Foreword to the fourteenth issue of peer reviewed scientific Journal of Security and Sustainability Issues

Dear readers,

It’s my pleasure to introduce the regular issue of peer-reviewed scientific journal devoted to wide range of sustainability facets. Energy security nowadays has become an object of international concern, cause and consequence of clashes of diverse character: starting by direct and public ones, finishing by hidden and sophisticated controversies.

During those turbulent times concern of stable and sustainable future is natural. It embraces widening circles of stakeholders, which embraces households, entrepreneurs, society, military forces, and governments. Despite each interested party has got its specific activities and aims, there is one universal and uniting aim: to continue building our future, preserve economic viability and secure environment.

I truly believe that engagement into solving of contemporary problems, especially related to behavioral patterns related to responsible entrepreneurial behavior in a field of energy use, switching priorities towards renewable sources of energy, incorporating innovations and smart solutions into our daily lives, would facilitate formation a new living styles, which would lead us to more sustainable and secure future.

With best regards

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Areas of research include, but are not limited to, the following:

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1. Introduction

Croatia and Poland are two countries formerly counted among socialist ones, who represent in many terms somewhat opposing cases. Croatia had been a part of Yugoslavia when the communist system collapsed and its road towards independence was more complicated since not only the system had to be changed but a new sovereign country created (even though Croatia had enjoyed a level of autonomy within Yugoslavia). Poland has officially been an independent state since the end of the WWI thus entered the transition process as an sovereign entity. Croatia is a relatively small country, with population barely exceeding 1% of the total EU and almost all other parameters on similar level. Poland is by far the biggest of “new” EU members and the sixth most populated state within the organisation. Although, as a relatively poor country, it still accounts for nearly 3% of the total EU GDP. In terms of factors traditionally enlisted as shaping national security Poland is, comparing to the European average, quite resourceful, lacking only oil. On the contrary Croatia is gifted with significant hydropower, potential for...
Ownership of refinery business in Croatia and Poland as a factor impacting national energy security

Robert Uberman, Saša Žiković

Croatia and Poland are hydrocarbon importers with a primary aim to serve local markets. Poland has been traditionally supplied with oil (and gas) from Russia and the whole pipeline system has been constructed to serve this import direction. Moreover, having as land neighbours only socialist countries it was left with a very few competitive supply options – the only important gate was Gdansk oil terminal created in 70s. Croatia is located in close neighbourhood of Italy and Austria enabling a fast and affordable conjunction to the EU oil and gas pipeline systems. It could also take advantage of the fact that the Mediterranean Sea is a vivid area of oil trade with both important producers (Libya, Algeria) and consumers (France, Italy) as well as a part of the route from the Persian Gulf via Suez Canal and Gibraltar to Northern Europe and North America.

Regarding the refinery business, both countries share a common feature: they are hydrocarbons importers with a primary aim to serve local markets. Poland claims to be the first country territory to process oil, created the first refinery and had been an important player till the WW II with five refineries, that are still operational, built before it and several others destroyed during the war. Since at that time Poland and Croatia were both part of the Austro-Hungarian Empire, both countries may share the claim. Croatia also counts itself among pioneers, with refinery in Rijeka built in 1882. The fall of socialist system has left Poland with two sizable refineries, in Płock and Gdansk, both of them constructed after the WW II, which served as foundations of two national oil companies: PKN Orlen and Lotos (Schoeneich 2000). Croatia was left with two much smaller units in Rijeka and Sisak, being a part of its national oil company: INA. Polish distinctive advantage comes from a size of the local market combined with lack of any direct competition in the vicinity. Some of the closest refineries: Mažeikių in Lithuania as well as Litvinov and Kralupy in the Czech Republic are controlled by PKN Orlen. In addition, geographically Poland represents a logistic heaven: prominently a flat country, densely populated, shaped according to a dream of supply chain manager. With the territory of over 300,000 sq. km, the longest distance between major cities is 900 km. Croatia, on the contrary is a much smaller market, with refineries in Bosanski Brod (Bosnia and Herzegovina) on its border and Trieste (Italy) 100 km away from Rijeka and several other plants not much further. On top of that, from the geographical point of view, it represents a logistic challenge, sparsely populated and with area smaller than 1/5th of Poland has the same distances between most distant major cities. The difficulties of connecting over 1200 islands and islets as well as numerous mountains do not need to be mentioned. Final advantage for Poland is that the Polish government maintains close control over the both oil companies running refineries while the Croatian one sold INA to MOL, leaving a 45% stake there company but having almost insignificant influence on the company policies.

All of the above mentioned differences and similarities offer an opportunity for scientific research on the refinery business ownership structure as a factor shaping energy security of various small and medium-size countries.

2. Definitions of energy security and role of refinery business

Security of supply implies that customers have access to energy at the time they need it, with the predefined quality. The most comprehensive definition of energy security has probably been given by Kalicki and Goldwyn (2005) as: “assurance of the ability to access the energy resources required for the continued development of national power”. Building on the above given description and interpreting it one can indicate the following criteria of energy security:
- prices of fuels available must be stable and reasonable,
- supply chains must be secure, eg. capable to resist minor interruptions,
- diversified in a way that no one such dominant source of fuels exists that its one sided actions could cause major disruptions of supplies or alternation of commercial terms,
- plentiful so a long term sustainability is secured,
- accessible not only to the country in consideration but also to its allies and partners.

Threats to national energy security are commonly divided into two following categories:
- physical, when a disruption in supply form one or more sources cannot be smoothly compensated by deliveries from alternative directions,
- economic, when a given country has to accept higher than market based prices of fuels or other unfavorable commercial provisions.
As each EU country should take care of its own security of supply this is also regulated on the level of Union by the EU Directive 2009/119/EC which contains an obligation to maintain minimum stocks of crude oil and/or petroleum products.

Main measures derived from Directive are (EU 2009):
- EU Member has to establish an independent and non-profit central stockholding entity (in case of Croatia it is an agency called HANDA, in Poland is ARM).
- Member must maintain a total level of oil stocks corresponding to 90 days of average daily net imports or 61 days of average daily inland consumption. The least prevails.
- Oil product for combustion equals crude oil equivalent by multiplying quantity with factor 1.2.

There are five points regarding security of supply approach within the EU framework, well corresponding with the above presented Kalicki, Goldwyn guidelines, called 5 “A’s” (Jensen 2013):
- **Availability**: availability and physical existence of sufficient energy sources; giving priority to domestic energy resources,
- **Accessibility**: access to cross-border interconnectors, domestic infrastructure, storage facilities and supply routes with sufficient capacity and non-discriminatory access,
- **Affordability**: prices for energy supply and transport services shall be transparent at reasonable costs,
- **Acceptability**: exploration and exploitation must be environmentally sound and taking into account sustainability,
- **Adaptability**: ensuring of technical integrity (codes and standards) and quality of energy (physical and chemical composition) among interconnected energy systems.

Oil has traditionally been, and will continue to hold this position for a foreseeable future, a most important single primary energy source, challenged only by coal (Figure 1). Despite all attempts to limit the role of fossil fuels in future energy mix all available forecasts give oil a very important role in satisfying world’s energy needs (Figure 2) (Baublys et al. 2014). Since crude oil is basically unusable in modern world without being processed to final products the refinery business plays as important role as a factor of energy security comparable with access to oil deposits. Moreover, the most promising application of gas, the third global primary energy source imply use of refinery based technologies such as GTL (Gas to Liquid) and growing importance of biofuels which need to be processed in refineries like plants, will only enhance importance of the refinery business through breaking it’s over hundred years dependence on one feedstock – crude oil (Figure 3).

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**Fig.1.** Global primary energy sources (2011)

*Source: Own calculations based on: BP (2012)*
It is a well-established fact that oil deposits, especially commercially attractive ones are rare product of nature. However it is hardly noticed, at least beyond industry related circles that refineries, even if they are man-made have become equally rare. Global number of operating refineries is commonly estimated at round 700 and remains quite stable over the last twenty years (Purvin & Gretz, Inc. 2008). On top of that there is a strong dependence on a diminishing number of key technologies providers, without whom any construction of a new, economically viable, plant is unfeasible. The set of most frequently listed companies capable to supply complex technology solutions is usually limited to Exxon/UOP (UOP being an arm of Honeywell), Chevron/Lummens, Shell Global Solutions International B.V., Kel-

Fig. 2. Oil (conventional liquids) share in the global primary energy mix - selected projections

Fig. 3. Projection of refinery feedstock by ExxonMobil
Source: ExxonMobil (2012: 38)
The refinery sector is given extensive coverage. In Croatian policy the approach to this notion with focus on primary energy security doctrine of Poland hardly recognizes the above mentioned issues while taking traditional approach to this notion with focus on primary energy sources and electric energy. In Croatian policy the refinery sector is given extensive coverage.

3. Development of a Croatian state policy towards the refinery sector

3.1. The Croatian refinery sector after gaining sovereignty

Oil and oil derivatives are the main energy source in Croatia and this will remain at least for the next decade. Along with the existing oil consumption of around 1.000kg per capita, Croatia is close to the developed European economies in total energy consumption. It is estimated that the average growth of the liquid fuels consumption in the final energy consumption will equal around 0.9% per year and that, despite all measures of energy efficiency and the replacement of liquid fuel, the consumption in 2020 will stand around 4.3 millions tons. In line with this projections Croatia has adopted the following guidelines for oil and natural gas sector (Jensen 2013):

- using the remaining indigenous oil reserves, condensates and natural gas;
- efficient consumption of oil, oil derivatives and natural gas that could slow down the growth rate of consumption of these energy sources, and diminish dependence on imports and improve supply security;
- accelerated modernization of domestic refineries;
- exploration of own oil and natural gas finds and the use of new technical and technological solutions to advance exploitation, increase exhausting and increase gained oil and natural gas reserves;
- securing new supply directions for oil (and natural gas) by participating in international projects;
- securing compulsory oil and oil products stocks;
- creating a favourable legislative-regulatory framework for the efficient functioning of an open natural gas and oil market.

3.2. Croatian energy security policy regarding the refinery sector

When looking at the Croatian oil supply security a couple of things are essential. Croatian oil sector has a significant import dependency; its own production satisfies only 19% of its crude oil needs (Ministry of Economy - Republic of Croatia 2014). There is a prolonged negative trend in the coverage ratio since the Croatian oil fields are mature.

Regarding diversity of suppliers and import countries Croatia has high diversity mainly due to the JANAF pipeline. Furthermore, Port of Omisalj, connected to Rijeka refinery, can receive oil tanker securing the diversity of supply. In 2013 Croatian refineries processed several types of crude oils from multiple supply regions including Black Sea, Caspian, Mediterranean and West Africa (INA, 2014). On the other hand, Druzhba pipeline allows Croatia to import Russian export blend crude oil from Hungary. The JANAF pipeline system was built as an international crude oil transportation system from the port and terminal of Omisalj to both local and foreign refineries in Eastern and Central Europe. The JANAF system, which has a total storage capacity of 1.54 mil m3 for crude and 0.1 mil m3 for oil products, consists of the crude oil handling Omisalj Terminal, with the storage oil tank farm of 1 mil m3 and 0.06 mil m3...
for oil products; 622km of pipelines; three oil-handling terminals in Sisak, Virje and Slavonski Brod with storage tank farms.

With regards to mandatory oil stocks Croatia is in compliance with EU Directive through HANDA – Croatian compulsory oil stocks agency. In regard to the security of supply of petroleum products the most important factors are refineries which operate within a favourable geographical position allowing the Croatian oil industry the possibility to optimize and extend the crude basket from the world crude market. Croatian refineries satisfy all EU quality standards, which was accomplished by partial modernization in the last few years. Access to the Mediterranean market increases the sales potential and the purchasing flexibility of crude, semi-finished and finished products. Key competitive advantages of Croatian geographical location and possession of refineries include:

- Rijeka Refinery’s Mediterranean access and Sisak Refinery’s centralised location enable a high level of market coverage and maximise crude selection and optimization possibilities.
- access to domestic and foreign crude oil and natural gas sources.
- developed logistic connections between the refineries and depots, including the possibility to transport products by road, rail, sea, river and pipeline which ensures flexible, safe and efficient market supply.
- synergies and joint optimisation of two production sites, continuously improving refining yields by increasing the utilization of key conversion units and optimizing the use of fuel components.

Rijeka oil refinery (Urinj) is located at the northern part of the Adriatic Sea, 12 km south of Croatia’s main harbour Rijeka. It is the shortest and most convenient connection with central Europe and the Mediterranean. In Rijeka INA has a road, railway, marine and pipeline infrastructure for supply and shipment of goods, crude oil and petroleum products. Rijeka oil refinery is connected by a sea pipeline with the port and petroleum terminal in Omisalj, on the island of Krk. Capacity of Rijeka refinery is 5.1 million tons per year (Ministry of Economy - Republic of Croatia 2014). The refinery processes domestic petroleum (produced by INA) in addition to the Russian oil imported through the “Druzhba” pipeline. Crude oil can also be supplied from the Mediterranean Sea by the JANAF Pipeline. As a part of refinery system development three plants have been completed: desulphurization plant (Claus) the hydrosdesulphurization of FCC gasoline plant and Isomerization plant. In September 2007 the Claus plant was started in order to reduce H₂S and SO₂ from the refinery fuel gas. In 2009 FCC gasoline plant was put into operation and Isomerization plant in 2011. Rijeka has the possibility of production of diesel fuels with bio component from mid-2013 and in September 2013 a system of additional wastewater treatment was put into operation. In April 2014, installation of new coke chambers was carried out at the Coking plant.

Rijeka refinery has a Nelson complexity index (NCI)²

In 2011 Rijeka Refinery completed the first phase of the modernization project. The first phase included three facilities: Mild hydrocracking, Hydrogen unit and Desulphurization plant (Claus) as well as numerous supporting facilities and installations. Hydrocracking of heavy hydrocarbons yields lighter products, and hydrosdesulphurization of these lighter products yields EURO V fuels. In July 2011, the suction station for natural gas was installed enabling natural gas to be used as fuel in the Rijeka Refinery.

The oil refinery in Sisak is a continental refinery, located 50 km south of Croatian capital, Zagreb. It is at the intersection of roads, railways and river routes, close to the domestic oil fields. The oil refinery in Sisak is a complex refinery with specifically selected technology. It covers about one million square meters of warehouse space, with modern installations for product shipment, a river harbour with four docks for oil supply and the shipment of derivatives. Capacity of Sisak Refinery is 2.2 million tons per year. (Ministry of Economy-Republic of Croatia, 2014). The refinery processes domestic petroleum (produced by INA) in addition to the Russian oil imported through the “Druzhba” pipeline. Crude oil can also be supplied from the Mediterranean Sea by the JANAF Pipeline. As a part of refinery system development three plants have been completed: desulphurization plant (Claus) the hydrosdesulphurization of FCC gasoline plant and Isomerization plant. In September 2007 the Claus plant was started in order to reduce H₂S and SO₂ from the refinery fuel gas. In 2009 FCC gasoline plant was put into operation and Isomerization plant in 2011. Rijeka has the possibility of production of diesel fuels with bio component from mid-2013 and in September 2013 a system of additional wastewater treatment was put into operation. In April 2014, installation of new coke chambers was carried out at the Coking plant.

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² Nelson complexity index (NCI) is a measure of the secondary conversion capacity of a refinery relative to the primary distillation capacity. It was developed by Wilbur L. Nelson in the 60’ and 70’. The NCI assigns a complexity factor to each piece of refinery equipment based on its complexity and cost in comparison to crude distillation, which is assigned a NCI of 1.0. The complexity of each piece of refinery equipment is calculated by multiplying its complexity factor by its throughput ratio as a percentage of crude distillation capacity. Adding the complexity assigned to each piece of equipment determines a refinery’s NCI complexity. Besides indicating the investment intensity or cost index of the refinery NCI also indicates the refinery’s potential for value addition to crude oil. A higher NCI means a higher cost of the refinery and higher value of refined products.
of 9.1 and Sisak refinery a NCI of 6.1. Compared to the US and EU averages the complexity index of Rijeka refinery is already quite high since the US refineries have a NCI of 9.5 and Europe’s average NCI is 6.5. MOL’s other two active refineries in Hungary and Slovakia have a NCI of over 11.

The joint capacity of two refineries surpasses the domestic demand for petroleum products which was 3.4 million tonnes in 2012. Despite of this surplus potential Croatia is a significant exporter and importer of petroleum products, i.e. in 2012 import was 1.2 million tonnes and export was 1.6 million tonnes (Croatian Bureau of Statistics, 2013). Table 1 presents the production mix and output of Croatian refineries in 2012 and 2013:

Table 1. Croatian refinery production, in period 2012-2013

| Refinery production | 2012 kt | 2012 % | 2013 kt | 2013 % | change%
|---------------------|---------|--------|---------|--------|--------|
| LPG                 | 236     | 6.7%   | 209     | 6.4%   | -11.4%
| Motor gasoline      | 1.135   | 32.1%  | 1.068   | 32.6%  | -5.9%
| Diesel              | 1.334   | 37.8%  | 1.268   | 38.7%  | -4.9%
| Heating oil         | 181     | 5.1%   | 193     | 5.9%   | 6.6%
| Kerosene            | 97      | 2.7%   | 109     | 3.3%   | 12.4%
| Naphtha             | 61      | 1.7%   | 27      | 0.8%   | -55.7%
| Fuel oil            | 440     | 12.5%  | 419     | 12.8%  | -4.8%
| Bitumen             | 26      | 0.7%   | 38      | 1.2%   | 46.2%
| Other products*     | 23      | 0.7%   | (56)    | -1.7%  | -
| Total               | 3532    | 107    | 3274    | -7.3%  |

* Benzene-rich cut, liquid sulphur, coke, motor oils, industrial lubricants, base oils, spindle oil, waxes, blend gas oil “M”, atmospheric residue, intermediaries,…

Source: INA (2014)

From the production data it is visible that the one of the main challenges of Croatian refineries is the high yield of unprofitable output mix, especially the share of fuel oil products in total production (13%) which can only be eliminated/reduced by further modernization. In 2013 the average crack spread on fuel oils, the most important loss carrier, was -234$/t which had a strong negative impact on profitability of INA’s downstream business.

Although Croatia has a domestic oil and gas sector, the share of imports is increasing and new energy sources have to be encouraged in order to increase domestic production and self-sufficiency. Discovery of new hydrocarbon resources in the Adriatic Sea can only benefit the energy security of the country but even with successful exploration, given the Croatian legislature, complex bureaucracy and interest groups, full commercial production cannot be expected to come online before 2025. Due to the long duration of setting up commercial production government must also focus on short term decisions and utilization of current assets while maintaining security of supply and sustainability of the existing energy system. On the positive side, Croatia has a well-developed energy infrastructure (oil, gas and electricity) with many interconnections with neighbouring countries. However, in the future, infrastructure will require investments in renovation/modernization and replacement of inefficient and ageing plants.

3.3. Strategic importance of Croatian national oil company INA

INA is a medium-sized European oil company with the leading role in Croatian oil business and a strong position in the region. INA Group consists of several subsidiary companies wholly or partially owned by INA which is a joint stock company owned by the Hungarian oil company MOL (49.08%), the Republic of Croatia (44.84%) and institutional and private investors (6.08%). Its shareholders equity amounts to HRK 9 bln ($1,636 bln) and capital is divided in 10 mil ordinary shares which are traded on Zagreb Stock Exchange while Global Depositary Receipts are traded on London Stock Exchange. INA was established in 1964 through the merger of Nafnaplin (company for oil and gas exploration and production) with the refineries in Rijeka and Sisak. In 1990, INA became a state-owned company and in 1993 a joint stock company. The first stage of privatization, when MOL became INA’s strategic partner by purchasing 25% plus one share, was completed in 2003. Seven percent of shares were transferred to the Croatian Defenders’ Fund in 2005. After selling 7% shares to former and current INA employees, ownership structure of the company has changed over time and now less than 50% of shares are state owned. With respect to these events, the Croatian Government and MOL have signed the First Amendments to the Shareholders Agreement. In October 2008, MOL’s voluntary public takeover offer to INA’s shareholders was finalized and MOL increased its share to 47, 16%.
Outside Croatia, INA manages an international upstream portfolio. Exploration and Production business segment is engaged in exploration, development and production of oil and natural gas in Croatia and abroad. INA is currently operating in Angola and Egypt while operations in Syria are temporarily suspended until the “force majeure” circumstances cease. INA has been involved in E&P activities in Egypt since 1989 and currently holds interests in four development concessions in the Western Desert and one exploration concession in Nile Delta of Egypt. The biggest part of INA’s foreign investments during the last few years was focused on Syria, where it participated in exploration and production activities on Jihar and Palmyra fields with peak production in 2011. In February 2012 Croatia adopted EU sanctions towards Syrian Arab Republic, hence INA declared “Force Majeure” for Hayan and Aphamia licences. By declaring Force Majeure, INA suspended all its petroleum activities in Hayan and Aphamia block and recalled all its local and expatriate employees. Proven reserves in Aphamia and Hayan fields are 35.8MM boe and daily production in 2012 stood at 3,1 mboe. Croatian government, along with a number of EU countries, officially supports the “Friends of Syria” rebel group created to overthrow the Syrian government. At the moment, 3 years into the Syrian war, it is becoming obvious that Syrian government will prevail and is constantly gaining ground, a reality which can also be detected in the reconciliatory tones between Europe and Syria. Ironically, while supporting and even training jihadist groups in Syria, US and Europe are now facing the same enemy in the form of ISIS (Islamic state of Iraq and Syria) which brings us to an anecdotal situation where the enemy of my enemy is my friend. Due to ISIS growing strength and a serious threat it poses to the whole Middle East; US, Syria, Iraq and Iran are now fighting the same enemy and hence there is a visible de-escalation between US on the one side and Syria and Iran on the other (Guardian 2014, Reuters 2014, VOA 2014). Under the new circumstances, and driven by the realpolitik pragmatism, it is possible that US, Europe and Syria will come to a mutual understanding which, in the energy sector, will result in the entry/return of the oil majors in Syria. Under that, very probable, scenario oil companies from the small countries that were vocal in their aggressive stance towards Syria will bear all the negative economic consequences while the oil majors will be spared. Given the Croatian government’s public support for the rebel/jihadist groups, primarily through sanctions and political pressure on the Syrian government but also through supplying weapons to such groups in Syria there is a very realistic danger that the Croatian government committed a very grave mistake which will almost certainly result in INA losing the Syrian oil concessions.

INA manages two crude oil refineries (in Rijeka and Sisak), lubricants production, a commercial wholesale network and a logistics network for storing and distributing crude oil derivatives to the market. The refined products are transported by road, sea, rail, river and pipeline utilizing owned and rented product depots. Main refinery products include Euro V quality gasoline and diesel, jet fuel, virgin naphtha, benzene concentrate, heating oils, several grades of fuel oil, sulphur, bitumen and calcined and green (regular) petroleum coke. INA has a significant domestic market but also key export markets like Bosnia and Herzegovina and Slovenia, while it is also present in Serbia, Albania, Hungary, Italy and the Mediterranean. During 2013 INA extended its crude basket by processing different light/heavy/low-mid sulphur crude oil types. The different crude grades were sourced from multiple supply regions - Black Sea, Caspian, Mediterranean and West Africa.

3.4. Future challenges and opportunities

Croatian government and MOL are at odds over the control of former national oil company - INA. As we pointed out earlier INA’s importance for Croatia is paramount both from the security and financial standpoint, since it is, by revenue, the biggest company in Croatia. The Croatian state has a 44,84% holding in INA but MOL has management control of the firm which the Croatian government wants back, especially as energy firm ownership has always been an important political issue. Besides the governance over the company the main point of dispute is the MOL’s plan to shut down both Croatian refineries which would be catastrophic for Croatia from several viewpoints: security, income, technology and human capital. MOL’s motives for the closure are understandable since in the last few years Croatia, Bosnia and Herzegovina and Slovenia have lost a total of 1.5 million tons of annual demand, which corresponds to 1/3 of the total capacity of the Rijeka refinery. Furthermore, MOL has already modernized
two refineries in Hungary and Slovakia, whose production can meet regional demand and modernization of Croatian refineries, in such circumstances and market conditions, does not make financial sense for MOL.

Under the original 2003 contract MOL undertook the obligation of modernizing both Rijeka and Sisak refineries, but so far it has not fulfilled all its obligations. It is evident that serious modernization in Sisak did not even get started. After the completion of the Claus facility, which started in September 2009 and was valued at $24 million, it became clear that broad modernization will not continue since its costs are estimated at $500 million. Although originally agreed between Croatian government and MOL, there was always some doubt among professionals in Croatia about the sustainability of Sisak refinery. The same cannot be said about Rijeka refinery which was always seen as the main Croatian refinery with an excellent geographical position and logistics routes. After INA’s good business results in 2010, work on the completion of the first phase of modernization of the Rijeka refinery intensified. The works officially began in 2005 and finished in February 2011, when the three new facilities were presented: hydrocracking and hydrodesulphurization (HC/HDS), sulphur recovery facility (Claus) and hydrogen generation unit. The total cost of the 1st phase was $530 million, the same as the planned costs for the next phase of modernization. Unlike the first phase which was largely financed from Syrian oil profits, the second phase of the modernization was planned to be financed by MOL. Originally it was planned that the 2nd phase would be finished by the end of 2014. The 2nd has not even started yet and it is unknown when the end can be expected since the license agreement for the process design of a delayed coking unit, using Bechtel’s (previously ConocoPhillips’s) ThruPlus technology, was signed in February 2014. Besides the questionable beginning of the 2nd phase the completion of the 1st phase is also riddled with problems. After the completion of the 1st phase in 2011 out of the three constructed facilities, HC/HDS and Claus were not fully operational, and their later delays led to increased levels of pollution. The cause of this was the poor quality and only partly performed works on the installed equipment.

In today’s global market and with current refining margins running the refinery without processing heavy oil remains is not profitable. Instead of just being used as a fuel for the refinery process, heavy oil residues has to be used as a feedstock for the production of so-called white products, either gas (gasification facility) or petroleum coke (delayed coking facility). The choice between these two option proved to be difficult for both the Croatian government and MOL since the public prefers the gas production, but there is no local market for such a large amount of gas since HEP (national electricity producer) and other potential investors have not shown interest in building a gas facility near Rijeka refinery. This is not surprising since the spark spread in many parts of Europe is negative i.e. gas powered plants are losing money. On the other hand, while there is a market for petroleum coke, its potential production caused outrage among environmental organizations and local population.

Under the 2009 agreement with the Croatian government, MOL, without having a majority stake, took complete management control over INA. Croatia is dissatisfied with MOL as a partner since it did not fulfil its contractual investment obligations and modernized INA’s refineries. It is also being blamed for the falling profits, as well as decreased production and capital spending in the previous years. What is more worrying for the Croatian side is the fact that MOL has fully modernized its Hungarian and Slovak refineries and is running them at full capacity while the Croatian refineries are not being modernized and are running at minimal levels. Accusations of corruption surrounding MOL’s attainment of a controlling stake in INA in 2009 led to the imprisonment of Croatia’s former Prime Minister Ivo Sanader for receiving a $6.76 million bribe from MOL to help it get control of the company. Croatia started proving its allegations about MOL’s bribery on August 11th 2014 in front of the International Chamber of Commerce (ICC) in Paris.

While MOL might eventually be forced to sell its stake if it cannot reach a workable deal with Croatian government on INA, it will try to avoid it. INA not only provides 20% of its operating cash flow and 40% of consolidated upstream production, but also gives MOL a strategic Balkan foothold, offers diversification across markets and access to Croatia’s Adriatic ports. Croatia’s mounting debts mean it can ill-afford to buy the stake back. With potential western refiners scaling down their operations, Rus-
sian companies are the most likely buyers. Russian ownership of such a strategic asset would probably be unacceptable for EU and US at the current time. Due to these circumstances Croatia finds itself in an impasse since it cannot afford to buy back INA, and even if it did, it does not have the capital to fully modernize the refineries, an undertaking of approximately $2 bln. Originally the first 25% stake in INA was sold in 2003 because the government wanted to cover a gaping deficit and contain the growing public debt. In the meantime the price of debt for Croatia did not decline, the deficit got even bigger as well as the public debt. Furthermore the price that the MOL is unofficially asking for its stake in INA, $2 bln, is effectively higher than it paid.

Over the last 11 years INA did not grow or prosper but instead it lost its Syrian oil fields, lost a significant part of the retail market and runs old refineries at the minimal capacity and negative margins. On the positive side, one extremely important geopolitical aspect that is often overlooked in the valuation of the company is INA’s ownership of oil terminals and a refinery, with above average complexity, directly on the Adriatic coast. We can assume that exactly this aspect of INA is what is so attractive to Russian oil companies. For all of these reasons MOL is in no hurry to sell its stake especially since MOL cannot transfer its exclusive governance rights to a potential buyer. This makes INA a very valuable asset for MOL, but not a very lucrative one to sell since it cannot transfer its management rights to a new buyer. Theoretically, since MOL controls 49.08% of the company it could try a hostile takeover of INA but that would undoubtedly trigger a counter reaction from Croatia. Ironically, Hungary experienced a similar situation when Austrian OMV tried to take over MOL and finally Hungarian government stepped in with the famous Lex MOL and blocked the takeover forcing the Austrians out of MOL. In the extreme case Croatia always has the option of creating a similar Lex INA which would block MOL and eventually force it out. In such circumstances keeping the status quo is MOL’s preferred strategy for as long as possible.

Biggest Russian oil company, state owned, Rosneft has shown interest in taking over MOL’s share in INA as well as Slovenian oil company Petrol. Rosneft’s plan would be to create a new vertically integrated oil company. A significant share of Petrol is owned by Slovenian banks and state funds which are eager to unload some of their holding since they are in urgent need of cash due to Slovenian deteriorating economic conditions. United INA and Petrol would have a dominant role in the retail sector of Croatia, Slovenia and Bosnia as well a serious foothold in Serbia, Montenegro, Kosovo and Albania. As for the wholesale segment it could successfully compete in the Hungarian, South Austrian and North Italian markets. Such an ambitious plan would be beneficial for INA since it implies the survival and modernization of both Croatian refineries. Since Petrol does not pose any refining capacity its retail network would be supplied by INA’s refineries. This would mean that INA is reclaiming its lost ex Yugoslavian market. Rijeka refinery, with its capacity of 5 mil t per year, could supply a large part of Slovenia, Croatian coast and other buyers in the Mediterranean. Its input would not change by much since it would continue to process Russian crude and heavy oil remains from technologically simpler Sisak refinery. Sisak refinery would continue to process higher quality, domestic crude and supply continental Croatia, Bosnia and Herzegovina, southern Hungary and Austria. Rosneft would use Petrol’s big oil terminal in Koper as a logistics centre to supply Western Europe with its derivatives from the Black Sea Tuapse refinery.

In Hungary there is a growing consensus that MOL will eventually sell its INA stake. EU and US would probably prefer that the buyer be a Western company but not a single one is interested in this acquisition since they are focusing on the fast growing Asian markets and upstream operations. The only ones that are strategically interested in the Balkan region are the Russian companies, mainly due to the direct access to Mediterranean and central Europe. Usually two Russian oil companies are mentioned as potential buyers, Rosneft and Gazpromneft (subsidiary of Gazprom). Gazpromneft is a less preferred one for Croatia since it owns a modernized refinery in Pancevo, Serbia and thus would close the Sisak refinery. A takeover by a Russian company would also have political consequences. EU is sceptical and careful about the expansion of Russian energy companies on the European market but at the same time Russia remains EU’s biggest supplier of fossil fuels and in the next ten years there is no realistic chance of significantly changing this. EU realises this and is limiting Russian acquisition of key energy infrastructure such as pipelines, which could lead to formation of monopolies. Up till now the EU limitations that ap-
ply to pipelines do not apply to commercial activities and Russian companies own a significant share of refineries, oil terminals and retail networks across Europe. E.g. Rosneft together with BP owns Ruhr Oel and through it controls four refineries in Germany. It cooperates and has strategic partnerships with a number of Western oil majors, such as ExxonMobil and BP. BP even has a 20% stake in Rosneft, a fact that would surely be used by MOL, Hungarian and Croatian government in their defence from critiques that would be coming from Bruxelles and Washington in case Rosneft acquires MOL’s stake in INA.

