequate Web page Environment (En), which includes an attractive design, an efficient and logically organized menu system, search capabilities, a multi-language support, an appropriate color scheme and fonts, and finally the harmonious arrangement of website elements all have a significant impact on the impressions first-time visitors have.

When the respondents evaluate the website in relation to the criterion Web page environment, some of the following questions are to be considered: Is the website environment adequately designed? Is it designed to attract the attention of first-time visitors? and Is it appropriate for obtaining the required information?

- **Content.** The Content (Co) of the website is of a crucial significance. However, in a just

few seconds first-time website visitors rather perform screening than reading the content.

When the first-time visitors evaluate the website in relation to the Content criterion, the following questions are to be taken into account: Does the web page contain the necessary information? Are the web pages organized in such a way so that the visitors could identify and find the information easily?

- **Graphics.** In the case of websites, especially the websites devoted to the promotion of tourist destinations, the appropriately designed Graphical elements (Gr) stored on the home page, as well as on other web pages, can have a significant positive impact on the visitors' attention.

Regarding the graphics, the following is to be considered: Do web pages contain the adequate graphic elements? and, Are the graphic elements adequately located on the web pages?

- **Authority.** The evidence supporting the Authority (Au) of the information on the website is certainly welcome. For first-time visitors, it is important that such evidence exists and that it can be spotted easily.

3. A Framework for Evaluating Websites Devoted to Promoting Tourist Destinations from the First-Time Visitors' Point of View

As previously mentioned, a significant number of average visitors spend less than 15 seconds, not so rarely less than 10 seconds, on a website. In this short period of time it is necessary to introduce a website visitor to the main goal and basic ideas of the website, and thus obtain his or her attention. Therefore, the following requirements have been taken into consideration during the proposed model forming:

- **Period of observation.** The period of time that the respondents have to observe the evaluated website should not be longer than time that average visitors spend on websites before their abandonment, i.e. the time of observation should not be longer than 10 seconds. In other words, during the evaluation of websites the respondents at any time may leave the website and begin the next step of the proposed evaluation procedure, but the period of observation should not be longer than 10 seconds.

- **Simplicity in use.** In order to obtain the real attitudes of ordinary respondents, the proposed model has to be user-friendly and easy to use. Therefore, the proposed model should use a smaller number of criteria whose meaning is clearly understood by all respondents.
- **Completeness.** In order to compensate the use of a small number of evaluation criteria, used for gathering attitudes of respondents, the proposed model should be based on the use of IFNs, which allows the respondents to express the level of their satisfaction and dissatisfaction regarding the complex evaluation criteria.
- **Qualitative versus quantitative.** It is clear that human beings often prefer to use qualitative descriptions as opposed to quantitative values. Therefore, the linguistic scale, adopted to the use of IFNs, for evaluating websites in relation to the selected criteria were presented to the respondents.
- **Precision.** It is known that quantitative values are more precise than qualitative variables. Therefore, after transforming linguistic variables in the corresponding quantitative values, respondents were allowed to adjust it if it is necessary. In addition, respondents were allowed to, if they want, neglect the use of linguistic variables and use numeric values for evaluation.
- **Consistency.** Using the degree of indeterminacy and condition (4) the respondents whose responses cannot be accepted can be identified. Such respondents should be introduced with omissions, and they should get the opportunity to correct their answers. However, if after performed correction the obtained responses do not satisfy the condition (4) then such respondent should be rejected as inadequate, i.e. as respondent who does not want to cooperate or cannot understand the use of IFNs.

3.1 The procedure for evaluating websites devoted to promoting tourist destinations from the first-time visitors' point of view

In order to fulfill the above mentioned requirements, which basically means that first-time visitors are satisfied with a particular website

promoting a particular tourist destination, the following procedure is suggested:

Step 1. Prepare the respondents for evaluation. In this step, the respondents are prepared to evaluate websites in relation to the selected criteria.

This step includes a short introduction to IFNs, meaning of the membership function and non-membership function, and their use for expressing satisfaction and dissatisfaction about something. In order to make the respondents more familiar with the use of IFNs, this step also presupposes that the respondents are guided to perform the evaluation using IFNs in some simple examples.

Within this step, the respondents are also introduced to the criteria that will be used to evaluate the websites and their meaning.

Step 2. Collect the data for website evaluation. In this step, clearly can be identified the following sub-steps:

1. Visit and observe the website, no longer than 10 seconds;
2. Rate the website in relation to the selected set of the evaluation criteria;
3. Transform the linguistic variables into the recommended numerical values, and modify the numerical values if necessary; and
4. Check the consistency of responses, and made corrections if the condition (4) is not satisfied.

The usual procedure used in the website evaluation normally involves more respondents, which means that the sub-steps 1–4 should be repeated for each respondent.

Step 3. Determine the group performance ratings. The group performance ratings can be determined using Eq. (15).

Step 4. Determine the significance of evaluation criteria. The procedures for determining the significance of criteria, more often called criteria weights or shorter weights, is usually not part of many significant MCDM methods. However, the weights may have significant influence on the results and that is why different authors suggest different procedures when determining weights [37], such as pair-wise comparisons [43], [44], Delphi method [24], Entropy approach [25], and SWARA method [28].

Each of the mentioned procedures, i.e. methods, can be used when determining the weights of the criteria relevant to evaluating the website quality.

Step 5. Calculate the overall performance rating for each of the considered websites. Based on the obtained group performance ratings and the criteria weights, the overall performance rating of each of the considered alternatives can be determined using Eq. (15).

Step 6. Calculate the Score function, for each of the considered websites. The overall performance ratings of the alternatives obtained in step 5 are IFNs. In order to perform their ranking it is necessary to determine the values of their Score functions using Eq. (14).

Step 7. Determine the ranking order of the alternatives. The considered alternatives are ranked in the ascending order and the alternative with the highest S_i is the best ranked.

3.2 The Procedure for Determining the Website's Weaknesses

In addition to website ranking, the proposed model can also be used to evaluate a website, or more precisely, to determine its weaknesses.

In such cases, the performance ratings are considered only for the selected website. By using steps 1, 2 and 4 of the above discussed procedure, webmasters can determine the performance ratings for the observed website as well as the criteria weights.

The remaining part of the procedures can be specified as follows:

Step 5a. Calculate the overall ratings for the considered website in relation to each criterion. In this step, the performance ratings in the decision-making matrix should be transposed and, instead of all performance ratings of alternatives, the performance rating of the considered alternative in relation to each criterion should be calculated.

