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International Entrepreneurial Perspectives and Innovative Outcomes
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Let us all together by our joint efforts strengthen our security, which in the current conditions becomes a top priority in this turbulent word.

Best regards,

JUOZAS OLEKAS
Minister of National Defence
Volume 5 Number 1 September 2015

JOURNAL OF SECURITY AND SUSTAINABILITY ISSUES

International Entrepreneurial Perspectives and Innovative Outcomes

2015
5(1)

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JOURNAL OF SECURITY AND SUSTAINABILITY ISSUES
2015, 5(1)

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NOT THE INVENTION OF ISIS: TERRORISTS AMONG IMMIGRANTS

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Received 15 June 2015; accepted 30 August 2015

Abstract. News took wing recently, ISIS is responsible for the migration pressure afflicting the Western World, furthermore ISIS wants to send terrorists among the mass of immigrants into Europe and America, where they – as a “third column” – are going to carry out terrorist attacks, similar to 9/11, at the proper time. This news generated serious debates and emotions in the Western World. Some people say, the threat should be taken seriously, others claim the ISIS is not able to carry out such well co-ordinated action, and the Western countries has to let in all of the immigrants indiscriminately, apart from the fact, if we are able to integrate them or not.

In my essay I would like to demonstrate, it is problem in the European countries and in the United States for a long time, that people with terrorist past mingle in the crowd of immigrants. Later on these people are carrying out terrorist attacks against the countries which generously accommodated them, risking the security of hosting societies, no longer consider these communities as partner but as an enemy needs to be exterminated.

Keywords: ISIS, terror, migration, USA, Europe

Reference to this paper should be made as follows: Besenyő, J. 2015. Not the invention of ISIS: Terrorists among immigrants, Journal of Security and Sustainability Issues 5(1): 5–20. DOI: http://dx.doi.org/10.9770/jssi.2015.5.1(1)

JEL Classifications: Z13

1. Introduction

The issue of immigrants is dividing the vox populi of the United States, but because of the history of the US, most of the Americans are extraordinarily tolerant and receptive with those people who want to live and doing well in the USA. However, this attitude is changing which is indicative of the statement of congressman Lou Barletta, member of the United States House Committee on Homeland Security, Counterterrorism and Intelligence Subcommittee. In his speech he reminded how dangerous the government’s and other organization’s plan is, wherein they are preparing to accommodate thousands of Syrian, mainly Muslim refugees (Barletta 2015). Senator Michael McCaul, chairman of the Homeland Security Committee, committed oneself similarly. According to his opinion, a group of Syrians living in America pose security risk as members of “Jihadist pipeline” (Hohman 2015).

Hard action of the two politician is rather surprising, as both of them are descendants of immigrant families. In contrast with them, some part of the refugees, mainly with Muslim background who is giving the 0.9% of the 310 Million country, do not want to fit into the American society. (Pew Forum 2012) Though they claim all the benefits, security, principles assured by the country, they are unwilling to accept the traditions, condemning and desiring to exterminate them with – in extreme cases – suicide bombings, or they want to force the majority to recept and admit their own norms (Sharia) (Pew Research Center 2005).
During a hearing in Senat Michael Steinbach, who is the chief of FBI Counterterrorism Division, made it clear, at present the American security organizations are not able to sieve terrorist hiding among legal or illegal immigrants sent by ISIS (Neumann 2015). Nicholas Rasmussen, chief of National Counterterrorism Center, had a similar declaration, who reminded the members of the Senate not only to the immigrants, but also to the danger caused by American citizens fighting in Syria and Iraq on the side of different terrorist organizations, then trying to return to the US. The number of these people is around 100 according to the intelligence reports. (The study of Thomas Hegghammer also affirm the dangerousness of people returning from Syria. In his paper he observed the activity of 945 Muslim immigrants fighting abroad, and found out, that 107 of them (every ninth) carried out terrorist attack after returning home into those Western countries which accommodated them or their families (Hegghammer 2013). Although it seems to be a negligible number, but it is a real threat, so this is the reason why I mention the number of all Muslim citizens fighting in foreign terrorist organizations (in particular ISIS, Al-Nusra) in case of every observed countries (de Roy van Zuijdewijn 2014).

It is a well founded fact and not a fiction, that among immigrants there could be terrorists. Only some of the human rights organizations has another point of view and they also say, Western countries have to accommodate every refugees, no matter where did they come from, what are they purposes and background. In 1960’s and ’70’s many of members of the Muslim Brotherhood with terrorist past were allowed to settle down in the country, later they financed different terrorist attacks from a safe distance through organizations performed social and caritative cover activities. In addition to them many other Iraqi, Afghan and terrorist-suspected people from different countries from the Middle East received asylum then citizenship (Rowman & Littlefield 2014 in American Foreign Policy Council). Infiltration of terrorist is proved in the study of Janice Kephart written in September 2005. As the member of the group investigated 9/11, she analysed the background of immigrants/terrorists living in the USA between 1990 and 2004. The article made several interesting ascertainments, from our point of view the most interesting was the fact, that 59 of 94 terrorists took part in different terrorist attacks denied and tried to hide they former activities when they arrived in America, later on they took advantage of the goodwill of authorities and participated in execution of terrorist attacks (Kephart 2005).

We can see similar facts in the case of those 90 thousand people from Iraq who were recognised as refugee and later they received citizenship. Plenty of these people committed murder or other crimes as members of terrorist groups. For example in 2009 two Iraqi, who allegedly persecuted from their homland by radicals, were stroke upon. They settled down in Kentucky and barely impliedly collected datas about military units were being statined in the neighbouring area (Meek, Galli, Ross 2013). One of them was Waad Ramada Alwan, who arrived in the country as an asylum seeker, although he participated in outrages against American soldiers. An FBI investigation led to his unveil when the authorities checked that database wich consist of fingerprints belong to terrorists who committed attacks against American soldiers served in Iraq. According to the report of Gregory Carl (Terrorist Explosive Device Analytical Center – TEDAC) in recent period authorities led investigation in 10-15 similar cases. He also said the problem is not only that more and more people with terrorist background were taken in America, but also at least one hundred Muslim immigrants and young American citizens radicalized by the Muslim immigrants have joined to the armed forces of ISIS, whose returning to America would pose more serious security risk (Neumann 2015; ISIL in Amerika 2015). Most people in Europe only da bit, they presume Americans provoked the hatred of Muslim world with interfering in, so they „deserve” what they receive. Terrorists camouflaged asylum seekers are causing headaches not only to the Americans but to the European countries as well.

As the ISIS is not the first terrorist organization which transported immigrants to European countries, but the GSPC and Ansar al-Islam, which organised the pass into Europe of thousands of immigrants for years. This points to the fact that both of these organizations established a well organised network in Europe as well. Of course they did not disspread loudly, that they are transporting migrants and terrorists among them – included they own members – into Europe, which activity generates them significant benefit, which were used to finance new terrorist acts (Perry, Negrin 2008). Of course, European countries also made mistake, as with they gracious immigration policy granted refugee status to several terrorist, who first used their new home as a base to commit new terrorist acts, later they considered them as a target (Hegghammer 2013). Although European
countries tried to neglect the security risks of immigration and its negative effect for years, nowadays more and more people realized the problem and they are concerned about the future of their closer environment and the continent. In the first place those countries feel threatened, where the refugees firstly arrive in.

2. Italy

One of them is Italy, where the immigrants mainly from Syria, Somalia, Eritrea and Northern African countries are arriving in after the Arab Spring. Today from 60 Million people of Italy 3.7% is Muslim (Pew Forum 2010). Earlier most of the asylum seekers did not want to settle down in Italy, they wanted to go to the Northern countries (France, Switzerland, Austria, Germany, etc.), from where they are deported back, so they stuck in Italy, where they are causing more and more trouble. Terrorists of ISIS appeared among the refugees. Abdelmajid Touilt has just arrested, who took part in organizing terror attack against the Bardo Museum in Tunisia, then he tried to hide among immigrants in Italy (Hohman 2015).

Improbably that he is the only one, according to Libyan sources, people smugglers transporting immigrants to Europe made a deal with Islamic State. According to it, Jihadist controlling some part of the country, allow them to continue people smuggling. In return they have to transfer half of their income to the Islamic State, on the other hand they have to take Islamist fighters with them. It is a huge problem and almost impossible for the European authorities to sieve and detect these terrorists due to the deficient cooperation among European states, which situation could be abused by members of ISIS or other terrorist organizations (Moor 2015). The 2015 report of European border-control agency, the Frontex also mentions these problems, and indicates, they are not able to filter neither terrorists hiding among immigrants nor those people who are returning to Western countries from the Syrian-Iraqi operations (Frontex Annual Risk Analysis 2015). Italian authorities are aware of at least five terrorist cells from Balkan Peninsula, who are operating incorporatedly into Albanian, Kosovan, Macedonian and Bosnian communities. They recruited hundreds of volunteers for the ISIS and Al-Nusra and other terrorist groups, whose return carry serious dangers (Neumann 2015; EU Terrorism Situation and Trend Report 2015). It seems terrorist immasked as immigrants arrived in Italy earlier, such as those Afghan and Pakistani men living in Italy, who participated in terrorist activities abroad as members of Al-Qaeda. The group was raided by the police when they started to carry out armed attack planned against the Vatican (Grierson 2015). Several other attempts were foiled committed by Muslim radicals, but the general public did not become aware of them (SIAM 2012). It shows the threat of the country, that in the video recorded the beheading of 21 Coptic Christian on 15th of February 2015, one of the Islamists pointed to the cost of Italy and said the following: “We will conquer Rome, by the will of Allah” (McDonald-Gibson 2015).