4. Development of Polish state policy towards the refinery sector

4.1. The Polish refinery sector after fall of communism

Poland claims to be a cradle of the refinery industry worldwide with Ignacy Łukasiewicz efforts in mid XIX century. The WWII changes left the country with five plants, three in the South-East and two in the Silesia region, with a combined capacity reaching hardly 2 million ton/year. During the communist times two new refineries were constructed and thus the industry geography was completely changed. The first one was located in Płock, on the famous Druzhba pipeline with initial capacity of 6 million t/year and became operational in sixties (the first VDU started production in ’64). The second, constructed in 70s, is located in the harbour city of Gdansk. It became operational in ’75 and had an initial capacity of 3 million t. These opening capacities have been constantly expanded. The two refineries served as fundaments for creation of two Polish integrated oil companies: PKN Orlen (in ’99 under different name) and Lotos (2003). As an outcome of complicated, often politically driven processes these two companies acquired also a previously state owned retail gasoline distribution network called CPN (the major share was taken by Orlen) and all five remaining old refineries (Orlen bought Jedlicze and Trzebinia while Lotos: Czecze-wice, Gorlice and Jasło). Subsequent developments led to the total or partial closures of their crude oil processing capacities with the development of some specialized units (e.g. biodiesel, lubricants). The closures of southern refineries combined with expansion of two northern ones created a situation in which Poland now has two big refineries with a combined capacity approaching 26 million t/year (Płock: 16,3 million, Gdansk 10 million), both of them relatively modern and competitive (Table 2). Płock has a NCI of 9.5 while Gdansk, after completion of the so called 10+ program NCI of 10.0.

Table 2. Polish refinery production, period 2012-2013

<table>
<thead>
<tr>
<th>Refinery products</th>
<th>2012</th>
<th>2013</th>
<th>Change y/y</th>
</tr>
</thead>
<tbody>
<tr>
<td>Motor gasoline</td>
<td>4027</td>
<td>4040</td>
<td>+ 0.3 %</td>
</tr>
<tr>
<td>Diesel oils</td>
<td>10927</td>
<td>10954</td>
<td>+ 0.2 %</td>
</tr>
<tr>
<td>Fuel Oil</td>
<td>5842</td>
<td>5397</td>
<td>- 7.6 %</td>
</tr>
<tr>
<td>Asphalts</td>
<td>1701</td>
<td>1451</td>
<td>-14.7 %</td>
</tr>
<tr>
<td>Others</td>
<td>2368</td>
<td>2043</td>
<td>-13.7 %</td>
</tr>
</tbody>
</table>

Source: PKN Orlen and Lotos websites

Refineries are well supported by the crude and product infrastructure. There are three oil port terminals in Poland. The main oil port terminal is in Gdansk with a capacity of about 34 Mt/year. Gdansk Port is used primarily for exports of Russian crude oils transported there via Druzhba and Pomerania pipelines. But its nominal capacity surpasses all domestic needs. Additionally there are two small oil terminals for imports of oil products; Gdynia Port (with a capacity of 3,5 million ton annually) and Szczecin (1,5 million ton annually) (IEA 2011).

Albeit Poland is a net importer of crude based fuels with total deficit of 0,5 million t in 2013 its dependence is not significant. It imports mainly LPG and diesel (total import stands at around 5 million t) while export consisting of gasoline and fuel oil stand at 4,5 million t (POIHN 2014).

At the same time both PKN Orlen and Lotos started a process of self-transformation from operators of refineries into integrated oil (and later gas) companies albeit they choose different paths. PKN Orlen has always considered itself a leader in Poland and swiftly disclosed ambitions to gain the same position in Central Europe. It early embarked on strong M&A activities. Acquisitions of Unipetrol in 2005 and Mažeikių Nafta in 2006 as well as taking over close to 200 BP petrol stations in Germany underlined this strategic choice. There were also other attempts which did not materialize: discussions about the merger with...
Hungarian MOL, especially in 2002, and occasional proposals to take over or merge with Lotos. These ambitions have been both politically as well as economically driven. Even geographically PKN Orlen is a tempting target for all political influences. It carries officially two headquarters: in Warsaw and Płock, the latter is located two hours’ drive away from the capital but a balance of power has clearly shifted towards the former one. Top management tenure is defined by political constellations and usually changes after parliamentary elections. Parliamentary change mark the disruption of company policy since the new management feels obliged to announce all the mistakes of the preceding team and devise a new strategy and big projects. Only during the last few years did PKN Orlen, feeling the weight of plethora of acquired assets and trapped into political tensions with Czech and Lithuanian governments started to pay more attention to efficiency of internal processes and quality of day to day management.

Lotos has always been in a different political and business situation. First of all it has been much smaller, making it an ideal takeover target, for PKN Orlen but also for other players. Its main refinery Gdansk initially had a capacity of only 6 million t/year which was considered too low for economic viability. Secondly, being located in Gdansk, it was more distant from Warsaw political circles. These two facts defined Lotos strategic goal: to growth internally in order to secure independence. Even if the company was forced to take over three small refineries this step was viewed as a compensation to government for protection against PKN Orlen hostile attempts than as tool to achieve any businesswise strategic objectives. In one case (Gorlice) when such an opportunity appeared, Lotos immediately pulled out. Consequently, Lotos flagship expansion program 10 +, has not referred to any acquisition but to expansion and modernization of its refinery in Gdansk, which in 2013 achieved the capacity of 10 million t and significantly improved the product mix. Despite being smaller than PKN Orlen Lotos inherited some precious assets of which the key one is location. Gdansk is a harbour, connected by a local pipeline with the Druzhba near Płock. It has the advantage of capability to source crude from both preferred logistic channels in the industry: sea and pipeline. Consequently it can sell products directly to tankers.

The other advantage became clear with discovery of oil deposits in Baltic shelf. These are not big reservoirs but the closest platform was located within eyesight form the refinery. More than a source of crude these venture created an opportunity to gain valuable experience in off-shore drilling and exploitation before entering distant, foreign areas. It gave Lotos a certain lead over PKN Orlen in upstream expansion. Lotos gained another advantage over PKN Orlen with a long tenure of its current CEO – Paweł Olechnowicz who got his position in 2002 and managed to maintain the leadership under five governments. This factor cannot be neglected since it has given the company certain continuity and immunity from direct political influence.

Recognizing the above stated differences the common factor for both Polish companies is that they are state controlled entities, pursuing their respective strategies independently from any direct foreign influence. It is also important to discuss briefly the issue on their prospective merger. There were and still are numerous voices in the industry circles supporting such idea, based on belief that a combined strength of PKN Orlen and Lotos would accelerate development of oil business in Poland and reinforced independence of such entity. In our opinion these arguments are not convincing and are actually contradicting the historical events and experience. First of all a hypothetical merge would not elevate the merged company to a higher rank nor would it bring any significant structural change. It would still be a 3rd tier integrated oil company with focus on downstream, not much different from PKN Orlen and Lotos alone. It is also hard to identify any business area in which such a company would become even a regional leader; beyond segments already dominated by these companies.

On the contrary, one can indicate several areas where PKN Orlen and Lotos independence has played in favour of both companies. First, promptly after transition to market economy both of them were exposed to a competitive environment even before foreign players built up their positions (infrastructure, petrol stations, brand awareness etc.). They had to learn how to compete with BP, Shell and several others that entered Polish market. Secondly, especially in case of Lotos they had to prove to their stakeholders that they are capable of developing without external assistance (foreign investor). The importance of this can be clearly seen when neighbouring coun-
tries with one national oil company are compared: Unipetrol (Czech Republic), INA (Croatia), Petrom (Romania), Slovnaft (Slovakia) could not secure their independence and are struggling to survive within structures of foreign owners. Their respective governments were convinced or wanted to believe that their future business prospects would be stable and secured in the hands of foreign owners.

As a consequence of different factors Poland has two national oil champions, however small in global terms, but independent and capable to pursue their own strategies without being forced to accommodate to decisions coming from foreign headquarters. Although PKN Orlen and Lotos are key players in Polish refinery and oil & gas industry other entities in this sector include:

a) PERN “Przyjaźń” S.A., a state owned company, which is an operator of the network of crude oil pipelines as well as storage facilities. The Druzhba and the Pomeranian are the main pipelines for Russian deliveries. These two pipelines supply Russian crude directly to the refineries at Plock and Gdansk as well as to Naftoport (oil terminal in Gdansk) for exports and transit volumes to German refineries at Schwedt and Spergau. The Polish branch of the Druzhba pipeline is composed of two main sections. The eastern section spans from the Belarus border in Adamowo to Plock, with an annual, nominal capacity of cca 43 million t. The western section of the Druzhba pipeline links Plock to the German border in Schwedt with a capacity of 27 million t. The Pomeranian pipeline is a local connection between Gdansk and Plock. In the direction from Gdansk to Plock, it has the capacity of 30 million t and 22 million t in the opposite direction. Another important asset in its portfolio is OLPP - the largest Polish storage company with a chain of 19 fuel storage depots where gasoline, diesel, light heating oil, biocomponents and aviation fuel are stored. The total storage capacity of the depots amounts to 1,8 million m³. OLPP also owns tanks with diversified capacities, the largest of which have capacities of 32 000 m³. PERN owns 67% of the Naftoport’s shares (the rest is held by PKN Orlen, Lotos and others) and 100 % of the OLPP S.A (International Energy Agency 2011).

b) PGNiG is known as a gas system operator but also has an almost monopolistic position in domestic landlocked hydrocarbon exploitation. Since Poland has significant gas deposits and small oil component PGNiG has been viewed as a gas company. Its crude output used to account for cca 2 % of total domestic needs but in 2013, due to new fields coming online, output jumped to over 1 million t/year, surpassing 4 % of the total demand. Although from 2005 it is a publicly listed company the State Treasury holds 72,4% of shares.

In summary, all four components of the Polish oil&gas industry remain under state control. Even though there are some notable drawbacks to this approach state ownership has been the key reason that these companies can be regarded as the pillars of the Polish energy security.

4.2. Polish energy security policy regarding oil refineries – clash with the neighbours

In case of Poland a special law was stipulated (April 10th 2007), under the Energy Law, which defines terms for energy policy creation as well as rules and requirements for enterprises involved in fuel and energy supplies. Articles 12 through 15 empower the Minister for economic affairs to prepare and provide the parliament with a state energy policy, including security issues, with at least 20 year time horizon. The currently binding document from 2009, covering the period till 2030 indicates that shareholdings in key energy companies should be used to promote energy security. It also states that current holdings in key oil&gas companies should be maintained, although none of the companies is mentioned by name. Another regulation, defining key enterprises for national security, mentions only PERN. The refinery business is not mentioned as the focus is given to crude oil supply and reserves. The new document, from August 2014, covering period till 2050 repeats the same view, or lack of one, on the refinery segment. Despite official negligence for the contribution of the refinery sector to Polish energy security it has to be said that unlike the official statements real actions regarding PKN Orlen and Lotos ownership structures point to the conclusion that the policymakers are aware of the importance of state control over these two companies.

It is worth mentioning that PKN Orlen, as a result of M&A activity, became an important player in terms of energy security for two other countries: Lithuania and Czech Republic. These two acquisitions exposed
PKN Orlen, and also, indirectly, Polish government to completely new challenges. It is now obvious that they were not well prepared for such a situation. Acquisitions of Unipetrol in 2005 and Mažeikių Nafta a year later were at that time outstanding deals for Polish companies. Even now they represent top Polish FDIs. Poland used to be a FDI host country and frequently dealt with problems pertinent to the ones experienced by Czech and Lithuanian partners. Moreover Poles had to act simultaneously on various areas: political, legal and business; none of which being their strong point. On the political level it was primary misled by favorable climate in both countries, overseeing numerous expectations from hosting governments and societies. It also undervalued the ability of the business stakeholders to play hardball protecting their own interests.

In case of Unipetrol the fact that its two big refineries were operated as a joint venture (Ceska Rafinerska) with oil majors proved to be a significant burden. Unipetrol has the 51% share but in practice it entered a very complex operational framework of agreements in which it found itself formally on equal terms to other partners but given disadvantages in managerial competences and experience the Polish company was the weakest player. Partners were not hostile to PKN Orlen but protected their interests well, while deeming an exclusive duty of partners’ directors to do the same. As the nominally major shareholder PKN Orlen was viewed by the Czech side as primary responsible for the Ceska Rafinerska sustainability and growth. Only after 9 years, as a result of a painful and costly process all minor shareholders have been bought out. Minority shareholders also represented a problem for Unipetrol (PKN bought and owns only 63% of shares) as well as in some other cases (e.g. Paramo operating two small plants in Kolin and Pardubice). Restructuring processes implemented by PKN Orlen, although necessary and similar to ones introduced by many other investors, were another source of disappointment. PKN Orlen was disappointed due to the length and less than satisfactory results. Czech stakeholders were disappointed because of social pains and lack of big investments compensating job losses. All of that lead to a political campaign initiated by some political forces in the hosting country demanding even the renationalization of Unipetrol. Even though such initiatives failed additional pressure was put on PKN Orlen.

Lithuanian investment proved even more troublesome. The Lithuanian government viewed Mažeikių Nafta, the only refinery on its territory and by far the biggest country manufacturing plant as its jewel. So, when with bankruptcy of Yukos in 2006, it was put on sale, facing a threat that another Russian company, even more loyal to Kremlin, would purchase it, Lithuanians strongly favoured PKN Orlen. The Polish company, according to Mr Chalupiec, its CEO that time, wanted to strengthen its position vis a vis Russian crude suppliers by becoming their biggest client by volume. If the transaction succeeded, relations with Lithuanian and Russians should have been settled. Unfortunately Poland failed to achieve this. Not surprisingly Russian took an obstructive attitude, cutting crude oil supplies in 2007. Although very reluctantly, an exasperated PKN Orlen even hired an investment bank, to look at possible options for selling its stake in the refinery. However the likelyest buyer would be one of the Russian oil companies. Sensing PKN Orlen’s weakness, the Russians have been signaling a valuation level of $1.5 billion for the refinery leaving PKN Orlen with an embarrassing loss. Deterioration in Polish-Lithuanian bilateral relations was also imminent. Due to these factors PKN Orlen retained its share.

Although Russian opposition was expected PKN Orlen was surprised by some actions undertaken by Lithuanian partners. As pipeline deliveries were cut the crude had to be supplied via Klaipėda and then by rail. This shortest route was soon made non-operational due to unscheduled modernization lasting up to the date of the article. PKN Orlen had to utilize longer routes incurring higher costs since rail tariffs are distance based. Its attempt to get control over the oil terminal has not been successful either so far.

Mažeikių refinery, although having the capacity of 10 million t/year cannot be considered as modern and efficient. It requires considerable investments to exploit its advantage: good geographic location in the interior of the country, far from competing plants. In view of the above indicated difficulties it is very unlikely that any expensive investment will be carried out in the foreseeable future.

Poland has been quite successful in maintaining state control over its refinery business. All drawbacks of this strategy have, up till now, been minor. The biggest challenge came from the PKN Orlen foreign
investments. It exposed Polish government (and the PKN management board) to energy security issues of other countries and in the process acquiring part of the responsibility. So far this process was not very successful since none of stakeholders feels satisfied with the outcomes. On the other hand the options of disinvesting are extremely limited.

4.3. Selected attempts to change ownership schemes of PKN Orlen and Lotos

Both PKN Orlen and Lotos have been subjected to various political games. Disputes regarding their governance and ownership structure stem from the fundamental differences on the desired role of the state and lack of clear strategy. Unfortunately, development programs have not been based on an in-depth analysis of the markets but rather driven by the short-term political needs. On top of that even the proclaimed programs and their realization are sometimes quite divergent. The most famous, alleged, case of such dichotomous plans to sell both oil companies took place during 2002-2005. In 2002, Jan Kulczyk, at the time, the richest Pole proposed to the Prime Minister Leszek Miller that they could merge Lotos with Orlen and sell them both. Although without formal authorization, (Andrusz, Bartyzel 2004) Kulczyk met in October 2002 with Wagit Alekpierow, the chief of Lukoil, in London and tried to conclude the transaction (Kennedy 2006). When information about this attempt became public it caused a public outrage and lead to the formation of a parliamentary investigative commission in charge of “Orlengate”. Under such circumstances both ideas: merger of two Polish oil companies and the sale of state’s holdings became impossible.

In 2007, the government led by Jarosław Kaczyński introduced a new strategy (officially called policy) for the oil sector based on assumptions that Lotos and Orlen could not be sold or merged (Ministry of Economy - Poland 2007). The rationale for such decision was based on a threat that at least one of them could be purchased by Russian oil giants. In 2008, a formally liberal and market oriented government formed by Donald Tusk announced a four-year privatization plan aimed at selling 740 companies. However, the plan did not foresee further privatization of oil refiners PKN Orlen SA and Grupa Lotos SA. The government would sell only a part of its shares in PGNiG, in order to allow the company’s employees to float their 15% stake on the WSE (The Treasury held a 84,75% stake in PGNiG). The employees who hold 15% were not allowed to sell their shares till further privatization of PGNiG (The PB Interim Report 2008).

The government changed its position on PKN Orlen an Lotos privatization and in 2011/2012 tried to sell Lotos. Due to market turbulence in Europe no binding bids were submitted. Government subsequently claimed to examine the potential for a domestic merger between Lotos and other companies, including Orlen and gas monopoly PGNiG (Conroy 2012). Finally, as officially expressed, the decision was made to wait for a more favourable environment. Simultaneously there was a strong social campaign, especially in Gdansk, aimed at preservation of status quo. Over 100,000 signatures were collected and the threat of referendum became real. Since Gdansk was one of the key regions for governing party (Mr Tusk himself lived there) selling Lotos in spite of such strong popular resistance was probably considered politically too risky.

Due to the substantial free float of PKN Orlen shares and turbulent internal politics attempts to take over PKN Orlen or buy government’s stakes are probably considered by bigger companies, especially in Russia. Occasionally information about such plans appears in the press. One of such cases prompted the main opposition party - Law and Justice to propose the merger of Lotos and Orlen, strengthening state’s control over PKN Orlen (at the expense of diluting its position in Lotos). Alleged Russian attempts failed (or were not serious at all) and the interest for such merger disappeared. It seems that, at the moment, all key political parties accept the status quo as the desired state. One of the reasons why the issue of oil companies’ privatization was dropped from the political agenda is the lack of prospective buyers. It became clear that the only serious buyers can come from Russia. This has always been a serious obstacle, but with the recent developments in Ukraine, any political party considering the sale of Polish oil companies risks broad public outrage.

4.4. Future challenges and opportunities

Poland, as oppose to Croatia, does not have such immanent problem like the INA – MOL relationship. This allows Polish government to form an unhindered, long term view of its refinery sector, based
Ownership of refinery business in Croatia and Poland as a factor impacting national energy security

on its own understanding of national interests. There are several key issues regarding Polish refinery sector which will shape its future:

a) plans regarding possible merge between PKN Orlen and Lotos,

b) government’s ability create a viable long term vision for both companies and to secure professional management capable of creating and implementing corresponding strategies,

c) Polish government’s and PKN Orlen’s ability to revalue the importance of foreign investments on its energy security,

d) PKN Orlen’s ability to rehabilitate its foreign assets (especially Unipetrol and Mažeikių Nafta),

e) both companies’ ability to expand upstream activities.

Regular rumours about the possible takeover of Lotos by PKN Orlen left a mark on Lotos. Lotos’ management had to prove itself to the major stakeholder and this lead to several positive outcomes. Awareness that a political configuration may someday change in a way that will disregard business conditions and realize someone’s idea fixe constantly weighs over managers’ heads. Another related issue refers to the relationship between management of state owned enterprises and governments. Logically in such a case governments have a major responsibility. First of all they have to express clearly their expectations towards company management. It is quite common that politicians take a passive attitude claiming that management boards are professional bodies responsible for strategy preparation and execution. This is a misconception since in a well-managed private company the owner defines the fundamentals of company’s culture and strategy. Certainly management have a say but their role is mostly advisory. Secondly, government has to support PKN Orlen in relation to other governments, by taking an active role in policy formulation and implementation. It has to recognize the host country’s principles of their energy security but at the same time secure Polish interests. Thirdly, governments have to secure an adequate level of managerial capabilities, if necessary, even by hiring foreign managers for selected posts. This argument applies especially to the upstream activities. This is definitely the most complex and challenging part of the oil business and one failed project may at worst bankrupt the whole company.

5. Future of the European refinery sector

Up till 1990s Europe was, alongside North America, one of two global centres of refinery industry. Creation of European economic zone, first under EEC and then under EU and the relaxation of trade and investment barriers under GATT or mutual agreements allowed for growing concentration of oil&gas companies in the developed countries while relative backwardness kept companies from OPEC countries at bay (Uberman 2014). The peak of this dual dominance was reached, when a string of so-called mergers of elephants created a group of 6 supermajors: 2 coming originally from US (ExxonMobil, Chevron, ConocoPhillips) and 3 from Europe (BP, Royal Dutch Shell, Total) but all landing with assets on both sides of Atlantic (Coll 2012; Yergin 2011).

Aside from the above mentioned developments, for the last 40 years European refinery sector has faced both internal and external unfavourable trends. Starting from 1973 it faces a slow but constant decline in terms of volume demand. For this reason completely new plants have been rarely constructed. Many European refineries built 30 to 40 years ago, using less sophisticated technology than their Asian, Middle Eastern and American counterparts are now at a disadvantage. With a smaller scale, oriented towards lighter, sweeter crude oils, producing an excess of gasoline, and with strict labour laws and high wages, most European refineries have suffered a structural erosion of their margins. The size of the newly constructed plants has fundamentally shifted the scale and location of the newly constructed plants has fundamentally shifted the scale and location of the new, high quality, price setting units outside Europe. Operators from these regions enjoy a number of key advantages, including new equipment, cheap labour, large capital reserves and rapidly growing local demand. On top of that European refiners are subject to the most stringent and thus costly environmental legislative requirements putting them in additional disadvantage (Soeting 2012). All of this led to the weakening of Europe’s attractiveness for global oil&gas companies. It is worth pointing out that after the fall of communism, when the majority of multinationals rushed to the Eastern Europe, motivated by the opening markets and competitive labour, oil&gas companies kept distant. With a notable exception of Shell and ConocoPhillips engagement in the Ceska Rafinerska and Shell’s and BP’s building petrol stations chains, oil majors made no significant investment in this area. The lack
of investments was not caused by a different view of relative attractiveness of emerging Europe. The real reason was the relative decline of Europe as a whole that discouraged ExxonMobil and others to invest even in the most attractive part of the continent.

EU refining restructuring is an ongoing process (totalling 1.8 million barrels/day since 2008) as EU refining activity remains low and, globally, refining margins continue to be weak as surplus capacity persists. EU net middle distillate imports surged in 2013 (averaging 1.3 mb/d, compared with 830 kb/d in 2012 and 1.1 mb/d in 2009). At present, in Europe, refining capacity of 683,000 b/d is for sale, and since 2009: 166,000 b/d has been downsized, 480,000 b/d has been bought by Asian companies, 1.419,000 bought by Russian companies, 921,000 b/d bought by others and 1.670,000 b/d shut down (Dušanić, 2014). Since 2007 Europe lost 15 refineries bringing the total to 86, with the highest number of closures taking place in France, where refining capacity has shrunk since 2008 by 30% to 1.4 million b/d. Additionally, approximately 15% of the remaining European refinery capacity (cca 2 million bbl per day) is expected to shut down till 2018 due to decreased demand for oil derivatives and increased competition from overseas. Majority of closures are likely to come from Italy, since over the last six year Italian capacity has shrunk by 10% compared to 15% in Germany and 22% in UK (Platts 2014).

Russia is a key supplier of refining products for EU market, followed by the US. Compared to refining sector in other parts of the globe, refining in the EU suffers from the very high operating costs, one of the most components of which, the energy costs, are among the highest in the world. NorthWestern Europe is especially vulnerable to these factors since the increased Russian production, which is midway through a major refinery modernization program designed to boost volumes of high-end products, primarily affects this region. It is expected that by 2016 additional 0.5 mil b/d of Russian diesel will appear in the NorthWestern Europe (EC 2014). Many European refineries were built in the 50’ and 60’ and are heavily geared towards gasoline production. But since the demand for gasoline continues to decline in favour of diesel, European refineries face a significant surplus of gasoline which is increasingly hard to sell on the continent or overseas as demand from the United States is also weakening. Furthermore the price of West Texas Intermediate (WTI), benchmark for US oil, is continually lower than the Brent oil, a European benchmark, giving a comparative advantage to US refineries. At the same time, modern and massive refineries in the US, Middle East and Asia are successfully competing with the European refineries in the segment of diesel fuels, on the European soil. As they benefit from cheaper oil feedstock and lower energy costs (especially US with the low price of natural gas brought by the shale gas revolution that started in 2008), they are aggressively pushing out the regional refiners in Europe. Due to these factors diesel will continue to flow from the US to Europe for the foreseeable future. Due to increased European focus on energy efficiency and decreasing CO2 emissions, the demand for oil in Europe is continuing to decrease at the same time when the competition from Middle East, Russian and US refiners, due to increased efficiency and lower energy costs, is increasing.

Demand for the oil products in Europe has slumped by 14% since 2008. One definite reason for the slump in the demand is the financial crisis which forced the EU economy into recession. In the macroeconomic literature the positive relationship and causality between economic growth and energy consumption has already been proven (for EU countries see: Vlahinić-Dizdarević, Žiković 2010; Žiković, Vlahinić-Dizdarević 2011). Industry analysts also add that the downward trend will continue with car industry developing more efficient engines. There are numerous sources of risks and additional costs for the European refinery sector but basically it is a combination of promoting alternative fuels, decreasing demand due to energy efficiency, fierce overseas competition, sluggish investment, extensive burden of health and safety worker conditions and finally - emissions legislation. A good indicator of the state of the European refining sector is the Euroilstock’s report which shows that in June 2014 European refineries processed 11% less crude oil than in the previous year. Another blow to the sustainability of Europe’s refining sector is the loss of its traditional export markets, especially Africa. Africa is important for the European refineries since it consumes a significant amount of fuel that is in serious decline in developed nations - gasoline. The Europe’s main competitor on the African continent is the US especially since the US refineries are pushing their gasoline surplus to Africa at dumping prices. A negative trend is also visible
Among the oil majors: French Total, Europe's largest refiner, after closing the Dunkirk refinery in 2010, is expected to further downsize its capacity in the 2015 (it cut 23% of its refinery capacity between 2006 and 2011 and aims to cut another 20% till 2017), Italian ENI is struggling between the credit rating agencies and unions, trying to increase refining margins and keep all the operations, Shell and BP have already sold a significant part of their capacity to independents, with some of them already going bankrupt (Platts 2014). ExxonMobil announce a billion USD investment in modernizing its European refineries, a move that would result in a number of regional refineries becoming obsolete.

2013 was one of the weakest years for the European refining sector in the recent decades, as refining margins sharply fell due to high crude costs and weak product demand. 2013 refining margins in Western Europe, at one point, dropped to a four-year low of $10.6/t and refinery utilisation in the EU went down to only 78 percent. Looking at yearly averages refining margins fell to $19.5/t in first half of 2014, down from $23.4/t in 2013 and $46.8/t in 2012 (Solomon Associates 2014). Besides the refineries with a high yield of gasoline, small, old and less complex plants and those in coastal areas such as Italy, that are easily accessible by sea, are the most vulnerable. A trend that is starting to form in Europe is the transformation of refineries into oil storage terminals/logistics centres that can be used for global trade.

EU refining trade body, Europe, estimates that there is around $30 billion of investment already announced for EU refinery projects to 2020, but that another $21 billion would be required to meet the changes in demand and new specifications. That $51 billion total equates roughly to $1/b on the refining margin in Europe, which is a huge amount since the normal margin ranges between $0 to $4/b. A lot of this investment is just to stay in business –there’s no obvious return (Elliott 2013). The uncertainty surrounding the precise requirements of EU emissions and sustainability legislation has had a detrimental effect on new investments. The current investment framework does not always offer long-term perspective given that the refinery sector has long investment cycles. A coherent EU legislative framework with clear and demonstrated benefits for sustainability and competitiveness is needed to create a clear investment environment over time. Without a clear and friendly framework it will be impossible to mobilize the capital which is required for modernization. If EU refiners want to remain key players in the international market, they have to become more competitive. This can be achieved by improving their efficiency in daily operations through investment but, again, the impact of EU legislation is critical in this perspective. The EU legislation includes the industrial emissions directive, which requires refineries to meet best available technology benchmarks, and the fuel quality directive, which sets targets for cutting greenhouse gas emissions from fuels. The refining sector is also impacted by EU legislation on renewables, emissions trading, strategic oil stocks, marine fuels, energy efficiency, energy taxation and chemicals.

Future of European refineries cannot definitely be viewed optimistically:
• it is a mature business with majority of generic products in its portfolio, exposing it to price competition,
• logistic burdens do not play in favour of European players since proximity of attractive markets is counterbalanced by distant crude sources,
• EU climate policy drives European refineries energy and environmental costs up to such extreme levels that traditional advantages coming from skilled workforce, advanced infrastructure and cheap capital cannot compensate for this.

It is true that the petroleum products are, at the moment, easily available and cheaper in the rest of the world and that by looking at only the economics, Europe can do without refining and all the problems and burdens connected to the industry. The problem is that the world is much more complex than this and cannot be explained just by classical economics. If more European refineries close, there are bound to be supply security ramifications. There is no doubt that having modern and adequate refining capacity helps Europe preserve its energy security and contributes to a healthier and sustainable economy in the long term.

Conclusions and further developments
The comparative analysis of Croatian and Polish refinery sectors evolution in last 20 years indicated clearly an importance of maintaining national ownership control over key players. Summarizing the Croatian INA’s story the government followed an established recipe for the transition of an old social-
ist industrial enterprises into privately operated commercial businesses. Croatian government:

- found an industry investor from an amicable country,
- achieved a favourable price,
- negotiated clauses regarding investments in Croatian plants thus presumably assuring their further development,
- kept significant shareholdings while passing managerial control into “private hands”.

But the final result became a failure, for the reasons which now are obvious but at the time of the deal were usually fiercely rejected as representing “old fashioned” way of thinking. First of all one has to point out that the whole transaction was in fact not a privatization at all since MOL was a state controlled organization. Instead of becoming a purely business oriented company, creating additional value for its shareholders (like ExxonMobil or Shell to name a few), INA has become a joint-venture between Hungarian and Croatian governments, in which all the key decisions are made by the appointees of the former one. Unfortunately the recognition of a key difference between real privatizations and the transfer of ownership from one state owned company to another is uncommon even today. In Poland a sale of the national telecom TP SA to the state owned France Telecom (now rebranded to Orange) is still considered a privatization in nearly all statistics and official documents.

Secondly, the fact that Hungary and Croatia run quite good relations and are both EU members (although Croatia only recently joined it had been considered as an “obvious candidate” for a long time) did not provide any guarantee that they would share the same view on INA’s strategy and development. After all they are independent countries and have sovereign rights to define their energy policy according to their own believes. Such situation cannot be considered as unique since it resembles the problems the Czech Republic expresses in case of their national oil company: Unipetrol. Consequently it was very risky to assume MOL would pursue Croatian national interests. In fact they have followed their own, not against Croatia but simply in their own favour.

Thirdly, governments of post-communist countries have been very reluctant to recognize the fact that one cannot sell an asset and still control it, even in certain selected aspects. The buyer’s management allocated investors’ money for the acquisition and is held responsible for the resulting financial consequences. Management’s primary obligation is to its shareholder not to the state that sold the asset. Governments have numerous tools to pursue their interests even without the ownership control but they are usually tacit and need to be developed over a long period. Unfortunately the post-communist countries have proven not to be skilled in such undertakings.

Fourthly, the Croatian government relied on the investments and development clauses of the privatization agreement hoping that they will provide a framework securing INA’s position in the future. This practice has to be evaluated negatively in terms of costs and actual results. Such agreements had to be vague, even if a few projects could be defined precisely, since they refer to the mid- or long-term future. An effective control requires both substantial industry competences and flexibility. Both aspects play in favour of investors and against governments since the industry expertise is within enterprises. In developed market economies governments had been exposed to such challenges and already developed similar competences in their regulatory bodies or agencies. In communist countries, since governments had direct control over the enterprises they did not need it since companies’ experts were at the same time governmental ones. Privatization left governments empty-handed. Hence investors have usually been successful in avoiding obligations they were reluctant to fulfil without nominally breaching contracts.