Step 6a. Calculate the Score function, for each criterion. The performance ratings of the alternative obtained in step 5a are IFNs. In order to determine the weaknesses of the considered website, it is necessary to determine the value of the Score function for each criterion, using Eq. (14).

Step 7a. Determine the "worst criterion" and analyze the website's weaknesses. The obtained performance ratings are ranked in a descending order, whereby the criterion with the lowest value of S_i is highlighted as "the weakest criterion", i.e. the criteria in relation to which the website has failed.

Besides, considering the satisfaction and dissatisfaction levels of "the weakest criterion",

it can be estimated to what extent the website visitors' expectations are satisfied. Such an analysis can also be made with the remaining criteria.

Based on such analysis, some appropriate activities, with the aim of improving the quality of the website, can be performed.

4. Numerical Example

In this example some partial results obtained from the case study dealing with the quality assessment of the websites which promote tourism potentials of the Old Mountain are presented, with the aim to verify the effectiveness of the framework proposed in Section 3 and to identify its potential weaknesses.

In accordance with the proposed procedure, the chosen websites are evaluated on the basis of a set of selected evaluation criteria. The ratings obtained from three respondents, related to the quality of the four selected websites, are shown in Tables 3, 4 and 5.

In order to be evaluated further, the ratings from Tables 3, 4 and 5 are transformed into a form more suitable for evaluation, as shown in Tables 6, 7 and 8. During this transformation, the linguistic variables are transformed into the corresponding numerical values in accordance with the data from Table 1; wherein the fields marked as "-", i.e. fields that are not filled during the interviewing, were transformed into the linguistic variables "IL", that is the value 0.005.

The group performance ratings obtained using IWAM operator, i.e. using Eq. (15), are shown in Table 9. During this transformation, it is assumed that all the respondents have the same significance that is $1/K$, which is 0.333.

The criteria weights, shown in Table 9, were determined using SWARA method, on the basis of the data collected from a relatively small number of respondents.

On the basis of the data from Table 9, the overall performance ratings are also determined using Eq. (15). Then, using Eq. (14), the value of the Score function for each of the considered websites was determined.

The overall performance ratings, values of Score function, and ranking order of consideration websites are shown in Table 10.

As it can be seen from Table 10, the alternative A2 is the most appropriate one among the considered websites.

In addition to websites ranking, the proposed model can be used for their evaluation, i.e.

Tab. 3: The ratings obtained from the first of the three respondents

Criteria	En		Co		Gr		Au	
Alternatives	μ	ν	μ	ν	μ	ν	μ	ν
A_1	ML	VL	ML	IL	ML	ML	L	–
A_2	H	VL	M	ML	VH	IL	VH	IL
A_3	ML	L	M	L	L	IL	L	–
A_4	ML	MH	MH	ML	MH	VL	L	–

Source: own

Tab. 4: The ratings obtained from the second of the three respondents

Criteria	En		Co		Gr		Au	
Alternatives	μ	ν	μ	ν	μ	ν	μ	ν
A_1	0.4	0.1	0.6	0.3	M	–	0.2	–
A_2	M	VL	0.5	–	VH	–	ML	H
A_3	0.5	0.3	0.4	0.2	ML	–	ML	–
A_4	MH	L	H	ML	ML	L	L	–

Source: own

Tab. 5: The ratings obtained from the third of the three respondents

Criteria	En		Co		Gr		Au	
Alternatives	M	ν	μ	ν	μ	ν	μ	ν
A_1	L	–	H	ML	ML	L	ML	–
A_2	L	–	MH	L	ML	L	ML	L
A_3	M	ML	VH	–	L	–	MH	ML
A_4	ML	M	VH	L	L	–	ML	–

Source: own

Tab. 6: The ratings obtained from the first of the three respondents in a numerical form

Criteria	En	Co	Gr	Au
Alternatives				
A_1	<0.375, 0.125>	<0.375, 0.005>	<0.375, 0.375>	<0.250, 0.005>
A_2	<0.750, 0.125>	<0.500, 0.375>	<0.875, 0.005>	<0.875, 0.005>
A_3	<0.375, 0.250>	<0.500, 0.250>	<0.250, 0.005>	<0.250, 0.005>
A_4	<0.375, 0.625>	<0.625, 0.375>	<0.625, 0.125>	<0.250, 0.005>

Source: own

Tab. 7: The ratings obtained from the second of the three respondents in a numerical form

Criteria	En	Co	Gr	Au
Alternatives				
A_1	<0.400, 0.100>	<0.600, 0.300>	<0.500, 0.005>	<0.200, 0.005>
A_2	<0.500, 0.125>	<0.500, 0.005>	<0.875, 0.005>	<0.375, 0.750>
A_3	<0.500, 0.300>	<0.400, 0.200>	<0.375, 0.005>	<0.375, 0.005>
A_4	<0.625, 0.250>	<0.750, 0.375>	<0.375, 0.250>	<0.250, 0.005>

Source: own

Tab. 8: The ratings obtained from the third of the three respondents in a numerical form

Criteria	En	Co	Gr	Au
Alternatives				
A_1	<0.375, 0.125>	<0.375, 0.005>	<0.375, 0.375>	<0.250, 0.375>
A_2	<0.750, 0.125>	<0.500, 0.375>	<0.875, 0.005>	<0.875, 0.750>
A_3	<0.375, 0.250>	<0.500, 0.250>	<0.250, 0.005>	<0.250, 0.375>
A_4	<0.375, 0.625>	<0.625, 0.500>	<0.625, 0.125>	<0.250, 0.375>

Source: own

Tab. 9: The group performance ratings

Criteria	En	Co	Gr	Au
Alternatives				
Weights	0.28	0.25	0.24	0.23
A_1	<0.383, 0.116>	<0.461, 0.020>	<0.419, 0.089>	<0.233, 0.005>
A_2	<0.685, 0.125>	<0.500, 0.089>	<0.875, 0.005>	<0.786, 0.027>
A_3	<0.419, 0.266>	<0.468, 0.232>	<0.294, 0.005>	<0.294, 0.005>
A_4	<0.473, 0.461>	<0.672, 0.413>	<0.555, 0.158>	<0.250, 0.005>

Source: own

Tab. 10: The ranking order of the analyzed websites obtained on the basis of Score function

Alternatives	IWAM	S_i	Rank
A_1	<0.382, 0.034>	0.174	3
A_2	<0.741, 0.037>	0.352	1
A_3	<0.377, 0.040>	0.169	4
A_4	<0.512, 0.123>	0.195	2