3. Spain

Spain, which is also considered as “gate country” is not in light situation, since 14% of its 46.5 Million population are immigrants, a significant part of them have Muslim background, their rate in the whole population reaches the 2.1% (Arango 2013; Pew Forum 2012). Besides the illegal migrants are carrying higher and higher security risk, whose number is permanently growing. While in 2013 the Spanish police captured 7000 immigrants, in 2014 this number was 70% more, almost 13.000 (Badcock 2015). Of course more people get in and stay illegally in the country. Most of the Muslim refugees (mainly from Northern Africa and Syria) are arriving in Europe through Ceuta and Melila using false documents (Corcoran 2015).

Integration of Muslim refugees is not trouble free, in several case they are abusing democratic rules to threat openly the members of inclusive society, and acts committed by them are shocking the common opinion which makes the hostility to foreigners stronger (Fernandez, Moraga, Ferrer, Saiz 2013). Among refugees there are plenty of Moroccans, some of them were sympathizers of Al-Qaeda previously, but more and more Moroccans are becoming radical after arriving in Spain, and they are also becoming more and more malevolent with the country which accommodated them (Soeren 2015). Many of the immigrants arrived in Spain used to belong to terrorist organizations and took part in terrorist attacks; after all they reside without problem in the country, where they planned and carried out further terrorist attacks (Bezunartea, López, Tedesco 2009). Most of them
was 30-40 year old first-generation immigrants, with significant combat experience, mainly from Northern African countries and Syria. They were able to act almost without any kind of control.

According to files of Spanish secret service leaked out by Wikileaks, the number of suspected Islamist terrorist or logistical operatives living in Spain was between 300-1000 in the mid-2000s (Soeren 2010)! Although after bomb outrage in Madrid, immigrants were inspected more carefully effectively by security and immigration organizations, the terrorists were still able to infiltrate the country. One of them was Abu Musab al-Suri (the Syrian), who was the member of the Syrian Muslim Brotherhood at first, then he escaped from the secret service into Jordan, later on Iraq, where he assist the drilling of Jihadists. Herefrom he fled into France, then he settled down in Spain in 1985, where he acted for 10 years untroubled. He was Spanish citizen he trained terrorists and fought in Afghanistan, and he also promoted the formulation of Al Qaeda. From 1994 to 1997 he worked for the GIA terror organization. Presumably he participated in the French terrorist attacks in 1995, then since 1997 he lived in Afghanistan and took part in organizing terrorist attacks of 9/11. Since 2004 he was on the list of most wanted terrorists in the USA (Kepel 2009).

Such was the Turkish Cengiz Yalcin and his Chechen associates, Eldar Magomedov and Muhamed Ankari Adamov, who wanted to carry out terrorist attacks using remote-controlled airplane in Gibraltar during the London Olympic Games in 2012. Terrorists who were responsible for outrage in Mumbai, which overtook 166 casualties were members of Lashkar-e-Taiba terror organization. They got trained in Afghanistan and Pakistan before they arrived in India, and they also took part in battle, moreover one of them was a practised bomb maker (Cruickshank 2012). Furthermore those citizens also cause problem for Spain, who are fighting or fought on the side of ISIS on the battlefields of Syria and Iraq, and some of them has already started to infiltrate back home. Besides of course recruiting of new “volunteers” continues, who are helping not only the ISIS, but they are participating in the actions of other terror organizations. One of them is Benaissa Laghmouchi Baghdadi, who fought in Mali on the side of Islamists, then he avoided prosecution and returned to Spain, where he established the “Sharia4Spain” organization together with his associates, which recruited fighters for ISIS and participated in organizing terrorist actions (Spencer 2014).

4. Germany

Germany, which is the main destination of international immigration – wherein Muslims presents a significant number – in Europe, is also endangered (International Migration Report 2013). In these days the second biggest religious group is the Islam, where 5.8% of the population (3.8-4.3 Million people) belong, but only 2 Millions of them have German citizenship (Pew Forum 2012; Jessa, Mannewitzi 2014). 70% of Muslims living in Germany stem from Turkey, they followed by immigrants arrived from Bosnia and Herzegovina, Iran and Morocco (Islam in Germany 2015). It is important to notice, the biggest Afghan and Kurdish community of Europe lives in Germany (Dr. Baser). In summary, most of the immigrants arriving from the third world are Muslim, and their number continues to grow in Germany.

The number of Islamist criminals committing acts of terrorism is also growing – in 2003 67, while in 2009 against 160 suspects were investigated in Germany –, and arrests connected to the Islamist terrorism reached 19 in 2012 (Jessa, Mannewitzi 2014). Because of these in partially, wide social resistance evolved against the Muslim immigrants recently, which best known representative is the Pegida-movement, and more and more ethnic and religious conflict occurs (Common Statement on Pegida 2015; Siegel 2015). In 2014 streets of Hamburg became battlefield, after the clash of sympathizers of Islamic State and the Kurds living in the city (Soeren 2014). So the threat caused by ISIS is real, which is confirmed by the datas published by the Federal Office for the Protection of the Constitution (BfV): according to these 680 people from Germany has traveled to the Middle East to fight on the side of terrorist organization (Garmiany 2015). Numbers published by BFV show that the extreme radical Salafist religions became significantly strong in Germany in the last couple of years: in 2011 3800 Salafist religions were recorded by the authorities and their number increased to 7300 today (Brandon 2015). In recent years several terrorist attacks were disconcerted by German authorities, which were organized by persons with Muslim background who have been radicalized as German citizens, but there was such failed
action, which intended to be carried out by Germans (Sauerland Group) who left their former Christian religion and accepted the doctrines of Islam (Cruickshank 2015; Ejkman 2014). The only successful Islamist terrorist attack was carried out in 2011 by Arid Uka from Kosovo, who killed two American soldiers at the Frankfurt Airport (Jessa, Mannewitzi 2014).

Some of the attackers were members of previous terrorist organizations, they arrived in Germany under cover name, hiding their past, where they started to organize and bring terrorist actions to effect.

One of the most resonated event was the case of Salim Boukhari, Fouhad Sabour, Lamine Maroni, Aeroubi Beandalis, who tried to blow up the Christmas market of Strasbourg in 2000 (Frankfurt Group, Global Jihad). In another case Youssef Mohamad El Hajdib and Djihad Hamad tried to explode two trains in Cologne, but because of the mistakes made during the preparation of the bombs, the explosive did not come into action. Later it was turned out, Hamad got trained by members of Al Qaeda in a Palestine refugee camp right before he arrived in Germany, so he was sent into Europe as a sleeper agent, ergo he did not become radical in Germany (Rabasa, Benard 2014). Similar person is Abdel-Akher Hammad, who sentenced to death in Egypt for terrorist activity, then he fought in Afghanistan, even so in 2000 he was given political asylum in Germany (Moussa 2001).

Besides the above mentioned, Germans have to face those radical Muslims, who were fighting on the side of ISIS and started to leak back in Germany. According to intelligence informations, until now almost 150 terrorists fighting in Syria came back to Germany, who are carrying serious security risk (Weinthal 2014).

5. Great Britain

Great Britain with its 64 Million inhabitants is also a popular destination for immigrants, which population is in 4.8% Muslim, mainly from Syria, Eritrea and Pakistan (Hacket 2015; Migration Statistics Quarterly Report 2015). The fact, that some part of immigrants do not want to be integrated in the recipient society is proved by those 104 of 178 arrested Muslim persons who charged by acts of terrorism committed between October 2012 and January 2015, and not to mention the fact that crimes linked to acts of terrorism were mainly committed by Muslims (Shaw 2015; Statistics, Terrorism Arrest).

A dust-raising report which observed migration tendencies pointed out, that many of immigrants got permanent residence permit or citizenship, who committed crimes in their homeland, or even worse, they murdered (Vine 2014). Because the British border authorities do not give due to investigate the background and former activity of asylum seekers, many of such Muslim has traveled in the country, who took part in acts of terrorism earlier (American Foreign Policy Council – The World Almanac of Islamism 2011).

One of them is Adel Abdel Bari, who was sentenced in Egypt for committing different acts of terrorism, despite he got political asylum in 1993 and until his arrest in 1998 he worked for Al Qaeda (U.S. Attorney’s Office 2012). Ibrahim Hussein Idarus also had terrorist background when he arrived in 1996, and after receiving right of asylum, he participated in blowing up two American embassies in Africa (Moussa 2001). British also granted the right of asylum for several Egyptian, who took part in terrorist actions earlier, such as Yasser Tawfiq Ali El-Sirri, Khalid Abdulrahman al-Fawwaz, Abu Hamza al-Masri and Sayed Agami Muhalhal Mu’awwad. Hani al-Sibia, who labeled as “hatred preacher”, is also belongs to them, who got the right of asylum in Great Britain after run away from Egypt, in spite of his tight connections to several terrorist organisation were known, and he referred to the terrorist outrages (subway bombing in 2005) committed against the residents of his hosting country as righteous and justifiable, as well as he inspired Seifeddine Rezgui who smote tourists on the beach of Tunisia. Although he did not take part personaly in a single terrorist attack, but he urged others, while he lived as a lord using the social benefits given by the British government. Though in the name of political correctness the government tried to underestimate the risk of terrorists arriving among immigrants, this attitude has changed already. Recently the British minister of immigration, James Brokenshire pronounced, it has a real risk, that among refugees heading towards the country there are radical Islamists, who can easily abuse the support of large Muslim communities, in particular the Northern Africans, who feel that the British exclude them intentionally (Khosrokhavar).
For the British, the radicalized Muslims from two and third generations are causing the biggest problem. Such as the terrorists who organized and committed the bombing on 7th of July 2005, or those who prepared outrage against the queen at the end of 2014, but they were not able to implement it, because of the intervene of Scotl yard (Sawer 2014). It is a more serious risk, if those 700 British citizens who are fighting under the flag of ISIS, would like to return home to Great Britain (BBC News 2015). So the authorities try to bear down those who are recruiting gunmen for ISIS, and they try to keep back Muslims who purpose to go in Syria, and to bring the home-comings to justice, and if it is necessary, in protection of the society, imprison them (Whitehead 2014; Reuters 2015; BBC News 2015).