Finally, INA became a good example of relativness of efficiency notion. MOL management took a comprehensive view of Croatian assets, evaluating projects in consideration of its complete portfolio of assets and markets served. Moreover MOL has always been aware of its responsibility to the government in Budapest. The MOL Group sells 18 million t of refinery products – a slightly higher volume than the capacity of Płock refinery, the key production asset of one of its direct competitors – PKN Orlen. Among industry experts there is a consensus that a minimal capacity allowing a fuel refinery (as opposed to so called speciality plant focusing on some sophisticated products, for example base oils) to be economically viable ranges between 10 and 12 million t/year. It clearly implies that MOL has room for only one such plant and Százhalombatta near Budapest is a definite favourite. Consequently, the efficient approach for
MOL does not include the modernization and development of Croatian units but actually the complete opposite; shutting down at least one of them while marginalizing the role of the other.

Poland initially took the same route as Croatia (and other CEE countries), creating commercial entities based on existing refineries, but from the beginning two differences appeared:

- two separate companies were created (more as an outcome of political tensions than as a result of any profound business analysis),
- the newly created oil companies did not have upstream activities.

Although both of them eventually went public and private investors (mostly financial institutions) acquired substantial shareholdings, the government has maintained a strict control over them. Even though they pursued different strategies with PKN Orlen expanding abroad (acquisition of Czech Unipetrol and Lithuanian Mäžeikų Nafta) and Lotos focusing on capacity expansion in Gdansk and entering upstream activities, both managed keep their national identity and pursued Polish national interests. Certainly these interests could be wrongly defined and inefficiently promoted but this is another story. The final outcome is definitely positive: there are two modern and sizable refineries in the country with a necessary distribution network run by companies which are actively expanding internationally while keeping a strong foothold domestically.

It is important to emphasise that the presented differences did not result, in case of Poland, from a carefully elaborated and executed long term strategy. The real reasons that prevented the sale of refineries are twofold. Firstly, almost for the entire period there has been a strong and visible opposition against privatization, forcing governments to justify the bigger sales. Since the oil companies present an attractive employment opportunity for government supported candidates the loss of control is highly politically unattractive. Secondly, the required price represents a serious hurdle. The political pressure forces any government to demand very attractive commercial terms implying that the compensation, especially in case of PKN Orlen, will have to be really high, exceeding the present market value of its share estimated at $1.5 billion. Any potential buyer should multiply this amount by the factor of four since it would be forced to offer the same price to all the other shareholders. This is a challenging price level for downstream assets in the declining European market.

State ownership of key energy assets should not be viewed as a sole requirement for an efficient energy security policy. It is just a tool, quite common, simple and powerful. Giving up this tool has to be carefully considered and compensating measurements must be made available as well as promptly implementable. It is especially difficult to achieve such competences in a mature business with declining production base. A voluntary contribution of foreign investor to national energy security should not be expected. This was a mistake made by the Croatian government in case of INA as well as Lithuanian and Czech in the PKN Orlen case. Not surprisingly the same approach was adopted by the Polish government authorizing both transactions and also causing substantial problems albeit different in kind.

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ENERGY SECURITY AND ECONOMIC GROWTH IN THE EUROPEAN UNION

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Abstract. Our paper tackles the issue of the European energy security and economic growth. Specifically, it evaluates the relationship between natural gas consumption and economic growth in the European Union (EU). Channels along which natural gas is supplied to the EU energy markets yield dependence from the Russian Federation which presents a threat to the European energy security. Our sample includes panel time series data over the period from 1997 to 2011 for 26 EU countries. Based on neoclassical growth model, we create a multivariate model including gross fixed capital formation and total labor forces of a country as additional explanatory variables. Using panel cointegration tests, we found that there exists a long-run relationship between economic growth, natural gas consumption, labor and capital. In the short-run there is bidirectional causality between natural gas consumption and economic growth. The causality running from economic growth to natural gas consumption is positive. On the other hand, the causality, which runs from natural gas consumption to economic growth, is negative.

Keywords: natural gas consumption, energy security, economic growth, panel data, multivariate model, European Union, Russian Federation


JEL Classifications: N70, O40, Q32, Q43

1. Introduction

The aim of this study is an assessment of energy security and economic growth in the EU. This objective is achieved through the evaluation of the relationship between natural gas consumption and basic macroeconomic indicators. The relationship between economic output and energy consumption has been analyzed in numerous empirical studies. Unfortunately, literature about relationship between economic output and natural gas consumption is quite limited. Nevertheless, many authors are dealing with energy consumption and economic growth, taking individual sources of energy as proxy variables for empirical testing the model. The nexus between energy consumption and economic growth can be tested in two different ways. One of them takes energy consumption at aggregate level. The other one, so
called disaggregate level, compares economic growth and energy consumption given by individual sources of energy (e.g. natural gas, oil, coal and etc.). Also, we can find two kinds of correlation between energy consumption and economic growth. First of them is a correlation in time, when energy consumption changes in the same way like economic growth. The second one is correlation in space, which means that more developed countries also have higher level of energy consumption (Amar 2013). Especially, our investigation will be concentrate on the sample of 28 European Union countries. The sample of EU countries is interested for us, because natural gas is an important source of energy in Europe. While natural gas production in Europe has declining tendency, European dependence on natural gas as well as share of natural gas in electricity production is expected to grow. With growing world energy consumption and scarcity of non-renewable reserves, efficient allocation of energy recourses, in our case natural gas, and energy security of fuels markets, in particular natural gas markets, are taking a significant place in policy of many states of Europe and worldwide.

Given the numerous researches, e.g. Eggho et al. (2011), To et al. (2012) and Śmiech and Papież (2013), Gazda (2010), Asafu-Adjaye (2000) showing the relationship between the basic macroeconomic indicator of economic development of a country such as GDP on the one hand and gross fixed capital formation, and labor forces in a country on the other hand, in the empirical part the effects of these variables are also taken into account. Time series period includes 15 years, which helps us to include in our analysis as largest size of a sample of countries as possible.

2. Natural gas consumption in Europe: a literature review

Natural gas consumption is a crucial aspect for the energetic sectors in most of the European countries. According to Eurostat (2014), in terms of supply of natural gas in 2012-2013, Norway was the country of origin for 23.8% of natural gas imports (with the Intra-EU trade excluded), Russian Federation supplies 17.5%, Qatar 7.1% and Algeria 6.0%. When it comes to natural gas dependency for EU-28, it makes about 65.2% in 2013 (marking a small decrease from 66.0% in 2012) with the Netherlands and Denmark being the only net exporters amongst the EU countries. It has to be noted, however, that for 16 EU Member States, natural gas dependency is higher than 90%. After the hit of financial crisis in 2008 natural gas consumption feel down during the period from 2008 to 2009 in the European Union. But next period from 2009 to 2010 it is observed a sharp growth to previous level of year 2008. After that, during the period from 2010 to 2012 it again extremely fell down, even more than in previous fall.

It can be seen that individual countries differ in their natural gas consumption. For example, countries of Western Europe (Germany, Spain, France, Italy, Netherlands and United Kingdom) have higher natural gas consumption in comparison with other countries of European Union. Belgium, Poland and Romania consume natural gas more or less on the level of 500 thousand terajoules. Other countries consume natural gas on the level below 500 thousand terajoules. Luxembourg, Estonia, Latvia, Lithuania, Sweden and Slovenia consume natural gas in quite low rate. A little bit more natural gas is consumed by Czech Republic, Denmark, Ireland, Greece, Hungary, Austria, Portugal, Slovakia and Finland. Malta and Cyprus do not consume natural gas at all. For Bulgaria there is no data for this time period.

There are some benefits of using natural gas. For example, from environmental point of view, natural gas does not contain solid particles and inorganic materials. The other thing is that natural gas does not increase SO2 emissions in the atmosphere. In comparison with other fuels natural gas produces less CO2 emissions, so it is becoming more advantageous to use for safeguard the environment. Comparing natural gas with renewable and nuclear sources of energy, it is should be pointed that natural gas has wider application than renewable and nuclear forms of energy because of its less necessary investment costs. Also, political decision making initiatives play important role for choosing the source of energy (Homer 1993; Tvaronavičienė 2012; Vosylius et al. 2013; Mačiulis, Tvaronavičienė 2013; Baublys et al. 2014). To et al. (2012) tested the casual relationship between energy consumption and economic growth over the period from 1970 to 2011 in Australia using labor, capital, human capital, and energy consumption as explained variables for Australian gross domestic product (GDP). This multivariate model is based on the production function in order to reduce potential omitted-variable biases. For analyzing short-run and long-run elasticities the bound testing cointegra-
tion approach was used. This cointegration testing is based on the autoregressive distributed lag (ARDL) model. Results suggest that in the long-run as well as in the short-run there is no any causal relationship between energy consumption and economic growth (To et al. 2012).

The same testing of the long-run and short-run elasticities was provided by Bhusal (2010). There had been found bidirectional causality between energy consumption and economic growth in the short-run and long-run using specific statistical techniques, like Augmented Dickey–Fuller (ADF) unit root test, Johansen maximum likelihood test of cointegration and Error Correction Modelling (ECM) (Bhusal 2010).

Studies (e.g. Adhikari and Chen (2013); Belke et al. (2011); Chontanawat et al. (2006); Dilaver et al. (2014); Farhani and Rejeb (2012); Stern (2004, 2010); Stern and Kander (2010); Sickles (2008)) describing relationship between energy consumption and economic growth mostly show an existence of causality whether running from energy consumption to economic growth or, opposite, running from economic growth to energy consumption, or bidirectional causality. It supports the assumption about causal relationship between energy consumption and economic growth. Taking into account these results, in empirical part of this work we will use some statistical techniques, which are going to help investigate the relationship between energy consumption and economic growth in European Union countries with a time series data trend.

3. The data and the model

The aim of the empirical model executed in our paper is a statistical verification of the relationship between natural gas consumption expressed by gross inland natural gas consumption and economic growth of a country measured by GDP per capita. Also relationship between natural gas consumption and economic growth will be verified by including gross inland natural gas consumption, as component of production, into multivariate model, based on production function, on the one side with capital measured by gross fixed capital formation and labor expressed by total labor forces in the country.

Assuming that the dependent variable is influenced by the compilation of independent variables, we have composed the collection of independent variables which captures the local labour market structure. The analysis of causal relationship between natural gas consumption and economic growth will be based on the secondary annual panel data, which was taken for 28 member states of European Union, except Cyprus and Malta, which are not using natural gas. So, the final sample will contain 26 countries. This sample will employ annual time series data from 1997 to 2011 sourced from the Eurostat and World Bank database to estimate the model.

In our study we are using gross domestic product (GDP), which is taken as dependent variable in our model, as a measure of an economic output. GDP is represented per capita in current US dollars. As explanatory variables we take stock of capital, stock of labor and energy consumption. Stock of capital is represented by Gross fixed capital formation in current US dollars, also given as gross domestic fixed investment. Stock of labor is given by total labor force in a country represented by people older than 15 years, who is economically active according to the definition of International Labor Organization. Natural gas consumption has been chosen as a proxy for energy consumption and it is expressed as the final natural gas consumption in thousands of tons of oil equivalent (TOE).

Although, many studies used bivariate and multivariate models to investigate the relationship between energy consumption and economic growth, there is a big advantage of multivariate model, because it helps us to solve the problem of omitted variables (To et al. 2012). Our empirical model is based on neoclassical growth model proposed by Solow (1956) with neoclassical aggregate production function:

\[ Y = F(K, L, A) \]  

where \( Y \) is an aggregate real output, \( K \) – stock of capital, \( L \) – stock of labor, and \( A \) – technology.

According to Olusegun Odularu and Okonkwo (2009) energy is one of the key components of technology. The usage of energy determines technological change, but it should be noticed that it’s not only one determinant factor.

After studying empirical works and theoretical concepts related to our paper’s main topic and taking into account that energy can be taken as a part of technology, we reconstruct our model in the follow-
ing way:

\[ Y = F(K, L, E) \]  \hspace{1cm} (2)

where \( Y \) – Economic output (GDP), \( K \) – Gross fixed capital formation (K), \( L \) – Labor forces (L), and \( E \) – Energy consumption, represented by natural consumption (GC).

### 4. Empirical model estimations and results

The results of Pedroni (1999, 2000) residual cointegration test using four within-dimension based tests and three within-dimension tests between four variables (LGDP, LGC, LK and LL) without deterministic trend, without deterministic intercept or trend, and with deterministic intercept and trend are presented in Table 1. LGDP is taken as dependent variable.

**Table 1.** The results of Pedroni residual cointegration test between LGDP, LGC, LK and LL. LGDP is taken as dependent variable

<table>
<thead>
<tr>
<th>No deterministic trend</th>
<th>Alternative hypothesis: common AR coefficients (within-dimension)</th>
<th>Statistic</th>
<th>Prob.</th>
<th>Weighted Statistic</th>
<th>Prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Panel v-Statistic</td>
<td>0.024</td>
<td>0.49</td>
<td>0.75</td>
<td>0.22</td>
<td></td>
</tr>
<tr>
<td>Panel rho-Statistic</td>
<td>2.88</td>
<td>0.99</td>
<td>2.32</td>
<td>0.98</td>
<td></td>
</tr>
<tr>
<td>Panel PP-Statistic</td>
<td>1.84</td>
<td>0.96</td>
<td>0.65</td>
<td>0.74</td>
<td></td>
</tr>
<tr>
<td>Panel ADF-Statistic</td>
<td>-0.96</td>
<td>0.16</td>
<td>-4.15</td>
<td>0.0000</td>
<td></td>
</tr>
</tbody>
</table>

| Alternative hypothesis: individual AR coefficients (between-dimension) |
|-----------------------------------------------|-----------------|
| Statistic | Prob. |
| Group rho-Statistic | 4.43 | 1.00 |
| Group PP-Statistic | 0.58 | 0.72 |
| Group ADF-Statistic | -6.63 | 0.0000 |

<table>
<thead>
<tr>
<th>Deterministic intercept and trend</th>
<th>Alternative hypothesis: common AR coefficients (within-dimension)</th>
<th>Statistic</th>
<th>Prob.</th>
<th>Weighted Statistic</th>
<th>Prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Panel v-Statistic</td>
<td>9.64</td>
<td>0.0000</td>
<td>2.39</td>
<td>0.0083</td>
<td></td>
</tr>
<tr>
<td>Panel rho-Statistic</td>
<td>3.95</td>
<td>1.00</td>
<td>3.58</td>
<td>0.99</td>
<td></td>
</tr>
<tr>
<td>Panel PP-Statistic</td>
<td>-1.64</td>
<td>0.049</td>
<td>-1.98</td>
<td>0.023</td>
<td></td>
</tr>
<tr>
<td>Panel ADF-Statistic</td>
<td>-4.96</td>
<td>0.0000</td>
<td>-4.93</td>
<td>0.0000</td>
<td></td>
</tr>
</tbody>
</table>

| Alternative hypothesis: individual AR coefficients (between-dimension) |
|-----------------------------------------------|-----------------|
| Statistic | Prob. |
| Group rho-Statistic | 5.66 | 1.00 |
| Group PP-Statistic | -2.73 | 0.0031 |
| Group ADF-Statistic | -5.36 | 0.0000 |

<table>
<thead>
<tr>
<th>No deterministic intercept or trend</th>
<th>Alternative hypothesis: common AR coefficients (within-dimension)</th>
<th>Statistic</th>
<th>Prob.</th>
<th>Weighted Statistic</th>
<th>Prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Panel v-Statistic</td>
<td>-0.60</td>
<td>0.72</td>
<td>-1.93</td>
<td>0.97</td>
<td></td>
</tr>
<tr>
<td>Panel rho-Statistic</td>
<td>2.017</td>
<td>0.97</td>
<td>1.88</td>
<td>0.97</td>
<td></td>
</tr>
<tr>
<td>Panel PP-Statistic</td>
<td>1.60</td>
<td>0.94</td>
<td>0.78</td>
<td>0.78</td>
<td></td>
</tr>
<tr>
<td>Panel ADF-Statistic</td>
<td>-0.24</td>
<td>0.40</td>
<td>-1.93</td>
<td>0.026</td>
<td></td>
</tr>
</tbody>
</table>

| Alternative hypothesis: individual AR coefficients (between-dimension) |
|-----------------------------------------------|-----------------|
| Statistic | Prob. |
| Group rho-Statistic | 4.27 | 1.00 |
| Group PP-Statistic | 2.33 | 0.99 |
| Group ADF-Statistic | -3.85 | 0.0001 |

*Source:* Own results
Statistics based on common and individual coefficients without deterministic trend suggests that two of eleven tests reject the null hypothesis about non-cointegrated relationship between variables. Taking into account deterministic intercept and trend, eight of eleven tests reject the null hypothesis about non-cointegrated relationship between variables. Two of eleven tests can reject the null hypothesis about non-cointegrated relationship between variables without deterministic intercept or trend. The results of Kao (1999) residual cointegration test between four variables (LGC, LGDP, LK and LL) are presented in Table 2. In this case, LGDP is taken as dependent variable.

**Table 2.** The results of Kao residual cointegration test between LGDP, LGC, LK and LL. LGDP is taken as dependent variable

<table>
<thead>
<tr>
<th>Kao Residual Cointegration Test</th>
<th>t-Statistic</th>
<th>Prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>ADF</td>
<td>-6.55</td>
<td>0.0000</td>
</tr>
<tr>
<td>Residual variance</td>
<td>0.0032</td>
<td></td>
</tr>
<tr>
<td>HAC variance</td>
<td>0.0049</td>
<td></td>
</tr>
</tbody>
</table>

**Augmented Dickey-Fuller Test Equation**

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>Std. Error</th>
<th>t-Statistic</th>
<th>Prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>RESID(-1)</td>
<td>-0.29</td>
<td>0.034</td>
<td>-8.57</td>
<td>0.0000</td>
</tr>
<tr>
<td>D(RESID(-1))</td>
<td>0.52</td>
<td>0.050</td>
<td>10.43</td>
<td>0.0000</td>
</tr>
<tr>
<td>R-squared</td>
<td>0.24</td>
<td>Mean dependent var</td>
<td>0.014</td>
<td></td>
</tr>
<tr>
<td>Adjusted R-squared</td>
<td>0.24</td>
<td>S.D. dependent var</td>
<td>0.067</td>
<td></td>
</tr>
<tr>
<td>S.E. of regression</td>
<td>0.058</td>
<td>Akaike info criterion</td>
<td>-2.81</td>
<td></td>
</tr>
<tr>
<td>Sum squared resid</td>
<td>1.16</td>
<td>Schwarz criterion</td>
<td>-2.79</td>
<td></td>
</tr>
<tr>
<td>Log likelihood</td>
<td>478.16</td>
<td>Hannan-Quinn criter.</td>
<td>-2.80</td>
<td></td>
</tr>
<tr>
<td>Durbin-Watson stat</td>
<td>1.83</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Source: Own results*

The results of Kao residual cointegration test based on Augmented Dickey-Fuller statistics suggest that there is cointegrated relationship between LGDP, LGC, LK and LL on significance level of 5%. The results of our empirical estimation are represented in Table 3 that shows the results of Error Correction Model (ECM) based on the two steps Engle and Granger (1987) procedure between four variables (GDP, capital, labor and natural gas consumption). Each of the relationship is based on the equations represented above.

The results for the model where GDP is dependent variable indicate that in the short-run only labor has positive and statistically significant impact on economic growth, 1% increase of labor increases GDP by 0.43%. Both, natural gas consumption and capital have negative and statistically significant impact on economic growth, 1% increase of natural gas consumption increases GDP decreases GDP by 0.02%, and 1% increase of capital decreases GDP by 0.46%. In the long-run we can see unidirectional causal relationship running from capital, labor and natural gas consumption to GDP. Natural gas consumption responds to deviations from long-run equilibrium at 1% level of significance.
Table 3. The results of causal relationship between GDP, capital, labor and natural gas consumption

<table>
<thead>
<tr>
<th>Dependent variable</th>
<th>Sources of causality</th>
<th>Short-run</th>
<th>Long-run</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>∆LNGDP</td>
<td>∆LNK</td>
<td>∆LNL</td>
</tr>
<tr>
<td>∆LNGDP</td>
<td>-</td>
<td>-0.467732</td>
<td>0.432817</td>
</tr>
<tr>
<td>(13)</td>
<td>(0.0000)</td>
<td>(0.0000)</td>
<td>(0.0093)</td>
</tr>
<tr>
<td>∆LNK</td>
<td>1.385251</td>
<td>-</td>
<td>1.520729</td>
</tr>
<tr>
<td>(14)</td>
<td>(0.0000)</td>
<td>(0.0000)</td>
<td>(0.0008)</td>
</tr>
<tr>
<td>∆LNL</td>
<td>0.000731</td>
<td>0.006865</td>
<td>-</td>
</tr>
<tr>
<td>(15)</td>
<td>(0.9206)</td>
<td>(0.3772)</td>
<td>(0.0013)</td>
</tr>
<tr>
<td>∆LNGC</td>
<td>0.135580</td>
<td>0.075212</td>
<td>0.340463</td>
</tr>
<tr>
<td>(16)</td>
<td>(0.0000)</td>
<td>(0.0000)</td>
<td>(0.0000)</td>
</tr>
</tbody>
</table>

Source: Own results

The results of the next model where capital is represented as dependent variable suggest that in the short-run all independent variables, GDP, labor and natural gas consumption have positive and statistically significant impact on gross fixed capital formation, 1% increase of GDP increases gross fixed capital formation by 1.38%, 1% increase of total labor forces increases and natural gas consumption increases gross fixed capital formation by 1.52%, and 0.02% respectively. In the long-run we can see unidirectional causal relationship running from capital, labor and natural gas consumption to GDP.

The model where labor is taken as dependent variable shows that both, GDP and capital, doesn’t have statistically significant impact on total labor forces, even if coefficients of the relationship are positive. On the other hand, natural gas consumption has negative and statistically significant impact on total labor forces, 1% increase of natural gas consumption decrease total labor forces by 0.009%. Also, there is unidirectional causality, which runs from GDP, capital and natural gas consumption to total labor forces at 1% of significance.

If we look at the model with natural gas consumption as dependent variable, we will see that GDP, labor and capital have positive and statistically significant impact on natural gas consumption in the short-run. 1% increase of GDP increases natural gas consumption by 0.13%, 1% increase of capital leads to increase of natural gas consumption by 0.075%, and 1% increase of labor increases natural gas consumption by 0.34% respectively. In the long-run there is unidirectional causal relationship, which runs from GDP, capital and labor to natural gas consumption. GDP responds to deviations from long-run equilibrium at significance level of 1% of the error correction term.

Conclusions and discussions

Based on the estimation of our econometric model, we were able to find that there exists long-run relationship between economic growth, natural gas consumption, labor and capital. In the short-run there is bidirectional causality between natural gas consumption and economic growth. The causality running from economic growth to natural gas consumption is positive, in other words, increase of GDP by 1% leads to increase of natural gas consumption by 0.13%. Surprisingly, the causality, which runs from natural gas consumption to economic growth, is negative. Increase of natural gas consumption by 1% leads to decrease of GDP by 0.02%.

As one can see, growing economic output in European Union countries requires more natural gas for maintaining the sustainable economic growth. Additional natural gas consumption with growing production need more investments for building infrastructure of processing natural gas terminals and delivery pipelines for transmission natural gas to consumers. On the other hand, one clearly sees that the increase of natural gas consumption leads to the decrease of economic growth. The same results were provided
by Ucan et al. (2014) for 15 European developed countries. He found that non-renewable energy consumption leads to decrease of economic growth. The other thing is that consumption of renewable energy increases economic growth. The results of estimated model are dependent on the kind of energy, which is included into the model, and resources of its energy.

As was pointed above, we can find an effort of European countries with developed economic systems to reduce greenhouse gas emissions. In that case, Governments and policy makers should focus on renewable sources of energy, like, e.g. solar energy, wind power and hydropower. Also, as points Nwosa (2013), environmental costs should be taken into account when Government provides some energy consumption policies. It is particularly important if energy consumption has impact on economic growth (Kasperowicz 2011). But if this influence is absent, then implementation of these energy conservation policies will not have negative effect on economic development of a state. All these facts suggest that natural gas will remain an important source of energy for European countries in next years.

The role of natural gas on European market also can be viewed in terms of dependence of the majority of the European Union countries on supplies of natural gas from Russian Federation. Market power of Russian Federation on European natural gas market can harm European energy security. Possible solution of this problem lays in diversification of natural gas suppliers. Besides supply from the Russian Federation, European Union countries should increase presence of other potential players on its market, e.g. possible supply from Caspian region countries. It should not be forgotten about political aspect of Russian Federation’s influence. The gas dispute between Russian Federation and Ukraine in years 2006 and 2009 clearly shows possible risks. Also in future we can expect a creation of new cartels between suppliers of natural gas. As a result, possible changes in European energy security will need more time. Effectiveness of their application will be seen in the long-term perspective.

As policy implications for further investigations about this topic, we would recommend analyzing how the results can change taking into account comparison between different sectors economy. For example, it would be interesting to compare relationship between economic growth and natural gas consumption in industrial and household sectors with its possible further dividing in some subsectors. Also, it is possible to try to find time series sample for more years and use not annual, but quarterly data to get stronger causal relationship. With growing usage of renewable resources in European countries, it will be good to include into the model impact of renewable sources of energy.

Knowing of natural gas consumption can help us in determination of natural gas prices volatility or if we are dealing with long-term natural gas contracts. Also it reduces uncertainty about future demand of natural gas. For governments, energy companies and financial institutions it represents opportunity for best realization of investment projects. The better managing of demand and supply and more efficient usage of natural gas in total economy as well as in different sectors of economy will be profitable for sustainable economic development of European countries.

References


ARE THE FOREIGN CONTROLLED FIRMS MORE ENVIRONMENTALLY SUSTAINABLE THAN DOMESTICALLY CONTROLLED ONES?

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Abstract. Do foreign controlled firms exhibit a different environmental performance from domestically controlled ones for ‘developed countries’? The aim of this paper is to examine whether foreign firms are more environmentally sustainable than their domestic counterparts, i.e., the Pollution Halo Hypothesis generally analysed in developing countries. By using firm-level panel data over the time period 2002-2006, this study explores the differences in environmental performance—measured by air and water pollution emissions—of Italian dirty-firms with different types of ownership: Foreign multinational enterprises (FMNEs), National multinational enterprises (NMNEs) and Domestic enterprises (DOMESTICs). Econometric results show that foreign ownership does not influence air and water pollution emissions, suggesting the lack of evidence of a Pollution Halo Hypothesis in developed countries.

Keywords: air pollution, environmental performance, foreign ownership, pollution halo hypothesis, water pollution, sustainability

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JEL Classification: Q53, Q56, F23, F21

1. Introduction

Over the last twenty years, on an international scale, various agreements have been introduced for the protection of the environment, especially in industrialised countries. The commitment to these agreements led to the adoption of increasingly strict environmental regulation that has resulted in an increase of environmental constraints. A major concern arising from the adoption of more stringent environmental regulation relates to the international competitiveness of domestic firms. In fact, the firms that hold a comparative advantage in production with a high environmental impact may be affected by the high costs incurred in order to comply with the more stringent environmental standards. The environmental constraints are, therefore, considered a source of comparative disadvantages for the pollution-intensive goods. It follows that firms having comparative advantages in goods with a high environmental impact may find it convenient to shift production to countries with more lax (or absent) environmental regulation, damaging the environmental quality in the host countries.

The hypothesis that explains the effects of international trade on environmental regulation and the choice of production location is known as the Pollution Haven Hypothesis (PHH). Part of the literature that has analysed the PHH has been developed since the 1990s and can be classified in two streams
of investigation. A first group of studies estimated the effects of environmental protection on the reduction of comparative advantage in goods with high environmental impact (Swann et al. 1996; Van Beers and Van den Bergh 1997; Xu 2000a, b; Harris et al. 2002; Copeland and Taylor 2003, 2004; Ederington and Minier 2003; Michida and Nishikimi 2007; Levinson and Taylor 2008). A second group of studies analysed the increase of foreign direct investment (FDI) determined by the choice of locating the production of more polluting goods in countries where environmental regulation is lax or absent (List and Co 2000; Neumayer 2001; Smarzynska and Wei 2001; Xing and Kolstad 2002; Keller and Levinson 2002; Fredriksson et al. 2003; Ljungwall and Linde-Rahr 2005; Hanna 2010; Petrović-Randjelović 2007).

There is, however, a contrary view, the Pollution Halo Hypothesis (PHaH), based on the assumption that FDI are vehicles of technology transfer from developed to developing countries and that the foreign-owned enterprises, being characterised by medium to large size, higher scientific and technological knowledge and implementing environmentally sustainable practices, are less polluting than domestic firms. Therefore, a progressively more stringent environmental law does not discourage foreign investments in countries with high environmental costs and, moreover, the presence of FDI causes a positive effect on the environmental quality in the host country (Zarsky 1999; Eskeland and Harrison 2003; Cole et al. 2008).

The PHaH is justified by the fact that the multinational enterprises generally use cleaner technologies and have more sophisticated environmental management systems compared to the national environmental regulation. These companies, which usually hold large market shares in the home countries, tend to adopt the same technologies in affiliated enterprises in order to meet the demand of consumers who are more sensitive toward the environment. This hypothesis is confirmed by some statistics from Italy. In fact, in the last twenty years, there has been an inflow of foreign investment in Italy, mainly coming from other developed countries such as the United States and other Western European countries. Considering the period 1990-2007, the number of Italian manufacturing firms with foreign participation has increased by 4.2 per cent for investments in subsidiaries and by 4.3 per cent for total participation (ICE-Print 2008). During the same period, the pollutants discharged into the air and water decreased. Emissions of sulphur oxides (SO\textsubscript{X}) and carbon monoxide (CO) were decreased respectively by 81 and 71 per cent, nitrogen oxides (NO\textsubscript{X}), non-methane organic compounds (NMVOC) and ammonia (NH\textsubscript{3}) were respectively decreased by 4.38 and 10 per cent. An improvement in quality has been observed even regarding water: in 2007, 48 per cent of monitored sites were in excellent and good ecological states (ISPRA 2008).

The aim of this paper is to investigate whether the reduction of pollution occurring in Italy in recent years is due not only to more efficient and effective environmental regulation with respect to several international agreements to which this country has joined but also to expansion in the presence of ‘cleaner’ foreign firms. The present work differs from the previous literature in two innovative aspects. The first concerns the features of the country. Previous studies have analysed the impact of foreign presence on environmental quality in a ‘developed country’. The second is related to the adoption of direct environmental performance measures at firm-level\textsuperscript{1}, such as emissions in the water and in the air.

This paper is organised as follows. After the second part provides a brief review of the theoretical and empirical literature on the relationship between FDI and environment, the third section reports a descriptive analysis of Italian polluting firms. The econometric model will be the presented in the fourth part. The final section draws conclusions and policy implications.

2. Brief review of the theory and empirical literature

Much of the theoretical literature on the relationship between FDI and environmental sustainability adopts an approach based on the analysis of strategic behaviour of governments in the implementation of environmental policies in the presence of FDI (Markusen et al. 1993; Rauscher 1995; Co et al. 2002; Ulph and Valentini 2002; Greake 2003; Kayalica and Lahiri 2005; Dijkstra 2006; De Santis and

\textsuperscript{1} Some authors have used indirect measures of environmental performance such as energy efficiency (Blackman and Wu 1999; Eskeland and Harrison 2003; Cole et al. 2008), the implementation of environmental management systems (Dasgupta et al. 2000; Albormox et al. 2009) and the pollution abatement costs (Hartman et al. 1997).
The theoretical literature exploring the influence of FDI and firm-level characteristics on the level of pollution is limited. Two works are relevant: Dasgupta et al. (2000) and Wang and Jin (2007). The first (Dasgupta et al. 2000) shows that the equilibrium level of pollution is determined by the intersection between the expected marginal penalty schedule—depending on variables such as emissions, environmental regulation, pressure from the local community, type of ownership and trade relations—and the plant’s marginal abatement cost curve including the plant size, the firm size, the process technology vintage, the human resources, and the quality of environmental management as possible determinants. The second work (Wang and Jin 2007) identifies the optimal level of waste by solving an optimisation problem where the firms with different types of ownership (private including foreign participation, state and cooperative) may receive different penalties even with the same pollution discharge.