Source: own

Tab. 11: The responses obtained from the three respondents for alternative A₄

Criteria Alternatives	En	Co	Gr	Au
Weights	0.28	0.25	0.24	0.23
Respondent I	<0.375, 0.625>	<0.625, 0.375>	<0.625, 0.125>	<0.250, 0.005>
Respondent II	<0.625, 0.250>	<0.750, 0.375>	<0.375, 0.250>	<0.250, 0.005>
Respondent III	<0.375, 0.625>	<0.625, 0.500>	<0.625, 0.125>	<0.250, 0.375>

Source: own

Tab. 12: Transposed decision-making table

Criteria	Weights	Resp. I	Resp. II	Resp. III
En	0.28	<0.375, 0.625>	<0.625, 0.25>	<0.375, 0.625>
Co	0.25	<0.625, 0.375>	<0.75, 0.375>	<0.625, 0.500>
Gr	0.24	<0.625, 0.125>	<0.375, 0.25>	<0.625, 0.125>
Au	0.23	<0.250, 0.005>	<0.250, 0.005>	<0.250, 0.005>

Source: own

Tab. 13: Transposed decision-making table

Criteria	IWAM	S _i	Rank
En	<0.473, 0.461>	0.012	4
Co	<0.672, 0.413>	0.259	3
Gr	<0.555, 0.158>	0.397	1
Au	<0.250, 0.005>	0.245	2

Source: own

for estimating the level of first-time visitors' satisfaction, based on the opinions of one or more respondents. This feature can also be considered as one of the most important characteristics of the proposed model.

Below is shown the process of analyzing the weaknesses of the website A₄ which was ranked as the second in the previous example. The responses obtained from the three respondents, related to website A₄, are shown again in Table 11. For the purpose of further processing, the performance ratings from Table 11 are transposed, as shown in Table 12. The values shown in Table 13 were calculated using Eq. (15) and Eq. (14).

As it can be concluded from Table 13, the considered website A₄ has the weakest ratings in relation to the Web page environment criterion. It is evident that by improving the web

page environment also growing the satisfaction of website visitors. By forming different variants of websites, i.e. different variants of web pages, and by their evaluation, the webmaster can improve the quality of his or her website, and thus increase the number of visitors who will spend more time on the website.

In addition, except the moderate value of the satisfaction level, it is possible here to observe the moderate value of dissatisfaction level which indicates that the design of the website has a weakness related to the Web page environment criterion.

The second criterion related to the weaknesses of the website is Authority. As it can be seen, in this case the satisfaction level have a low value, while the value of the dissatisfaction level is negligible, which indicates that the website does not contain

enough evidence that confirms its Authority, or such evidence was not clearly visible.

Using such analyses a webmaster can take adequate actions and modify the website in accordance with the needs of its visitors.

Conclusions

Some of current researches indicate that many first-time visitors spend a very short time on a particular webpage when accessing a particular website. Therefore, if we presume that the acquisition of new customers is one of the features of a website, such a website should be designed to obtain the attention of the first-time visitors and to keep them.

Various elements of websites essential for obtaining the attention of website visitors and crucial for their satisfaction, have been identified in numerous studies. As opposed to these studies, this paper focuses on designing a multiple criteria model that could realistically determine the quality of the website from the first-time visitors' view. In order to form a realistic model, this approach uses a small number of criteria that are evaluated using Atanassov fuzzy sets. Also, in order to create a model which as simple as possible, based on Atanassov fuzzy sets, this approach uses the Singleton Intuitionistic Fuzzy Numbers.

The use of the proposed approach for assessing the quality of some websites which promote tourist potentials of the Old Mountain indicates the applicability and efficiency of the proposed approach, but also indicates some its weaknesses, such as: Firstly, the use of Atanassov fuzzy sets can be quite complex for ordinary respondents, and therefore, before the evaluation itself, it is necessary to introduce respondents to their use; and Secondly, the respondents must be accurately introduced to the meaning of the criteria used in the proposed model.

Finally, with the proposed, or with some other, set of criteria, while retaining a relatively small number of criteria, the proposed approach, or more precisely framework, can be successfully applied to the tourism and hotels industry, as well as to other areas, with the aim of determining the quality of the websites from the first-time visitors' point of view.

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Abstract

AN APPROACH TO MEASURING WEBSITE QUALITY IN THE RURAL TOURISM INDUSTRY BASED ON ATANASSOV INTUITIONISTIC FUZZY SETS**Dragisa Stanujkic, Edmundas Kazimieras Zavadskas, Jolanta Tamošaitienė**

Attracting new customers can be identified as one of the key roles websites play in the tourism and hotels industry that can be of special importance for less known tourist destinations, especially for rural tourism. However, some of current researches indicate that many first-time visitors spend a very short time on a particular webpage when accessing a particular website. Therefore, if we presume that the acquisition of new customers is one of the features of a website, such a website should be designed to obtain the attention of the first-time visitors and to keep them.

Various elements of websites essential for obtaining the attention of website visitors and crucial for their satisfaction have been identified in numerous studies. As opposed to these studies, this paper focuses on designing a multiple criteria model that could realistically determine the quality of the website from the first-time visitors' point of view. In order to form a realistic multiple criteria decision making model, the proposed approach is based on the use of a smaller number of criteria that are evaluated using Atanassov fuzzy sets. Also, in order to create a model which as simple as possible, based on Atanassov fuzzy sets, this approach uses the Singleton Intuitionistic Fuzzy Numbers.

The use of the proposed approach for assessing the quality of some websites which promote tourist potentials of the Old Mountain indicates the applicability and efficiency of the proposed approach.

Finally, with the proposed, or with some other, set of criteria, while retaining a relatively small number of criteria, the proposed approach can be successfully applied to the tourism and hotels industry, as well as to other areas, with the aim of determining the quality of the websites from the first-time visitors' point of view.

Key Words: Website quality, website evaluation, rural tourism, intuitionistic fuzzy sets, satisfaction level, multiple criteria decision making.

JEL Classification: D81, C61, C44.

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VIRTUAL ORGANIZATION: SPECIFICS OF CREATION OF PERSONNEL MANAGEMENT SYSTEM

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Introduction

Development of Information and communication technologies (ICT) creates new possibilities for organizations management, and human resources management is one of the fields which is strongly effected by ICT. Technological development help to solve specific problems related to personnel management especially in the virtual organizations, which development are caused by ICT as well. Application of ICT in business creates not just opportunities and advantages but cause new challenges for business organizations. Exchange of information via e-mail, web conferences become the common in business activity. A lot of people joining virtual groups, organizations and networks for business development reasons, and using these opportunities intensively. If models applied in human resource management (further in article personnel management) do not meet current market requirements as a consequence can be named decrease of competitiveness, and loss of potential markets. This leads to certain social problems, such as migration, unemployment, social exclusions, etc. This highlight importance of personnel management improvement questions not just aiming for business development but also in terms of solving social aspects in regions and in the state. These circumstances frame the topicality of this article subject.