6. France

Immigration in France also hides security riks, and those persons with terrorist past, who mingled in the crowd of refugees, whose sieving out is all the more difficult, because immigrants of Muslim background are giving the 7.5% of the population (4,7 Million) (Journalist resource 2015; Pew Forumm 2012).

Most of those acts of terrorism which are known in the country are committed by young people from the second and third generation, who radicalized locally, such as Sid Ahmed Ghlam, who murdered a young mother and planned several terrorist attacks against Christian churches, or Yassin Salhi, who shot a selfie and posed on it with the severed head of his own boss, then he uploaded the photo on the internet (Global Jihad 2015; The Guardian 2015). But Chérif Kouachi, Said Kouachi and Amedy Coulibaly are also belong to them, who became widely known aprouse of the outrage against Charlie Hebdo (BBC News 2015). Khaled Kelkal is also one of them, who took part in several terrorist attacks i.a. in the outrage which occured on one of the station of RER Railway in 1995. The attack resulted the death of 16 and injury of 300 people (Global Jihad 2009).

In the outrage of Paris two such terrorist assisted – Boualem Bensaid and Smain Ait Ali Belkacem –, who arrived in France from Algeria with terrorist past, but they merged into the mass of immigrants and disappeared from the sight of authorities (Globan Jihad 2009). They were not the first terrorists who arrived as refugee. In 1994 such persons arrived, who personate themselves refugee, however they were trained in Pakistan and Afghanistan and they also took part in battle, then they domiciliated in France (Hussey 2014). Most of the arrivers are members of the Algerian GIA (Groupe Islamique Armé), who are helped out by Algerians or other Northern African immigrants living in France or by Muslims already with French citizenship (Khosrokhavar).

In other cases it has proved, terrorist cloaked to immigrants arrived in France, who committed acts of terrorism or other crimes after years of hiding. In light of this it is understandable, that French authorities take seriously the threat of ISIS leaders in connection with the incorporation of “sleeper agents”. However at present those French citizens who infiltrating back from Syria and Iraq, causing bigger headache. Till now they are aware about 1430 persons, who left France to fight on the side of ISIS, 85 of them died in battle. According to the data so far, 11 Jihadists returned from Syria brought to justice, further 152 suspects were commited to prison, and the authorities are expecting more than 200 home-comings (Al Arabiya News 2015). In spite of the alert an “ex-Syrian”, Mehdi Nemmouche evaded the atteition of French authorities, but it is also true, he did not do it in France, but in the neighbouring Belgium, where he committed terrorist action on 24th of June 2014, where he killed an employee and three visitors in the Jewish Museum of Brussels during daytime. After a couple of days he captured by the French police, he was equiped with significant number of weapons. Hence French has the doubtful glory, that the first home-comer from Syria who committed terrorist action was their citizen (Dickey 2014).

7. Belgium

10% of the population of the neighbouring Belgium with 11 Million inhabitants is immigrants, whose significant part is Muslim, their ratio reached 5,9% of the whole population in 2010, and it is increasing continuously (International Migration Statistics; Pew Forum 2012). According to national security agencies there are at least 20 such cells consisting of Muslim terrorist – around with 120-180 members – are located in Belgium, France,
the Netherland and Germany, which are only waiting for to be activated by ISIS. Many of them probably has infiltrated as immigrants into the countries mentioned above (Smith-Spark, Watson, Lister 2015). In case of Belgium it is really easy, since the country is famous about its liberal immigrants policy, it is “opening the gate” almost for everyone (Immigration and Islam in Europe).

Thus the veteran terrorist Abdelkader Hakimi could lived in Belgium, in spite of he was a party in several terrorist actions before he arrived in the country, then he sentenced to 8 years of imprisonment, and after his release, he stayed in Belgium. From here he left for Syria, where he is fighting under the flag of ISIS at present (Emmekhahd 2014). But he is not the only one. We are aware of several similar person with terrorist past, who lived more in less time undisturbed in the country, such as Ahmed Zaoui, Tarek ben Habib Maaroufi, Abdesattar Dahmane and Baraoui El Ouera (Coolseat, Struye de Swielande 2007).

In Belgium they are afraid of those 470 radical Belgian citizens fighting in Syria but later they will return, and not without reason (de Bode 2015). As a week after outrage against editorial office of the French Charlie Hebdo, in January 2015 Belgian police raid a three-membered group returned back from Syria only just before the carrying out of a planned terrorist action in Verviers. In heavy firefight two of the terrorist have died, the third was captured. Since then numerous raid carried out in several places of Belgium, among them in the capital, Brussels. People who arrested in Belgium, has already appeared in ISIS’s videos available online, where they are posing with dead bodies. Terror-alert has raised to level three on a four grade scale (Cruickshank, Almas, Feyerick 2015).

8. The Netherlands

Similar to Belgium the Netherlands is a popular destination of Muslim immigration. In the 17 Million populatio the number of immigrants are around 1 965 000, among them there are quite plenty of Muslims who gives 6% of the inhabitants (International Migration Statistics; Pew Forum 2012). Most of them are Moroccans, Turkish, Algerian, Tunisian, Afghan, Iraqi and Somali.

Although in the Netherlands highlighted terrorist attack has not committed yet, the terrorists considered the country as a safe base, a sort of logistics center until now. Already in the 1980’s the Dutch secret service indicated the presence of Muslim radicals which was not significant in that time, but in the 1990’s more and more people with terrorist background arrived from Algeria, Bosnia, Chechnya, Egypt and Syria as political refugees, who, although they have rejected the hosting Western society, lived in almost “invisibly”. Osama Rushdie Ali Kalifa, one of the leader of Egypt’s Islamist Jihad (Al-Jama’a al-Islamia, ), also had a terrorist past, who took part in several terrorist outrages along with his connive at crime in his homeland. Terrorist of GIA (Groupe Islamique Armé) carried out several terrorist attacks in France, the Hamas, IBDA-C (İslami Büyükdoğu Akıncılar Cephesi) found safe shelter in Holland, where they organized further terrorist actions, or they produced their material base(Veldhuis, Bakker 2009).

This situation has changed, since the situation depraved to that point, when Moroccan youngsters are wawing the flag of ISIS, blaring anti-Europe slogans and encouraging to establish a European Islamic State on a demonstration in Hague organised by Muslim immigrants (de Visser 2014). Under the flag of ISIS 200-250 Dutch citizens fight, whose leak back has already started, and who are carrying high security risk (Neumann 2015; National Terrorist Threat Assessment 2015). Of course we can find Dutch not only in ISIS but in Al Nusra Front and other terrorist organizations as well, who are also pose a threat to the safeness of the Netherlands. So the Dutch government aim to neutralize them, for example in 2014 legal procedure has started against a person, who were sentenced to three years of preonement after he returned from Syria, prepared to commit terrorist act and recruited gunmen for ISIS, beside him other perpetrators were also accused of acts of terrorism.

Dutch has learned from their previous mistakes, so their immigrants agencies try to check the early life of Syr-
ian refugees more effectively, in consequence some of them were expelled, because they provingly committed war crimes in their home countries (Dutchnews 2014).

9. Sweden

Sweden is not in an easy situation neither, which has 9.4 Million inhabitants, and a notable number of immigrants (15.1%) growing permanently due to the welfare achievements (Ramalingam 2012). One third of the immigrants are Muslims, most of them are Iraqi, Iranian, Bosnian, Kurdish and Somali, they give 4.6% of the population, but this number is increasing continuously (Pew Forum 2012).

Integration of Muslims is not trouble free, sometimes they committed aggressive acts in several cases, which evoked bigger and bigger revulsion and rejection from the recipient society, so the number of clashes between the native Swedish inhabitants and Muslim immigrants is growing (Ramalingam 2012). Today the Swedish government also acknowledges, they are incapable of integrating Muslim immigrants. It is proved by the report published by the Swedish police which presents those residential zones where it is unadvisable to enter not only for the natives but even for the police officers as well (Swedish Police 2004). Many people with terrorist background got political asylum or citizenship, such as Fuad Mohamed Kalaf from Somalia, who recruited warriors and organized terrorist actions, while he was staying in Sweden, then he returned to Somalia in 2004, where he became one of the prominent leaders of Islamic Court of Sharia then the Al Shabab (Ranstorp, Gustafsson, Hyllengren 2015). Mohamed Moumou from Morocco was a similar person who as a member of GICM (Groupe Islamique Combattant Marocain) arrived in the country in the 1980’s, later he became citizen in the 1990’s. In Sweden he continued to carry out acts of terrorism, and though he took part in the terrorist attack in Casablanca 2003, he was deported to Sweden by Danish police arrested him at Moroccan government’s request. In 2006 he went to Iraq, where he acted as number two leader of Al Qaeda until 5th of October 2008, when he was liquidated by the Americans (Siegel 2008). People with terrorist past arrived among immigrants acted so independently, that the Ansar al Sunnah terrorist organization were able to established a drill camp even in Sweden 2005 (Rogio 2008). In the country many other Iraqi and Chechen refugees were allowed to settle down, who had terrorist background, the they left to Syria to fight. Swedish Security Service mentions in its report from 2010 at least 200 Islamist radicals, 30 of them are extremly dangerous (Säkerhetspolisen 2010).