From the empirical point of view, the topic about FDI and the environmental sustainability is analysed through the effects of environmental regulation on capital movements and the relationship between environmental performance and multinational enterprises. More precisely, the empirical analysis focuses mainly on the role played by environmental regulation in the choice of location of FDI to explain the increased migration of dirty industries to the developing countries (List and Co 2000; Smarzynska and Wei 2001; Xing and Kolstad 2001; Keller and Levinson 2002; Eskeland and Harrison 2003; Cole and Elliott 2005; Waldkirch and Gophinat 2008; Wagner and Timmins 2009; MacDermott 2009). The PHH has been tested concerning the impact of national environmental regulation on FDI flows to one or more host countries, at the aggregate and sectoral level (Xing and Kolstad 2002; Eskeland and Harrison 2003; Cole and Elliott 2005; Hanna 2010; Kirkpatrick and Shimamoto 2008; Dam and Scholtens 2008; Ben Kheder and Zugravu 2008; Elliott and Shimamoto 2008; Wagner and Timmins 2009; MacDermott 2009), and on FDI inflows (List and Co 2000; Keller and Levinson 2002; Millimet and List 2004; Waldkirch and Gopinath 2008).2

The empirical evidence on the relationship between the environment and multinational firms is limited, and the results are controversial (Pargal and Wheeler 1996; Hartman et al. 1997; Blackman and Wu 1999; Eskeland and Harrison 2003; Gallagher 2004; Wang and Jin 2007; Cole et al. 2008; Koop and Tool 2008). In this regard, a first group of work has verified the validity of PHalH and has identified the positive influence of some factors on the level of pollutant emissions, such as the medium-large scale, the high level of scientific knowledge and technology, and the greater sensitivity for environmental protection (i.e., all those characteristics of multinational firms of the DCs) (Cole et al. 2005). Blackman and Wu (1999) can be considered the first work in support of PHalH. The authors show that foreign investments in power generation in China have increased energy efficiency and reduced emission levels. Subsequently, Eskeland and Harrison (2003) find that the presence of foreign firms located in four developing countries3 is positively associated with lower levels of pollution and energy consumption. This framework is also explored by Gallagher (2004), who analyses the emissions resulting from the combustion of energy and by-products during the production process of the manufacturing industry by comparing Mexican firms with corresponding firms in the U.S. in 1984 and 1998. The results find that, on average, the environmental impact of industrial activity in Mexico is much higher than that produced by the U.S.

One last work supporting the positive relationship between environmental performance and foreign ownership is Cole et al. (2008), which shows how some variables such as the firm size, the use of cleaner technologies, productivity, factor intensity and exports produce positive effects on energy consumption for manufacturing enterprises in Ghana. In contrast, a second group of works did not find empirical evidence of a relationship between environmental performance and foreign ownership. Pargal and Wheeler (1996) analyse the manufacturing industry in Indonesia over the period 1989-1990 and estimate the relationship between the biological oxygen demand (BOD) and some economic variables such as the economic sector, the output, the factors of production, the age, the efficiency, and the ownership. By classifying firms according to their type of owner-

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2 This group of works also examines the regional distribution of inflow FDI into a particular country of destination (List and Co 2000; Wang and Wheeler 2000; List 2001; Keller and Levinson 2002; Millimet and List 2004; Smarzynska and Wei 2004; Dean et al. 2009; Ljungwall and Linde-Rahr 2005).

3 Ivory Coast, Morocco, Mexico and Venezuela.
ship in state, private and multinational companies, the authors show that foreign participation does not have a significant effect on the intensity of pollution. Conversely, public ownership appears to be strongly associated with high environmental impact products. Conflicting results have also been achieved by Hartman et al. (1997), who analyse the relationship between the abatement costs and some characteristics of plants such as technology, age, ownership (state, private and multinational), the quality of management and human resources available, relating to 26 companies in four different Asian countries (Bangladesh, India, Indonesia and Thailand) operating in the manufacture of pulp, paper and paper products for 1992. The authors demonstrate that the least environmental impact is positively associated with size and competitiveness and negatively influenced by public ownership; conversely, multinationality, financial activity and the willingness to export do not result in significant effects. The recent work of Koop and Tool (2008) finds a negative relationship between foreign presence and environmental quality. The authors attempt to determine the presence of substantial differences between the firms related to FDI country origins (developing or developed countries). The analysis, in contrast with the previous works about the mining industry and, specifically, to the gold mines (419 observed in the period 1996-2005). Their analysis also focuses on the level of pollution of the old mines controlled by foreign companies, in comparison with their national correspondents. Through the method of Bayesian stochastic frontier, the authors analyse the multiple nature of the output from gold production and the fact that the mines produce huge amounts of waste pollutants.

Some of the main features of the mentioned empirical works (as Pargal and Wheeler 1996; Hartman et al. 1997; Blackman and Wu 1999; Dasgupta et al. 2000; Eskeland and Harrison 2003; Gallagher 2004; Wang and Jin 2007; Koop and Tool 2008; Cole et al. 2008) are shown in Table 1. Following the main literature and its limit related to the host countries type (the PHalH is analysed in developing countries) the present work is to assess the existence of a positive relationship between foreign multinationality and emissions of polluters, relative to firms located in a developed country. In addition, since most of the previous works have used indirect measures of environmental performance (such as energy consumption or energy efficiency, the use of fuel, pollution abatement costs or the amount of waste), this work is based on a direct measure of the amount of pollutants released into the environment (twenty-nine substances emitted into the water and forty into the air). This is possible due to the availability of data at the firm level. The description of the sample under analysis and the econometric model are given in the Table 1.

### Table 1. Previous studies investigating the PHalH

<table>
<thead>
<tr>
<th>Paper</th>
<th>Countries</th>
<th>Period</th>
<th>Sectors</th>
<th>Environmental Variable</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Efficiency</td>
</tr>
</tbody>
</table>

No Evidence of the PHalH

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* Foreign ownership is measured by the authors through the share of capital owned by the foreign firm, while the share of capital owned by regional and national governments is the state-owned.
3. Data description and methodology

3.1. Data Issues

The empirical analysis has been conducted by using firm-level data obtained from the intersection of two databases: the AIDA database (Analisi Informatizzata Delle Aziende) and the Ines Registry. AIDA is a database of Bureau Van Dijk, which provides financial, business and personal data of about 700,000 corporations operating in Italy. The AIDA database collects annual accounts of Italian corporate enterprises and contains information on a wide set of economic and financial variables, such as name, social security number, sector, firm size, firm age, value added, property, equipment and raw materials, in addition to the proprietary nature of the enterprise. By knowing the owner state, the firms are divided in three groups: foreign multinationals (FMNE) (i.e., Italian companies whose ultimate owner is foreigner), national multinationals (NMNE) (i.e., Italian companies with subsidiaries located in foreign countries), and domestic firms (DOMESTIC). The second database is represented by the Ines Registry Inventory of emissions and their sources) from ISPRA (Institute for the Protection and the Environmental Research) (former APAT). The registry collects quantitative information about the releases into the air and water of specific pollutants from major industries and establishments of large capacity (IPPC) on the national territory. It contains information about the name, whole name, social security number, sector of activity, task list with codes IPPC and NOSE, main activity and emissions data in air and in water (pollution, emission value total units measurement, allocation of emissions between the activities and sources of sewage treatment outside). In particular, the regulatory criteria require that an establishment in which one or more activities are carried out, the IPPC (Appendix I Legislative Decree no. 372/99) is required to submit a declaration to INES if at least one pollutant in Table 1.6.2 and 1.6.3 of the Ministerial Decree of 23th November 2001 exceeds the corresponding threshold. From the intersection of the two databases, by aggregating information at firm-level and omitting all observations for which the necessary data are incomplete, an unbalanced panel of about 2,185 observations over the period 2002-2006 is obtained.

3.2. The econometric analysis

In order to analyse the impact of foreign presence in Italian firms on environmental performance, we use a variant of the model proposed by Cole et al. (2008) that environmental quality is a function of foreign ownership and other control variables including firm size, capital intensity, age, total factor productivity and production inputs:

\[ E_i = f(\text{OWNERSHIP}_{it}, X_{it}, \delta_{it}, \mu_j) + \epsilon_{it} \] (1)

In (1), E is the proxy of environmental performance, i.e., the emission of pollutants in water and air; OWNERSHIP means being multinational or not; X is a vector of additional control variables; δ is the time dummy; μ is the dummy ‘industry’ for industry j; and ε is the usual error term. All variables are in logarithm form and are specified in the following way:

E is a direct measure of environmental quality that is the total emissions of the pollutants in the water and in the air. Emissions are expressed in kg/year. For the calculation of the environmental variable, were added emissions of the pollutants listed in Annex I to DM 23/11/2001, by firm, year and environmental sector. Since we expected a different threshold value for

<table>
<thead>
<tr>
<th>Authors</th>
<th>Location</th>
<th>Time Period</th>
<th>Industry (Subsector)</th>
<th>Indicator</th>
</tr>
</thead>
</table>

Source: author
each type of pollutant, emissions have been weighted to the “weight” that each substance has on pollution data from the complement to one of the composition ratio between the threshold value pollutant i-th and the sum of the threshold value of all pollutants.

OWNERSHIP is a qualitative variable that reflects the proprietary nature of the enterprise. To this end, the following dummies are introduced depending on the specifications of the model:

- \( FMNE = 1 \) if the firm is foreign-owned, 0 otherwise.
- \( DOMESTIC = 1 \) if the firm is a multinational, 0 otherwise.
- \( NMNE \) Italian = 1 if the firm has holdings abroad.

The foreign presence is used as a proxy for the degree of access to technology. Since the occurrence of the phenomenon of pollution halo implies that foreign-invested enterprises are less polluting than domestic firms, we expect a negative sign for the FMNE (Pargal and Wheeler 1996; Cole et al. 2008);

AGE: the variable indicating the age of the firm has been used as a proxy for technological innovation. The expected relationship is positive, since the companies most ‘young people’ might be using have the most modern technologies and are cleaner than the ‘older’ companies in which the emissions would increase with advancing age (Hartman et al. 1997) although most of the empirical studies have found that the age of the firm does not produce any effect on the environment (Pargal and Wheeler 1996; Eskeland and Harrison 2003; Cole et al. 2008)

SIZE: indicates the size of the firm measured by the total number of employees (Hartman et al. 1997). The underlying assumption is that the larger companies have a number of potential advantages compared to smaller firms with regard to the introduction of environmental management systems, and as a result would be cleaner than small firms (Cole et al. 2006). The relationship with the emissions is expected to be negative (Cole et al. 2008). KW: measures the intensity of physical capital per worker and is calculated by dividing the stock of physical capital by the number of employees. The expected relationship is positive, because the capital-intensive production processes are typically more dirty, with the result that emissions tend to increase for the more capital-intensive establishment (Copeland and Taylor 2003; Cole and Elliott 2003).

IMM: indicates the amount of tangible assets. The expected negative sign is based on the assumption that firms with more assets are also those most skilled at introducing cleaner technologies and those most likely to adopt environmental management tools in order to meet the obligations imposed by regulation (Cole et al. 2006; Cole et al. 2008).

All estimates are made to include sector and time dummies. We also included dummies for the geographical area through which the country is divided into four main areas: North-West, North-East, Central and South. All economic variables included in the database are expressed in thousands of Euros and were deflated through the price index provided by ISTAT (Italian Institute of Statistics). The analysis covers the period 2002-2006 considering, i.e., the year dating back to the first statements provided by the DM of 26.04.2002. Sixty-six sectors are analysed, classified according to the classification NACE 2002 in the two digits.

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5 Although the AIDA dataset provides information on patents and research, there are many missing data. Consequently, it is preferred to use age as a proxy of technological innovation, as well by Pargal and Wheeler (1996); Cole et al. (2008).

6 Table 3A in the Appendix shows the list and the name of the sectors included in the analysis.
**Table 2.** Test for equality of means

<table>
<thead>
<tr>
<th>Variables</th>
<th>Mean_1</th>
<th>Mean_2</th>
<th>Mean_3</th>
<th>diff_1_2</th>
<th>t</th>
<th>diff_1_3</th>
<th>t</th>
<th>diff_2_3</th>
<th>t</th>
</tr>
</thead>
<tbody>
<tr>
<td>EMI_WATER</td>
<td>12343.78</td>
<td>13493.60</td>
<td>5804.10</td>
<td>-1149.83</td>
<td>-0.24</td>
<td>6538.78</td>
<td>1.56</td>
<td>7688.61</td>
<td>2.53</td>
</tr>
<tr>
<td>EMI_ARIA</td>
<td>6395.45</td>
<td>52460.03</td>
<td>11653.05</td>
<td>-46064.58</td>
<td>-3.47</td>
<td>-5257.60</td>
<td>-1.69</td>
<td>40806.98</td>
<td>8.17</td>
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<tr>
<td>SIZE (employees)</td>
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<td>2156.54</td>
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<td>-1497.70</td>
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<td>1603.01</td>
<td>10568.31</td>
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<td>1238321</td>
<td>-3054938</td>
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<td>-356828</td>
<td>-0.82</td>
<td>2698110</td>
<td>5.18</td>
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</tbody>
</table>

Source: authors’ calculations

Tables 2 and 3 provide a summary of the characteristics of the variables used in the model together with the test of equality of means for the three types of firms. The results of t-tests performed on three groups of firms show that multinational companies, both foreign and domestic, on average emit more pollutants, both in water and in the air, compared to the national non-multinational firms. With regard to economic variables, the tests show that the multinationals are older and larger (in terms of employees) than domestic firms or non-multinationals. In addition, the foreign-owned firms are, on average, less polluting, younger, smaller but more capital-intensive (per worker) than Italian multinationals.

**3.3. The results**

A direct analysis to study the impact of foreign presence on the level of pollution of the companies operating in Italian territory is carried out by estimating the following two equations:

\[
\ln E_{it} = \alpha + \beta_1 \ln AGE_{it} + \beta_2 \ln (AGE)^2_{it} + \beta_3 \ln SIZE_{it} + \beta_4 \ln KW_{it} + \beta_5 \ln IMM_{it} + \delta_{it} + \mu_{it} + \epsilon_{it} \quad (2)
\]

\[
\ln E_{it} = \alpha + \beta_1 \ln AGE_{it} + \beta_2 \ln (AGE)^2_{it} + \beta_3 \ln SIZE_{it} + \beta_4 \ln KW_{it} + \beta_5 \ln IMM_{it} + \delta_{it} + \mu_{it} + \epsilon_{it} \quad (3)
\]

To this end we have employed two types of environmental indicators: emissions in water and those in air. Both equations are estimated both by OLS and the random effects (REM).
Table 4. Determinants of pollutant emissions in water and in air

<table>
<thead>
<tr>
<th></th>
<th>ln_EMI_WATER (1)</th>
<th>ln_EMI_WATER (2)</th>
<th>ln_EMI_AIR (3)</th>
<th>ln_EMI_AIR (4)</th>
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<td>OLS</td>
<td>REM</td>
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<td>-0.224</td>
<td>-0.162</td>
<td>-0.090</td>
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<td>(-0.78)</td>
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<td>(-0.38)</td>
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<td>-1.801</td>
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<td>ln_AGE_sq</td>
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<td>10.175***</td>
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<td>9.933***</td>
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<td>(0.66)</td>
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<td>Yes</td>
<td>Yes</td>
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<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
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<td>0.011</td>
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</table>

Source: authors' calculations

Note: The estimates were made using the White's test for heteroskedasticity
*** statistically significant at the 1% level, ** statistically significant at the 5% level, * statistically significant at the 10% level
t-statistic in round brackets
p-values in square brackets

Table 4 shows the estimates of equation (2) in which are included the two dummies (FMNE and NMNE). For the water quality, the national corporation status has a negative effect on emissions associated with a significance level of 10 per cent (column 2). Column 4 shows, however, that the status of multinational itself produces no effect on air pollution. This result, in line with some previous works (Pargal and Wheeler 1996; Hartman et al. 1997), suggests the lack of validity of the hypothesis that foreign firms are less polluting than domestic firms.

With regard to firm-specific characteristics, the non-linearity of the model (in quadratic form), would indicate that younger companies have a better environmental performance. The expected sign of the variable AGE is positive: the more newly established the companies, the lower the level of emissions. The results, contrary to those expected, indicate that the age of the firm is not significant for the level of emissions. This result is, however, consistent with the work of Pargal and Wheeler (1996) and with Eskeland and Harrison (2003). Specifically, it is supported by Cole et al. (2008) who showed how the age of the firm is a positive determinant if the environmental quality is measured by the consumption of liquid fuel and solids10. As expected, the variables KW and IMM both

10 The authors estimate the relationship between foreign presence and environmental performance through three indirect measures: a first estimate covers the total energy consumption, while in the other two energy consumption is factored in use of fuels (liquid and solid), and use of electricity.
have a significant and positive coefficient to confirm that the intensity of capital contributes to increase of the emissions. The allocation of assets reduces the level of pollution, as firms with more fixed assets are also more adept at introducing cleaner technologies (columns 2 and 4). As concerns the other firm-specific characteristics, the estimates show that the positive sign of the size variable (SIZE), opposite to what was expected, indicates instead that larger firms are more polluting (column 2 and 4); such a relationship could exist in the case of constant returns to scale, that is, when the emissions are proportional to production. As a result, larger companies, producing larger volumes of output compared to smaller firms, emit high levels of pollutants (Cole and Elliott 2005). Also, the implementation of environmental management systems for the reduction of emissions in an enterprise that consists of the coordination of multiple people, businesses with greater dimensions, is more complex and more expensive (Dasgupta et al. 2000).

Table 5. Determinants of pollutant emissions in water

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<th>(2) REM</th>
<th>(3) OLS</th>
<th>(4) REM</th>
<th>(5) OLS</th>
<th>(6) REM</th>
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<td>-0.431*</td>
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<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
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</tr>
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<td>ln_AGE_sq</td>
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<td>(2.73)</td>
<td>(2.06)</td>
<td>(2.85)</td>
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<td>ln_KW</td>
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<td>3.562**</td>
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<td>(1.63)</td>
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<td>(1.64)</td>
</tr>
<tr>
<td>ln_IMM</td>
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<td>Yes</td>
<td>Yes</td>
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<td>0.296</td>
<td>0.296</td>
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</table>

Source: authors’ calculations

Note: The estimates were made using the White’s test for heteroskedasticity
*** statistically significant at the 1% level , ** statistically significant at the 5% level , * statistically significant at the 10% level
t-statistic in round brackets
p-values in square brackets
The results presented above are confirmed by the estimates obtained from the specification of the model proposed by equation (3), respectively, for water and for air, where OWNERSHIP is the proprietary nature of the enterprise (Tables 5 and 6). This variable classifies companies according to their proprietary nature through three dummies: FMNE, if the firm is foreign-owned, Italian NMNE if the firm has holdings abroad and DOMESTIC if the firm is not a multinational corporation.

Table 6. Determinants of pollutant emissions in air

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<th>Dependent Variable: ln_EMI_ARIA</th>
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<th>(3) OLS</th>
<th>(4) REM</th>
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<th>(6) REM</th>
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<td>R²</td>
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</table>

Source: authors’ calculations

Note: The estimates were made using the White’s test for heteroskedasticity
*** statistically significant at the 1% level, ** statistically significant at the 5% level, * statistically significant at the 10% level

t-statistic in round brackets
p-values in square brackets
In this model, the status of a multinational company has a positive and significant at 10 per cent to pollution in water (Table 5, column 4), while no effect is observed in the case of the investee companies and the domestic ones (Tables 5 and 6, columns 2 and 6). As regards the economic variables, the results confirm those obtained with the estimate of equation (2) too: note how the intensity of capital per worker, for the sector of water, is significant at 10 percent, and the positive sign is only for the FMNE (Table 5, column 2).

Conclusions

The considerable expansion of global flows of FDI occurring in the last two decades has been accompanied by a growing interest about its environmental implications. The empirical literature that has analysed the effect of foreign presence on the environmental performance of firms covered only the developing countries, highlighting how the liberalisation of FDI can help to shift, from the country of origin to the host country, cleaner technologies and environmental management systems often derived from more sophisticated types of national environmental regulation. Taking a cue from this limit, the present work has concerned the mechanism by which passive multinationalisation can support or damage the quality of the environment, analysing the case of a developed country, Italy. Specifically, the pollution halo, the hypothesis that foreign firms, adopting the most advanced technologies and more sustainable production methods, are less polluting than domestic firms, has been tested for a sample of about 437 companies on the Italian territory which, in 2002-2006, issued large amounts of pollutants in water and air. In doing so, the companies were divided in relation to the proprietary nature, in foreign multinationals, domestic multinationals and non-multinational firms. The contribution of this paper is twofold. First, it is the first study that analyses the impact on the environmental quality of the proprietary nature of the companies operating in a developed country. Secondly, through analysis at the firm level, we use a direct measure of environmental quality, such as the level of emissions in the water and in the air.

The empirical analysis showed that the presence of foreign control in firms has no effect on environmental quality in the case of Italy. Significant results are obtained instead for the determinants of environmental indicators within the firm as the intensity factor, the allocation of fixed asset and firm size: the larger companies that use more capital than labour are the most polluting. Conversely, companies with greater assets are the cleanest.

The invalidity of PHalH in the case of a developed country is the main result obtained in this work. However, the analysis shows the proposed limit on the non-identification of the country of origin and/or destination of FDI; it does not allow distinguishing multinational firms from developed countries to those originating from least developed countries. In fact, the factors associated with the activity of multinationalisation (active and passive) that positively affect the environmental performance of a company concern environmental regulation, which is closely linked to the geographical origin of foreign investment, as well as the size of the company, the intensity of production factors and the scientific and technological knowledge. For this reason, we propose to enrich the present research with future studies, including information regarding the origin of FDI, making it possible to identify those firms that are typically newer, more clean and equipped with the best technologies and environmental management systems, often resulting from more stringent environmental regulation. These companies, which belong to the developed countries and which usually hold significant market shares in the countries of origin, are, in fact, more sensitive to demand coming from green consumers and could use FDI as a vehicle for the dissemination of the best production techniques in the world.
APPENDIX

Table 1A. List of pollutants in water to be reported if threshold value is exceeded

<table>
<thead>
<tr>
<th>Pollutants Identification</th>
<th>Thresholds water in kg/yr</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1 – Nutrients</strong></td>
<td></td>
</tr>
<tr>
<td>Nitrogen Total - Nitrogen as N</td>
<td>50 000</td>
</tr>
<tr>
<td>Phosphorus Total - Phosphorus as P</td>
<td>5 000</td>
</tr>
<tr>
<td><strong>2 - Metals and compounds</strong> (inorganic and organic compounds, expressed as arsenic elementary)</td>
<td></td>
</tr>
<tr>
<td>Arsenic (As) and its compounds Total</td>
<td>5</td>
</tr>
<tr>
<td>Cadmium (Cd) and its compounds Total</td>
<td>5</td>
</tr>
<tr>
<td>Chromium (Cr) and compounds Total</td>
<td>50</td>
</tr>
<tr>
<td>Copper (Cu) and compounds Total</td>
<td>50</td>
</tr>
<tr>
<td>Mercury (Hg) and its compounds Total</td>
<td>1</td>
</tr>
<tr>
<td>Nickel (Ni) and compounds Total</td>
<td>20</td>
</tr>
<tr>
<td>Lead (Pb) and its compounds Total</td>
<td>20</td>
</tr>
<tr>
<td>Zinc (Zn) and compounds Total</td>
<td>100</td>
</tr>
<tr>
<td>Selenium (Se) and compounds Total</td>
<td></td>
</tr>
<tr>
<td><strong>3 - Chlorinated organic substances</strong></td>
<td></td>
</tr>
<tr>
<td>Dichloro-1, 2 (DCE) Total</td>
<td>10</td>
</tr>
<tr>
<td>Dichloromethane (DCM) Total</td>
<td>10</td>
</tr>
<tr>
<td>Chloralkanes (C10-13) Total</td>
<td>1</td>
</tr>
<tr>
<td>Hexachlorobenzene (HCB) Total</td>
<td>1</td>
</tr>
<tr>
<td>Hexachlorobutadiene (HCBD) Total</td>
<td>1</td>
</tr>
<tr>
<td>Hexachlorocyclohexane (HCH) Total</td>
<td>1</td>
</tr>
<tr>
<td>Pentachlorobenzene Total</td>
<td></td>
</tr>
<tr>
<td>Halogenated organic compounds Total (expressed as AOX)</td>
<td>1 000</td>
</tr>
<tr>
<td><strong>4 - Other organic compounds</strong></td>
<td></td>
</tr>
<tr>
<td>Benzene, toluene, Ethylbenzene, xylene Total (expressed as the sum of the individual compounds)</td>
<td>200</td>
</tr>
<tr>
<td>Brominated diphenyl ether Total (expressed as bromine Br)</td>
<td>1</td>
</tr>
<tr>
<td>Organotin compounds Total (expressed as tin Sn)</td>
<td>50</td>
</tr>
<tr>
<td>Polycyclic aromatic Hydrocarbons Total (sum of 6 PHA Borneff)</td>
<td>5</td>
</tr>
<tr>
<td>Phenols Total (expressed as C)</td>
<td>20</td>
</tr>
<tr>
<td>Nonylphenol Nonylphenol ethoxylate and related substances</td>
<td></td>
</tr>
<tr>
<td>Total organic carbon expressed as C or COD / 3</td>
<td>50 000</td>
</tr>
<tr>
<td><strong>5 - Other compounds</strong></td>
<td></td>
</tr>
<tr>
<td>Chloride Total (expressed as Cl)</td>
<td>2 000 000</td>
</tr>
<tr>
<td>Canide Total (expressed as CN)</td>
<td>50</td>
</tr>
<tr>
<td>Fluoride Total (expressed as F)</td>
<td>2000</td>
</tr>
</tbody>
</table>

Source: Ines Registry
Table 2A. List of pollutants in air to be reported if threshold value is exceeded

<table>
<thead>
<tr>
<th>Pollutants Identification</th>
<th>Threshold value kg/yr</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1 – Conventional and greenhouse gases</strong></td>
<td></td>
</tr>
<tr>
<td>Methane (CH4)</td>
<td>Total</td>
</tr>
<tr>
<td>Carbon monoxide (CO)</td>
<td>Total</td>
</tr>
<tr>
<td>Carbon dioxide (CO2)</td>
<td>Total (according to published guidelines used by the IPCC in 1996 UNFCCC that exclude CO2 emissions from biomass and bunkers)</td>
</tr>
<tr>
<td>Hydrofluorocarbons (HFCs)</td>
<td>Total (sum of: HFC-23, HFC-32, HFC-41, HFC-43-10mee, HFC-125, HFC-134, HFC-134a, HFC-152a, HFC-143, HFC-143a, HFC-227ca, HFC-233fa, HFC-245ca)</td>
</tr>
<tr>
<td>Nitrous oxide (N2O)</td>
<td>Total</td>
</tr>
<tr>
<td>Ammonia (NH3)</td>
<td>Total</td>
</tr>
<tr>
<td>Non-methane volatile organic compounds (NMVOC)</td>
<td>Total volatile organic compounds except methane</td>
</tr>
<tr>
<td>Oxides of nitrogen (NOx)</td>
<td>Sum of nitric oxide (NO) and nitrogen dioxide (NO2), expressed as NO2</td>
</tr>
<tr>
<td><strong>2 - Metals and compounds</strong></td>
<td></td>
</tr>
<tr>
<td>Arsenic (As) and its compounds</td>
<td>Total (inorganic and organic compounds, expressed as arsenic elementary)</td>
</tr>
<tr>
<td>Cadmium (Cd) and its compounds</td>
<td>Total (inorganic and organic compounds, expressed as cadmium elementary)</td>
</tr>
<tr>
<td>Chromium (Cr) and compounds</td>
<td>Total (inorganic and organic compounds, expressed as chromium elementary)</td>
</tr>
<tr>
<td>Copper (Cu) and compounds</td>
<td>Total (inorganic and organic compounds, expressed as copper elementary)</td>
</tr>
<tr>
<td>Mercury (Hg) and its compounds</td>
<td>Total (inorganic and organic compounds expressed as elemental mercury)</td>
</tr>
<tr>
<td>Nickel (Ni) and compounds</td>
<td>Total (inorganic and organic compounds expressed as elemental nickel)</td>
</tr>
<tr>
<td>Lead (Pb) and its compounds</td>
<td>Total (inorganic and organic compounds, expressed as lead elementary)</td>
</tr>
<tr>
<td>Zinc (Zn) and compounds</td>
<td>Total (inorganic and organic compounds expressed as elemental zinc)</td>
</tr>
<tr>
<td>Selenium (Se) and compounds</td>
<td>Total (inorganic and organic compounds expressed as elemental selenium)</td>
</tr>
<tr>
<td><strong>3 - Chlorinated organic substances</strong></td>
<td></td>
</tr>
<tr>
<td>Dichloro-1, 2 (DCE)</td>
<td>Total</td>
</tr>
<tr>
<td>Dichloromethane (DCM)</td>
<td>Total</td>
</tr>
<tr>
<td>Hexachlorobenzene (HCB)</td>
<td>Total</td>
</tr>
<tr>
<td>Hexachlorocyclohexane (HCH)</td>
<td>Total</td>
</tr>
<tr>
<td>P-dioxins (PCDDs)</td>
<td>Expressed as total Teq</td>
</tr>
<tr>
<td>Pentachlorophenol (PCP)</td>
<td>Total</td>
</tr>
<tr>
<td>Tetrachloroethylene (PER)</td>
<td>Total</td>
</tr>
<tr>
<td>Tetrachloromethane (TCM)</td>
<td>Total</td>
</tr>
<tr>
<td>Polychlorinated biphenyls (PCBs)</td>
<td>Total</td>
</tr>
<tr>
<td>+ Polidiclorobenzofurani (PCDF)</td>
<td>Total</td>
</tr>
<tr>
<td>Trichlorobenzes (TCB)</td>
<td>Total</td>
</tr>
<tr>
<td>Trichloroethane-1, 1,1 (TEC)</td>
<td>Total</td>
</tr>
<tr>
<td>Trichloroethylene (TRI)</td>
<td>Total</td>
</tr>
<tr>
<td>trichloromethane</td>
<td>Total</td>
</tr>
</tbody>
</table>
Myriam, Anna Scaringelli
Are the foreign controlled firms more environmentally sustainable than domestically controlled ones?

<table>
<thead>
<tr>
<th>4 - Other organic compounds</th>
<th>Total</th>
<th>1 000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Benzene (C6H6)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Polycyclic aromatic hydrocarbons (PAHs)</td>
<td>Sum of 6 IPA Borneff</td>
<td>50</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>5 - Other compounds</th>
<th>Total</th>
<th>10 000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chlorine and inorganic compounds</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fluorine and inorganic compounds</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hydrogen cyanide</td>
<td>Expressed as total HCN</td>
<td>200</td>
</tr>
<tr>
<td>PM</td>
<td>Total</td>
<td>50 000</td>
</tr>
<tr>
<td>PM10</td>
<td>Total particulate matter with a diameter &lt;10μm (within the meaning of Council Directive 1999/30/EC of April 22, 1999)</td>
<td>50 000</td>
</tr>
</tbody>
</table>

**Table 3A. Correlation Matrix**

<table>
<thead>
<tr>
<th></th>
<th>FMNE</th>
<th>NMNE</th>
<th>AGE</th>
<th>AGE _sq</th>
<th>SIZE</th>
<th>KW</th>
<th>IMM</th>
</tr>
</thead>
<tbody>
<tr>
<td>FMNE</td>
<td>1.000</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>NMNE</td>
<td>-0.165</td>
<td>1.000</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AGE</td>
<td>0.062</td>
<td>0.172</td>
<td>1.000</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AGE _sq</td>
<td>0.054</td>
<td>0.161</td>
<td>0.910</td>
<td>1.000</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SIZE</td>
<td>-0.016</td>
<td>0.339</td>
<td>0.000</td>
<td>-0.033</td>
<td>1.000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>KW</td>
<td>-0.012</td>
<td>-0.038</td>
<td>-0.063</td>
<td>-0.037</td>
<td>-0.027</td>
<td>1.000</td>
<td></td>
</tr>
<tr>
<td>IMM</td>
<td>-0.033</td>
<td>0.132</td>
<td>-0.089</td>
<td>-0.041</td>
<td>0.4202</td>
<td>0.036</td>
<td>1.000</td>
</tr>
</tbody>
</table>

**Source:** Ines Registry

References


Smarzynska, B.K.; Wei, S.J. 2001. Pollution havens and foreign di-
Are the foreign controlled firms more environmentally sustainable than domestically controlled ones?