Goal of the research – to construct model of personnel management of virtual organization, which created possibilities to manage geographically dispersed personnel using information technologies.

Methods of the research – there was applied systematic analysis that allowed disclosing personnel management specifics under the conditions of virtual organizations' development. Performing the research there were used methods of survey, comparison, summarization and documentary analysis.

1. Previous Research and Theoretical Framework

Topics of increasing effectiveness of personnel management of traditional organizations were analysed by [33], [6], [27], [30], [7], [13], [26], [14], [21], and [2]. Biggs and Swailes [4] analysed personnel management issues in the perspective of organizational commitment. Melnikas et al. [22] analysed personnel management problems under the conditions of economical systems' transformation, globalization and integration process [37].

Problems of virtual organizations were analysed by [3], [11], [12], [17], [47], [8], [18], [35], [28], [40], [31], [1], [43] and others. Lee [16] analysed the problems of adoption of existing leadership theories to e-leadership also the ability to use progressive tools and techniques leading to improvement of virtual project communications. The empirical evidence suggests that psychic distance can be positively related to performance when it leads to great expectations of challenges, which in turn leads to greater effort [20].

Minas et al. [23] analysed the role of information in the virtual teams and found that information that challenges an individual's pre discussion decision preference is processed similarly to irrelevant information, while information that supports an individual's pre discussion decision preference is processed more thoroughly. Empirical research of Brahm and Kunze [5] suggests that managers should emphasize the development of team trust at early stages of collaboration in a virtual team to reach high performance outcomes. Wilson et al. [44] notes the limitations of the preoccupation with objective measures of diversity in virtual groups' performance and propose the incorporation of perceptual measures to better capture the perceived differences between team members and the resulting reactions,

behaviours, and team outcomes. Pangil and Chan [29] identifies that team effectiveness are positively associated with trust and knowledge sharing. Their finding emphasizes that organizations need to continue working on organizational support structures that increase trust, which will then help to promote knowledge sharing and finally boosts the virtual team effectiveness.

Empirical research of Lin et al. [19] indicate that communication has no significant direct impact on the effectiveness of virtual teams. Virtual teams focused more on social dimensional factors than the task-oriented factor, social dimensional factors could only affect the satisfaction of virtual teams indirectly through their performance, and there is no significant relationship between the task dimensional factor and the effectiveness of virtual teams. Sarker et al. [36] in their empirical research identify and test three models – additive, interaction, and mediation, describing the role of trust in its relationship with communication to explain performance. In testing the relationships, authors noted that the concepts of communication and trust are inherently relational and not properties of individuals. The results indicate that the mediating model best explains how communication and trust work together to influence performance. Xiao and Jin [45] found that virtual team effectiveness is directly influenced by virtual team size. Pinjani and Palvia [32] explored the mediating effects of trust and knowledge sharing in mitigating the negative effects of diversity in the team and found that it is essential in such an environment to motivate mutual trust and knowledge sharing. The task interdependence and collaborative capabilities of technology have significant impact on the functioning of team processes [38].

The results of this scientist's research showed the importance of dynamic factor in the rapidly changing environment, implementing personnel management objectives in the organization. These scientists offered a mean of integrated management, which allows harmonizing different management methods and approaches as well as methodologically grounded techniques for the realization of corporate strategic management models; they stressed the importance of improving corporate management systems, together with personnel management systems, strengthening integral

relations between strategic, tactical and operative tasks in the management functions' implementation process and facilitating relations between those functions [9], [10]. Tools offered by different scientists create opportunities to form flexible corporate management systems together with personnel management systems characterized by high efficiency [24].

2. Empirical Research

It is necessary to find out what factors have influence on the system of personnel management of virtual and traditional organization, and what essential differences between different forms of organizations are in order to attain the results of research. Major purpose of the research is to explore and compare factors forming personnel management system in virtual and traditional organizations, and determine main factors influencing effectiveness of personnel management of virtual organization. To achieve such aim empiric research has been performed. Since relevant researches have not been performed for virtually working employees and necessary material on this topic has not been saved, initial data was collected for the research. In contrary, big amount of researches related with personnel management problems were performed with personnel who work in traditional companies, therefore, there is a possibility to compare already founded factors forming the effective personnel management system of traditional organization with new collected research data of virtual organizations [25], [39].

Research methodology is as follows. The quantitative survey was conducted in Lithuania, period of research 2014 March–May. For the research selected questionnaire survey method. The choice of method is based on the fact that, there could be the difference among the elements building the personnel management system of traditional and virtual organizations. Questioning the representatives of both types of organizations it is possible to compare the factors forming the personal management system, and to identify the elements of personnel management system, that are important building the personnel management system of virtual organization. Total are surveyed more than 100 organizations. For the research were selected two groups of organizations: business organizations, which according the criteria of Duoba and Savanevičienė [8] are identified as

virtual organizations and second group – the traditional organizations.

The survey sample – for 55 organizations, that are members of association “INFOBALT” and meets the criteria of virtual organizations [8] by the e-mail was delivered the questionnaire. INFOBALT association is a locally and internationally recognized representative of Lithuanian ICT industry. The association, founded in 1994 has today more than 140 members, including national and global businesses, universities, colleges and research institutions involved in ICT education, employing more than 10,000 experienced ICT professionals, teachers and researchers. Companies, selected for our research had chosen one person who represent the company and is working in the virtual workplace, and who completed the questionnaire. Calculating the reliability of the data by Paniotto formula [42] showed that a total of 48 respondents should be interviewed from 55 organizations, at 5 percent relevance. In total, there were received 48 questionnaires. In this case the data of research are representative with 5 percent relevance. The control group was selected from 67 traditional businesses organizations and a total of 53 questionnaires were received.

The study was based on probability sampling method. For interviewing companies that fulfil the criteria of virtual organization where was the probabilistic selection method used, because the chances of the test element to be the sample was known. Profiles questionnaire was compiled using an online survey site www.publika.lt. The questions were formulated in accordance with the guidelines and requirements of methodological questions in the questionnaire form [15], [41], [34], [42]. Questionnaires reference was sent to the personnel of virtual and traditional organizations. This form and method was chosen for several reasons. This profile is convenient for respondents to fill in and the form for the researcher is returned automatically, in addition saving the time to collect the questionnaire. Also, this method does not require large financial investments, and the results are easily imported into the selected computer processing program and can be dealt with a variety of selected sections.