Swedish authorities are deeply concerned because of those 250-300 Swedish Muslims who have joined to the ISIS terrorist oranization, and although the authorities tied to prevent them in returning home, at least 80 are in Sweden again (Ranstorp, Gustafsson, Hyllengren 2015). If ISIS will keep its former promise, Sweden will have to face with serious terrorist actions.

10. Norway

Norway has such problems as Sweden have to confront. From the 5 Millions of inhabitants 805 000 are immigrants, they give 15.6% of the whole population, while Muslims (mainly Pakistani, Iraqi, Iranian, Turkish, Bosnian, Kosovan, Afghan and Somali) give 3.7% (Statistics Norway 2015; Storhaug 2011; Pew Forum 2012). Since in recent years members of the Muslim community caused several problems, the government has hardened its immigration policy, they try to locate more effectively the immigrants with terrorist past, if they find them, these immigrants will be deported. Many of applications of asylum seekers personated themselves as refugees were refused because they were linked to Al-Nusra, ISIS, Boko Haram or Al-Shabab (Porter 2015; Norway News 2015). Despite many of person with terrorosit background got into the country, where they continued to support terrorist activities.

One of them is Abdukadir Mohamed Abdukadir alias Ikrima, who participated in blowing up American embassy in Kenya 1998, in the outrage in Mombasa 2002 and in other terrorist acts. After all with this kind of past he was allowed to settle down in Norway in 2004, where he lived calmly until 2008, while he contributed to organize other terrorist actions (Neubert, Simmons 2013). The Kurdish Mullah Krekar was not an Islamist when he arrived in 1991, but later he established the Ansar al Islam terrorist organization, which carried out terrorst
actions in Kurdistan under his leadership, but of course he denied. In 2006 he was added to the list of UN enumerated terrorists, in 2007 High Court of Norway declared him as a person who is endangering the security of the state. Although they tried to deport him back to Iraq, they did not succeed due to the long legal struggle. After he mortally threatened the prime minister, he was sentenced to three years imprisonment, later when he was released he appraised the terrorist who attacked Charlie Hebdo, moreover he labeled it as a righteous act, so he was sent back to the prison (Capon 2015). Beside them many other people with terrorist background acted undisturbed in Norway for more or less long term (Vermat 2010).

Although Norwegian authorities are removing more and more illegal immigrants recently, still they are aware of 15 000 immigrants who have already been expelled, but they are still in the country carrying security risk (Norway News 2014). Norwegian inhabitants are considering those Norwegians who joined ISIS in Syria and their returning as a risk, so they made such law, which penalize those who are fighting in terrorist organizations and those who are recruiting. According to the newest informations, it concerns at least 60 people (Neumann 2015). As first precedent, two Albanian brothers, Valon Avdyli and Visar Avdyli and a Somalian, Djibril Abdi Bashir were sentenced to years of imprisonment for participation in Syrian civil war, and for co-operation with terrorist organization (The Local 2015). Since then another Norwegian citizen, Ishaq Ahmedet was sentenced to for fighting on the side of ISIS in Syria (Norway News 2015). Norwegian citizens have joined not only to ISIS but to the Al Shabab as well, one of them was Hassan Abdi Dhuholow, who participated in the attack against a mall in Kenya where 67 people died in 2013 (The Independent 2013).

11. Denmark

The third northern country which has to face with serious immigration problems is Denmark. The country has 5.5 Million inhabitants, 12.16% (668 704) of them are immigrants (Statistics Denmark 2015). The ratio of Muslims (Turkish, Bosnian, Iraqi, Palestinian, Pakistani, Iranian, Somali and Afghan) in the whole population is 4.1% (Pew Forum 2012). The relationship of natives and Muslim immigrants is problematic here too. According to surveys, half of the Danish inhabitants would like if legislators would make more strict rules concerning the migration of those who are coming from Muslim countries in order to keep themselves in safe (Lindekilde, Sedgwick 2012). It is understandable in the light of the fact, that many immigrants were allowed to settle in Denmark who have terrorist background, later these people continued their activities (American Foreign Policy Council 2014).

Abdel-Hakem Mohamed Atia Soliman, Mohamed Shaaban Mohamed Hassanein and Mohamed Abdel Halim were members of the Egyptian Al-Gama’a al-Islamiyya terrorist organization when they moved to Denmark, and they had something to do with the attack against the World Trade Center in 1993. Many other members of the Egyptian terrorist organization have settled down in Denmark, who belonged to the network of Omar Abdel Rahman, who planned and organized the attack against World Trade Center. One of the most famous was Abu Talal, who has got refugee status in spite of the opposition of Egypt and the Interpol. Talal was captured by the Croatian police after he tried to co-operate with Bosnians in the Balkan conflict, later he was handed over to the government of USA, who delivered up to Egypt, where he was sentenced to death and executed for acts of terrorism. In Denmark many other members of GIA and different Northern African terrorist organizations found shelter, then they continued to support terrorist acts and guaranteed the ideal, financial and logistical basis (Jensen 2006). One of them was Athmane Mehiri from Algeria, who arrived in Denmark in 1995 as a member of FIS, where he worked for years, then in June 2001 robbed a bank for the Algerian terrorist organization GSPC, but he was captured soon and crimininated (Jensen 2006).

The Palestinian Ahmed Abu Laban, die din 2007, also risked the security of Denmark. He was exiled from Egypt and Kuwait as a member of Muslim Brotherhood in 1983. In Denmark He picked up with Abu Talal al-Qassimy, the leader of Gama’a Islamiya terrorist group. Al-Qassimy fought together with Osama Bin Laden and other leaders of Al Qaeda in Afghanistan, which makes this relationship interesting, then he participated in the terrorist attack of 9/11 (Ammitzbøll, Vidino 2007). Laban acted in Denmark as radical religionist leader, and he also played role in – most of the times – terrorist attacks against Denmark, the newspaper Jylland-Posten
and its journalist because of the cartoons published in September 2005 (Kepel 2009). He threatened the Denish people, he will “release hell”. Although he did not participated physically in the terrorist acts, but he did not condemned the actions, it seems he even encouraged them (Larsson 2009).

From Denmark 100-150 people have joined terrorist organizations in Syria, despite Denmark gives a second chance to reintegrate for those who come home from Syria (Neumann 2015; Higgins 2014).

**Conclusion**

This study was not written make prejudice stronger against Muslim immigrants, actually I acknowledge all the values of Muslim immigrants, which made/make the recipient Western societies rich. Despite we have to see, there are some others, who have terrorist background indeed, who are abusing the quite permissive immigration policy of Western countries, they are arriving in hiding their past, in the Western countries they are carrying out terrorist activities, they are attacking the recipient societies on purpose, questioning their raison d’être, moreover they are carrying out terrorist attacks against the members of these communities. In my point of view self defence is completely lawful and reasonable against these people. Self defence has to be started with more careful investigation of the background of refugees, and if it is going to turn out any time, that an accomodated refugee is carrying out terrorist activity and endangering the recipient society, there have to be a possibility to send him or her back to that country from where he or she came from.

In the United States the authorities keep count of 2.5 Million Muslim immigrants, and in the European Union 43.5 Million Muslims live who give 5.9% of the continent’s population (Pew Forum 2012). From them the authorities are not able to sieve out every simple terrorist-suspicious person, so we should consider the threat of ISIS, namely they will send terrorist into America or the European countries among immigrants – in the light of cases I have studied –, seriously. Since the leaders of ISIS are not just speeking about the restauration of the caliphate, but they are using every availabe tool – mainly terror – to realize it.

The phenomenon, that hosting societies are becoming more and more irreceptive and intolerant because of the anti-terror measures, helps the terrorist cloacked to immigrants, so the community of the Muslims are going to be more closed together against the recipient societies, and in better case they will look at the more and more brutal terrorist actions as a passive or neutral beholder, or even worse, they will support those actively who take part in the actions. This is the reason why the Western countries have to find a way of co-operation with the Muslim immigrants to make sure, no one will be able to hide behind the mask of immigrants.

**Notes**

1. If only Muslims with peaceful intention would arrive into the accomodating countries, this could be also a serious challange, because of the different culture and tradition, and only adapt themselves to the majority without problem. The majority exists as a passive, closed entity inside Western societies, where they take all entitlements (job opportunity, social alimentation), but there is a small part of activity (mostly connected to there life-style) where they take part and join to the recipient societies. Not to mention, there is a small, but significant and domintive, more and more radicalized minority, which specifically hate those countries which gave home them or they parents; they do not want to be an integrated part of society, but they want to force the majority to follow their own religious orders and traditions.

2. According to the Country reports on Terrorism 2014 published by the US Government immigrants are on distingushed place of terrorist’s recruitment list, so European counterterror organizations consider as an important part of preventing terrorist attacks to help integration of immigrants, even it is failed sometime.

3. According to competent informations 95 citizens from the country are fighting under the flag of ISIS, which does not seem to be plantly in comparison with other European countries, but if we add those circa 1.200 Morocans who have Spanish residence/work permit, Spain has to face that big danger as the neighbouring French.
4. According to some forecasts until 2030 France and Belgium will be the two countries in the European Union, where the rate of Muslims will exceed 10% in the whole population, which is going to expand to 6.86 Million; this fact is caused by the continuous wandering from Islaamic countries, and the higher fertility ratio of Muslim women.