Xu, X. 2000a. International trade and environmental policy; how effective is ‘eco-dumping’?, *Economic Modelling* 17: 71–90. DOI: 10.1016/S0264-9993(99)00021-8


IN-HOUSE PROCUREMENT EXCEPTION: THREAT FOR SUSTAINABLE PROCEDURE OF PUBLIC PROCUREMENT?

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Abstract: The article analyses an in-house procurement concept in the contexts of scientific doctrine, substantive law and legal practice. The Directive 2014/24/EU of the European Parliament and of the Council of 26 February 2014 on public procurement and repealing Directive 2004/18/EC is discussed in the part of provisions regulating cases where a public contract between public entities is not a subject to public procurement procedures. In addition, statistical data of in-house procurements in Lithuania are presented and threats of in-house procurement concept application as well as possibilities of improvement thereof are assessed.

Keywords: sustainability, corruption, in-house procurement, public procurement

Reference to this paper should be made as follows: Kanapinskas, V.; Plytnikas, Ž.; Tvaronavičienė, A. 2014. In-house procurement exception: threat for sustainable procedure of public procurement?. Journal of Security and Sustainability Issues 4(2): 147–158. DOI: http://dx.doi.org/10.9770/jssi.2014.4.2(4)

JEL Classifications: K10

1. Introduction

Sustainability issues in public procurement can be presented as well known and widely discussed topic. Most common approach to this issue can be disclosed by analysing three core aspects: the best meet of the contracting authority's needs, the lowest total cost over the lifetime of the product, the sensitivity to the environment, and use social impact tools through acquisitions (Vasiliūnaitė 2014). In general, the concept of sustainable public procurement may be defined as the acquisition most consistent with the needs of the contracting authority that is actively directed to ensure the economic, social and environmental balance (Tvaronavičienė 2012). Still sustainability issues in this field cannot be restricted by understanding public procurement as a tool for stimulation of some socially or environmentally oriented needs of society. Another side of sustainability in public procurement is a necessity to guarantee transparency and competition during the procedures of governmental procurements. It can be called sustainability in procurement procedure. Public sector concentrate in its hand huge purchasing power, what opens the questions of private and public interest conflict and corruption. Sustainable public procurement in this approach may be understood as a process which provides equal opportunities and high level of competition for all market players as well as preserves necessity of transparency and accountability of purchasing authorities decisions. This area in temporary world is a high-profile topic both in legal doctrine and economics. In this article, one of the most important component of sustainable procedure of public procurement, i.e. in-house procurement exception will be discussed.

The public procurement law is apparently one of the
most particularly regulated field in the legal system of the European law. Besides the provisions of substantive law, interpretation and equitable construction thereof that is commonly used by the ECJ in its practice, is also essential. Notably, in the event of in-house procurement, the first signs of such exception to public procurement were born out of ECJ case-law and their development and extensive use forced transferring them to the substantive law, i.e. directives on public procurement. It is to be noted that this was done as recently as in 2014. This topic continues to appear in the spotlight of public procurement law specialists scientists and theorists; and institutionalisation of this concept on regulatory level still has not eliminated its doubtfulness. In spite of the comprehensive case-law of the ECJ, in recent decades, criteria and conditions for exception to general public procurement procedures have been argued controvertially within the EU authorities and member states. Application of each exception to public procurement is questionable as deviations from the general rules often create preconditions for violations of such procurement principles as transparency, accountability, openness, and equality of suppliers’ rights. This also applies to in-house procurement exception, because its use may give rise to corruption, non-transparent purchasing, threaten procurement efficiency and fair competition. In-house procurement essentially eliminate competition which is among fundamental grounds of the EU public procurement law. Competition’s necessity and benefits for public procurement is beyond doubt because only competition enables suppliers to emulate each other’s strengths and to fight for the market, which means lower prices for goods and services and higher quality. Basically only competition within public procurement can ensure effective use of public funds.

It should be noted that in spite of difficulty and relevance of the situation, threats of in-house procurement and the concept’s improvement feasibility have not been extensively analysed in legal science. The following foreign scientists that analysed individual cases of the ECJ practice should be mentioned: Pedersen, Olsson (2010), Birkelund (2010), Cintioli (2014), Burgi and Koch (2012), Perin and Casalini (2009), Hausmann and Queisner (2013) etc. It should be emphasized that all these works for the most part describe and interpret the ECJ’s case-law, but do not examine the necessity and the benefits of in-house procurement as well as the threat thereof to sustainability of public procurement procedures. As for Lithuanian law-scholars, doc.dr. Soloveičikas should be mentioned. The scientist investigated the concept of in-house procurement as early as in 2009 when the concept had not yet been accepted in Lithuanian and the EU substantive law. Dr. Soloveičikas proposed to introduce the concept of in-house procurement to the substantive law of the Republic of Lithuania; this was basically done in 2010. Although the concept has been continuously improved in order to prevent possible abuse of in-house procurement exception, however the related laws and application thereof in the Republic of Lithuania has not been considered so far. This study will deepen the awareness of the issue and complement the public procurement law science by the new knowledge and insights. From a practical point of view, the investigation could be used in the formulation and implementation of policy in the field of public procurement, as well as for the improvement of legal regulation of the concept of in-house procurement.

The aim of the study is to analyse the concept of in-house procurement in public procurement law as well as to determine feasibility of the improvement of its legal regulation in the Republic of Lithuania. The object of the study is an interface of the legal regulation of in-house procurement concept and the practical implementation thereof in the view of promotion of fair competition and rational use of public funds.

In the study, the theoretical research methods of systematic analysis, analysis of documents, observation, and generalisation as well as comparative methods have been applied. The method of document analysis was used in order to obtain the information, to qualitatively investigate scientific publications of social sciences, various laws, and legal practice documents relating to in-house procurements. The qualitative analysis of the documents is based on an intuitive understanding and summarising of the content of the documents as well as the logical conclusion. One of the authors worked for 4 years at the position of the director of Public Procurement Office of the Republic of Lithuania and gained extensive professional experience in the field of public procurement. The systematic analysis method was used for the complex (in the levels of scientific doctrine, substantive law and legal practice) examination of the problematic areas of in-house procurement concept within the
In-house procurement is an exception to the general legal regulation of public procurement. Consideration shall be given to the fact that the concept of in-house procurement in the European public procurement law was developed by the European Court of Justice (hereinafter referred to as the ECJ), for instance, in its judgement of 18 November 1999 in the case Teckal Srl v Comune di Viano and Azienda Gas-Acqua Consorziale (AGAC) di Reggio Emilia (ECJ 1998) where the court determined the conditions for the relations between contracting authority and the supplier to be in-house relationship: first of all, the contracting authority exercises over a person (supplier) legally distinct from that authority a control which is similar to that which it exercises over its own departments; and, secondly, that person carries out the essential part of its activities with the controlling local authority or authorities, i.e. the activities of the internal entity are devoted principally to that authority and any other activities are only of marginal significance. In the EU public procurement law, these two conditions are broadly known as Teckal criteria. In order the contracting authority's contracts concluded with a legally independent entity to be recognised as an in-house procurement, it is necessary that both of the above conditions exist and are applied together. In interpreting identical nature of control and activities not only formal, but together estimation criteria shall be applied. Case-law of the ECJ explains that the Teckal criteria comprise an exception to the rules of public procurement law of the European Union (hereinafter referred to as the EU) and shall not be subject to extensive interpretation. There must exceptional circumstances exist justifying a deviation from the rules, and the proof of legitimacy thereof lies with the person seeking to use them.

As already mentioned above, for a long time, the rules under the concept of in-house procurement, and the criteria for its practical implementation have not been regulated neither in the EU public procurement law nor in the Law on Public Procurement of the Republic of Lithuania. The concept was developed by the ECJ, the decisions of which are considered sources of law in the broad sense in the EU Member States, the national courts must follow them. According to D.Soloveičikas, absence of regulation of in-house procurement exception in the LPP shall be considered a defect of the law. The ECJ jurisprudence on Teckal exception was sufficiently coherent and defined in order to establish this exception with national public procurement law (2009).

Transactions entered into by two legally independent entities - the contracting authority and the supplier - are recognized as a public contract. An exception to this legal regulation is made for the so-called in-house relationship, i.e. relationship, based on internal control. In-house procurement can be understood in two ways (Soloveičikas 2009). In the strict sense, the internal transactions include actions where a body governed by public law awards a contract to its unit having no independent legal status. In other words, the contracting authority is allowed to acquire goods, services or works without a public tender, if the supplier is not formally separated and independent from the contracting authority in decision-making. ECJ in its judgement of 11 January 2005 in the case Stadt Halle and RPL Lochau (ECJ 2005) stated that a public authority which is a contracting authority has the possibility of performing the tasks conferred on it in the public interest by using its own administrative, technical and other resources, without being obliged to call on outside entities. In a broad sense, in-house procurement may also include situations in which contracting authorities conclude contracts with companies having an independent legal status but controlled by the authorities. The ECJ names such situations as institutionalised or vertical cooperation that have to meet the above mentioned Teckal criteria. It means that contracts concluded with state-owned entity shall not be considered public procurement if the contracting authority controls the entity similarly as it controls its own departments and if the essential part of its activities is performed with the contracting authority (ECJ 1999).

There is no doubt that the contracting authority controls a legally separate entity (company) as its administrative divisions, if it participates in such a company solely, i.e. it is the only shareholder of the supplier. In this case, interests of the contracting au-
authority, which owns all capital of the subsidiary, and the interests of the company are essentially the same. However, in the practice of in-house procurement, there are situations where a third private party participates, even in a small part, in the ownership of the company (supplier), share of which is owned by the contracting authority concerned. In its case-law, the ECJ states that any private capital investment in an undertaking follows considerations proper to private interests and pursues objectives of a different kind. According to the ECJ, the participation, even as a minority having no veto right, of a private undertaking in the capital of a company excludes the possibility of the contracting authority exercising over that company a control similar to that which it exercises over its own departments. In addition, the award of a public contract to a semi-public company without calling for tenders would interfere with the objective of free and undistorted competition and the principle of equal treatment of the persons concerned, in particular in that such a procedure would offer a private undertaking with a capital presence in that undertaking an advantage over its competitors (ECJ 2005). The control is considered identical to the control over the own departments when the authority intends to impact the decisions of the entity (supplier) and such impact is decisive and aimed to strategic goals and significant decisions. The control identical to the control over the own departments is not necessarily individual. Where several public authorities decide to perform public services task by establishing joint undertaking, one of those authorities may exercise the management of a public service together with all other authorities, controlling the undertaking similarly to the control they exercise over their own departments when it is exercised by those authorities jointly. The Court has also noted that where several public authorities exercise identical control, the procedure used in adopting collective decisions and the share of the controlling authority are legally immaterial.

When analysing the control exercised by the authorities, there may appear a question concerning in-house procurement exception where the control is exercised indirectly, i.e. through another legal entity (e.g. holding). Following the ECJ case-law (e.g. European Court of Justice Judgement of 11 May 2006 Carbotermo SpA and Consorzio Alisei v Comune di Busto Arsizio, AGESP SpA), the mere fact of indirect control of the company (supplier) (without assessment of other criteria) does not mean the company (supplier) is controlled efficiently. Determining whether the contracting authority controls the company (supplier) as its own departments shall include reference to all legal provisions and essential circumstances. Such investigation shall indicate whether the company for which the contract was awarded is controlled in the manner where the contracting authority can decisively influence both strategic goals and essential decisions of the company. Therefore, the mere fact that the contracting authority, alone or together with other public authorities, owns all of the capital of the company with which the contract is concluded, reflects the probability, but does not ensure that the contracting authority controls the company the same way as its own divisions. On the other hand, indirect control over the company (supplier) can be recognised as similar to the control over own departments if such indirectly controlled company is required to carry out the orders given it by the public authorities and is not free to fix the tariff for its actions (ECJ 2007).

Contracting authority can not function without human, intellectual and material resources which are necessary for the operation of the organisation. In some cases, public procurement procedures may be waived if the company (supplier) operates its authorities in favour and for meeting the needs of the controlling authority. The ECJ has pointed out that for this condition to be met, it is necessary to evaluate all the circumstances, including quantitative (eg., turnover, income) and qualitative (eg., part of the activities carried out in favour of the contracting authority in the context of overall activity, the nature of the activity in the market) criteria (ECJ 2007).

The ECJ stated in its later judgements (eg. European Court of Justice judgement of 9 June 2009 Commission v Germany) that vertical cooperation shall not be the only way of public entities' cooperation not falling under the EU rules on public procurement, i.e. there could be cases where solely public authorities performing the public interest tasks in cooperation with other public authorities by using their own resources, pursuing common objective and based on mutual rights and obligations being of greater significance than performance of a task for remuneration. The ECJ calls such cases horizontal and (or) non-institutional cooperation.

Summarising the ECJ case-law in the field of in-
house procurement exception, it can be stated that public contracts between public entities shall not be subject to public procurement rules in a case all of the following conditions be fulfilled: a) the contracting authority exercises jointly with other contracting authorities a control over that legal person which is similar to that which they exercise over their own departments; b) more than 80 % of the activities of that legal person are carried out in the performance of tasks entrusted to it by the controlling contracting authorities or by other legal persons controlled by the same contracting authorities; c) there is no direct private capital participation in the controlled legal person with the exception of non-controlling and non-blocking forms of private capital participation required by national legislative provisions, in conformity with the Treaties, which do not exert a decisive influence on the controlled legal person. The contracting authority is considered controlling a legal person similarly to the way it exercises over its own departments when it makes decisive impact to strategic goals and significant decisions of the entity under control. Such control may be carried out by another legal entity, which is itself in the same way controlled by the contracting authority.

In this respect it should be noted that the Directive 2014/24/EU of the European Parliament and of the Council of 26 February 2014 on public procurement and repealing Directive 2004/18/EC (hereinafter referred to as the Directive 2014/24/EU) summarise the aforesaid ECJ case-law and clearly defines provisions for regulation of in-house procurement exception. Article 12 of the Directive 2014/24/EU contemplates another cases where general procurements procedures need not to be applied. Paragraph 2 of Article 12 of the Directive 2014/24/EU provides that the aforesaid rules also apply where a controlled legal person which is a contracting authority awards a contract to its controlling contracting authority, or to another legal person controlled by the same contracting authority, provided that there is no direct private capital participation in the legal person being awarded the public contract with the exception of non-controlling and non-blocking forms of private capital participation required by national legislative provisions, in conformity with the Treaties, which do not exert a decisive influence on the controlled legal person.

Paragraph 3 of Article 12 of the Directive 2014/24/EU states that a contracting authority, which does not exercise over a legal person governed by private or public law control within the meaning of paragraph 1, may nevertheless award a public contract to that legal person without applying the Directive. In such a case all of the following conditions shall be fulfilled: a) the contracting authority exercises jointly with other contracting authorities a control over that legal person which is similar to that which they exercise over their own departments; b) more than 80 % of the activities of that legal person are carried out in the performance of tasks entrusted to it by the controlling contracting authorities or by other legal persons controlled by the same contracting authorities; c) there is no direct private capital participation in the controlled legal person with the exception of non-controlling and non-blocking forms of private capital participation required by national legislative provisions, in conformity with the Treaties, which do not exert a decisive influence on the controlled legal person. Following the Directive 2014/24/EU, for the purposes of point (a) of the first subparagraph, contracting authorities exercise joint control over a legal person where all of the following conditions are fulfilled: 1) the decision-making bodies of the controlled legal person are composed of representatives of all participating contracting authorities. Individual representatives may represent several or all of the participating contracting authorities; 2) those contracting authorities are able to jointly exert decisive influence over the strategic objectives and significant decisions of the controlled legal person; 3) the controlled legal person does not pursue any interests which are contrary to those of the controlling contracting authorities.

Paragraph 4 of Article 12 of the Directive 2014/24/EU regulates relations exclusively between two or more contracting authorities where their contracts fall outside the scope of the Directive. For this purpose, all of the following conditions shall be fulfilled: a) the contract establishes or implements a cooperation between the participating contracting authorities with the aim of ensuring that public services they have to perform are provided with a view to achieving objectives they have in common; b) the implementation of that cooperation is governed solely by considerations relating to the public interest; c) the participating contracting authorities perform on the open market less than 20 % of the activities concerned by the cooperation. Paragraph 5 of Article 12 of the Di-
rective 2014/24/EU states that for the determination of the percentage of activities concerned, the average total turnover, or an appropriate alternative activity-based measure such as costs incurred by the relevant legal person or contracting authority with respect to services, supplies and works for the three years preceding the contract award shall be taken into consideration. Where, because of the date on which the relevant legal person or contracting authority was created or commenced activities or because of a reorganisation of its activities, the turnover, or alternative activity based measure such as costs, are either not available for the preceding three years or no longer relevant, it shall be sufficient to show that the measurement of activity is credible, particularly by means of business projections etc.

Mentioned provisions of the Directive 2014/24/EU are welcome because they provide greater legal clarity to the application of procurement rules for public sector entities’ contracts, as well as precondition EU Member States, as well as contracting authorities for a uniform interpretation of the ECJ case-law in this area. The evaluation of the said provisions leads to the conclusion that procurement rules should not restrict the freedom of public authorities to carry out public service tasks assigned thereto by using their own resources, including the ability to cooperate with other public institutions. On the other hand, it is necessary to ensure that public-public cooperation does not distort competition in respect of private economic operators and the relevant service provider is not placed in a privileged position over its competitors. Taking in consideration the above, further analysis of the threats of in-house procurement is appropriate.

3. The Threats of In-house Procurement

Public procurement is intended to enable the contracting authorities to buy the necessary goods, services or works making a rational use of the state budget. Part 3 of Article 46 of the Constitution of the Republic of Lithuania provides that the State shall regulate economic activity so that it serves the general welfare of the Nation (Constitution of the Republic of Lithuania 1992). Considering that, it can be said that the liberalisation of public procurement must be coordinated with the constitutional duty of public authorities to defend public financial interests, to limit the opportunities for corruption and to ensure a transparent and rational use of state budget funds in public procurement.

The concept of in-house procurement was introduced to the Lithuanian substantive procurement legislation on 11 February 2010 by the Law No. XI-678 supplementing Article 10 of the Law on Public Procurement with Paragraph 5 which stated that the requirements of this Law should not apply to procurement where the contracting authority awards a contract to an entity holding a separate status of a legal person which it controls as its own service or structural division and in which it is the sole member (or exercises the rights and duties of the state or a municipality as the sole member) and where the controlled entity derives at least 90% of the turnover from the activities intended to meet the needs of the contracting authority or to perform the functions of the contracting authority (the Law of the Republic of Lithuania On Amendment of Articles 2, 6, 7, 8, 10, 13, 15, 18, 22, 23, 24, 31, 32, 39, 41, 54, 58, 78, 85, 89, 90, 91, 92, 93, 94, 95, 96, 97, Title of Chapter V and Annex, Supplementing by Articles 21(1), 94(1), 95(1), 95(2) and Repealing Articles 98, 99, 100, 2010).

Paragraph 5 of Article 10 of the current LPP sets the following mandatory conditions for in-house procurement: 1) the contracting authority controls an entity (supplier) holding a separate status of a legal person as its own service or structural division; 2) the contracting authority makes impact to essential and strategic decisions of the company (in this case supplier); 3) the contracting authority shall own 100 per cent of controlled company shares; 4) the controlled entity derives at least 80% of the turnover from the activities intended to meet the needs of the contracting authority or to perform the functions of the contracting authority; 5) it is obligatory to get the consent of the Public Procurement Office, which shall be issued within 15 working days. Under these conditions procurement procedures can be avoided and goods, services or works can be purchased by in-house method.

Issues of in-house procurement are raised in Lithuanian courts as well. For instance, in 2011, Supreme Administrative Court of Lithuania ruled that if the transaction meets the criteria for the in-house procurement, the purchase without a tender can not be considered a breach of the Law on Competition (SACL, 2011). In this ruling, the Court enable validation of the previous practice, when the munici-
pal, transport and energy companies in some cases voided to purchase goods or services in the market using public procurement, and purchased them from controlled companies. Municipalities often buy from their established companies the products which other suppliers on the market can offer as well. Absence of competition in such purchases may lead to improper product quality and price ratio, while the competition is one of the most important objectives of public procurement regulations. Purchases of public utilities sector's contracting authorities from associated companies may also be ineffective, since in some cases, the price of goods, services or works purchased can be higher than prices in the market. In this regard, it should be noticed that Paragraph 2 of Article 9 of the Law on Local Self-Governments sets a right for a municipality to establish new providers of public services only in cases when other providers are not rendering public services or cannot render the said services to residents economically and of good quality (Law on Local Self-Governments 1994, 2008). Thus, the legislature established its will to prevent local governments from setting up new businesses so influencing market processes, when in the market, there are other efficient operations. Meanwhile, according to the current situation, a large number of companies controlled by municipalities function in Lithuania, while other entities also provide the services in the market, as confirmed by the Competition Council research on infringements of Article 4 of the Law on Competition. Thus, the application of in-house procurement can eliminate operating in a competitive environment, that surely is a threat for the contracting entities not be offered the appropriate market price, and the end-user will be forced to pay for it.

The next section of the article presents the statistics of in-house procurement, showing that in most cases the entity subject to in-house procurement being the contracting authority itself or such entity, which should be regarded as a contracting authority, in line with contracting authority's attributes as provided in Article 4 of the LPP, i.e. it is subject to control (management) by the state or local authorities and its activities are intended for meeting the needs of general interest, not having an industrial or commercial character. As regards to contracting authorities acting in the field of water, energy, transport or telecommunication, usually the entity subject to in-house procurement is established for the activity identified in paragraph 2 of Article 70 of the LPP. The definition of the subject to in-house procurement given by the ECJ - 'person carrying out the essential part of its activities with the controlling local authority or authorities, i.e. the activities of the internal entity are devoted principally to that authority and any other activities are only of marginal significance' (ECJ, 2006) - supposes that its activities are intended to satisfy the public interest, regardless of its commercial nature. On the other hand, some entities subject to in-house procurement deny being consistent with the characteristics of the contracting authority and do not consider themselves a contracting authority, and hence acquire goods or services or render subcontractors required to implement the in-house procurement deal without applying public procurement procedures. Thus, public procurement in general fail and an environment for corruption-related activities is created which in democratic society should be avoided at all levels.

In-house procurement exception supposedly precludes the presence of uncompetitive companies. Such entity under control has a greater advantage over the other players in the market because it is guaranteed for orders and income from its shareholder. In such a case, the contracting authority does not search for cheaper alternatives existing in the market and buys goods or services from the controlled entity at higher prices, and the additional costs to be covered later by the end-users. In addition, the activities of the controlled entities are not required to respond to market conditions, such as wages to personnel higher than the average in the sector regardless of costs. Therefore often local government-controlled entities employ people close to local politicians and civil servants. Besides that, such entities can influence the whole market segment concerned as they can also participate in tenders of other contracting authorities and offer unreasonably lower prices thus putting other tenderers into unfavourable position.

Hence, it follows that validation of in-house procurement in Lithuania without an effective control mechanism and additional safeguards threatened and continues to threaten the procurement efficiency, transparency, competition between service providers and consumer protection. Having evaluated the foregoing, it is advisable to amend Paragraph 5 of Article 10 establishing that the provisions of Law on Public Procurement shall not apply to contracts where the contracting authority enters into a contract with
another contracting authority, which is under its control the same way as its own service or structural division, and in which it is the sole member, and and where the controlled entity derives at least 80% of the turnover from the activities intended to meet the needs of the contracting authority or to perform the functions of the contracting authority. Such amendment would not eliminate the possibility of in-house procurement, and would constitute a preventive measure and encourage entities that meet the contracting authority attributes, but negating its status of the contracting authority, to take responsibility and approve the status. It should be also noted that for the procurement of the contracting authorities operating in the fields of water, energy, transport and postal services, which are necessary for commercial activity but not for the activity under Paragraph 2 of Article 70, the Law on Public Procurement does not apply pursuant to subparagraph 1 of paragraph 3 of Article 10, so after the amendment those entities for their commercial activities will be able to enter into contracts with companies under their control gaining no contracting authority status. Another potential threat is insufficient external control of in-house procurement. Although in-house procurement contracts may be concluded only with the permission of the Public Procurement Office, but due to the large number of purchasing (in 2011-2013, 831 in-house procurements were carried out), there is a good chance that the PPO may perform the verification formally, without going deep into the in-house procurement conclusion and execution context. Secondly, the legislation does not impose mandatory obligations to the contracting authority to publish all information about the conclusion or performance of in-house procurement and conduct thereof. In addition, the part of the entities controlled by the contracting entities are not the contracting authorities themselves and perform purchases in accordance with their internal rules, so both procurement and contract performance are totally out of the control.

Considering the risks, it is advisable to set such a legal regulation in the LPP under which the contracting authorities could perform in-house procurement and exempt from public procurement procedures solely in cases where deal with contracting authorities, and in cases where the contracting authorities acquire goods, services or works from non-contracting authorities engaged in commercial or industrial activities, the public procurement procedures should always be applied. Furthermore, it is proposed to supplement paragraph 5 of Article 10 of the LPP with a provision stating that the contracting authority can benefit from the exception of in-house procurement exclusively in the case where due to objective reasons there is no possibility purchase works, goods or services in the market competition conditions. In our opinion, these proposals would expand the range of procurement open to the EU operators, as well as create the preconditions for effective implementation of the fundamental principles of the EU law on public procurement principles (equality, non-discrimination, mutual recognition, proportionality and transparency).

4. Statistics of In-house Procurement in Lithuania

In order to illustrate the problems analysed in the previous sections of the study, an overview of the in-house procurement statistics is appropriate. Municipalities, energy and transport companies perform in-house procurement most frequently. Municipalities awarded in-house contracts to companies under their control, mostly related to the provision of utility and transportation services. 22 contracting authorities presented information on their in-house procurement in 2011. In 2011, the total number of in-house procurement cases amounted to 512 and the value thereof totalled to 728.3 million Litas. Lithuanian Railways (AB “Lietuvos geležinkeliai”, 110053842) performed the largest amount of in-house procurement. The total value of in-house procurement of the company in 2011 amounted to 379.4 million Litas and accounted for 51.6 per cent of the total in-house procurement value in 2011 (728.3 million Litas). With regard to the controlled entities of the contracting authorities, the in-house procurement contracts of the biggest value were awarded to Vilnius Locomotive Repair Depot (UAB ‘Vilniaus lokomotyvų remonto depas’, 126280418). The total value of in-house procurement contracts awarded to this company (285.3 million Litas) accounts for 39.2 per cent of total amount of in-house procurement in 2011 (728.3 million Litas). Railroad centre (UAB “Geležinkelio tiesimos centras”, 181628163) held the first position in regards of the quantity of contracts in 2011. 115 in-house procurement contracts were concluded with this company, it accounted for 23 per cent of total in-house procurement cases in 2011 (512) (Table 1).
Table 1. Contracting authorities filed the biggest amount of requests for in-house procurement in 2011

<table>
<thead>
<tr>
<th>Contracting authority</th>
<th>Number of in-house procurement cases</th>
<th>In-house procurement value (in Litas)</th>
<th>Quantity percentage</th>
<th>Value percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lithuanian Railways</td>
<td>264</td>
<td>379,435,896.9</td>
<td>51.6</td>
<td>52.1</td>
</tr>
<tr>
<td>Vilnius City Municipality</td>
<td>144</td>
<td>22,157,998.9</td>
<td>28.1</td>
<td>3.0</td>
</tr>
<tr>
<td>Vilnius District Municipality</td>
<td>48</td>
<td>87,873,434.4</td>
<td>9.4</td>
<td>12.1</td>
</tr>
<tr>
<td>LITGRID</td>
<td>10</td>
<td>117,387,096.8</td>
<td>2.0</td>
<td>16.1</td>
</tr>
</tbody>
</table>

Source: Public procurement (annual) reports accumulated in the Central Information System of Public Procurement

19 contracting authorities presented information on their in-house procurement in 2012. In 2012, the total number of in-house procurement cases amounted to 131 and the value thereof totalled to 278.3 million Litas. In 2012, Kelmė District Municipality (1188768730) concluded the biggest value in-house procurement contracts, i.e. 160.1 million Litas, it accounted for 570.5 per cent of total in-house transactions value in 2012 (278.3 million Litas). Lithuanian Railways (49) performed the largest amount of in-house procurement in 2012. It accounted for approximately 37.4 per cent of total in-house procurement performed in 2012 (Table 2).

With regard to controlled entities of the contracting authorities, the in-house procurement contracts of the biggest value were awarded to Kelmė Local Utilities (UAB “Kelmės vietinis ūkis”, 162732556). Kuršėnai Public Utilities (UAB “Kuršėnų komunalinis ūkis”, 175606358) held the first position in regards of the quantity of contracts in 2012. 23 in-house procurement contracts were concluded with this company, it accounted for 17.6 per cent of total in-house procurement cases in 2012 (131).

Table 2. Contracting authorities filed the biggest amount of requests for in-house procurement in 2012

<table>
<thead>
<tr>
<th>Contracting authority</th>
<th>Amount of in-house procurement cases</th>
<th>In-house procurement value (in Litas)</th>
<th>Quantity percentage</th>
<th>Value percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lithuanian Railways</td>
<td>49</td>
<td>76,867,971.1</td>
<td>37.4</td>
<td>27.6</td>
</tr>
<tr>
<td>Šiaulių District Municipality</td>
<td>23</td>
<td>1,618,986.6</td>
<td>17.6</td>
<td>0.6</td>
</tr>
<tr>
<td>Vilnius District Municipality</td>
<td>18</td>
<td>5,359,969.7</td>
<td>13.7</td>
<td>1.9</td>
</tr>
<tr>
<td>Klaipėda City Municipality</td>
<td>8</td>
<td>2,893,917.3</td>
<td>6.1</td>
<td>1.0</td>
</tr>
<tr>
<td>Kelmė District Municipality</td>
<td>2</td>
<td>160,141,978.7</td>
<td>1.5</td>
<td>57.5</td>
</tr>
</tbody>
</table>

Source: The information is prepared following the data of public procurement (annual) reports accumulated in the Central Information System of Public Procurement

19 contracting authorities presented information on their in-house procurement in 2013. In 2013, the total number of in-house procurement cases amounted to 206 and the value thereof totalled to 641.2 million Litas. Lithuanian Railways (110053842) performed in-house procurement to the largest scale (value, amount) in 2012. The total value of in-house procurement of the company in 2013 amounted to 589.8 million Litas and accounted for 92.0 per cent of the total in-house procurement value in 2013 (641.2 million Litas). With regard to controlled entities of the contracting authorities, the in-house procurement contracts of the biggest value were awarded to Vilnius Locomotive Repair Depot (126280418). The total value of in-house procurement contracts awarded to this company (473.3 million Litas) accounts for 74 per cent of total amount of in-house procurement in 2013 (Table 3).
Table 3. Contracting authorities filed the biggest amount of requests for in-house procurement in 2013

<table>
<thead>
<tr>
<th>Contracting authority</th>
<th>Amount of in-house procurement cases</th>
<th>In-house procurement value (in Litas)</th>
<th>Quantity percentage</th>
<th>Value percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lithuanian Railways</td>
<td>137</td>
<td>589,847,191.7</td>
<td>66.5</td>
<td>92.0</td>
</tr>
<tr>
<td>Šiauliai District Municipality</td>
<td>25</td>
<td>5,064,290.7</td>
<td>12.1</td>
<td>0.8</td>
</tr>
<tr>
<td>Vilnius District Municipality</td>
<td>7</td>
<td>83,892.0</td>
<td>3.4</td>
<td>0.0</td>
</tr>
<tr>
<td>Kaunas City Municipality</td>
<td>5</td>
<td>13,331,296.5</td>
<td>2.4</td>
<td>2.1</td>
</tr>
<tr>
<td>Kaunas City Municipality</td>
<td>4</td>
<td>6,791,005.8</td>
<td>1.9</td>
<td>1.1</td>
</tr>
</tbody>
</table>

Source: The information is prepared following the data of public procurement (annual) reports accumulated in the Central Information System of Public Procurement.