On the base of analyses of the scientific literature was prepared structured questionnaire and formulated questions for the traditional and virtual organizations in order to investigate the

important elements of personnel management of virtual organization. As a methodological basis for the questionnaire was used: 1) criteria of identification of virtual organizations [8]; 2) personnel motivation theoretical aspects [32], [5]; 3) theoretical aspects of recruitment, selection and employment of virtual organization personnel [45]; 4) effectiveness of personnel management [44] and others. All the questions in the questionnaire was formulated specifically to get certain results and divided into different groups: group 1, questions that intended to determine specific of personnel selection; group 2, formation of personnel management policy; group 3, motivation of personnel; group 4, issues of informal communication and it's affect to personnel management; group 5, questions that intended to clarify the priorities of the individual employee and specifics of teamwork; group 6, questions designed to identify the respondents' age, gender or other characteristics. To avoid monotony on survey were selected different types of questions. For some of them needed to be short and succinct answers, allowing to deny or approve certain statements, answers other questions require more attention and concentration. The results or research were used for the formation the personnel management system of virtual organization.

3. Personnel Management System of Virtual Organization

As analytical object of personnel management problems, there is chosen a virtual organization, which appeared under the influence of information technologies development and globalization. There are submitted definitions of virtual organization as well as its description in the scientific literature, outlined its characteristics and features, affecting implementation of personnel management tasks.

On the grounds of accomplished scientific literature analysis and summarizing virtual organization's descriptions provided by various authors, there is revised and specified the definition of virtual organization, according to which, virtual organization is the form of collaboration joining work resources from different geographical places in order to implement common goals and which personnel work according to its competence. Presenting good or service to a third party it identifies

itself as a single organization. Due to absence of physical contact between organization members, they inter-communicate and share resources for the implementation of the common goals using information technologies.

After analysing characteristics assigned to the virtual organization, there is stated that virtual organization has all features of traditional organization but due to the absence of physical contact between organization members, new managerial problems emerge, firstly, problems of personnel management. The question is how to successfully join personnel for implementation of set goals under new conditions and motivate employees to perform their tasks in time. Personnel management questions in the scientific literature generally are analysed having assumption that employee works in the same premises or he/she is easily reachable by supervising personnel.

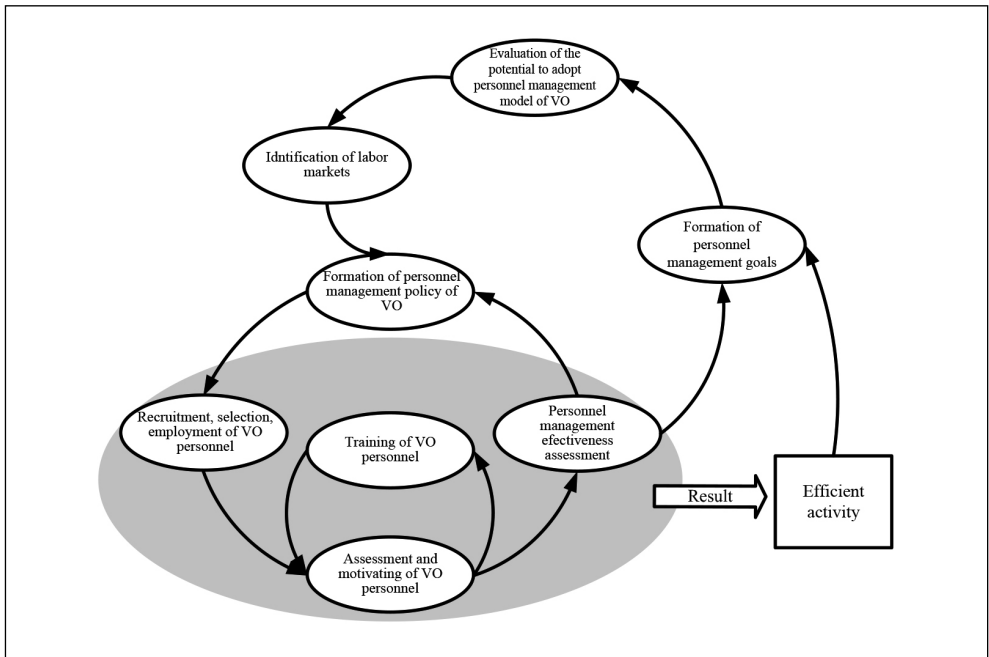
Personnel management problems in virtual business organizations and priorities of their solution. According to an evolution nature point, problems of virtual organizations,

which manage personnel by network, are divided into political, economic, social, technological and legal; by aspect of expression degree, problems are divided into global, international, regional on an international scale, national and regional on the state scale.

The underlying attention should be paid to: 1) identification of personnel management problems in the environment affected by changes of information technologies; 2) personnel management by information technologies, also in virtual organizations; 3) joining intellectual and geographically dispersed work resources by information technologies and using them in the solution of regional and national problems, together successfully taking business opportunities that emerge under globalization and acquiring competitive advantage.

After accomplishment of systematic analysis and empirical research, there is created personnel management model of virtual organization (see Fig. 1). Each element of model is explained in ongoing text.

Fig. 1: Model of personnel management of virtual organization



Source: own processing

Formation of personnel management goals and evaluation of organization's potential to implement model of personnel management of virtual organization. For evaluation of organization's technical potential to manage personnel by network, it is proposed to use reasons and outcomes diagram, which creating procedure is as follows:

1. Preparative stage. There is selected a desirable result, which attainment's reasons are to be analysed. In studied case, it is the effectiveness of personnel management tasks implementation, using information technologies available in the company.
2. Data gathering and processing stage. There are proposed the possible technical reasons for personnel management tasks implementation problems. Technical reasons, that affect personnel management, can be described by the following function:

$$y = f(x_1, x_2, \dots, x_n), \quad (1)$$

here y —personnel management tasks implementation effectiveness; x_n —technical reasons having impact on personnel management tasks solving.