5. The brutal outrage, which is mentioned often and which horrified the liberal Dutch community, committed against Theo Van Gogh was carried out by a second generation Muslim, Mohamed Bouyer, who was born in the Netherlands and he also radicalized there. In this essay I am not surveying this case, neither with those more and more brutal acts, which were committed by second and third generation immigrants. For these the recipient societies are also responsible, while a first generation person with terrorist past requires a different type of approach.

6. It is also crushing, that in 2014 not only in this country, but in Austria, the Czech Republic and in Finland all crimes connected to terrorism were committed by Muslims.

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og-efterkommere


Technogenic terrorism in Ukraine: Genesis, Typology, Characteristics, Offers to National Concept of Counter Action

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Received 18 August 2015; accepted 15 September 2015

Abstract. The article deals with the most dangerous topical issue related to the immediate safety of a person, society and the state as a whole - to technogenic terrorism. Technogenic terrorism represents an extremely complicated phenomenon in the social and legal environment of any state in the world and can have disastrous consequences for human security and for the world as a whole. This research focuses on the historical aspects of occurrence of hazard, it is analyzed individual objects of technosphere that carry potential danger, and it is defined the emergency essence as part of technogenic terrorism and it is provided their classification. Separately, it is focused on the technological safety state in Ukraine and finding of appropriate legal measures of counteractions to technogenic terrorism in Ukraine.

Keywords: technogenic terrorism, emergency, emergency legal regime, technosphere, counter-terrorism, national security of Ukraine.

Reference to this paper should be made as follows: Kuznichenko, S. 2015 Technogenic terrorism in ukraine: genesis, typology, characteristics, offers to national concept of counter action, Journal of Security and Sustainability Issues 5(1): 21–33. DOI: http://dx.doi.org/10.9770/jssi.2015.5.1(2)

JEL Classifications: Z13; Z18

1. Introduction

Protection of human rights and citizen is one of the most actual task nowadays, which has long ceased to be a sphere of interest of individual states and human rights organizations, and it passed into the category of the world community’s priority, and for Ukraine.

This is confirmed by the events that have arisen since the end of February 2014 in our country and due to external armed aggression against Ukraine in violation of international treaties and national legislation. These circumstances complicate the political and socio-economic situation in the country, leading to humanitarian disaster, a large number of casualties, including civilians, abuse of infrastructure system, destruction of material objects of different ownership which predetermined the numerous refugees and migrants from the territories. Such a complex situation in the country poses a real threat to national security and territorial integrity of Ukraine, which makes the state and local authorities to take urgent emergency management decisions on the basis of existing legal acts. In addition, the optimization of public administration encourages to adopt promptly new legal mechanisms on introducing of special legal regimes in these circumstances, to ensure the legitimacy and normalization of law and order in the state.
On April 15, 2014 the Law of Ukraine “On the rights and freedoms of citizens and legal regime of the temporarily occupied territory of Ukraine” [On the rights and freedoms of citizens and legal regime in the temporarily occupied territory of Ukraine 2014] was adopted. It aims on determination of the status of temporarily occupied territory of Ukraine establishes a special legal regime in this area, defines features activities of state agencies, local governments, enterprises, institutions and organizations during the regime, observance and protection of human rights and civil and human rights and legitimate interests of legal entities. It is supposed, in this situation there is a social need, which provides the legal basis for the introduction of other kinds of special legal regimes, including those introducing and implementing mechanisms are provided by the Law of Ukraine «On legal regime of emergency» [On legal regime of emergency 2000], other laws and regulatory acts.

A large number of global hazards of various origins requires special legal mechanisms regulating social relations that arise in emergency situations. The important issue of security of the population and territory of Ukraine is technogenic threat of acts of terrorism on potentially hazardous objects of the country.

2. Historical background emergence of hazard

The danger technosphere for population and environment is caused by the presence - in industry, energy and utilities sector - of large amount of radiation, chemical, biological, and explosive fire- industries and technologies. According to the State Service of Emergencies of Ukraine, there are about 30 thousand units of hazardous activities in the state.

The threat of danger to society by terrorist organizations chosen the means of achieving of their goals and planning terrorist actions on objects technosphere occurred long ago. The concept of technogenic terrorism as a new form of terror began in 1946 considered carefully and was developed in 1970-th. [Bonner 1989]. But until recently, the issue under discussion was not the focus of the specialists involved into counter-terrorism activity.

Recently, among the acts of terrorism we can see negative qualitative changes. Among them we must distinguish the increasing attacks on human life and health while reducing fate encroachment on material objects; increasing of terrorism acts with the number of casualties; spreading of violence and terrorist acts; sharp increasing of terrorism acts on technosphere objects. The information data and tactical resource mutual support terrorist groups and unions, both in individual countries and internationally. You can watch the unification of political and criminal terrorism against the background of the merger and cooperation of extremist illegal and legal structures with nationalist, religious, sectarian, fundamentalist and other groups on the mutual interest basis.

Terrorism is distributed across the planet under the epidemic laws. But today in Ukraine it has not only developed the concept of effective protection of individuals, society and the state against terrorism at the state level. To build the national concept of combating terrorism is a very important analysis of this complex of social and legal phenomenon. The strategy of combating terrorism must necessarily be based on the conceptual and legal definitions. This is necessary in order not to repeat the faults that were made in the construction of the state system of combating organized crime.

We call terrorism as socio-legal phenomenon because of its content and genesis of this phenomenon is social and legal aspect in its legal assessment, in forming of state system of prevention and response to terrorist acts. Terrorism should be distinguished from a number of phenomena that are essentially favorable environment, where terrorism is formed. We understand that the concept of terrorist act covers such a motive, as a favor, revenge, economic competition, irrationalism, mentally sick, etc. The traditional perception of terrorism as phenomenon only of political motives in the narrow sense prevents understanding the true motives of the phenomenon and to program and perform adequately deal with it.

Based on the above, we understand terrorism at global, historically variable social and legal phenomenon that causes an extraordinary danger for society (regardless of motives) and is manifested in the actions that reflect
above confrontation type of relationship of a person or group of people to the state, several states, civil society or the world community in general, state or public figure, based on the philosophy of violence.

The philosophy of violence is combining fundamental system of views on violence as the most effective, versatile and virtually the only way to resolve any conflict of specific individuals, state agencies and organizations. This philosophy makes illegal the nomination requirements for individuals and legal entities, increase in such requirements, increasing of pressure at displays of weakness signs from the opposite side. Philosophy violence defines violence and enhance refinement methods of action of terrorists willingness to use against the state, public figures or people maximum random violence.

For a long time people thought about the content, origin, consequences of terrorism. “Terrorism is nothing but as a form of makiavelizm. Makiavelizm is not only poisoned and sly policies of depraved monarchies; it is a brutal policy of bloodthirsty democracies ..." Whence did we receive the theory of terrorism? It came to us from the XV century, the most treacherous of all the centuries, it has come to us from the tyrants homeland, flatterer Medici, friend and supporter Borgia was its teacher”[Hesse 1908].

In the future, it is necessary to focus on the analysis of the tehnogenic terrorism genesis. A human being appeared on the Earth as a result of complex and long process of historical-evolutionary development. At the stage of his/her origin a person lived in harmony with nature. According to the widespread view, the evolution of the human branch split off from a common stem from apes about 12 - 15 million years ago in the evolutionary process of development primogenitors began to lose their instinctive life program, which was associated with the development of employment and culture, the emergence of new method of treatment. Having appeared out of natural harmony, a human being had lost biological usefulness, he/she had rid of knowledge of nature, which became hatred. In turn, about 12 thousand years ago environmental crisis had appeared that, according to some scientists, threatening the existence of mankind as species. There were adverse climate change mega-fauna became to extinct, which was the main source of human nutrition. In fact, relations between a person and nature were so weak that the threatened loss of his/her ecological niche and ecological destruction of them as species. Humanity has responded to these crises by transition to a new existence mode and reproduction - to the producing economy, which in turn led to the creation of artificial nature for human existence.

3. Technosphere as the object of terrorist threat

This artificial nature to mankind was the technosphere. Technosphere (from the Greek. Techne - art, craft, skill and sphaira - layer). Technosphere is a collective term that refers to the broad and narrow senses. In its broad sense it is part of the biosphere that a person has changed as a result of their activities; here refers to arable land, cut down forests, areas of radiation and chemical pollution, artificial reservoirs, structures and mechanisms created by human being and etc. By definition of scientists Technosphere now covers almost 80% of the biosphere, and 95% of humanity is living within the technosphere. Technosphere in its the narrow sense is the aggregate of human activities that are created for the implementation of production processes and maintenance of non-production needs of society. In our research technosphere will be used in its broad sense.

At first technosphere objects really significantly reduced the risk associated with exposure to a human being of negative natural processes and phenomena, but creating powerful engineering complex, humanity creates a new, extremely complex system of laws which are not known. Increases uncertainty information on its operation, entropiynist processes that occur in it.

Many facilities are technosphere potential danger. From year to year the number of technogenic disasters in the world, according to leading experts in technological security, the number of these disasters increases in its expansion [Porfyrev 1991]. This happens for three reasons: the lack of knowledge about the construction features, the functioning of the technosphere, or property protection from the effects of disasters on human
negligence, detached instances when a person intentionally damages the Technosphere facility order to apply a negative factor catastrophe losses to persons, society or state. By its motivation and purpose, these cases are divided into: technogenic sabotage, industrial vandalism, industrial terrorism and technogenic disaster with aim to conceal another crime.