General dynamics of in-house procurement value and quantity in 2010-2013 is presented in pictures 1 and 2. It can be seen that in 2010, 247 procurements were performed for 203.6 million Litas, in 2011, 512 procurements for 728.3 million Litas, in 2012, 131 procurements for 278.3 million Litas, in 2013, 206 procurements for 641.2 million Litas. According to the wording of the LPP enforced on 13 October 2011, PPO permission is necessary in order to carry out a purchasing provided for in Paragraph 5 of Article 10. Decrease of in-house procurement amount in 2012 can be related to the mentioned amendment of the law which strengthened the external control of in-house procurement conclusion (Figure 1 and 2).

![Dynamics of in-house procurement value in 2010-2013](image)

**Fig.1.** Dynamics of in-house procurement value in 2010-2013

Source: The information is prepared following the data of public procurement (annual) reports accumulated in the Central Information System of Public Procurement.
In summary, it appears that looking retrospectively at the in-house procurement statistics in past three years, it is clear that during all of the periods such purchasing was carried out basically by the same subjects. Notably, the number and amount of such purchases changed (decreased) after the substantive law provisions entered into force in this field. This may be largely related to the preventive effect of normative regulation, which enables to assume that such a regulation was necessary and identify the guidelines for further development.

Conclusions

Although the concept of in-house procurement as an exception to the general public procurement regulation in the EU public procurement law was developed by the ECJ, over the last decade, the normative regulation was introduce to both the national law of the member states and the EU law. In Lithuania, in-house procurement exception was established in the Law on Public Procurement in 2010. However, it can be stated that the legalisation of in-house procurement in the substantive Lithuanian law in the absence of effective control mechanism and additional safeguards, threatens the procurement efficiency, transparency, competition between service providers and consumer protection.

At present, contracting authorities can perform in-house procurement without applying the public procurement procedures either with the contracting authorities or non-contracting authorities engaged in the commercial or industrial activity, if they comply with paragraph 5 of Article 10 of the Law on Public Procurement criteria. Such legal regulation implies space for some threats of abuse of this exemption. In particular, the absence of the competition for such purchases may lead to improper product quality and price ratio. Procurement from associated companies may also be ineffective, since in some cases, the price of goods, services or works purchased can be higher than prices in the market. In-house procurement suppliers often challenge their status as a contracting authority. However, the systematic evaluation of provisions of the Law on Public Procurement that govern the in-house exemption and requirements for gaining the status of contracting authority, shows much parallelism, which would entail the conclusion that the vast majority of in-house suppliers should be the contracting authorities. Another important threat is that due to in-house procurement, there are certain companies in Lithuanian economy that receive high profits, but in general are non-competitive and could not otherwise exist at free market conditions. Such companies often pay higher wages, they become an excellent employer for protegees of public officials, which should be regarded solely negative in a democratic society.

It is advisable to improve the current legal regulation by setting that the contracting authorities could perform in-house procurement and exempt from public
In-house procurement exception: threat for sustainable procedure of public procurement

 procured procedures solely in cases where dealing with contracting authorities, and in cases where the contracting authorities acquire goods, services or works from non-contracting authorities engaged in commercial or industrial activities, the public procurement procedures should always be applied. Furthermore, having assessed all the threats reviewed in the article, it is proposed to supplement paragraph 5 of Article 10 of the LPP with a provision stating that the contracting authority can benefit from the exception of in-house procurement exclusively in the case where due to objective reasons there is no possibility purchase works, goods or services in the market competition conditions. These proposals would expand the range of procurement open to the EU operators, as well as create the preconditions for effective implementation of the fundamental principles of the EU law on public procurement principles (equality, non-discrimination, mutual recognition, proportionality and transparency). Therefore we recommend for the legislature to consider these proposals transferring provisions of Article 12 of the Directive 2014/24/EU to the national law of Lithuania.

In-house procurement is an important concept and its appropriate regulation and interpretation thereof in practice can help ease the administrative burden to certain contracting authorities in the cases where by objective evaluation the procurement procedures are not appropriate, but on the other hand it can create a legal vacuum, which could be used by unscrupulous market players, and thus distort the free market. The legislator should aim to find a balance between the ideological purpose of the concept and the scope of fuses to protect competition in the market.

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BANKING CONSOLIDATION AS VALUE CREATION TO THE BUYER AND THE FINANCIAL SYSTEM (CASE OF LITHUANIA)

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Abstract. The banking and finance sector is one of the most dynamic sectors that is continuously experiencing most of structural changes. Fast consolidation and concentration of banks globally has evoked active discussions on behalf of scientists and practitioners on the effect gained from concentrating on the efficiency and competitiveness of the banking system, financial and microeconomic stability of countries and economic development. Mergers and acquisitions of the banking sector are mostly encouraged by the target to get more authority in the international banking environment, to eliminate competitors from profitable activity and to strive for additional financial benefit for shareholders, to increase the range of the services provided, to use the resources efficiently, i.e. to create the value for shareholders and to contribute to the development of the financial sector. Therefore, the article analyses the bank mergers and acquisitions of the Lithuanian banking sector; it is assessed whether the bank mergers have created the value for shareholders and (or) the financial system. The research that has been carried out shows that mergers and acquisitions of the banking sector are take placing in order to increase the benefit for shareholders and to strive for the economy; the aspect of financial stability of such transactions appears in a short term and is most commonly inspired by the government. Modern Lithuanian banking sector has been formed by means of mergers and acquisitions; strategic investors helped transitive economy countries to guarantee the stability of the banking sector and to achieve the benefit of the economy of scale. Restructuring of the banking activities, i.e. the performance distribution can be a useful measure in ensuring stable activities of both the financial system and the accepting bank – to acquire a market share and to optimise its performance.

Keywords: banking, financial intermediaries, regulation, value creation, mergers, acquisitions, restructuring, market structure

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JEL Classification: G21, G28, G32, G34, L1

1. Introduction

In the historical retrospective of the last decades there have been several cases when banks acquired other banks thus getting new opportunities to develop their activity. Acquiring the competitors, banks reduced market competition, increased their market share, reduced service provision expenditure using the effect of the economy of scale. In addition, more liberal regulation of financial institutions at the end of the 20th century and the beginning of the 21st century provided the opportunities for banks to merge with different providers of financial services and thus take advantage of the economy of scale, when the institutions providing various financial services (e.g. provision of loans, insurance, financing trade, investment management,
etc.) belong to one financial institution – financial aggregation. The institution thus becomes less dependent on its clients, on the reduction of one provided service and becomes a more diversified service provider. This situation can also be explained by the Markowitz Portfolio Theory, when portfolio diversification disperses (reduces) the risk. However, there are certain barriers for financial services sector (banks, insurance companies, etc.) to enter the market (capital requirements, activity risk limitations and other), thus it can be stated that only a limited number of participants can provide services on this market.

The activity of modern banking sector is multilateral and miscellaneous, especially of the banks forming or being part of financial groups or aggregates. Multilateralism and current activity of banks can be regarded to be a great challenge for the banking sector. The authors opinion is that modern financial world, especially the competition between the members of the financial sector, fast development, the application of modern technologies in the activity, the changes in the regulation and supervision of the financial system, the recent global financial crisis has a very strong effect on the financial sector. Currently, the improvement of the banking sector supervision and regulation has an exceptional effect on it.

It should be noticed that the problem of mergers and acquisitions has been widely analysed and there are special literature theories explaining the motives of this process. Harford (2011), concluding the motives of mergers and acquisitions, states the motives and the reasons explaining these processes which can be ascribed to neoclassical, agents and behavioural theories. Piesse et al. (2013), analysing the motives of mergers and acquisitions, distinguish 8 theories (hypotheses), which explain the process of mergers and acquisitions on the market. Novickyté, Saikevičius (2013) show that separate hypotheses in the literature sometimes intertwine, and thus ascribe them to the main theories distinguished by Harford (2011).

Different authors and research (Berger et al. 2000; European Central Bank 1999; Grundey 2008) show that bank consolidation in Europe and the world was mainly determined by the increased performance efficiency, when there were attempts to merge several banks or other financial institutions into one which, due to its size, could provide its services cheaper and, what is more, optimise the representation network of a branch of the bank or any other financial institution. Heffernan (2005) divides the reasons of bank mergers into three categories: maximising shareholder’s equity/return, striving for self-interest of bank managers and other reasons (increased competition of the members of non-bank services; bank services’ development, increasing banks’ non-balance indicators; innovations and IT development in the banking sector, which help to strive for the optimisation of activity expenditures, increasing income and generating additional income from bank services using financial innovations), which create a positive environment for mergers and acquisitions.

Authors (Dermine 1999, 2002; Hernando et al. 2009) state that there are other reasons which encourage mergers and acquisitions in the banking sector. In general such transactions are determined by the improvement of the purchased company’s shareholders benefit. Still 10 main reasons are distinguished while determining mergers and acquisitions in the banking sector: the economy of scale based on expenditure, the economy of scale based on the trademark, the economy of scale based on income, the economy of scale based on security, the economy of expenditure, the economy, based on selling, the economy based on financial diversification, X efficiency, market power, the economy of scale based on defence.

Authors (Bottiglia et al. 2010), analysing the motives of banks and other financial sector’s members’ mergers, divide them into endogenous (increasing the activity of the market, the economy of scale, the optimisation of management structure, the opportunity to avoid opposite takeover, increasing shareholder’s return, settling bank management and status) and international (the development of bank activity). Asimakopoulos and Athanasoglou (2013), Caruso and Palmucci (2011), Altunbas and Ibáñez (2004), Beitel and Schiereck (2001) having analysed the creation of value in the banking sector through mergers and takeover, have established that bank target shareholders receive greater abnormal return than the owners of bank purchaser. It should also be noticed that the acquisition of a smaller or less efficient bank helps to diversify income better and thus create value rather than the acquisition of a bank which is liquid but has a higher credit risk. Altunbas and Ibáñez (2004) in their research state that mergers and acquisitions in the banking sector have increased banks’ capital return, because an opportunity emerged to efficiently differentiate the bank resources. However, the differ-
ences between endogenous and international transactions should be noticed: creating endogenous translations there is a problem to integrate different institutions according to their strategies of loans, income, expenditures and deposits management; international transactions of mergers and acquisitions, though can be characterised by different separate institutions’ loans and credit risk management strategy, but still adds to the greater efficiency of a merged bank. Valkanov and Kleimeier (2007) state that in terms of bank mergers a greater value is created if the bank’s target capital rates exceed the rates of the bank’s purchaser. The authors also state that bank capital quality is reflected in the fluctuations of the stock market price what affects the merger.

Hitt et al. (2012), Dutordoir et al. (2014), analysing the created value of mergers and acquisitions, provide that mergers and acquisitions can create little value or no value at all. One of the main reasons due to which no synergy is created is the one that the seller overpays for the bank acquired when wrong aims and inefficient integration processes are selected. It should be noticed that only selected aims and efficiently implemented acquisitions can achieve the interaction and create added value. It should be noticed that synergy is one of the main reasons of mergers and acquisitions in the banking sector. Being a business company and having its shareholders, a bank strives for financial synergy (return). Financial synergy can be achieved by optimising the performance of the merged banks with the achievement of the economy of scale, market power, the efficient use of expenditure etc. This aim is most likely to be achieved by implementing the mergers of separate institutions or just acquiring other ones and thus striving for the efficiency. However, it is stated that such aim of a finance subject – a bank – cannot always be combined with the aim of the market or that of separate institutions to guarantee the financial stability. This issue becomes especially relevant assessing too-big-to-fail risk (Mishkin 1999). This is why such consolidation can cause the opposite effect, i. e. reduce the market efficiency and cause anticompetitive environment (Sood, Ahluwalia 2009).

Thus the aim of the current article is to analyse the reasons of bank mergers and acquisitions which have taken place in Lithuania during the period of independence and to define whether the merged banks have created value for shareholders and (or) the financial system. The second part of the article provides research methodology and describes the scope of the research. The third part of the article provides the results of the research which include the evaluation of four bank mergers and acquisitions that have taken place in Lithuania.

2. Data and research methodology

The analysis of mergers and acquisitions in the Lithuanian banking sector in the context of value creation has been carried out using case research methodology. This qualitative research allowed a separate interpretation of the issue analysed and provided the opportunity to holistically view the problem of the research. The scope of the research consists of bank mergers and acquisitions that have taken place in the period of 1990-2013: the merger of AB Vilniaus bankas and AB Hermis bank, the restructuring of AB Lietuvos valstybinis komercinis bankas (with the participation of AB Lietuvos taupomasis bankas), the acquisition of AB Finasta taupomasis bankas, the acquisition of AB Snoras and the restructuring of AB Ūkio bank (with the participation of AB Šiaulių bank). This option was determined by the theoretical assumption that consolidation takes place when several members of the market merge together and due to such a merger or acquisition one market member is formed, in the analysed case – one bank.

Dermine (2009, 2010) provides one of the most detailed methods determining bank value. He states that in order to create value in the bank’s activities, first of all it is necessary to define and understand the functioning of value creating agents. Dermine (2009) provides that there are four methods used in determining bank value: a) market multiplier method, b) future divided discount value method c) economic profit value method d) “fundamental” value determination method. In order to define the financial synergy and the value of Lithuanian bank mergers economic profit (or EVA – economic value added) value method. EVA estimate was created and developed by Joel M. Stern and G. Bennett-Stewart III, they defined the economic profit as the difference between net operating profit after tax (NOPAT) and capital expenditures (1998):

\[ EVA = NOPAT - (IC \times WACC), \]  

here: NOPAT – net operating profit after tax; IC – invested capital; WACC – weighted average cost of capital.
Economic profit can also be calculated as the multiplication of the invested capital and the difference of the return on invested capital and weighted average cost of capital:

$$EVA = (ROIC - WACC) \times IC,$$

where $ROIC$ – return on invested capital.

The main problem calculating the economic benefit arises due to the limited possibilities to define the price of the equity. With the application of this method, the main problems are associated with the evaluation of the value created by finance intermediaries. It is especially important to emphasise that bank’s net operating profit after tax is calculated by taking away extraordinary activity result and non-financial articles result (e.g. formed loan provisions, tax provisions etc.) from the net value. The calculation of this index is affected by the fact that subordinated liabilities are kept together with net asset and clients’ deposits are not evaluated as their price (expenditures to attract them) are evaluated with NOPAT indicator.

In order to calculate the equity price of the analysed banks the methodology proposed by Geretto and Mazzocco (2010) was used. P/E ratio (market price per share divided by earnings per share) was used to calculate the equity price. However, this method has several restrictions of application as well. Though the ratio combines two variables: balance value (net asset) and market value (price per share), there are, however, possible market distortions arising due to future profit expectations from the members of the market (the expected rise of profit raises the price per share and this tendency reduces E/P ratio). Thus a situation is formed when with the same amount of the profit the equity price decreases. In such a case, with the applied adjustments of EVA calculation methodology for a bank, the economic profit is calculated as follows:

$$EVA = (ROE - r_e) \times E.$$  

The main difference between formulas (1), (2) and (3) is that instead of the amount of the return on invested capital the difference between equity return and equity price is used. It emphasises the main differences between bank capital and other companies’ capital structure. With banks’ merger or acquisition the changes of value are evaluated comparing ex-ante data of two separate business subjects before the merger/acquisition with ex-post (after merger/acquisition) data. If EVA result of the new (merged) bank is larger than EVA sum of the two separate institutions, the merger/acquisition which has taken place has created economic added value.

Concentration ratios were used to establish bank consolidation effect on the financial system. “$k$” concentration ratio evaluates the part of the market occupied by the largest banks. Most commonly $CR_1$ and $CR_k$ concentration ratios are applied. However, $CR_1$ ratio is used in the research in order to define the effect of the merging banks and the bank merger (the occupied part of the market) on the market.

“$k$” concentration ratio is calculated according to the following formula (Bikker, Haaf 2000):

$$CR_n = \sum_{i=1}^{k} S_i,$$

where $k$ – the number of banks, $S_i$ – the market share of $i$ bank.

Another index used to evaluate the effect of the merged banks is Herfindahl–Hirschman index (HHI). It is the concentration index that is most commonly used in theoretical literature, as the measure for other concentration evaluating indices. HHI index is calculated as the sum of the squares of the market shares of the bank sizes. HHI is calculated according to the following formula (Bikker, Haaf 2000):

$$HHI = \sum_{i=1}^{n} S_i^2,$$

where $S_i$ – the market share of the bank.

When HHI < 1000, market concentration level is not high; when 1000 < HHI < 1800, market concentration level is average, when HHI > 1800, market concentration level is high.

3. Research results

3.1. AB “Vilniaus bankas” and AB “Hermis” bank merger analysis

The analysis of this translation shows that when AB “Vilniaus bankas” declared its plan to acquire AB “Hermis” bank, its economic value index was the highest and reached almost LTL 26 million and AB “Hermis” bank’s economic profit was slightly above LTL 1 million. With the acquisition of AB “Hermis” bank by AB “Vilniaus bankas”, the economic value of the merged bank decreased and became negative (see
Table 1). It can be stated that the merger brought no benefit for the merged bank. However, the later data shows that the economic added value of the merged bank increased and almost reached the value of AB “Vilniaus bankas” before the merger. Thus it can be stated that there was one-year gap during which the merged bank used the synergic effect created by the merger and realised additional benefit acquiring the bank, what influenced the growth of the economic benefit\(^1\). However, the later results of the merged bank activity show that the economic value decreased.

Table 1. Economic value added of AB “Vilniaus bankas” and AB “Hermis” bank

<table>
<thead>
<tr>
<th>Year</th>
<th>Return on equity (ROE)</th>
<th>Equity price, (K.)</th>
<th>Amount of the equity capital, thousands LTL (E)</th>
<th>EVA, thousands LTL</th>
</tr>
</thead>
<tbody>
<tr>
<td>1998</td>
<td>0,2595</td>
<td>0,1993</td>
<td>435,445</td>
<td>26,213,789</td>
</tr>
<tr>
<td>1999</td>
<td>0,1602</td>
<td>0,1928</td>
<td>513,666</td>
<td>-16,745,512</td>
</tr>
<tr>
<td>2000</td>
<td>0,1519</td>
<td>0,108</td>
<td>585,764</td>
<td>25,715,04</td>
</tr>
</tbody>
</table>

\(^1\) Synergic effect is when EVA merged bank > EVA VB + EVA HERMIS

\(^2\) 2002 and subsequent years AB “Vilniaus bankas” share price is measured in calculating the carrying value of the shares price as AB “Vilniaus bankas” shares were included in the Lithuanian National Stock Exchange till February 1, 2001.

In order to evaluate the effect of this transaction on the financial system market concentration indexes were calculated. It can be noticed that in 2000 the market share of AB “Vilniaus bankas” assets, loans and deposits exceeded 40 percent. The Law on Competition of the Republic of Lithuania provides that the economic subject occupies a dominating position in the market if its market share composes at least 40 percent, thus AB “Vilniaus bankas”, acquiring AB “Hermis” bank, occupied the leading position in Lithuanian banking market, what allowed it to take the advantage of synergy. Later, AB “Vilniaus bankas” domination in the market gradually reduced, however, it was close to 40 percent (see Fig. 1). AB “Hansa-LTB” became the main competitor for AB “Vilniaus bankas”, when in 2001 AB “Lietuvos tarpomasis bankas” was privatised, i. e., acquired by a daughtering foreign bank “Hansabankas”.

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**Fig.1. Operating banks share in Lithuania’s market in 2000-2002**

*Source: composed and calculated by the authors, on the basis of (AB “Vilniaus bankas”: Report 2001; AB “Vilniaus bankas”: Financial Statements 2002, 2003)*
It is important to mention that any merger or acquisition first of all should be beneficial to shareholders, because without their agreement and intention such a transaction is not carried out. Thus the shareholders' intention to develop, increase the influence on the market, the number of clients and the circle of the services provided ensures the opportunity for mergers and acquisitions to take place on the market. After the calculation of economic value added of both banks it can be observed that when AB “Vilniaus bankas” acquired AB “Hermis” bank, its EVA estimate deteriorated a lot and became negative (LTL -16.745 thousand), and the economic value of the bank grew instantly in one year. This growth could be justified by the received synergy effect: when the banks merged, the management structure, the network of the branches was optimised, the information basis was integrated, a perspective to found new companies, providing additional services appeared, monopolistic position on the market allowed to use the power to govern interest margin, increase the number of clients and the circle of the services provided. After the banks were merged and the capital increased, there were the conditions to provide the market with larger loans, the demand for which was especially felt at that time. Moreover, the participation of AB “Vilniaus bankas” strategic investor in the transaction and its pursue allows making an assumption that AB “Hermis” bank’s acquisition by AB “Vilniaus bankas” was supposed by the agents determining long-term mergers and acquisitions: the acquired dominating position on the market and too-big-to-fail benefit.

However, this merger of two banks which took place in Lithuania and ended up with the acquisition of AB “Hermis” bank, had negative effects as well: first of all, the process of merger/acquisition was very long (almost 2.5 years), during which the board of AB “Hermis” bank opposed the transaction by all possible means, what had negative effects on the bank itself: there were mistakes in granting loans, assessing the accepted risk; all this determined a relatively worse asset value and later allowed AB “Vilniaus bankas” to form a great prestige of the acquired bank.

It is difficult to provide a single evaluation of the merger of these two banks. It is assumed that the Bank of Lithuania should have not approved of the merger of these two banks, AB “Vilniaus bankas” and AB “Hermis” bank, because the market share governed by both of them increased a lot (see Table 2). When the new bank acquired the dominating position on the market, it could actively govern the equity interest rates, to establish and dictate interest rates, commission fees for the bank’s provided services; the merged bank also acquired an opportunity to provide syndicated loans and attract large clients. Such a situation on the market strengthened the struggle for large clients and other banks became unsatisfied due to small possibilities to compete with the merged bank.

3.2. Analysis of the reorganisation (acquisition) of AB Lietuvos valstybinis komercinis bankas

The restructuring of AB Lietuvos valstybinis komercinis bankas (hereinafter – LVKB) is important because it is closely associated with the baking sector and the entire finance sector stability. It is established that LVKB assets before the restructuring reached LTL 0.8 billion, loans portfolio composed LTL 0.6 billion of which (see Table 3). In 1997 LTB was one of the major Lithuanian banks with 22 percent of assets, 14 percent of loans and 26 percent of deposits market. After the “good” part of LVKB assets and liabilities was taken over, LTB market share increased and composed 38 percent of the assets, 27 percent of loans and 39 percent of deposit market, and it became the largest in Lithuania (only AB “Vilniaus bankas” had 30 percent of loan market) (see Fig. 2).

### Table 2. Indicators of banks market concentration in 1998

<table>
<thead>
<tr>
<th></th>
<th>January 98</th>
<th>March 98</th>
<th>June 98</th>
<th>September 98</th>
<th>December 98</th>
<th>December 98*</th>
</tr>
</thead>
<tbody>
<tr>
<td>HHI</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Assets</td>
<td>2.128</td>
<td>2.117</td>
<td>2.066</td>
<td>2.105</td>
<td>2.143</td>
<td>3.068</td>
</tr>
<tr>
<td>Loans</td>
<td>2.183</td>
<td>2.077</td>
<td>2.07</td>
<td>2.063</td>
<td>2.035</td>
<td>3.178</td>
</tr>
<tr>
<td>Deposits</td>
<td>2.325</td>
<td>2.257</td>
<td>2.228</td>
<td>2.298</td>
<td>2.264</td>
<td>2.977</td>
</tr>
</tbody>
</table>

Note. In the period marked by the asterisk (*) AB “Vilniaus bankas” and AB “Hermis” bank are regarded as one merged bank.

Source: Navickas (1999)
On April 30, 1998 the Government accepted a decision to liquidate LVKB (On AB “Lietuvos valstybinis komercinis bankas” liquidation, 1998). Finally, on July 1, 1999, the Board of the Bank of Lithuania decided to exclude LVKB from the Companies’ Registration Office of the Republic of Lithuania (On Lietuvos valstybinis komercinis bankas AB exclusion from the Companies’ Registration Office of the Republic of Lithuania, 1999), and at the beginning of 2001 AB “Lietuvos taupomasis bankas” was sold.

The start of the concentration in the banking sector was the restructuring of LVKB and giving over part of its assets and liabilities to LTB. The calculated HHI index shows that the concentration in the part of assets increased from 0.1602 to 0.3271 points, in the part of liabilities it increased from 0.1740 to 0.2671 points, and in the part of deposits it increased from 0.164 to 0.26 points (see Fig. 2). Thus it can be stated that Lithuanian banking market has become very concentrated.

Table 3. Performance results of AB “Lietuvos valstybinis komercinis bankas” and AB “Lietuvos taupomasis bankas”

<table>
<thead>
<tr>
<th>Year</th>
<th>Assets, thousands LTL</th>
<th>Loans portfolio, thousands LTL</th>
<th>Amount of the equity capital, thousands LTL</th>
<th>Deposits portfolio, thousands LTL</th>
</tr>
</thead>
<tbody>
<tr>
<td>1996</td>
<td>856.800</td>
<td>616.700</td>
<td>165.000</td>
<td>544.200</td>
</tr>
<tr>
<td>1997</td>
<td>778.000</td>
<td>599.300</td>
<td>-122.600</td>
<td>598.700</td>
</tr>
</tbody>
</table>

Results of AB Lietuvos taupomasis bankas after acquiring “good” share of AB Lietuvos valstybinis komercinis bankas assets and liabilities

<table>
<thead>
<tr>
<th>Year</th>
<th>Assets, thousands LTL</th>
<th>Loans portfolio, thousands LTL</th>
<th>Deposits portfolio, thousands LTL</th>
</tr>
</thead>
<tbody>
<tr>
<td>1996</td>
<td>1.184.600</td>
<td>505.000</td>
<td>40.000</td>
</tr>
<tr>
<td>1997</td>
<td>1.839.600</td>
<td>591.100</td>
<td>81.600</td>
</tr>
<tr>
<td>1998</td>
<td>3.212.100</td>
<td>1.067.900</td>
<td>235.000</td>
</tr>
</tbody>
</table>

Source: composed and calculated by the authors, on the basis of the Bank of Lithuania’s monthly statements (1996-1997; 1998)

Thus this case of the bank acquisition (restructuring) can be a particularly important example connecting bank acquisition process and finance system stability. In order to reduce the hazard of “infection” in the financial system, the government recapitalised the bank and, despite the failure to successfully sell the bank, restructured it. This case also proves one of “concentration-stability” hypotheses, raised in scientific literature, when bank activity reform was chosen by restructuring it (incorporating part of the bank’s assets and liabilities into another bank). After overtaking part of LVKB activity, LTB became important and large and the banking sector became highly concentrated. However, it can be noticed, that LTB, after increasing its market share, became a large and important bank on Lithuanian market. It is observed that such restructuring of the bank’s activities increased the assets of the acting bank significantly, and also ensured its opportunity to actively compete on the market and to use the benefit of the synergy: to optimise the management structure and to provide new services on the market.

Fig.2. Market share of AB “Lietuvos valstybinis komercinis bankas” and AB “Lietuvos taupomasis bankas” and market Herfindahl-Hirschman index (right scale) 1996 – 1998

Source: composed and calculated by the authors, on the basis of the Bank of Lithuania’s monthly statements (1996-1997; 1998)
Banking consolidation as value creation to the buyer and the financial system (case of Lithuania)

3.3 AB “Finasta” bank acquisition analysis

The newest and the most unique example of a bank acquisition in Lithuania’s banking history took place on 16 September, 2009, when AB “Snoras” bank group completed the transaction during which it independently acquired 100 percent of shares of AB “Finasta įmonių finansai”, governing AB “Finasta” bank from AB “Invalda” and 100 percent of shares of the companies AB FMĮ “Finasta”, UAB “Invalda turto valdymas” and IPAS “Invalda Asset Management Latvia”. This bank acquisition is analysed in more detail because AB “Finasta” bank acquisition took place by establishing holding and later, the activity of the bank purchaser, AB “Snoras” bank, raised a certain public resonance: the purchaser bank was denied the activity licence and the management of this bank’s shares was transmitted to the state.

The evaluation of AB “Finasta” bank acquisition by EVA method is difficult, because in 2008 AB “Finasta” bank experienced a LTL 3.88 million loss; in 2009 the loss was LTL 6.71 million; in 2010 the bank made LTL 89 thousand net profit (AB FINASTA bank: 2009 financial reports; 2010; AB FINASTA bank: 2010 financial reports, 2011). AB “Snoras” bank’s activity results in 2007-2011 second quarter were also rather poor: in 2007 the bank made LTL 71.7 million net profit, however since 2008 the bank’s profit decreased and made about LTL 22 million, in 2009 LTL 8.7 million of net profit, in 2010 LTL 9.9 million and in 2011 second quarter – LTL 7.1 million of net profit (see Table 4). However, calculating the effect of AB “Finasta” bank’s acquisition on AB “Snoras” bank by EVA estimate, it has been established that AB “Snoras” bank capital price exceeded capital return (see Table 5).

Table 4. Performance results of AB “Snoras” bank and AB “Finasta” bank

<table>
<thead>
<tr>
<th>Year</th>
<th>Assets, LTL thousands</th>
<th>Loans portfolio, LTL thousands</th>
<th>Amount of equity, LTL thousands</th>
<th>Deposits portfolio, LTL thousands</th>
<th>Net interest income, LTL thousands</th>
<th>Return on assets (ROA), per cent</th>
<th>Return on equity (ROE), per cent</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>AB “Snoras” bank</td>
<td></td>
<td></td>
<td>AB “Finasta” bank</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2008</td>
<td>5.694.651</td>
<td>3.425.752</td>
<td>495.120</td>
<td>3.905.418</td>
<td>99.662</td>
<td>0.386</td>
<td>4.43</td>
</tr>
<tr>
<td>2009</td>
<td>6.342.578</td>
<td>3.269.786</td>
<td>505.009</td>
<td>4.994.204</td>
<td>4.043</td>
<td>0.137</td>
<td>1.72</td>
</tr>
<tr>
<td>2010</td>
<td>7.656.346</td>
<td>4.220.429</td>
<td>597.253</td>
<td>6.346.562</td>
<td>81.144</td>
<td>0.13</td>
<td>1.66</td>
</tr>
</tbody>
</table>

AB “Finasta” bank

<table>
<thead>
<tr>
<th></th>
<th>2008</th>
<th>53.025</th>
<th>31.491</th>
<th>15.314</th>
<th>34.272</th>
<th>1.430</th>
<th>-7.32</th>
<th>-25.34</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2009</td>
<td>73.974</td>
<td>25.292</td>
<td>21.382</td>
<td>49.371</td>
<td>4.043</td>
<td>0.137</td>
<td>1.72</td>
</tr>
<tr>
<td></td>
<td>2010</td>
<td>188.757</td>
<td>42.572</td>
<td>21.471</td>
<td>110.537</td>
<td>4.792</td>
<td>0.03</td>
<td>0.27</td>
</tr>
<tr>
<td></td>
<td>2011</td>
<td>288.577</td>
<td>49.980</td>
<td>5.286</td>
<td>71.222</td>
<td>7.874</td>
<td>-9.07</td>
<td>-495.37</td>
</tr>
<tr>
<td></td>
<td>2012</td>
<td>363.812</td>
<td>56.823</td>
<td>19.282</td>
<td>125.948</td>
<td>10.817</td>
<td>-0.4</td>
<td>-7.55</td>
</tr>
</tbody>
</table>

* In 2011 AB FINASTA bank additional has 192.5 million LTL and in 2012 – 191.1 million LTL deposits of other credit institutions.

The dynamics of the indices shows that AB “Snoras” bank acquiring AB “Finasta” bank tried to “hide” the inefficiency of its activity and through this transaction (“Finasta” financial group acquisition), the bank hoped and could strengthen its activity in the field of investment banking and assets management, offering the clients high qualification specialists’ services in companies’ finance, investments, assets and welfare management. Moreover, due to this translation AB “Finasta” bank gained the opportunity to provide the services and spread the products through the largest at that time Lithuanian network of clients’ services and offer new products. This synergy opened AB “Snoras” group the opportunities to raise the managed assets and the number of customers in retail and investment banking sectors in Lithuania and abroad. Thus, through this transaction AB “Snoras” bank broadened its market, raised assets and thus tried to become a too-big-to-fail bank and acquire more trust of the market members. However, it can be stated that AB “Snoras” bank acquired AB “Finasta” bank reaching for financial and non-financial synergy.
After the acquisition, AB “Finasta” bank acted as a separate legal entity, 100 percent of the equity of which was governed by AB “Snoras” financial group. It can be noticed that this transaction had no particular effect on the concentration of the banking market, because AB “Finasta” bank’s acquisition was dedicated to broaden the field of investment banking services provided by AB “Snoras” bank. It can also be stated that AB “Snoras” bank’s market share (assets, loans and deposits) has not considerably changed after the transaction, what can also be observed in table 4: AB “Finasta” bank had approximately LTL 63 million assets, about LTL 30 million loans and about LTL 40 million deposits, and AB “Snoras” bank had more than LTL 6 billion assets: above LTL 3 billion loans and LTL 5 billion deposits. However, a successful bank’s acquisition and its possible positive synergy have not ensured the existence of the bank’s purchaser. Due to wrong management of the bank’s activity risk and its negative effect on the bank’s activity, on August 22, 2012 by the decision of Vilniaus apygardos teismas, AB “Snoras” bank liquidation procedure was commenced.