As personnel management by network tasks implementation is strongly influenced by information technologies available in organization, possibilities to manage personnel by network in existing organizations are proposed being analysed according to the following criteria:

- a) Investments into modern technologies which help solving personnel management problems (x_1), which are measured by expert method in percentage expression from company's profit portion;
- b) Information technologies usage level in organization (x_2), which is determined by expert method, comparing information technologies available in the market and applied in organization for personnel management problems solving;
- c) Information technologies usage level among organization's leaders, who are able to manage personnel by network (x_3); the level is determined by expert method, comparing information technologies, which are installed at work by managers and which are potentially applicable there;
- d) Acceptability of modern technical means

among leaders (x_4), which is measured by leaders' ability to install the needed information technologies in a certain time period;

- e) Acceptability of modern technical means among personnel (x_5), which is measured by personnel's ability to install the needed information technologies in a certain time period;
- f) Priorities of communication means in organization (x_6), which affect the selection of information technologies for personnel management.

The identification of potential labour markets. For labour markets analyses, it is offered to use adapted Zavadskas et al. [46] (electronic business and Internet decision support systems, which apply the method of multi-criteria analysis. In determining criteria values, it should be considered the positive and negative characteristics of the selective labour markets, their potential, and inter-compatibility. Using interviews, questionnaires, or applying expert methods, determine the amount, values and significances of qualitative criteria. The assessment of labour markets is accomplished in the following order: there are chosen characterizing labour markets criteria x_1-x_m , which are described by $\check{Z}$ -conceptual information, expressible in numbers, formulas, and text; to every criterion there are assigned d -expert proposed measurement units, best describing chosen criteria; also, there are assigned q -expert proposed significances. Criteria proposed by author that describe labour markets: price of labour force; communication costs; unemployment rate; consumer expenditure level; technological environment; social cultural environment; influence of different time zones; political environment; legal environment; economic environment; potential labour market changes; labour market compatibility with other markets; other criteria, according to personnel management goals. There are chosen potential labour markets D_1-D_n , and using multi-criteria analysis they are being assessed, also, there are determined labour markets' selection priorities from P_1 to P_n .

Formation of personnel management policy. It is proposed to accomplish the formation of personnel management policy in the organization, according to organizational goals, in the following stages: 1) determination

of personnel management principles: structure, systems, style; 2) determination of work nature principles; 3) determination of personnel motivational factors, creation of importance feeling; 4) determination of size for the most productive intellectual activity team, education and experience coordination; 5) formation of separate teams, i.e. organizational units, for performing different tasks, determining professional requirements for different members. Individual work or work in teams has to stimulate their members to improve knowledge and seize market opportunities. There should be determined the diversification of team members' knowledge as well as opportunities of functional cooperation; 6) formulation of tasks for different teams. Also, there is intended the work of different members in several virtual teams at the same time; 7) the principles and requirements for virtual learning and qualification raise are determined.

Recruitment, selection and employment of virtual organization personnel. Personnel selection is carried out in the following sequence: in the first stage electronic applications are accepted; in the second stage the initial selection is performed, according

to recommendations of potential employees; further, tasks for candidates are created, determining evaluation criteria; according to set criteria, performed work is being assessed and summing up results, the decision, concerning personnel hiring, is made. Different methods of personal selection could be used, including self-assessment tests, online interviews, fuzzy method of staff selection, and others.

Assessment and motivation of personnel of virtual organization. Assessment and motivation of personnel in virtual organization is accomplished in the following order (see Fig. 2).

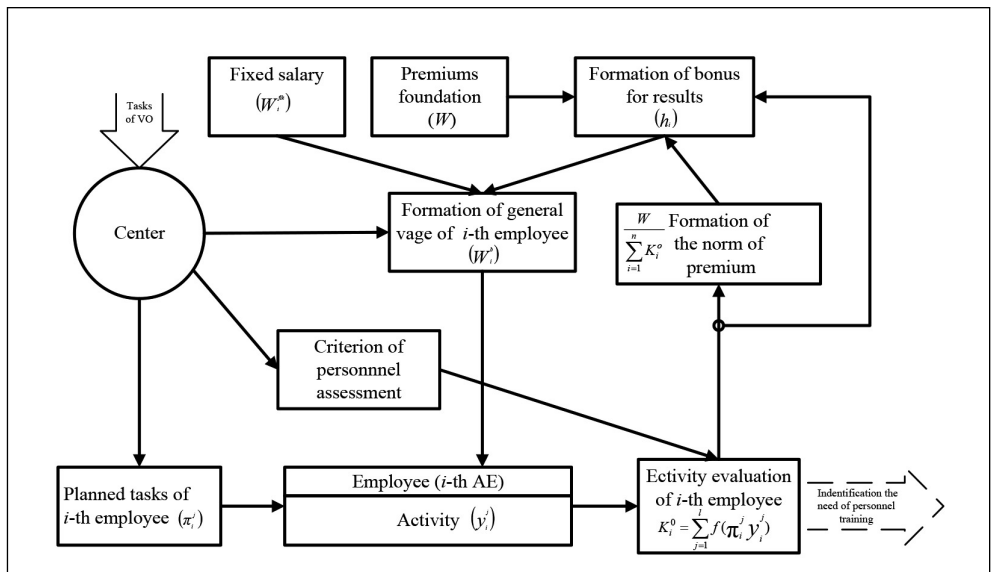
1. First of all, the centre (network agent), which performs personnel management functions, determines the scheduled personnel management tasks' status, which comprises the set of planned personnel management tasks

$$\pi_i = \{\pi_i^1, \pi_i^2, \dots, \pi_i^n\}. \quad (2)$$

This set is conveyed to organization's personnel, i.e. to each i -th element.

2. Employees perform the activity y_i^j , which is expressed as of factual status accomplished tasks' set

Fig. 2: Model of personnel assessment and motivation



Source: own processing

$$y_i = \{y_i^1, y_i^2, \dots, y_i^n\}. \quad (3)$$

3. Employees' activity is assessed according to the determined assessment criteria, which are set by selecting the functions of criteria determination, according to the specifics of personnel management tasks implementation. As employees' activity's evaluation indicators, there are selected corresponding sets

$$K_i = \{K_i^1, K_i^2, \dots, K_i^n\}, \quad (4)$$

which are set by selecting the functions of indicator determination (see Fig. 2):

a) Monotonically growing straight line; its characteristic is that coefficient, evaluating employee's (active element's) results, always is $K > 0$; $K=1$ when AE results $y_i^j = \pi_i^j$, i.e. when scheduled personnel management goals are implemented. The mathematical expression of such function can be

$$K_i^j(\pi_i^j, y_i^j) = \text{tg} \alpha \cdot y_i^j, \quad (5)$$

b) Curve of parabola type, when in the initial stage the value of coefficient K , according to the results, grows not much. Personnel is stimulated to implement the tasks, which are close to planned ones, or to exceed them, its mathematical expression can be, e.g.:

$$K_i^j(\pi_i^j, y_i^j) = y_i^{jn}, \quad (6)$$

here n degree chosen, according to the set goals.