Technogenic disasters have great social and psychological impact on society. Because terrorists increasingly turn to acts on technosphere objects. A classic example is worst in scale and the number of victims of the terrorist act that took place on September 11, 2001 in New York (USA), which claimed about 7,000 lives. In this case, the aircraft were used for terrorism in an unusual role of terrorist acts and the object of the act was elected 110-storied World Trade Center building, where the working day can be up to 150 thousand people at once. These giants are not designed to crash and almost an hour twin buildings fell.

Recently a negative trend can be traced of increasing in the scale and number of terrorist acts carried out on the most dangerous objects technosphere. Since 20 March 1995 the followers of the sect “Aum Senrike” committed terrorist act in Japan. As a result of this act 16 underground subway stations were affected. 12 people died and 3796 people got various degrees of poisoning.

Cases of terrorist attacks in subway are not isolated. Thus, in February 1993, an explosion in London subway station (no information about the victims); in March 1993 - in the subway of Santiago (no information about victims); in December 1994 - in the subway car at the station “Fulton Street” in New York (suffered 43 people); in October 1995 in Paris subway train (injured 29 people); in October 1995 in the underground of Baku (killed 286 people, injured more than 200 people); in July 1996 in the subway near the station “Tula” in Moscow (killed 4 people, injured 17 people); in 1997 at the station “Izmailovsky” (no victims); in 1998 - at the station “Pushkinskaya” (11 people killed); in 2000 at the station “Belarus” (no victims).

There is also a big problem trafficking of nuclear and chemical materials, due to the existence of organized crime. The possibility that nuclear and chemical materials can be transferred to terrorist groups in order to blackmail them is a reality of our days. On March 3, 1999 in Moscow an ensign of the Ministry of Emergency Situations of Russia tried to sell about 100 liters of dichloroethane. Experts estimated that amount was sufficient to fatal poisoning of tens of thousands of people [Rotani 1999]. November 23, 1995 Chechen leader Basayev said on NTV that in the vicinity of Moscow 4 containers with radioactive cesium were hidden. In Izmailovsky Park it was found one container of cesium weight of 32 kg. Each year it is recorded more than 200 cases of detention nuclear smugglers in the world. Typically, trafficking begins in one of the countries established in the former Soviet Union, and transshipment bases are Slovakia, Czech Republic, Germany, Lithuania.

One of the reasons of possible terrorist attacks is the lack of reliable physical security in large parts of potentially dangerous objects, and where it is, it needs improvement. According to GAN of Russian Federation “access of people and transport in areas where nuclear power is free. This can contribute to sudden secret preparation of terrorist acts on or near the object, complicate preventive measures changes in various conditions. In addition, the water area on the outskirts of the coastal pumping stations at all nuclear power engineering and technical facilities are not equipped, which is the vulnerable point in the protection of nuclear power plants. “[The annual report on the state of protection of the population and territory of the Russian Federation from emergency situations of natural and man-made 1997]. According to official data of the Federal Security Service of Russia from 1990 to 1997, the leadership of Kursk, Rostov nuclear power stations received letters threatening explosion or capture terrorists [Luneeva 1997]. And in case of an explosion on the Kursk and Rostov nuclear power plant will be affected a large area of Ukraine. Now the east hostilities are conducted at a distance less than 200 km. of Zaporizhzhya NPP.

4. State of technological safety in Ukraine (risks of technological terrorism)

We offer further to review the state of technological security in Ukraine by means of the annual reports of the State Service of Emergencies of Ukraine [Analysis of emergency in Ukraine 2009, 2011-2014: 15, 18-21]. Thus,
According to the Ministry of Transport in Ukraine more than 900 million tons of cargo, including a large number of hazardous and more than 3.0 billion passengers annually are transported by public transport. From the total volume of goods 15% are potentially dangerous (explosive, flammable, chemical and other substances). In recent years capital renewals of railway transport dramatically are reduced. The technical state of rolling stock is critical: the degree of its wear is an average of 77%, to be replaced over 20% of tracks, and 16% of tracks are in a dangerous condition. The State of technical means can not fully protect the railway transport using.

According to the State Emergency Service, the state economy has more than 1200 explosion and fire facilities, which as of 2008 was concentrated over 13.6 million tons of solid and liquid explosive and flammable substances. More than 10 million hectares of the territory of Ukraine covered with forests and peatlands, which are potential sources of fire.

At present, Ukraine has five nuclear power plants with 16 nuclear reactors, two experimental nuclear reactors and more than 8,000 businesses and organizations that use in manufacture, research work and clinical practice in a variety of radioactive substances. Radiation accident at the nuclear reactor in the destruction of one of the 10% release of radioactive products outside the buffer zones of stations can create zones of contamination (with various levels of radiation) of total area of 431,200 km², in which 5249 settlements are situated with a population over 22, 5 million people. More than 80% of the units at thermal power plants of Ukraine already exceeded their design life, and 48% are higher than the limiting resource. In addition, 40 - 50 thousand kilometers of electric power had been put in operation before 1970 and they almost have worked out their resources.

According to the Ministry of Energy and Coal Industry of Ukraine, the last 25 years in the coal mines of the country nearly 600 people died in accidents. Mining and concentrating production company operate in Ukraine 2700 different kinds of piles, which hold about 3.6 billion m³ of rocks, 219 industrial and hydraulic total capacity reaches 2.26 billion m³.

Totally at the beginning of 2009, 1,806 industrial facilities operated in Ukraine, where highly toxic substances, including - 9.2 thousand tons of chlorine and 194 thousand tons of ammonia are stored or used in the production. About 23 million people live in all areas of possible chemical contamination from these sites, but over the past five years the replacement or upgrade of fixed assets of these facilities practically were not carried out. Chemically dangerous objects that use and keep a large amount of chlorine, ammonia and other volatile toxic substances, mostly are fitted with outdated or obsolete equipment, which worked out its allotted time.

According to the Ministry of Regional Development, Construction and Housing and Communal Services of Ukraine data, the fourth part of the water treatment plants and networks actually worked out its lifetime, 22% of networks are in disrepair. It has ended the lifetime of every fifth pumping station. Today in Ukraine more than 17,000 bridges are operated. Almost all of them do not have appropriate supervision, their condition is not checked. 34% of bridges were built before 1961 on the roads of common use, although the estimated service lifetime of them is less than 30 - 40 years.

The area of Ukraine is full of many pipelines objects: length of main gas pipelines is over 35,200 kilometers, domestic and transit pipelines - 7900 km. Their work provides 31 compressor oil pumping and gas compressor 89 compressor stations, and product length is 3400 kilometers.

The system of large reservoirs of the Dnieper cascade caused raising of water level in the river from 2 to 12 meters, which resulted in flooding of vast areas of the Dnieper. There is a catastrophic degree of infestation by this process (50%) in the area of influence of the Kremenchuk reservoir.

According to scientists, it is possible occurrence of catastrophic flooding in the destruction of dams, culverts 12 and 16 hydroelectric reservoirs rivers the Dnieper, the Dniester, the Southern Bug, the Seversky Donets. Their total area can reach 8294 km², where 536 settlements and 470 industrial facilities for various purposes.
are situated. Potentially catastrophic flooding zones in the destruction of facilities Dnieper cascade hydropower stations, which gets part of the territories of eight regions with a total area of over 8000 km², 463 towns and over 200 industrial companies are very dangerous in its consequences. Because of this phenomenon it is possible the disruption of power (damage to 2,000 kilometers of power lines), failure of networks and facilities of gas facilities, water supply.

The Ministry of Health of Ukraine drew attention to the dangerous tendency of various deteriorating health situation in Ukraine. Infectious of human diseases, such as lentospiroz, rabies, anthrax, rickettsial, trichinosis, tularemia and others appeared recently in the country. Epifitotychna and epizootic situation are complicated. It is not excluded the likelihood of such cells due to acts of “biological” terrorism.

Scientists’ researches show a negative outlook on the number of negative effects of technological (including technological acts of terrorism), who are studying the impact of solar activity on the earth processes. Considering helio-physical expired at the number of negative phenomena, scientists have concluded that at intervals of 9 - 11 years depending on the periods of solar activity splash negative phenomena of various kinds (social, natural, technological) happen [Kiselev 1997].

The tendency of uprising of the number of technological anomalies, severity of their consequences indicate that the social transformation process in Ukraine significantly weakened the governance in the field of technological safety. There is a lack of labor and technological discipline, reducing of the safety expences, physical protection of facilities, prevention and forecasting of disasters and catastrophes, which lead to additional difficulties and losses. There is a way beyond the boundary of the main project resource transport, energy, chemical plants and vehicles. The above factors affect the growth of the number of technological acts of terrorism.

The reality of technological threat of terrorism for new aspects of complicating unified state policy to protect the individual, society and state from technological acts of terrorism, defining a number of specific issues of counter-terrorism activities, provision of physical protection of potentially dangerous objects of technosphere.

In order to solve the above problems it is appropriated:
- to develop a comprehensive legislative framework with a package of proposals in the form of departmental and interagency legal acts, considering various measures to prevent terrorist acts on objects technosphere;
- Identify the most vulnerable of potentially dangerous objects containing radioactive sources, chemical, biological contamination;
- Clarify and, in some cases radically changing the system of physical protection of potentially dangerous objects of technosphere. Creating and comprehensive application of effective technical means of physical protection. Thus, the western experts’ idea deserves an interest of need of maintenance of air defense parts to protect the nuclear power plant of crash captured terrorists on these stations;
- Real planning for the transport of nuclear and chemically hazardous materials.