### 3.4. Analysis of restructuring AB “Ūkio” bank and AB “Šiaulių” bank

The newest significant change in the Lithuanian finance system is AB “Ūkio” bank restructuring, which took place at the beginning of 2013. The case is significant because it can be associated the Bank of Lithuania’s intention to ensure the stable activity of the banking sector. Analysing the main performance results of AB “Ūkio” bank (see Table 6), it can be observed that in 2010 the bank has experienced loss from its main activity (loan provision) (LTL -3.48 million); this result shows the inadequate management of the bank’s activity (especially credit and interest rates) risk. Later (from 2011) banks net interest income increased and reached approximately LTL 48 million. The bank’s main activity indexes (assets and return on equity, as the bank experienced loss), in 2010-2012 3rd quarter were negative. The bank’s loans portfolio has almost remained the same and through the analysed period composed LTL 2.3 billion. A large part of the bank’s assets consisted of investment assets (almost half of the assets). Deposit portfolio in 2010-2012 3rd quarter decreased 11 percent; at the end of 2012 3rd quarter decreased 11 percent; at the end of 2012 3rd quarter, AB “Ūkio” bank’s capitalisation composed LTL 131.3 million, and AB “Šiaulių” bank’s capitalisation – LTL 187.3 million. It is important to mention that AB “Ūkio” bank’s and AB “Šiaulių” bank’s loans portfolios were similar. The main difference was that AB “Ūkio” bank’s assets 1.5-2 times exceeded AB “Šiaulių” bank’s assets. This difference mainly formed due to AB “Ūkio” bank’s investment assets.

However on 12 February, 2013, the Board of the Bank of Lithuania declared AB “Ūkio” bank’s activity restrictions (Temporary restrictions of “Ūkio” bank’s activity, the appointment of temporary bank’s administrator, 2013; On the approval of the recommendations and conclusions provided by AB “Ūkio” bank’s temporary administrator and AB Ūkio bank insolvency and the withdrawal of the banking licence, 2013). Thus it was decided that AB “Šiaulių” bank will takeover the AB “Ūkio” bank’s commitments to its clients, not exceeding the insurance remuneration provided in the Law on Insurance of Deposits and Liabilities to the Investors of the Republic of Lithuania. According to the approved preliminary asset evaluation the gen-

### Table 5. Economic value added of AB “Snoras” bank and AB “Finasta” bank

<table>
<thead>
<tr>
<th>Year</th>
<th>Return on equity (ROE)</th>
<th>Equity price, (K)</th>
<th>Amount of the equity capital, thousands LTL (E)</th>
<th>EVA, thousands LTL</th>
</tr>
</thead>
<tbody>
<tr>
<td>2007</td>
<td>0.1422</td>
<td>0.0518</td>
<td>504.484</td>
<td>45,605,354</td>
</tr>
<tr>
<td>2008</td>
<td>0.0443</td>
<td>0.1316</td>
<td>495.120</td>
<td>-43,223,976</td>
</tr>
<tr>
<td>2009</td>
<td>0.0172</td>
<td>0.0222</td>
<td>505.009</td>
<td>-2,418,993</td>
</tr>
<tr>
<td>2010</td>
<td>0.0166</td>
<td>0.0226</td>
<td>597.253</td>
<td>-3,571,57</td>
</tr>
<tr>
<td>2011 m. II ketv.</td>
<td>0.0091</td>
<td>0.0132</td>
<td>791.150</td>
<td>-3,212,069</td>
</tr>
</tbody>
</table>

**AB “Snoras” bank**

Considering the fact that during its activity period AB “Finasta” experienced loss and its return on equity (ROE) and other indices (EPS, K) are negative, in its case EVA estimate calculation is not applicable.

**AB “Finasta” bank**


The table above shows that AB “Finasta” bank’s acquisition was the right step of AB “Snoras” bank. It can be observed from EVA estimate change. It is noticeable that economic value added of the merged bank, though was negative, but decreased. Of course, it cannot be stated that this transaction had direct positive effect on EVA estimate. However, additional dispersal of the bank’s performance and the diversification of the earned income improved EVA estimate.
eral sum of the client’s liabilities transferred to “Šiaulių bankas” made LTL 2.7 billion. The value of the transferred assets (LTL 1.9 billion) and VI “Indėlių ir investicijų draudimas” deposit value (LTL 0.8 billion) was equal, LTL 2.7 billion (The signed agreement on transferring Ūkio bank commitments and assets to “Šiaulių” bank, 2013). The remaining part of “low quality” assets remained in “bad” AB “Ūkio” bank. Also, after auditing AB Ūkio bank’s financial results, it was established that after the transfer of liabilities and assets, AB “Ūkio” bank’s net asset value is LTL 356.322 million, liabilities – LTL 1 583.14 million, i.e., net asset value is LTL 1 226.82 million lower than the liabilities, thus the bank remains insolvent (The Bank of Lithuania will commence the proceedings on the bankruptcy case for “Ūkio” banks, 2013). Thus the board of the Bank of Lithuania decided to appeal to the court on commencing the bankruptcy proceedings against AB “Ūkio” bank. On May 2, 2013, the bankruptcy proceedings against AB “Ūkio” bank were commenced and temporary bankruptcy administrator was appointed (Bankruptcy proceedings against AB “Ūkio” bank, 2013).

The analysis of the Lithuanian banking market share of both banks shows that before the termination of its activity, AB Ūkio bank had a greater market share of assets, loans and deposits than AB Šiaulių bank (see Fig. 3). Both banks had a similar market power only on the loans market. Anyway, after AB Šiaulių bank acquired a “good” part of AB Ūkio bank’s assets and liabilities, its market influence increased, especially AB Šiaulių bank’s deposit market share: it increased from 4.7 percent to 10.2 percent; the deposit portfolio increased 114 percent (till LTL 4.6 billion). AB Šiaulių bank’s assets also increased (due to the overtaken AB Ūkio bank’s good quality investment assets).

Thus the division of one unsuccessful bank’s activity provided the opportunity for the bank which overtook the assets to acquire market power and take advantage of the bank’s size. Another important evaluated aspect is banking market concentration. The calculation of HHI index shows that after the reorganisation of AB “Ūkio” bank’s activity, the concentration on the market increased insignificantly. The assets on the market increased from 0.19 to 0.201, the loans – from 0.192 to 0.218, the deposits – from 0.201 to 0.218. Thus the current Lithuanian banking market is of average concentration level. Additionally, it can be mentioned that in this case “concentration-stability” hypothesis has partially been confirmed.

In order to achieve the stability of the financial system (and the financial sector as well) (On the approval of the recommendations and conclusions of AB “Ūkio” bank’s temporary administrator and AB “Ūkio” bank’s insolvency and bank’s licence termination, 2013), the board of the Bank of Lithuania has decided to partially increase the concentration on the market, but in this way to retain the stability of the financial system. “Standard & Poors” ranking agency is of the same opinion. The agency, after the decision of the board of the Bank of Lithuania to reorganise AB “Ūkio” bank’s activities, published the report which stated that “the restructuring of the collapsed “Ūkio” bank by transferring part of its liabilities and assets to “Šiaulių” bank, will not have any effect on Lithuania’s credit rating, because Ūkio bank was mainly financed from deposits, the part of which in the common system did not reach 8 percent, the agency does not hope that the likely bank’s restructuring will affect the financial stability of Lithuania’s banking sector” (“Standard & Poors”: “Ūkio” bank’s restructuring will not affect Lithuania’s credit rating, 2013).

Table 6. Performance results of AB “Ūkio” bank and AB “Šiaulių” bank

<table>
<thead>
<tr>
<th>Year</th>
<th>Assets, LTL thousands</th>
<th>Loans portfolio, LTL thousands</th>
<th>Amount of equity, LTL thousands</th>
<th>Deposits portfolio, LTL thousands</th>
<th>Net interest income, LTL thousands</th>
<th>Return on assets (ROA), per cent</th>
<th>Return on equity (ROE), per cent</th>
</tr>
</thead>
<tbody>
<tr>
<td>AB Ūkio bank</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2011</td>
<td>4.220.417</td>
<td>2.282.394</td>
<td>452.218</td>
<td>3.438.435</td>
<td>55.264</td>
<td>-0.1</td>
<td>-1.06</td>
</tr>
<tr>
<td>2012 m. III ketv.</td>
<td>4.094.363</td>
<td>2.230.654</td>
<td>406.622</td>
<td>3.526.626</td>
<td>41.927</td>
<td>-1.17</td>
<td>-11.76</td>
</tr>
<tr>
<td>AB Šiaulių bank</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2010</td>
<td>2.334.654</td>
<td>1.657.609</td>
<td>256.147</td>
<td>1.672.394</td>
<td>28.839</td>
<td>-1.1</td>
<td>-9.47</td>
</tr>
</tbody>
</table>
International Monetary Fund in its report (IMF Executive Board Concludes 2013 Article IV Consultation with Republic of Lithuania 2013), also positively evaluated the Bank of Lithuania’s solution of the problems of this bank. According to the IMF, the decisive actions of the state’s institutions have strengthened the credibility of all the financial system. The IMF also notes that current Lithuanian banking sector has enough capital and liquid assets stocks.

In conclusion it can be stated that the reduced number of the market agents first of all determines a larger market concentration which is not always favourable for the customer. However, it would be incorrect to state that market concentration always increases when banks merge, because the acting banks can specialise in different market segments and thus not raise the competition. AB “Hermis” and AB “Finasta” banks’ acquisitions were made in order to make value for their acquirers – AB Vilniaus bankas (its strategic investor – SEB) and AB “Snoras” bank. The Too-big-to-fail concept cannot be rejected as well, because new banks (especially in the first case) have expanded the part of the market share and became important parts of the financial system. It should be noted that AB “Hermis” bank’s acquisition was affected by the intention to ensure the stability of the financial system. However, it should be remembered that a bank, though being a systematically important institution, is also a profit institution, thus the aim of strategic shareholders to receive financial benefit is always implemented (the result of this transaction: in short term – financial system stability; in long term – shareholder’s return).
Analysing the current Lithuanian banking market it can be presumed that mergers and acquisitions can take place in the nearest time in order to develop and (or) optimise the activity. At the beginning of 2013, “Ūkio” bank’s activities were terminated and the bank’s assets, rights, transactions and liabilities were transferred to other bank of Lithuania – “Šiaulių” bank. It should be noted that AB “Šiaulių” bank, after the acquisition of the “good” AB Ūkio bank’s assets, could become an attractive bank for foreign investors and most probably the member of the acquisition. Moreover, the aim of one of the main shareholders of AB “Šiaulių” bank, the European Bank for Reconstruction and Development, is not a long-term participation in the bank’s capital, but the strengthening of the bank’s performance and the recovery of the invested funds in case of possible bank selling.

Though the aim of the processes of the bank consolidation in Lithuania was to ensure the stability of the financial system, there is still observed particular domination of the bank’s acquisitor in the transaction. AB “Vilniaus bankas” currently belongs to one of the largest Scandinavian financial group SEB, AB “Lietuvos taupomasis bankas” was acquired by AB “Hansabankas”, which later became a subsidiary of the Swedish bank Swedbank. Both these banks acting on the Lithuanian market constitute about 50 percent of the bank’s assets market (together with the third bank, acting in Lithuania, a Norwegian finance group DNB subsidiary bank they constitute 74 percent of the market (Main banks activity ratio, 2014)). It should be mentioned that there are two branches of Scandinavian banks, “Nordea” and “Danske”, in Lithuania, which constitute about 16 percent of Lithuanian banks’ assets market. Thus modern Lithuanian banking market is closely related to the Nordic European financial sector. On 27 July, 2008, The Ministry of Economy of the Republic of Lithuania provided the Government of the Republic of Lithuania with the Economic security strengthening project in which indicated that “Lithuanian banking sector is very concentrated and dependent on one foreign region’s banks (investors from Scandinavia through their subsidiaries occupy about 68.7 percent of the market), thus financial problems of the Nordic countries’ market can affect the stability of Lithuanian banking activity. On the one hand, the domination of Scandinavian banks which are financially strong and of good reputation contributes to the development of the national banking sector and financial services (and all the economy) and increases the stability. The commitment declared and actually proved by these institutions to pursue a responsible and long-term oriented activity in the Baltic region strengthens the ability of Lithuanian banking sector to act in a less advantageous domestic economic environment, sustain general shocks of financial markets. On the other hand, however, the problems of patronising banks in Nordic countries would also affect their subsidiary banks in Lithuania”. Thus such a close relation of Lithuanian banking sector with a single foreign region is dangerous. The government of the Republic of Lithuania is suggested to consider this situation and form a long-term strategy of the Lithuanian financial sector, the result of which would be the creation of a banking sector not dependent on one global region. The Bank of Lithuania has recently suggested the acting credit unions to unite to form cooperative banks, as this would increase the unions’ competitiveness, strengthen their capital and management quality and together would be an alternative for the Scandinavian banks dominating in Lithuania. The experience of the countries with long banking traditions, such as Switzerland, should not be forgotten. The country has many local banks (e.g. Raiffeisen Bank, Kantonalbanken, Regionalbanken), which are independent of other countries’ banks and able to sustain the liability of non-finance companies and households during the economic decline and significantly reduce debt service expenditure, what is necessary for the economic incentive. It should be noticed that an individual country’s economic and financial independence depends on its possibility to freely provide itself with the necessary resources (have a financial institution managed by the country’s own capital, which would be able to contribute to the implemented economic policy).

Conclusions

The mergers and acquisitions in the banking sector are determined by tangible and intangible synergy agents. The main motives for such transactions depend on the state’s economic situation. It should be noticed that the most common reason for bank mergers is economic benefit for the banks: to raise shareholders’ revenue and benefit. The aspect of financial stability in mergers and acquisitions emerges in short term and is most often determined by the
It should be noticed that the first analysed merger in the banking sector, which ended up with the acquisition, is unique and complicated. AB "Vilniaus bankas" and AB "Hermis" bank’s merger significantly increased market concentration, acquired monopolistic position on the market and could benefit from it seeking for additional value. However, all these possible negative aspects had positive effects as well: the strategic investor from the Nordic state, Swedish SEB bank enriched Lithuanian baking sector with new labour culture, standards of ethics, the peculiarities of the communication with the clients etc. The new bank gave an impulse for the national economy and could also provide the country with new services, which had been poorly developed or not developed at all. It could also be partially stated that the acquisition ensured the stability of the financial sector because the result of the transaction was a great prestige which was formed revaluing the assets (loans portfolio) of the acquired bank.

AB “Lietuvos valstybinis komercinis bankas” restructuring is distinguished by its uniqueness and specificity. Such a transaction is not essentially a typical merger or acquisition. However, it was important for Lithuanian economy in order to ensure a stable activity of financial sector. Due to its difficult situation, “Lietuvos valstybinis komercinis bankas” was split and qualitative bank’s assets were transferred to AB “Lietuvos taupomasis bankas”, acting at that time. The “bad” part of the bank’s assets was transferred to AB Turto bank. Such a conclusion of the bank’s division transaction helped to reduce the fluctuations of Lithuanian financial sector’s stability.

AB “Snoras” bank acquired AB “Finasta” bank in order to reach financial and non-financial synergy, especially providing the clients with the new services: companies’ finance, assets and welfare management. However, the successful acquisition of the bank and its synergy did not ensure the activities of the bank’s acquisitor, thus it can be stated that, due to its ineffective activity, AB “Snoras” bank was declared bankrupt and the bank was liquidated.

Moreover, such division of one unsuccessful bank’s activity provided the bank which overtook the assets with the opportunity to acquire market power and take advantage from the bank’s size.

The recommendations for the Government of the Republic of Lithuania would be to pay attention to the concentration of the banking sector which includes its dependence on the banks of one foreign region. This dependence can be dangerous during the time of economic instability, when the “contamination effect” (or the systematic risk) spreads more easily. The domination of one region’s banks is especially dangerous because the lack of trust in the financial sector could spread fast to markets and negatively affect the economy of the state.

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The shadow economy has an impact on all economic phenomena and processes of the society: formation and distribution of income (Baikovs, Zariņš 2013; Giriūnienė 2013; Garškaitė-Milvydienė 2014; Peker et al. 2014; Giriūnas, Mackevičius 2014; Šabaševičienė, Grybaitė 2014; Korsakienė, Tvironavičienė 2014; Tvironavičienė 2014), trade, investment (Dudzevičiūtė 2013; Laužikas, Krasauskas 2013; Korsakienė 2013; Wahl, Prause 2013; Figurska 2014), motivation of employees (Laužikas, Mokšeckienė 2013; Išoraitė 2013; Caurkubule, Rubanovskis 2014; Tarabkova 2014), approach towards entrepreneurship (Litvaj, Poniščiaková 2014; Moskvina 2013; Bileišis 2014; Dzemyda, Raudeliūnienė 2014; Raudeliūnienė et al. 2014), valuation of companies (Prause 2014; Peker et al. 2014) and economic growth and sustainable development in general (Plachciak 2010; Baikovs, Zariņš 2013; Tvironavičienė 2014; Vasiūnaitė 2014). Shadow behavior is observed not only in economics but also in a variety of non-economic areas of the state: political system, law and law enforcing spheres, media, education, culture and science, etc.

Globalization in the world economy has not only opened up new possibilities for progressive economic development in the post-Soviet countries, but at the same time caused a number of qualitatively new global threats. Today the shadow economy has become one of such threats. The statistical analysis shows that to calculate the exact share of the shadow economy in the world GDP is extremely difficult. According to representatives of the International Monetary Fund, the total amount of shady transactions in the world reaches up to 10-11 trillion dollars, which is comparable to the size of the total U.S. GDP.

The goal of the article is to define the essence and causes of the shadow economy, and to indicate measures required for its suppression in the economy in Latvia. The objectives of the article are to define the

1. Introduction

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nature of the shadow economy and its main causes, to analyze its structure and identify its components, to determine the factors contributing to the development of the shadow economy and to evaluate the system of measures which combat it, to identify practical mechanisms of control. The object of the study is a comparative analysis of the socio-economic development in the Baltic countries - Estonia, Latvia and Lithuania, the subject of the study is the analysis of existence of the shadow economy as a socio-economic phenomenon. The methods of the study were basic techniques of systemic and situational approach, structural and comparative analysis. This article describes the investigation of the shadow economy mainly at the macro level. The criminal shadow economy is not considered, especially its extreme variant - latent economy (in German “Latentwirtschaft”, in French “Economie latente”, in Russian “ЛАТЕННАЯ ЭКОНОМИКА”).

2. The essence of the shadow economy

With the development of the science of management, views on the shadow economy also develop. It is believed that the shadow economy emerged simultaneously with commodity and commodity-money relations. Prior to the formation of national legal systems a major restriction of unfair business practices was a tribal moral or religious morality. Ethical standards were formed mainly on the basis of religious principles (e.g., “Thou shalt not kill,” “Thou shalt not steal”).

It is possible to find in Plato and Aristotle, what developed the economic sense of a natural way of managing. For instance, Plato (428-348 BC) opposed the use of money in order to gain wealth and usury. Aristotle (384-322. BCE) is notable for his analysis of capital, as it existed in the ancient world of trade, in its monetary form. He singled out two forms of economic organization: he called the first one chrematistics, and there he included activities aimed at profit and the accumulation of wealth. He called the second one the economy, which meant activities aimed at the acquisition of goods for households and the state.

According to the ideology of Christianity the economic interests must be subordinated to the common good and genuine cause of life – the salvation of the soul. In medieval theory, there was no place for economic activity that was not associated with a moral purpose. The state has not always been a model. It often violated the rules itself, especially in the sphere of money circulation.

The period of the so-called primitive accumulation of the capital during XV-XVIII centuries is likely to be regarded as the end of the dominant influence of the ideas and practices of canon law. The leading states of that time (Spain, Portugal, the Netherlands, and England) were actively involved in the slave trade, in the export of precious metals from Latin America and in encouraging piracy. That period led to the emergence of a new social class - entrepreneurs. The evolution of attitudes towards entrepreneurship also represents a certain interest. It is well known that the term “entrepreneur” was introduced into scientific discourse by Richard Cantillon at the beginning of XVIII century. He considered business income as a payment for risk. The concept included not only traders but also people who organized military expeditions, and even thieves. It should be noted that the views on what constitutes fair and unfair business practices also changed over time. Thus, in the period of primitive capital accumulation, slave trade, sea piracy, confiscation of the native lands flourished abundantly. They were considered to be normal business practices.

One of the most paradoxical phenomena of economic science in XX century was that the shadow economy was increasingly growing within the market economy, changing shapes and scale, but economists continued to ignore the fact, considering it to be the subject of study of criminal law, criminology, etc. The problems of present day informal economy have attracted the attention of researchers in 1930s. In the late 70s there were a number of serious studies in this field. The work of P. Gutmann can be noted in this connection (USA) “The Subterranean Economy” (1977), where he strongly argued in favor of the inadmissibility of ignoring its scope and role (Gutmann 1977). Also the work V. Burov (Russia) should be mentioned “The shadow activities of small businesses” (2011), in which she explores the problem of shadow activities of MPs, tendencies of transformation and quantitative assessment of the scope and structure of these activities (Burov 2011).

In 1991, the Conference of European Statisticians took place in Geneva and it was devoted to the phenomenon of hidden and informal economy. The conference was guided by the latest publications on the statistics of the shadow economy in the countries
with a market economic system. In May 1996, at a joint meeting of Eurostat, the problem of assessing the scope of the shadow economy was considered and a special working group for its study was set up. Although the studies on the shadow economy have been going on for several decades, economists have still not formed a unified conceptual framework for its analysis. Most authors, who tried to assess the shadow economy, are still facing the difficulty of producing a precise definition of the phenomenon. (Alderslade et al. 2006; Brueck et al. 2006; Chen 2004; Flaming et al. 2005; Marcelli et al. 1999; Tafenau et al. 2010; Williams and Windebank 1998, 2001a, b). In trying to produce this definition different terms in different countries have been applied: in English-speaking countries it is called the “shadow”, «unsanctioned», «parallel», «hidden» economy, in French – “informal” (informelle), «underground» (souterraine), «informal» (inofficielle); in German - the “shadow economy” (Schattenekonomie).

However, in the economic and sociological literature there it may be noticed not only the absence of a single unified term that defines the phenomenon of the shadow economy, but there is absent a clear understanding of the phenomenon too. Even EU countries do not have a single principle of accounting, for example, of manpower and agricultural production. In the Netherlands only land owners are treated as producers, but direct services providers, such as workers of specialized cooperatives, are not. (They are considered service producers.) In Denmark, the owners of certain types of land and those who actually work in these lands are not counted as employed. On one fine Saturday in September, A. Rubanovski had the honor of talking to burgomaster of Ærø island. (This island is about 16 x 4 sq. km, the village is divided into two settlements and there is just one police officer as he crime situation is very quiet there). A. Rubanovski asked him, how many people were employed in the agricultural production on the island, as it was noticed that a lot of people worked in all fields. The burgomaster replied: “Nobody! This is hobby farming!” (They call these areas as home gardens, backyard farms, etc.). The owners of these farms - mostly retired, may be living even in Copenhagen. They are helped by children, grandsons and great-grandsons, and are not included in any special cooperatives, as in the Netherlands.

At the initial attempt undertaken by German researchers to economically define this term, only secret financial transactions of various kinds were attributed to the underground economy. A number of German authors believe that the shadow economy primarily involves criminal activity, while others define it as a sector which involves all tax evading practices. Some others include here not only financial transactions, but also economic activities, which results in their opinion, should be included in the GDP. Here it is also worthwhile to mention the definition formulated by E. Feige (1990): “The informal economy includes economic activity which bypasses the (private) costs and eliminates the (social) benefits and rights prescribed by the laws and regulations governing the relations of property, commercial licensing, labor contracts, the relationship of financial credit and social insurance.”

The “Business Oxford Dictionary” gives the following definition of the shadow economy: “The underground economic activities, the discovery of which entails a taxation of income and even imprisonment of those who are engaged in them” (Business: The Oxford Dictionary 1995). Pass et al. (1995) define it in this way: “The shadow economy is an activity that is conducted within the framework of the economy, but not registered properly and therefore not reflected in the national income accounts.” According to one commonly used definition it comprises all currently unregistered economic activities that contribute to the officially calculated Gross National Product (Buehn et al. 2009; Feige 1989, 1994; Frey et al. 1984; Gołębiowski 2007; Karmann 1986, 1990; Schneider 1994, 2003, 2005). Smith (1994: 18) defines it as “market-based production of goods and services, whether legal or illegal, that escapes detection in the official estimates of GDP.” Put differently, one of the broadest definitions is: “...those economic activities and the income derived from them that circumvent or otherwise avoid government regulation, taxation or observation” (Dell’Anno 2003; Dell’Anno and Schneider 2003; Feige 1989; Feld et al. 2005; Fleming et al. 2000; Thomas 1999).

Such activities may include:

1. Working for a friend, which work may be performed as a favor without payment, also unpaid services of a spouse (with the development of household appliances and technologies, the cohabitants gladly help each other in the kitchen, by cleaning the property and so on.)
2. One person delivering to another person goods or
services in exchange for the equivalent without receiving payment in cash.

A Latvian scientist V. Roldugin (2005) gives the following definition of the underground economy: “It is the economy, which is not controlled by the state and it does not include the official state statistics.”

In most cases, the shadow economy promotes the emergence of a crime situation in which subjects avoid taxes. There may be other reasons, when the economic subject does not want to report his economic activities to anybody. The UN specialists engaged in national accounting consider the shadow economy as three, partly overlapping, spheres of activity, but they are well-defined and distinct from other sets of phenomena. These spheres are:

- Legitimate activities connected with the production of goods by households and consumed by them not subjected to official registration and taxation (“informal”), for example, agricultural production on the private farms and for individual needs, is considered beneficial to the society.
- Legitimate activities which, in order to evade the payment of taxes, are hidden or minimized and/or carried out without the appropriate licenses (“hidden”). This type of informal economic activity covers a significant share of the economy, ranging from large enterprises, firms, financial institutions and to the activities of small enterprises without legally employed workforce (e.g. temporary construction teams). It poses a threat to the economic safety of the country, first in the form of concealment of income and taxes, and secondly, in the form of the creation of criminal economic environment.
- Illegal activities representing production and distribution of goods and services forbidden by law (for example, the production and distribution of drugs, weapons, prostitution, smuggling), as well as the activities representing illegal obtaining of income not related to the production of goods and services (e.g., racket, fraud). These activities represent a direct threat to the security of individuals, society and the state. (Kovalev and Latov 2006).

In the light of all said above, it is evident, that the shadow economy is a part of the national economy, where certain business operations are conducted not according to the legally accepted business behavior. Because of the illegality of the shadow economy, its products are fully or partially concealed from the official record by economic agents (Kovalev and Latov 2006). In the most general form, the shadow economy is defined as a set of economic activities, which, for some reason are not taken into account by official statistics, are not covered by taxation and are not included in the GDP (Grjaznova and Dumnaja 2005.).

Summarizing all views on the shadow economy considered above, the authors propose the following definition: “The shadow economy is production, distribution, exchange and consumption of any commodity, material assets, money, services, uncontrollable by state and society and being hidden from the government and the public.” The shadow economy covers the sphere of socioeconomic relationships between individuals, social groups, etc, by the use of state property for personal or group interests. The shadow economy includes all unaccounted, independent, other than those specified in the regulations and the rules of managing economic activities.

3. The scope and the structure of the shadow economy

There are many approaches to the study of the shadow economy. The peculiarity of the economic approach is related to its impact on the economic policy effectiveness, distribution and use of economic resources, the development of reliable methods of measurement and evaluation. This approach tends to explore the underground economy at its various levels. At the macro level, shadow economic activities are analyzed in terms of their impact on the structure of economy, production, distribution, redistribution and consumption of the GDP, employment, inflation, economic growth and other macroeconomic indicators. In this case a variety of methods are used to quantify the scale of the shadow economy (Burov 2011). As a result of application of different methods the following estimates of the shadow economy were produced (in % of GDP) for the countries that differ in a number of features from each other and at different periods of time: for Austria - from 4 to 9%, Belgium - from 2 to 20%, France - 6 to 9%, Germany - from 3 to 15%, UK - from 2 to 8%, U.S. - from 4 to 30%. A famous publication of the American economist Feige (1979) was scandalous: he calculated that the sector of irregular economy in the U.S. makes at least one third of the official GDP, i.e. about the same as the informal economy in the countries of the third world. Just how strong repercussions this article produced was evidenced by the fact that a special hear-
ing of the economic committee of the U.S. Congress was dedicated to its discussion. (The underground economy 1979) E. Feige’s colleagues unanimously reproached him in overestimating his figures several times (apparently, the author wrote his article specifically with an aim to produce an epatage). For example, P. Gutmann (1979.) estimated the size of the informal economy in the U.S. in 1978 only about 10% of officially registered GNP and V. Tanzi (1982) even cut it to 4.4%. While experts continue to argue about the extent of the phenomenon, the attention of the scientific community to this sector of the economy of developed countries has been assured since then. In later years, special studies on informal economic activity began to be conducted not only in the U.S. but also in other developed countries. In Europe, the share of the shadow economy in 2012 decreased to 19% of gross domestic product (GDP). The research of scientists at Linz University included the countries of EU, together with Switzerland, Norway, Croatia and Turkey. In 2012, the shadow economy in these countries amounted to 2.175 trillion euro (1.5 trillion LVL). In 2011, the proportion of the shadow economy in Europe was 19.2% (Figure 1).

![Image](Fig.1. The scale of the shadow economy in EU in 2011

*Source: Schneider 2013*

As for Latvia, according to CSB LR, in 2011 the proportion of the shadow economy was 18%, according to preliminary estimates of professor Friedrich Schneider of the Linz University- 29% of the GDP (Latvian statistics 2014). At the end of the study, F. Schneider gives the final figure for 2011 - 26.5% (Schneider and Buehn 2012), which is the fifth highest in all EU countries. According to the shadow economy dynamics, it can be seen that since 2010 the share of the shadow economy has reduced, but the level is still high. Figure 2 reflects the dynamics of the shadow economy scale in Latvia.

![Image](Fig.2. The scale of the shadow economy in Latvia 2003-2012.

*Source: Schneider 2013*
4. The links between the shadow economy and the economic progress in the Baltic states of Lithuania, Latvia and Estonia

Table 1 reflects the dynamics of growth for the shadow economy in the Baltic States:

Table 1. The growth rate of the shadow economy in the Baltic States (in % of the GDP)

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Estonia</td>
<td>12.0</td>
<td>22.4</td>
<td>12.8</td>
<td>19.4</td>
<td>28.6</td>
<td>19.2</td>
</tr>
<tr>
<td>Lithuania</td>
<td>12.0</td>
<td>39.2</td>
<td>21.6</td>
<td>18.8</td>
<td>29.0</td>
<td>18.2</td>
</tr>
<tr>
<td>Latvia</td>
<td>12.0</td>
<td>34.3</td>
<td>35.3</td>
<td>27.3</td>
<td>26.5</td>
<td>21.1</td>
</tr>
</tbody>
</table>

Source: the author’s construction from (Does not indicate a reduction of the shadow economy 2012; Burov 2011; Sauka 2011)

The analysis of the data represented by Table 1 shows a trend of downward tendency in the level of the shadow economy of Latvia in the post-crisis period. However, in comparison to Estonia and Lithuania, in 2012 Latvia was the leader according to the scale of the shadow economy, which to some extent correlated to the economic development in these states.