c) Stair function, when the value of coefficient K changes, according to AE activity results in different intervals. Its mathematical expression could be, e.g.:

$$K_i^j(\pi_i^j, y_i^j) = \begin{cases} 0, & \text{if } \pi_i^j > ay_i^j \\ \frac{1}{n}, & y_i^j \in [a; b) \\ \frac{2}{n}, & y_i^j \in [b; \pi_i^j) \\ 1, & \text{if } \pi_i^j \leq y_i^j \end{cases}, \quad (7)$$

where a, b – defined intervals; n – amount of intervals; figures 1, 2 – numbers of intervals.

d) Straight line function,

$$K_i^j(\pi_i^j, y_i^j) = \begin{cases} 0, & \text{if } \pi_i^j > y_i^j \\ 1, & \text{if } \pi_i^j \leq y_i^j \end{cases}, \quad (8)$$

is used for minimizing difference between plan and employee results $y_i^j - \pi_i^j \rightarrow \min$.

4. For each criterion (K_i^j), according to its importance, there is assigned a grade (r_j^j), for each grade there can be determined a separate leverage indicator (a_j^j).

5. After evaluating the values of all criteria, it is finally estimated, how personnel management tasks are implemented, aggregating indicators to K_i^o – activity evaluation indicator,

$$K_i^o = \xi(K_i^1, K_i^2, \dots, K_i^n). \quad (9)$$

Indicators aggregating procedures are selected and coordinated, evaluating the importance of personnel management tasks. Using additive

$$K_i^o = \sum_{j=1}^l K_i^j \quad (10)$$

(summing-up indicators) and multiplicative

$$K_i^o = \prod_{j=1}^l K_i^j \quad (11)$$

(multiplying indicators) procedures, it is required to evaluate their effect to the final estimation result.

6. According to the activity evaluation indicator K_i^o , for i -th employee (AE) it is determined the size of material incentive (h_i), which employee, in accordance with achieved results, gets as a bonus from premium foundation intended for implementation of personnel management goals:

$$h_i = f_i(\pi_i, y_i) = W_i^{\text{fk}} \cdot K_i^o(\pi_i^j, y_i^j) \cdot \frac{W_c}{\sum K_i^o(\pi_i^j, y_i^j)}, \quad (12)$$

W_c – foundation of employees (active elements) monetary incentives; K_i^o – personnel activity evaluation indicator; W_i^{fk} – i -th AE's (employee's) fixed salary.

7. For personnel it is paid the total wage, which is the sum of fixed salary and bonus for the results.

8. After evaluating achieved personnel results, new personnel management tasks as well as their implementation norms are created.

Personnel management effectiveness assessment. Effectiveness should be estimated in the following sequence: 1) selection of assessment criteria; criteria are selected, according to set personnel management goals;

2) expert assessment of personnel management goals' implementation in accordance with each criterion; 3) determination of general total effectiveness indicator, which evaluates the general condition of personnel management goals' implementation in comparison with set goals; 4) formulation of propositions for personnel management improvement.

Conclusions

It can be stated that lack of attention for ICT management problems in virtual organizations in scientific studies, which are dedicated to personnel management problems is observed. Personnel management questions generally are analysed having assumption that employee works in the same premises or is easily reachable by supervising personnel.

Personnel management issues concerning virtual organization are analysed fragmentally, therefore, personnel management theoretical models and their application practice do not meet the latter-day market requirements, posed by the outspread of information technologies.

It is proposed personnel management model of virtual organization, which consists of few important parts:

The evaluation of the organizational potential to manage personnel by network. Analysed questions: organizational preparation to apply forms of virtual work, evaluation of possibilities to manage personnel by network.

Potential labour markets identification and personnel management policy formation. In this case, the following problems are to be analysed: evaluation of labour force potential prevailing in different regions, evaluation of labour force qualification, price, and other aspects, the search for personnel that are able to work by network and implement organizational goals, data base creation, formulation of personnel management policy.

Formation of virtual organization personnel. Problems concerned: technological principles of personnel recruitment, setting communication principles, establishing communication standards for common activity and determining personnel relationships within organization, evaluation of personnel needs and expectations, their consistency with organizational goals.

In organizing business activity under conditions of globalization and adapting personnel management by network model, the following priorities should be considered:

Virtual organizations formation priorities, which comprise personnel selection of virtual organization, determination of work nature principles, determination of personnel motivational factors, determination of size for the most productive intellectual activity team, problems of education and experience coordination, and others. Technological principles comprising communication, administration, project management, usage of supply chain systems, creation of electronic collaboration structure, forethought of collaboration content, usage of collaboration possibilities determined by a communication means.

Communication priorities that encompass protocol requirements of electronic nets, their definition and coordination, promotion of frequent interaction by network, determining the decision making processes, uncertainty assessment, the usage of informal signs interacting by information technologies and telecommunication means.

Relationships within an organization that include formulation of a personnel values' set, stimulation of maintaining personal contacts with other members of organization, attention to work relations management, others.

Motivation of virtual organizational members comprising the determination of motivational factors, personnel value perception, determination of confidence degree, admission and expression of individual feelings.

This implementation of priorities should be foreseen by formed virtual organizations' goals and strategies, also, personnel management process. Management by network has to be developed using systematic approach, emphasizing priorities in personnel management activity, taking into consideration defined organizational tasks and possibilities to coordinate them with personnel goals, together organizational activity has to be distinguished by flexibility and adaptability, according to market requirements.