Technological terrorism is a quite complex, dynamic, multifaceted phenomenon and represents one of the possible forms of different types of terrorism. Selecting of targets of terrorist influence dangerous objects technosphere as means of achieving of the goals inherent, as analysis showed, to political terrorism.

Considering technological terrorism as socio-legal phenomenon should be noted that unlike conventional displays of terrorism (hostage-taking, kidnapping, bombings in public places and robbery, seizure of vehicles) technological terrorism is characterized by additional negative factors. This is a great destructive power, which is in addition to big casualties and material damage factor in moral and psychological and physical impact of terrorist activities on the participants of antiterrorist activity and society.

The past decade was marked by dramatic changes in the military-political situation in the world, which could not affect the internal situation in Ukraine. Changes were occurred in the geopolitical, military, economic, so-
cial and legal situation in Ukraine. The above changes have marked new aspects of safety of technosphere. We believe it is necessary to distinguish the following external and internal aspects, including the external aspects include:
- The lack of a stable military and political stability, the emergence of the former Soviet Union and the world in general contentious international, legal, territorial and other problems, which in turn develop into military conflicts;
- Destabilization of peaceful initiatives of some states in the most important military and political aspects of international security;
- Increasing of the availability of illicit trafficking of nuclear and chemical materials;
- Illegal migration;
- Smuggling of weapons, ammunition, poisonous substances.

The internal aspects are:
- Destabilization of the situation in credit-financial, scientific and production activities;
- Acute crisis in socio-political sphere;
- Escalation of organized crime in anti-social system.

Classification of technological terrorism by forms, content, sources, scope and implications should also be used to determine the subject of the fight against terrorism, the decision on the legal regulation of such a struggle, determination of competence power structures, etc.

In our opinion, the classification of technological acts of terrorism in scope and objects technosphere, which aimed to use terrorism provisions on classification emergencies by their level, because every act of terrorism actually causes an emergency.

5. Emergency as part of technological terrorism, their classification

Emergency is a general clearly defined in the legislation of Ukraine the concept used in most legislation concerning the fight against terrorism.

Emergency is a violation of normal life and activities at the facility or territory caused by accident, disaster, natural disaster or other factors that led (could lead) to the death of people, animals and plants, considerable material damage and (or) cause damage to the environment.

In accordance with this provision of the object encroachment of technological acts of terrorism can be divided into:
- Acts of terrorism on transport;
- Fires, explosions;
- Acts of terrorism connected with the release of highly toxic substances;
- Acts of terrorism associated with the presence of pollutants in the environment above the maximum permissible concentration;
- The release of radioactive substances;
- The destruction of buildings;
- Acts of terrorism in power systems;
- Acts of terrorism on life-support systems;
- Acts of terrorism on systems and telecommunications;
- Acts of terrorism in the treatment plants;
- Acts of terrorism in the hydrodynamic facilities;
- Biological contamination.

It should again be emphasized that in its genesis, terrorism is a social phenomenon that is danger factor there in the social sphere, the above classification applies only to specific objects of technosphere, where terrorists
commit their acts. State Classifier of Emergencies correctly distinguishes terroristic acts between emergencies of socio-political nature, they are:
- Armed attacks, seizure and retention of important objects or real threat of such actions;
- Attempt on the state leaders and people’s deputies of Ukraine;
- Assault, attempted at a crew air or high-speed sea (river) vessels, theft or attempted theft, destruction or attempted destruction of such ships, taking hostages from among the members of a crew or passengers;
- The establishment of an explosive device in a public place, institution, organization, enterprise, residential areas and transportation;
- Objects stolen from storage, use, recycling and during transport: firearms; ammunition; armored vehicles; artillery weapons; explosives; radioactive substances; highly toxic substances; drugs, medicines and raw materials.

Each emergency situation is defined by classification criteria (physical, chemical, engineering, statistics, etc.). And special features that characterize the threat or emergency. Also the agency of central executive body is responsible for the specification of each concrete emergency.

The scale of classification divides emergencies at four levels: at facility, local regional and national, in our opinion, this list is have to be added with an international level. In the process of determining the level of emergency consistently considered three groups of factors: the territory of distribution; size of caused (expected) economic losses and human losses.

Appealing to the certain danger categories of emergency allowed to increase objectivity when entering appropriate emergency of legal and administrative regimes, and thus reduce the administrative discretion of authorities. Thus, the legal regime of emergency state is introduced in emergency situations not below the national level - Art. 1 of the Law of Ukraine “On legal regime of emergency” [On legal regime of emergency 2000].

In the classification for the purpose of committing terrorist acts we support some authors and believe that there are three classes: political; criminal; mental. M.P. Kireev, had examining cases of terrorism acts on air transport, concluded that 25% of such acts are committed for political reasons, 25% - criminal reasons and 50% are committed by individuals with various mental illnesses [Kireev 1998].

Ranging in size and organization of terrorist acts we distinguish between unions (including clandestine sects and organizations), organized groups, terrorist groups and spontaneous single.

Given the content in the population structure the fate of people with mental illnesses and other abnormalities, mental health criterion, anomalies within sanity and abnormalities that lead to the conclusion that insanity, we also considered that is necessary for classification.

There can be classified:
- Applying to a loss of - mass, group, individual losses, differentiation of victims of religious demographic and social characteristics;
- In relation to the damage - especially large, large, small;
- Applying to moral and psychological damage - causing panic, fear of people, mistrust of authority;
- Regarding the weapons’ use - weapons of mass destruction, automatic weapons, close combat weapons, non-lethal weapons, special means.

Important seems sub-classification use and features such as sources of financial support for terrorists, sources of weapons, terrorists corrupt ties with official authorities, etc. The combination of all the above features allows you to enter in the framework of a strict classification of a variety of technological manifestations of terrorism, which further allows the formalization of such notions as legislative or normative acts related to the fight against terrorism.
6. Countermeasures to technogenic terrorism in Ukraine

The main measure in the fight against terrorism is criminal liability. Optimization of legal regulation of combatting terrorism, man-made, in our opinion, should include expansion units possible target, interpretation of the relevant acts as multiple element (with the possibility of isolating the main and additional facilities), including the relevance of attacks on mass loss of population, life and the health of certain population groups, for information, energy, food resources and life support systems on dangerous objects technosphere. The expansion, in our view, needs to describe the methods and consequences of terrorist crimes as aggravating circumstances (including, forcing the operator to carry out the sources of increased dangerous actions, regularity, perseverance in implementing the goals). As part of the criminal law it is necessary to determine the specific risk at a reasonable stopping terrorist actions and responsibility for the inaction and neglect the duties as to prevent and suppress criminal acts (in relation to decision makers dangerous objects technosphere).

It should be used a number of ideas and foreign laws in the optimization of legal regulation, including the Criminal Code of the Federal Republic of Germany for details methods and consequences of terrorism (nuclear explosion, ionizing radiation, flooding areas, poisoning of reservoirs, important public infrastructure). Also work on optimization of legal regulation has complete direction in domestic law of international instruments ratified in accordance with the law Ukraine. This refers to the European Convention on Combating Terrorism, UN Resolution 40/61, the Convention against detention of hostages seizure of nuclear materials, aircraft, etc. Recently, many questions arise regarding the justification of individual terrorist acts, as measures of the liberation struggle. General guideline here should be the idea of international instruments that the aim does not justify the means, and, therefore, any terrorist act should be treated as criminal offense, regardless of the purpose and reasons.

As the improvement of criminal procedural law to investigate terrorist acts can offer contactless interrogation, removal from the case of data on witnesses identify, empowerment for the control of banking operations and so on.

Also, it should be noted that the fight against terrorism can not be limited only by means of criminal responsibility. Since terrorism is complex social and legal nature, its causal complex covers many different areas of public life, so need a system different-legal means. This means of prevention, both at national level and internationally, is operational-search, information retrieval, organizational and technical measures regime, including special operations. In our opinion, it would be true to perceive the system of criminal activities as subsystem of a large system.

By the way, with the help of sociologists, psychologists and social psychologists need to develop specific methods of measuring the impact of this phenomenon on changing of public opinion, psychology of society. To counter this influence we must develop common ways to neutralize the “contamination” of panic rumors' spreading, intimidating and video information, negative effect of sensationalism in the media.

One of the issues is the development and study of strategic integrated technological system to combat terrorism. Counter-terrorism should be viewed as a set of ideological, information-analytical, operational and military measures agreed for period goals, content, objectives, targets prevention and actors participating in it. The principles of the Counter-Terrorism Strategy, in our view, are: proactive nature; activity; universality; resources; system-level approach; variability; interaction; differentiation of tasks.

In Ukraine there is no inter-sectoral state system that would coordinate activities of services to fight against terrorism. This is not effectively counter-terrorism in state of interaction and coordination in this field at the national, regional and local levels it needs improvement and regulatory consolidation. The practice indicates the need for a special interdepartmental management of counter-terrorism system, such as the Unified state system of prevention and response to emergency situations of technogenic and natural character. But we can already identify the bodies of coordinating anti-terrorist influence: at the national level - the National Secu-
rity and Defense Council of Ukraine, Antiterrorist center of the Security Service of Ukraine, Departmental and interdepartmental commission on emergency situations, permanent operational headquarters in the state enforcement agencies. At the regional, local and site level there are the Commission for Emergencies, operational headquarters of regional enforcement structures of the state. The bodies of daily administrative system of antiterrorist impact are: Centers of Crisis administration and specialized units of state executive bodies of relevant levels, alternate, dispatching service, operational duty of the Security Service of Ukraine, Ministry of Internal Affairs of Ukraine, Ministry of Defense of Ukraine, Ministry of Health. That remains to complete the construction of system to determine the permanent system of anti-terrorist authorities influence: the particular administration (departments) in the central apparatus of the Security Service of Ukraine, Ministry of Internal Affairs of Ukraine, Ministry of Defense of Ukraine. Also there are relevant structural units of preventing and responding to terrorist acts at the regional level of governance.