In May 2011, TNS Latvia completed the study, which showed that 58% of the economically active people of Latvia were in some way connected with the phenomenon of the shadow economy. As for the structure of the shadow economy, the results of the study released on 15.05.2013 at a press conference in Riga Graduate School of Economics, showed that 42.9% of the shadow economy in Latvia are wages “in envelopes”, 39.5% - concealed income and 17.6% - unofficially working people. In Lithuania, the structure of the shadow economy is similar - wages “in envelopes” make 39.3%, concealed profit - 42.7%, unofficially working people - 18%. In Estonia, the main proportion in the shadow economy structure is wages “in envelopes” - 52.3%, the share of not shown profits - 28.5%, unofficially working people - 19.2%. The proportion of the shadow economy is the highest in the wholesale and retail trade, which is respectively 28.7% and 26%. 23.2% of the sector of services is also in the “shadow”. According to the conclusions of the authors of the cited study, mostly small businesses and micro-enterprises with the number of employees from 1 to 5 persons are involved in the shadow economy - 30.5%. The share of enterprises with number of employees from 6 to 10 is 26.2%. The lowest share of the shadow economy is in the group of large enterprises employing more than 200 people - 17.3% (Sauka 2013). Table 2 reflects the rating of the Baltic States in relation to the GDP per capita and the average level in EU, which shows that Latvia has the lowest GDP per capita according to the EU average.

Table 2. Rating of the Baltic States in relation to the GDP per capita and the average level in the EU

<table>
<thead>
<tr>
<th>Position</th>
<th>Country</th>
<th>2010</th>
<th>2009</th>
<th>Changes</th>
</tr>
</thead>
<tbody>
<tr>
<td>21</td>
<td>Estonia</td>
<td>65</td>
<td>64</td>
<td>1</td>
</tr>
<tr>
<td>24</td>
<td>Lithuania</td>
<td>58</td>
<td>55</td>
<td>3</td>
</tr>
<tr>
<td>25</td>
<td>Latvia</td>
<td>52</td>
<td>52</td>
<td>0</td>
</tr>
</tbody>
</table>

Source: RIA “Analytics” (2011)

Eurostat data on labor productivity also show that the gross domestic product per working hour in Latvia in 2010 was only 15.6 euro, while in Lithuania - 18.5, and in Estonia - 20.6 euro. Lower than in Latvia, productivity indices were registered only in Bulgaria and Romania (Development of Latvia is slowed by shadow economy 2011). This is also evidenced by rating data on the share of food expenditure in overall consumer spending in 2009 (Table 3), although during the post crisis period the situation in Latvia did not change much.

Table 3. Ranking countries according to the share spent on food products in the overall amount of consumer expenditure (2009)

<table>
<thead>
<tr>
<th>Position</th>
<th>Country</th>
<th>Food-stuff, %</th>
<th>Non-alcohol drinks, %</th>
<th>Alcohol, %</th>
<th>Catering, %</th>
</tr>
</thead>
<tbody>
<tr>
<td>26</td>
<td>Estonia</td>
<td>20.9</td>
<td>1.4</td>
<td>5.8</td>
<td>4.4</td>
</tr>
<tr>
<td>32</td>
<td>Lithuania</td>
<td>23.3</td>
<td>1.9</td>
<td>4.7</td>
<td>1.9</td>
</tr>
<tr>
<td>25</td>
<td>Latvia</td>
<td>18.4</td>
<td>0.1</td>
<td>4.3</td>
<td>3.3</td>
</tr>
</tbody>
</table>

Source: RIA “Analytics” (2011)

The important factor in the growth of the shadow economy is the level of corruption in the state. The Old Greek philosopher Socrates (≈ 469 - 399 BCE) already specified the corruption of a state as an immoral phenomenon. In the ranking of countries in terms of corruption (Table 4), according to the study conducted by the international organization “Transparency International”, Latvia looks the worst, in comparison with Estonia and Lithuania and among 182 countries, which was expected:
Table 4. Corruption Perception Index of the countries in 2012

<table>
<thead>
<tr>
<th>Position</th>
<th>Country</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>32</td>
<td>Estonia</td>
<td>64</td>
</tr>
<tr>
<td>48-49</td>
<td>Lithuania</td>
<td>54</td>
</tr>
<tr>
<td>54-57</td>
<td>Latvia</td>
<td>49</td>
</tr>
</tbody>
</table>

Source: The most corrupt countries in 2012

There are two different explanations of high interdependency between the shadow economy and corruption: the shadow economy is an attempt to eliminate corruption - the entrepreneur goes into hiding to avoid paying bribes, thus corruption generates additional growth of the shadow economy. According to some estimates, the increase in the corruption index by one point leads to the growth of the shadow economy by 7.6%. This is not consistent with the concept of the shadow economy as a way to bypass the corruption, but supports the concept of the shadow economy as a product of corruption. Table 5 was compiled on the basis of reports made in 2011, which covered 142 countries. The table shows that Estonia takes 35th place, Latvia – 43rd and Lithuania – 47th. According to the ratings of the Baltic States in the last 3 years, it can be concluded that Estonia is the leader among these countries in the field of social welfare, and its place is relatively stable over the last three years. Latvia worsened its position in the ranking of 2011 as compared with a rating of 2010 by 4 points, but in 2012 moved up by 8 points, ahead of Lithuania. It means that in 2011 (rating of 2012) social welfare in Latvia improved compared to 2010 (rating of 2011) (The 2012 legatum prosperity index table).

Table 5. Rating of the countries according to the index of prosperity

<table>
<thead>
<tr>
<th>Year</th>
<th>Latvia</th>
<th>Estonia</th>
<th>Lithuania</th>
<th>Countries researched</th>
</tr>
</thead>
<tbody>
<tr>
<td>2010</td>
<td>47</td>
<td>35</td>
<td>42</td>
<td>104</td>
</tr>
<tr>
<td>2011</td>
<td>51</td>
<td>33</td>
<td>44</td>
<td>110</td>
</tr>
<tr>
<td>2012</td>
<td>43</td>
<td>35</td>
<td>47</td>
<td>142</td>
</tr>
</tbody>
</table>

Source: The 2012 legatum prosperity index table

5. Factors influencing the development of the shadow economy

Several groups of causes affecting the development of the shadow economy may be identified:

1. Economic factors - the restructuring in the spheres of economic activity, which is not always focused on the development of legitimate business structures, the crisis of the financial system and the impact of its adverse effects on the economy as a whole; imperfect investigation of the privatization process; the operation of unregistered economic structures; problems of economic competition; low income level of the population; the rise in prices of basic food products; improperly balanced tax burden; shortcomings in the regulation of the labor market; the quality of social services and inadequate formal assessment of the current economic situation in the country.

2. Social factors - low standard of living, which contributes to the development of hidden economic activities; high level of unemployment and the general orientation of the population to earn income by any immediate means; the uneven distribution of the GDP; and low level of social protection.

3. Legal factors - inadequate functioning of law enforcement agencies due to the lack of necessary materials and technical resources; poor knowledge of people working in the system of law enforcement regarding the economic activities and conditions of the market economy; the overall low level of legal awareness and legal culture of the population; imperfect legislation.

4. Political factors - controversy in the political system. One of the fundamental questions here is about the relationship of power and big business.

5. Anthropological factors - these are connected to contradictory human nature. The aspiration to receive more at the expense of less effort is typical of a human being. Similar rationalism in case of absence or weakness of delimiters induces a person to engage in shadow activities.

6. Ethical factors - poor ethical foundation of entrepreneurship.

7. Social and cultural factors – it is essential to understand the basics of entrepreneurship and the features of the shadow economy in culturally different societies.

The analysis shows that to the already mentioned factors influencing the shadow economy development in Latvia, the low income of the main part of the Latvian population should be added - the minimum gross salary in Latvia is 200 LVL (net salary of about 146 LVL), which is significantly lower than the subsistence minimum established by the government (176 LVL). According to the LR Ministry of Welfare, the minimal wage in 2012 was received by
According to the World Bank, an important reason for the growth of the shadow economy is the excessive tax burden, and also, as the World Bank mentions in its report, imperfect regulation of the labor market, a poor quality of social services and incorrect formal assessment of the current economic situation in the country (Latvia - first in Europe in the shadow economy). Another important reason for the growth of the shadow economy is a low level of social protection. As it is seen in Table 6, one can conclude that expenditures on the social protection in Latvia are much less than in the EU. The figure for Latvia is not stable and has not yet reached 20%, which is the indicator of a normal development of a country according to the UN.

### Table 6. Expenditures on social protection (by ESSPROS classification) in the EU countries for 2005-2010 (% of GDP)

<table>
<thead>
<tr>
<th></th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
</tr>
</thead>
<tbody>
<tr>
<td>ES - 27</td>
<td>27.1</td>
<td>26.6</td>
<td>25.7</td>
<td>26.7</td>
<td>29.5</td>
<td>29.4</td>
</tr>
<tr>
<td>Latvia</td>
<td>12.8</td>
<td>12.7</td>
<td>11.3</td>
<td>12.7</td>
<td>16.9</td>
<td>17.8</td>
</tr>
</tbody>
</table>

*Source: Eurostat (2013)*

On 11.08.2010, the Government of Latvia supported the plan developed by the Ministry of Finance to control the underground economy, which purpose was to make shady financial transactions unprofitable for enterprises. The plan proposed a number of bonuses and benefits for businesses operating legally, the introduction of zero declaration and partial taxes amnesty from July 1, 2011. Entrepreneurs were offered the opportunity to legalize undeclared income by paying a certain tax. At the same time, the Ministry of Finance proposed to create a “white list” of companies that will have advantages in obtaining government contracts and easier access to the EU funds. Also the idea of possible differentiation of the minimum wage, depending on the scope of activities was supported. In total, the plan of the Ministry of Finance listed 60 proposals, most of which eventually acquired a repressive character. However, the international experience shows that the repressive measures are not effective mechanisms for solving the problem of eliminating or reducing the shadow economy. The best measures are considered to be the so-called “stimulating” instruments or incentives. Thus, according to V. Gustsons (2012) an important government decision may be a correct long-term program of fiscal discipline and strategy. Another very effective
“stimulating instrument” is the proposal of the Minister of Health to connect the actual tax payments with the right to receive planned healthcare services. The introduction of such a regulation will make those who are paid in envelopes think twice, whether it will not cause even greater losses in case of the need in medical assistance. V. Gustsons (2012) also considers being an important factor the government procurement orders and the procurement orders of local governments, which account for a significant part of the total purchase briefcase. In perspective there should be a system, when every entrepreneur who wants to receive a government contract will be assessed according to the tax payment criteria. In addition, the government should take measures to tax alignment with the entire Baltic region, as currently the tax burden on workers is the highest in Latvia in comparison with other neighboring countries.

7. Ways to reduce the shadow economy

To effectively combat the shadow economy, it is necessary to understand its causes, which are implied by the economic environment in Latvia. These include, above all, a low living standard of the majority of the population, and a fairly high level of tax burden on business. However, the actions of various government agencies, unfortunately, are insufficiently coordinated with each other and not systemic. In addition, the national legal system is not adapted to combat the laundering of funds, and a huge bureaucratic apparatus of public administration provides a good breeding ground for various corruption schemes at the level of government, especially municipal.

Restriction of the size of the shadow economy may happen only as a result of very serious efforts, including political ones. This should be a real progress towards democratization of all social and economic processes, the increase of accountability of the executive power, strengthening the judicial system and law enforcement system as a whole, and combating corruption of the government. In the light of the global interbanking transactions in the EU and worldwide, prevention of the activities of “laundering” money should conceptually be based on a common basis for all states. Each country is required to develop a strategy for such a struggle, taking into account national peculiarities and specific local conditions. Integrated measures should be based on international practice and should include the following points:

- constant monitoring of new schemes of “laundering” of money and exchange of the information received at the international level;
- monitoring the penetration of organized crime into the sphere of politics and government structures by way of using illegally obtained capital;
- monitoring processes of fusion of organized crime with legitimate criminal and financial institutions;
- continuous tightening of control over banks’ reporting on their work with clientele, and in case of violations applying such measures as criminal prosecution, fines, and withdrawal of licenses;
- strengthening of control over the activities of non-banking financial organizations and institutions, and over the functioning of non-profit organizations, if they create charitable foundations;
- the analysis of the impact of criminal activity related to the “laundering” of money on national law enforcement authorities and economic structures;
- continuous improvement of the performance of public and state structures involved in the prevention of the crime of “laundering” money.

In general, the restriction of the development of the shadow economy in Latvia would contribute to a further improvement of the economy and to the implementation of the governmental plan to control the shadow economy.

Conclusions and proposals

Shadow economic activities have always been neglected by the law. The development of the science of management promotes the development of views on the shadow economy. All sources of shadow economy are intertwined and cannot always be clearly differentiated. One of the most paradoxical phenomena of economic science in the XX century was that the shadow economy was increasingly growing within the boundaries of the market economy, changing in shape and scale, but economists continued to ignore it, considering it a subject of study by criminal law, criminology, etc. The shadow economy embraces the socioeconomic relations among individuals, social groups, etc. and uses the state property in personal or group interests. The shadow economy includes all unaccounted and independent economic activities, other than those specified in the regulations and the rules of managing. The shadow economy is a part of the national economy, where business operations are conducted outside the field of legality. At the macro
level, the shadow economic activities are analyzed in terms of their impact on the structure of economy and the spheres of production, distribution, redistribution and consumption of the GDP, employment, inflation, economic growth and other macroeconomic processes. The data analysis shows a tendency of downward trend in the level of the shadow economy in Latvia during the post-crisis period. However, in comparison with Estonia and Lithuania, in 2012 Latvia was the leader according to the proportions of the shadow economy, which, to some extent, correlated to the economic development of these states. As for the structure of the shadow economy, the results showed that 42.9% of the shadow economy in Latvia are wages “in envelopes”, 39.5% - hidden income and 17.6% - unofficially employed workers. There are two different explanations of high interdependency between the shadow economy and corruption: the shadow economy is an attempt to eliminate corruption - the entrepreneur goes into hiding to avoid paying bribes; in its turn, corruption generates additional growth of the shadow economy. The important factor in the growth of the shadow economy is the level of corruption in the state. The rise in prices of basic foodstuffs and especially utilities reduces the standard of living of the low income section of the population. The important reasons for the growth of the shadow economy are improper tax burden and a low level of social protection. The social protection in Latvia is significantly below than in most countries of EU. The level of social protection in Latvia is not stable and has not yet reached 20%, which % is the indicator of a normal development of a country according to the UN. Some economists believe that the shadow economy makes a major component of the economy of Latvia, and it allows people with low incomes to survive and thus resist emigration to more affluent EU countries. However, this is a short-term “aid” for which people will have to pay in a long-term period. On 11.08.2010, the Government of Latvia supported the plan developed by the Ministry of Finance to control the underground economy, which purpose was to make shady financial transactions unprofitable for business enterprises. The plan of the Ministry of Finance consisted of 60 proposals, most of which ultimately had a repressive character, although the international experience shows that repressive measures are not effective in solving the problem of the shadow economy. An important government decision may be a correct long-term program of fiscal discipline and strategy. First of all the government should align taxes with the entire Baltic region, as currently in Latvia and in comparison with other neighboring countries, the tax burden on workers is the highest. In general, restriction of the shadow economy in Latvia would contribute to the further improvement of the economy and to the implementation of the national plan to control the shadow economy. The shadow economy is decelerating element in the development of the national economy.

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Sustainable Development of Public Institutions: The Model of Functional Review

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Abstract. Sustainable development and efficiency of public sector remain priority of governments. Hence, governments are concerned with assessment, plan and measure of functions performed by public institutions. However, various problems related to the methodology of functional review are indicated. The paper aims to develop the model appropriate for the planning and execution of functional reviews in public institutions. The research is based on the method of systemic analysis what let us carry out comparative analysis and synthesis of prevailing models developed by different scholars and practitioners. Suggested model contributes to sustainable development of public institutions by providing consistent guidelines relevant for various stakeholders.

Keywords: institution, function, methodology, model, functional review, sustainable development


JEL Classifications: H83

1. Introduction

Considering various external and internal factors of public institutions, the decisions related to the functions, their content and/or process development are accepted and implemented (Bivainis, Tunčikienė 2009, 2011; Burkevičius, Bivainis 2009; Bileišis 2012; Giriūnas, Mackevičius 2014; Tunčikienė et. al. 2013; Bileišis 2014). The complexity and dynamics of environment, the principles of allocation, the usage of resources and capabilities influence the peculiarities of functional review: rationality, complexity, number of iterations, involvement of stakeholders in the decision-making process and etc. On the other hand, the nature of functional review depends on the motives and demand to prepare, accept and implement decisions related to the functions, assessment of risk relevant to the implementation of these decisions, accumulation of resources and capabilities (Modell 2009; Bileišis 2014). The researchers and practitioners (Dudina, Sprindzuks 2006; Functional reviews … 2008; GRL 2011, 2012a, b, 2013; Gromov 2007; Lukashenko 2009; Manning, Parison 2004; Medvedev 2002; Nakrošis, Martinaitis 2009; OECD 2013; Petrov 2002 a, b; Reed 2010; The report on investigating... 2010; Zabolotnic 2007; Mačiulis, Tvaronavičienė 2013; Bileišis 2014; Tvaronavičienė 2014; Vasiliiūnaitė 2014) provide different attitudes to the external and internal factors impacting functional reviews. Hence, various ideas how to develop the most favourable preconditions and how to assure the alignment of environment and public institutions have been proposed. These suggestions led to the huge variety of models, focused on the functional reviews of institutions.

The paper aims to develop the model appropriate for the planning of functional review in public institu-
tions. We argue that developed model contributes to sustainable development of public institutions by providing consistent guidelines relevant for various stakeholders. Aiming to implement the objective the tasks are defined as follows: to investigate and reveal prevailing functional review models, to group and compare these models, to suggest the model of functional review and to define the content of constituent stages. The research is based on the method of systemic analysis what let us carry out comparative analysis and synthesis of prevailing models developed by different scholars and practitioners.

### 2. Methodological background of functional reviews

Methodology of functional reviews comprises applied methods and procedures (Manning, Parison 2004; Petrov 2002b; Recommendations for the application ... 2011). Considering the scheme provided in Figure 1, functional review is placed in the centre and is impacted by environmental and resource assessment, long-term strategic objectives of State, the principles of reforms focused on the public sector and essential guidelines for functional review. Notably, functional reviews have focused on different concerns such as, policy effectiveness or efficiency of organisations. Therefore, reviews can focus on two different sorts of potential review objects: policy and organisational. However, the authors of the paper aim to narrow the scope of paper and focus on organisational level.

![Methodology of functional review](image)

**Fig.1. Methodology of functional review**

*Source: developed by authors according to Manning, Parison (2004); Petrov (2002b); Recommendations for the application ... (2011)*

Functional review is seen as a set of tasks and comprises the development of initial list of functions and classification of functions according to the defined criteria. The final outcome of functional review is specific recommendations related to the function.

### 3. The process of functional review: the main stages and sequence

Considering the problems and priorities of public sector, functional reviews are focused on the changes
in public institutions, management levels and a system as a whole. The literature focused on functional reviews is vast and the researchers provide different approaches to the processes of functional reviews (Table 1). For instance, Manning and Parison (2004) distinguished the preparation stage of functional review as a starting point of a whole process. Then the analysis of good practice, collection of information related to the functions and initial analysis are carried out. Next step requires investigating functions, their executors and organizational structure. The emphasis is put on the investigations of needs related to structure change and transfer of functions to other executors. Finally, the outcomes of functional review are considered and recommendations are developed. The scholars proposed the process of functional review comprised of planning, execution and coordination.

Meanwhile, Medvedev (2002) suggested the process of functional review similar to the process developed by the World Bank. The main idea of proposed process is to find ways how to develop execution of functions. The process of functional review is finalised by the development of new suggestions related to these functions. Petrov (2002b) proposed stages of functional review; however their sequence remains similar to other models. According to the scholar, the assessment of the consequences in the process of functional review is seen as the most important. The outcomes of assessment of consequences lead to the preparation of changes and change management. According to Gromov (2007), the process of functional review comprises different stages. Notably, various actions are carried out in each stage aiming to justify the need of functional review, to develop initial list of functions and finalize the list by developing the register of functions. Meanwhile, Maslenikova (2009) suggested different process of functional review. The initial stages namely: investigations of documents, integration of sociological research, design and change management were proposed. Lukashenko (2009) developed the process of functional review comprised of initiation, development of essence, analysis, development of reports and recommendations. In each stage of functional review different procedures are carried out what lead to the following outcomes: the scope of analysis, priorities, the objectives and tasks of analysis, the list of functions, new functions, structure and etc., the plan for implementation of recommendations.

According to the functional review methodology approved by Lithuanian Government (GRL ... 2013) the process of functional review comprises planning and organization, execution, implementation of recommendations and procedures for monitoring. The methodology suggests rational and summarized process of functional review. Thus, the process allows justify the needs for review, to guarantee provision of resources required for functional review, to solve various tasks of functional review, to assess recommendations related to implementation of functions.

**Table 1. The process of functional review (developed by authors)**

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<td>Establishment of a task force</td>
<td></td>
<td>Test of hypotheses</td>
<td>Initial actions</td>
<td>Planning and execution of functional review</td>
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<td>Analysis of good practice</td>
<td>Separation of functions</td>
<td>Analysis of good practice</td>
<td>Collection and revision of information about functions</td>
<td>Investigation of documents</td>
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<tr>
<td>Collection of information about functions</td>
<td>Structural analysis of functions</td>
<td>Collection of information about functions</td>
<td>Functional review</td>
<td>Sociological research</td>
<td>Implementation of recommendations and monitoring</td>
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<td>Functional review</td>
<td>The directions for optimisation of functional execution</td>
<td>Functional review</td>
<td>Standardisation</td>
<td>Integration</td>
<td></td>
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</tr>
</tbody>
</table>
Sustainable development of public institutions: the model of functional review

4. Specific tasks of functional review

The stage of planning and execution

Both researchers and practitioners suggested similar content of planning and execution stage (Table 2). Notably, a task force comprised of responsible individuals, representatives from supervised bodies, national and international experts has to be established (Manning, Parison 2004; Medvedev 2002; Petrov 2002b; Maslenikova 2009). Hence, the objectives of functional analysis, time of implementation and methods have to be defined. In addition, the endorsement of management and in some cases endorsement of controlling institutions has to be acquired (Manning, Parison 2004; Medvedev 2002; Petrov 2002b; Maslenikova 2009). Therefore, the analysis of information related to researches carried out in other countries, applied models and obtained results is necessary. Notably, benchmarking was suggested by the majority of scholars (Gunasekaran, Gupta 2008). For instance, Gromov (2007) suggested to define and to check hypotheses related to the main factors impacting decisions of functional review in the initial stage. According to Maslenikova (2009), the main conditions of functional review are as follows: political support, development of a task force, definition of objectives, time and outcomes, selection of appropriate type of analysis and methodology. These aspects define implementation plan of functional review. Summing up, the main tasks of this stage are as follows: justification of needs for functional review, preparation of plan, identification of scope and type of functional review, objectives, expected outcomes, time scale, financial resources an financial sources, responsible bodies, establishment of a task force.

<table>
<thead>
<tr>
<th>Analysis of executors of functions</th>
<th>Provision of recommendations</th>
<th>Analysis of executors of functions</th>
<th>List of functions and development of register of functions</th>
<th>Design</th>
</tr>
</thead>
<tbody>
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<td></td>
<td>Development of recommendations and report consisting of analysis of possible consequences</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Summarized outcomes and development of recommendations</td>
<td></td>
<td></td>
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</tbody>
</table>

The stage of functional review

The process of functional review begins from the collection and analysis of information necessary for functional review, namely: legislation linked to the activities of institution, action plans, annual reports of activities, budget and etc. (Manning, Parison 2004; Medvedev 2002; Petrov 2002b; Gromov 2007; Maslenikova 2009). Samarucha (2008) asserts that functional review starts from legal documents, regulating implemented functions of institution taking into consideration specific criteria. Meanwhile, Maslenikova (2009) suggested the analysis of information related to image of institution from external and internal perspectives. The analysis of image let to disclose priorities of fields where changes are needed and to take into consideration opinions of society and employees of institution. In this stage the obstacles related to review of documents are identified and various methods (e.g. surveys) are suggested aiming to identify implemented functions of institution. On the other hand, the surveys have to be assessed considering limitations of the method.

Taking into consideration relevant information, it is possible to identify if functions are regulated by legal documents and what is the level of their implementation (Samarucha 2008). The identification of inputs and outputs of functions are considered to be the most important task of this stage. Majority of scholars (Pedraja-Chaparro et al. 2005; Lonti, Woods 2007; Borge et al. 2008; Afonso et al. 2009; Arend, Levesque 2010) assert that the identification of inputs and outputs leads to the evaluation of efficiency and productivity of organisation’s activities. Lonti and Woods (2007) suggested technical assessment of effectiveness of inputs and outputs. Medvedev (2002) stressed the importance to align one function with one activity, one outcome and recipients.

In the stage of execution of functional review the standardization of statements of functions are suggest-
ed according to the certain rules (Manning, Parison 2004; Medvedev 2002; Petrov 2002b; Gromov 2007; Maslenikova 2009) what let to identify overlapping and side functions, to formulate initial conclusions regarding functions (Maslenikova 2009). Next task is classification of functions. The opinions of scholars and practitioners about the role and place of functional classification are different. While some scholars suggested to carry out classification before standardization of functions (Gromov 2007; Maslenikova 2009), others suggested to carry after standardization (Manning, Parison 2004; Medvedev 2002; Petrov 2002b). On the other hand, the opinions related to classification of functions are different. For instance, the research carried out by Manning and Parison (2004) focuses on public functions. The questions have been raised: how to distinguish functions and how to find the most appropriate executors in State structure. According to the World Bank, functional reviews are focused on the efficiency of functions. For instance, Medvedev (2002) stress the importance of related and unrelated functional review as well as their implementation analysis. Aiming to increase efficiency of functions, some scholars suggested requirements corresponding to institutional management (Manning, Parison 2004; Petrov 2002b). According to the review of abilities to carry out functions, the changes of organisational structures, processes and capabilities are determined. If the need appear, new structure is developed, new processes implemented and etc. The identification of problems related to the service provision let to justify expenses necessary for organisational changes in institution (Medvedev 2002). The identification of development directions necessary for implementation of institutional functions is based on the proportion of power and outcomes, difference of outcome in comparison to the sought, expectations of citizens and recommendations of experts. Hence, we can conclude that the change projects have to be developed (Maslenikova 2009). The process of functional review is finalised by the discussions of outcomes, the development of recommendations, the discussions with stakeholders and publication of recommendations (GRL ... 2013).

Table 2. The tasks implemented in each stage of functional review

|-------------------|----------------------|--------------|------------|-------------|------------------|---------------------|
Živilė Tunčikienė, Renata Korsakienė
Sustainable development of public institutions: the model of functional review

<table>
<thead>
<tr>
<th>Execution of functional review</th>
<th>Collection and analysis of necessary documents</th>
<th>Collection and review of necessary data base</th>
<th>Collection and analysis of legal documents</th>
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</thead>
<tbody>
<tr>
<td>Collection and analysis of activities' regulation</td>
<td>Interviews with representatives of departments</td>
<td>Review of authorization</td>
<td>Internal analysis of institution</td>
</tr>
<tr>
<td>Analysis of execution of functional review</td>
<td>Development of functional objectives, final outcomes</td>
<td>Legal justification of functions</td>
<td>Review of information related to image of institution</td>
</tr>
<tr>
<td>Identification of functions</td>
<td>Standardisation of functional statements</td>
<td>Assessment of inputs and outputs of function</td>
<td>Interviews with management, line managers and employees (survey)</td>
</tr>
<tr>
<td>Identification of appropriate functional executors</td>
<td>Reviews of functional cycles</td>
<td>Standardisation of functions</td>
<td>Development of initial list of functions</td>
</tr>
<tr>
<td>Identification of assessment criteria of functions</td>
<td>Development of structural-functional model of institution</td>
<td>Distinguished overlapping functions</td>
<td>Review of syntax</td>
</tr>
<tr>
<td>Development of structural-functional model of institution</td>
<td>Development of final functional list</td>
<td>Investigation of reorganisation of structure</td>
<td>Development of functional list</td>
</tr>
<tr>
<td>Development of final functional list</td>
<td>Development of recommendations</td>
<td>Assessment of functional delegation</td>
<td>Characterisation of defined functions</td>
</tr>
<tr>
<td>Development of recommendations for functions</td>
<td>Development of recommendations</td>
<td>Development of final functional list</td>
<td>Detail competencies</td>
</tr>
<tr>
<td>Development of recommendations</td>
<td>Development of implementation of change plan</td>
<td>Development of implementation of change plan</td>
<td>Development of initial list of functions</td>
</tr>
</tbody>
</table>

Source: developed by authors
The stage of implementation of recommendations and monitoring

Maslenikova (2009) assert that the main steps of implementation stage are as follows: development of action plan for changes, preparation of civil servants for changes, assessment of effectiveness of reforms. Meanwhile, Manning and Parison (2004) suggested developing implementation plan required for changes. Hence, monitoring and assessment of obtained outcomes are seen as essential. According to the methodology developed by Lithuanian Government, in the stage of implementation of recommendations and monitoring the plan for functional review is approved and review outcomes are assessed (Table 2).

5. The model of functional review: composition and constituent parts

Notably, the content and character of functional review of public institutions have to be related to the components of the model of functional review. These interrelationships lead to:

1) The possibility to disclose factors, determining the necessity and the adequacy of the functions, performed by the institutions and to determine how these factors correspond to the requirements of external and internal environment and how these factors are interrelated together.

2) The possibility to carry out a complex evaluation of the needs for functions as well as their adequacy to the requirements of the environment considering defined factors.

3) The possibility to use the outcomes of such review and evaluation purposefully.

Hence, the conclusion can be drawn, that functional review is seen as a significant tool necessary for effective management in public institutions. Summing up, the synthesis of various functional review models let us determine the composition of proposed model as follows:

1. The propositions for functional review:
   1.1. Development of organisational propositions for functional review.
   1.2. Development of methodical propositions for functional review.

2. Functional review and development of decisions based on insights:
   2.1. Analysis and assessment of factors (external and internal).
   2.2. Development of rational list of functions (initial list of functions and classification of functions).
   2.3. Justification of functional review and assessment (considering criteria of purposefulness, scope and location).
   2.4. Management of implementation, review and assessment of related subsystems linked to implementation of function.
   2.5. Development and acceptance of decisions related to functions and their implementation (development of alternatives, assessment of accepted criteria, decision making).
   2.6. Development of plan related to implementation of decisions (development of alternatives, assessment according to selected criteria, and acceptance of actions plan).

3. Monitoring of decisions related to function and improvement of implementation plan:
   3.1. Control of implementation of actions plan.
   3.2. Analysis and assessment of outcomes related to actions plan.
   3.3. Application of outcomes related to actions plan analysis and outcomes of assessment.

The application of proposed model leads to rational context of functional review, functional review of institution and implementation of decisions related to functions.

Conclusions

Prevailing variety of functional review models is determined by many factors. The most important of these factors are: defined objectives, applied methodology, attitude to the significance of external and internal factors, the role of stakeholders and etc. Aiming to systematize various models, general and specific attributes are applied. The application of specific attributes (objective, measures and tasks) let us distinguish main features and carry out structural analysis.

Hence, structural analysis of prevailing models of functional review let us determine the main features of prevailing models. Notably, some models are detail models, some models – aggregate and some models combine aspects of detail and aggregate models. Considering relationships, some models determine strong relationships or relationships are determined taking into consideration the context. The authors of
the paper suggested the model of functional review. The main parts of the model are as follows: development of propositions for functional review, functional review and development of decisions based on insights, monitoring of decisions related to function and improvement of implementation plan. These parts are interrelated and are impacted by the outcomes of external and internal environment analysis. The analysis of content of functional review models let us determine the following: the main tasks of the stage linked to the propositions for functional review are development of plan for functional review and establishment of a task force. Meanwhile, typical tasks of the stage of functional review are analysis of documents regulating activities of institution; classification of functions; functional review considering purposefulness, scope, place; analysis and assessment of management aspects; development of recommendations related to the implementation of functions. Finally, the attitudes to monitoring of decisions related to function and improvement of implementation plan can be distinguished into narrow and broad in terms of the following tasks: development of change plan, preparation of civil servants for changes, assessment of consequences of changes and development of report and action plan.

The synthesis of functional review models let us determine the content of suggested model. The application of the model contributes to rational development of context of functional review and functional review of institution and implementation of decisions related to functions.

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