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Abstract

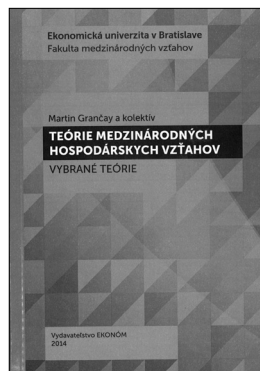
VIRTUAL ORGANIZATION: SPECIFICS OF CREATION OF PERSONNEL MANAGEMENT SYSTEM**Juozas Merkevičius, Vida Davidavičienė, Jurgita Raudeliūnienė, Jan Buleca**

Development of new types of organizations such as a Virtual organization brought for society certain possibilities and opportunities which usually are named as advantages, but also they can be observed as challenges or even named as a problems within organization. Models and methods applied in personnel management should be adequate and meet requirements of markets and present newest scientific mind in order not to cause decrease of competitiveness, loss of potential markets, not to cause social problems, such as unemployment, migration, disproportion between regions, etc. Due to the following reasons, the perception of personnel improvement problems and their solutions stand not only for business development factor. These circumstances formed the topicality of the article subject. Virtual organizations formation priorities contains personnel selection of virtual organization, determination of work nature principles, determination of personnel motivational factors, determination of size for the most productive intellectual activity team, problems of education and experience coordination, others. In organizing business activities under current globalization trends and adapting personnel management by network model, implementation of these priorities should be foreseen by formed virtual organizations' goals and strategies, as well as personnel management process. Management by network has to be developed using systematic approach, emphasizing priorities in personnel management activity, taking into consideration defined organizational tasks and possibilities to coordinate them with personnel goals, together organizational activity has to be distinguished by flexibility and adaptability, according to market requirements. Goal of the research was to construct a model of personnel management of virtual organization that create possibilities to manage geographically dispersed personnel using information technologies. Methods of the research – there was applied systematic analysis that allowed disclosing personnel management specifics under the conditions of virtual organizations' development. In performing the research there were used methods of comparison, summarization and documentary analysis.

Key Words: Virtual organization, globalization, personnel management, information and communication technologies.

JEL Classification: M12, M15.

DOI: 10.15240/tul/001/2015-4-014



THEORY OF INTERNATIONAL ECONOMIC RELATIONS. SELECTED THEORIES

Authors: Martin Grančay et al.

Publisher: Vydavateľstvo EKONÓM, Bratislava, 2014

The new interesting book written by the team of authors led by Martin Grančay has appeared on a market with professional economic literature. As is evident from the title, the publication is devoted to a specific scientific discipline – the theory of international economic relations, both from a theoretical point of view, as well as practical one. This is a fairly comprehensive book which is divided into six main parts with several chapters. Each chapter contains a brief summary and open questions for testing reader's acquired knowledge. As a

refreshing element, it may be perceived inclusion of biographies of the main economists in the field of international economic relations. It is also very beneficial application of various theoretical models on the example of Slovakia and other countries in the world economy.

The first part defines the international economic relations theory as a scientific discipline, including its interaction with the general microeconomics and macroeconomics. The second and third parts of the book are devoted to the chronological overview of the development of approaches to the issues of foreign trade from mercantilism, through the neoclassical theory of international trade to the present. The text is accompanied by a number of graphs that can help to better understanding the issue. The fourth section refers to another very important field – the theory of international investment, which might be very interesting for the Czech and Slovak readers, especially from the point of view that both countries are among the major recipients of foreign direct investment. In the fifth chapter, the authors discuss the theory of international migration. In the last, sixth specific section, there are numerical examples including their solution.

The publication is logically arranged and authors present the key findings in the field of international trade, international movement of investment and international migration. Among the indisputable advantages of the book are a broad theoretical background including mathematical formulas for subsequent practical application and topicality of the data in the tables and figures that clearly reproduce the situation in the area of international trade. The reader may compare a wide range of theoretical knowledge with their practical implementation and gain a comprehensive view of the described area of international economic relations.

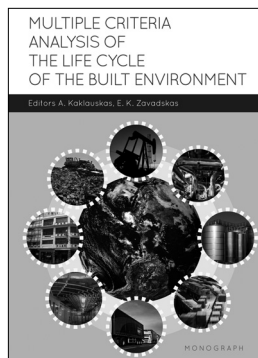
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MULTIPLE CRITERIA ANALYSIS OF THE LIFE CYCLE OF THE BUILT ENVIRONMENT

Editors: Artūras Kaklauskas, Edmundas Kazimieras Zavadskas
Publisher: VGTU Press TECHNIKA, 2015

The monograph addresses the highly topical and innovative area of multiple criteria analysis of the life cycle of the built environment. Authors of the monograph analyze the life cycle of the built environment as follows: the built environment, the stakeholders involved in its life cycle as well as the micro, meso and macro environments, in terms of their particular impact on making it an integral whole.

The structure of the monograph is well thought-out, comprising seven chapters. Each chapter serves its own purpose. The objectives the authors lay down at the beginning of the research have been effectively achieved in succession.

Chapter 1 (authors: Artūras Kaklauskas and Edmundas Kazimieras Zavadskas) focuses on multiple criteria analysis of the life cycle of the built environment. *Chapter 2* "Facilities Management" (author: Natalija Lepkova) presents the following aspects: the origin and analysis of the definition of facilities management; facilities management goals and tasks; and the facilities management process. Special attention is paid to facilities management services quality assurance. *Chapter 3* "Retrofit of buildings in urban neighbourhoods" (authors: Saulius Raslanas, Arturas Kaklauskas and Edmundas Kazimieras Zavadskas) analyse modernisation and retrofit of buildings as one of the forms of urban development. Modernisation of apartment houses is a particularly relevant issue both in Lithuania and many other countries. To make it more efficient, the modernisation of apartment houses must be integrated – an entire block or residential area must be renovated and the principles of sustainable development must be followed. *Chapter 4* (author: Jūratė Šliogerienė) reviews academic research papers which discuss the role of values in the energy sector and then presents a set of criteria and an automated decision support system for the assessment of the environment of energy generation technologies with emphasis on the dimension of social issues and values. *Chapter 5* "Knowledge management in the built environment" (authors: Artūras Kaklauskas and Lina Bartkienė) gives background to the different approaches to knowledge management, analyses air pollution, noise, and illnesses they cause and real estate prices. *Chapter 6* "Built environment life cycle process and climate change" (authors: Artūras Kaklauskas and Lina Pečiūre) introduces the climate change mitigation and adaptation in the built environment's quantitative and qualitative aspects. *Chapter 7* "Distance Learning Experience in Construction and Real Estate at VGTU" (authors: Natalija Lepkova, Silva Rimkuvienė) contains the general information about distance learning development in the World, Lithuania and Vilnius Gediminas Technical University (VGTU).

This monograph represents a large body of work. It is well presented, and very interesting to read. The work is highly innovative in several areas, and will encourage other researchers to take the authors' ideas forward themselves. The results make the monograph much more usable and extendible, and may have direct impact on the actual life cycle of the built environment processes. The list of researched literature is extensive; the sources were chosen with the purpose in mind and correspond to the issues discussed in the monograph.

The monograph has been prepared for researchers, practicing engineers and managers, MSc and PhD students of civil engineering, construction and the real estate sector.

The conclusion of this review is that the monograph meets the highest requirements applicable to the relevancy, originality, theoretical and practical significance, which will certainly be evidenced in the dissemination of its research results.

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