Specific objectives of the anti-terrorist system of influence should be: development of legal acts and regulations and standards on the prevention of terrorist acts, legalization of their impact; conducting search operations and administrative and preventive measures to prevent terrorist acts; collection and analytical processing of information on terrorist organizations, stocks, prepared, etc; preparedness of central and local executive bodies subordinate forces and means to conduct counter-terrorist operations, the elimination of the consequences of terrorist attack; scientific and technical programs to combat terrorism; warning people of the dangers; participation in international cooperation in the fight against terrorism; actions and conduct search operations on the facts terrorism and others.

It is necessary to emphasize the issue of creating subsystem information support counter-terrorist activities. It is proposed to create a single information system with different levels of access regulations and accounting information between actors counterterrorist activities. In practice it is low rate and lack of necessary information lead to serious errors in the implementation of anti-terrorist activities. “In particular, the opportunities of system (IWeTS) Interpol in arms and explosives isn’t used, which is an unique source for identifying illegal proliferation of weapons and terrorism” [Kravchenko 1999].

Another important aspect of state system of counter-terrorism cooperation in the exposure is anti-terrorist activity. The effectiveness of the national system of measures to combat terrorism in large degree depends on cooperation of all entities involved in process. Interaction allocated to interdepartmental, interagency and international. In practice, the main problem is the interaction occurring at the interdepartmental level. The main bodies that carry out counterterrorist activities are the Security Service of Ukraine, Ministry of Internal Affairs of Ukraine, Ministry of Defense of Ukraine. The distribution of competence is based on objective terrorist act - political or venal. If goal is venal, this terrorist act should be eliminated by the Ministry of Internal Affairs of Ukraine if it is political by the Security Service of Ukraine. But this statement of fact does not give rise to a clear division of functions and roles of the Security Service of Ukraine and the Ministry of Internal Affairs of Ukraine in the organization of the combat against terrorism. Indeed the question now is not solved: what terrorist acts are considered political and what are venal. We are interested in the distribution of political terrorism and criminal just because technogenic terrorism in most cases are political ones.

Given the analysis of foreign experience we try to formulate hallmarks of political terrorism and venal, particularly to political terrorism should include:
- Bound by ideological concepts, for which terrorist act is committed;
- The strategic goal is reforming of society;
- Subjects are members of extremist parties, groups, nationalists, clerics, religious fanatics;
- Development of medium- and long-term programs of action;
- Advertising of goals, attempt to influence the general public;
- Committed actions are right, existing laws are not true;
- The nisus to save the hostages’ lives, to support the image;
- The possibility of self-sacrifice.
Venal terrorism includes:
- Lack of ideological concepts;
- The purpose of obtaining wealth;
- Subjects are representatives of professional or organized crime;
- Short-term of terrorist plans;
- Public support is not required;
- Understanding of illegality of their actions;
- Planning the death of hostages;
- Never going to sacrifice.

In this world the idea is realized in practice that the organization of the fight against terrorism is a very important preventive activity of special services and other actors in this struggle, which requires cooperation and coordination of efforts of all government agencies and the public through a specially created for this purpose centers.

In carrying out of counter-terrorism activities is not enough without operational measures. First, special administrative regimes of the potential dangers during transporting dangerous goods, etc. Such regimes in its content with the following measures: protection of zone object, implementation of access control, tracking of sanitary-epidemiological, radiological and environmental condition on the closed area, prevention of illegal actions against objects that are protected, the protection of information of state secret, restrictions on the entry and residence restrictions on flights lethal devices over this territory, limiting driving economic and entrepreneurial activity, use of natural resources.

The regime of controlled zone is established throughout the closed administrative-territorial entity object to restrict people onto this territory. To make unauthorized access of persons and vehicles have travel checkpoints. Such regimes are nothing but means of prevention of various technologic disasters, including acts of technological terrorism. Among these acts regime can be called the Law of Ukraine “On Protection of Environment” [On environmental protection 1991] “On legal regime of territories contaminated by the Chernobyl disaster” [On legal regime of territories contaminated by the Chernobyl disaster 2001], «On increased risk» [About an increased risk 2001] “On Radioactive Waste Management” [On Radioactive Waste 1995] and others.

Subsequent events associated with regime since the onset of negative consequences if a large probability of their occurrence. In the Administrative law theory such regimes are fixed as special emergency ones. The legal basis of counter-terrorist operation regime is precisely the laws, namely the Law of Ukraine “On legal regime of emergency” [On legal regime of emergency 2000] “On legal regime of martial law” [On legal regime of martial law 2000] “On the zone of ecological emergency” [On the zone of ecological emergency 2000] and others. Extraordinary legal and administrative regimes are like on the edge of the legal system and its content are the most intensive law-restricted for citizens without the use of which is not possible to eliminate the danger. These measures such as the introduction of labor; the introduction of curfew; verification documents to citizens, and if necessary, conduct of personal inspection, inspection items, vehicles, baggage and cargo, office space and housing citizens; ban the manufacture and distribution of information materials that could destabilize the situation in the country and others.

These modes limit the absolute power of administration in terms of danger. Thus Article 4 of the Law of Ukraine «On legal regime of emergency» [On legal regime of emergency 2000] points directly to the state of emergency in the event of mass terrorism involving loss of life or destruction of important critical infrastructure. It is proposed to supplement other forms of this technogenic disasters, destruction hazard, accident vehicles carrying dangerous goods and more.

Also, there are many questions concerning the operation of Article 17 of the Act “Additional measures of emergency state due to technogenic emergencies or natural disasters.” [On legal regime of emergency 2000] Measures such as the evacuation of people from dangerous places to live, establishing housing obligations, establish-
ing quarantine and others who need the liquidation of technogenic terrorist acts can not be used, based on the fact that the above-mentioned measures are applied only upon the occurrence of conditions that are in p. 1 of Article 4 of the Act [On legal regime of emergency 2000]. But just mentioned measures are necessary for successful localization of hazards caused by technogenic terrorist acts. In our opinion, this case should be expected in the law.

Based on the experience liquidation of accidents at nuclear power plants, large enterprises petrochemical industry it should be noted that the limitation of emergency mode for a period of 60 days is not advisable, since the elimination of negative factors required a great time. In this case the proposed legislation to make the transition in certain circumstances, to the exclusion of negative anthropogenic factors on the situation of emergency state regime to environmental emergency that is not limited by time and has a sense measures aimed at localization and liquidation is negative anthropogenic factors.

But not always appropriate to enter the emergency state. More acceptable is considered one of the lower-level modes, the Administrative law combines regimes under the collective term of special status, such modes are provided by the Code of Civil Defense of Ukraine [Code of Civil Defense of Ukraine 2012], the Law of Ukraine «On ensuring sanitary and epidemiological welfare» [On ensuring sanitary and epidemiological welfare 1994] and several others. But today there is no a special emergency mode, which can be directly used for counter-terrorism operations, in addition to the above one. Law enforcement agencies adapt other regimes for combating this phenomenon. So, the regime of emergency state is entered under the provisions of the Code of Civil Defense of Ukraine and the regime of counterterrorist operation in accordance with the Law of Ukraine «On Combating Terrorism». [On Fighting Terrorism 2003]

Conclusions

At the head of the legal framework of combat terrorism must be comprehensive conceptual law regulating the overall state policy in the fight against terrorism. Such law must have its content and special emergency of administrative-legal regime defined list of events held during counter-terrorist operations.

It is advisable to establish and consolidate the legislation order in which every political, ideological, economical solution was subjected to anti-terrorist expertise in effect. Such an approach would be consistent with a provision stating that the fight against terrorism is one of the priority tasks of the state and society.

Thus, tensions focus both within Ukraine and outside its borders promote the growth of terrorism threat on potentially hazardous objects technosphere. These circumstances make it necessary to develop a comprehensive strategy against this systemic threat. The issue of prevention of technogenic terrorism, prevention of this phenomenon and prompt response to it requires further radically increased efforts in all areas and in all areas of counter-terrorism activities focus on integrated and responsible approach to this activity.

References


Towards Security and Safety: Police Efficiency Across European Countries

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Received 15 May 2015; accepted 10 July 2015

Abstract. The duties of the police (to protect from criminal and other illegal threats life, health, rights and freedoms, property, and the interests of society and the State), requires the substantial financial resources to provide police operations. Nowadays, the police can be considered as a service institution, and the issue of the efficiency of the police work has become topical. The author’s research is focused on the multi-national problem of comparing police efficiency issue. Selected set of countries are the following: Belgium, Czech Republic, Denmark, Germany, Estonia, Greece, Spain, Croatia, Italy, Cyprus, Latvia, Lithuania, Luxembourg, Hungary, Malta, Netherlands, Austria, Poland, Portugal, Romania, Slovenia, Slovakia, Finland, Sweden, Iceland, Liechtenstein, Norway and Switzerland. The author’s research is based on the USA and the UK researchers’ studies, surveys of citizens, indicators derived from Eurostat data. The main conclusions of research are the following. The dynamics of the number of crimes recorded in the state, number of crimes recorded by the police per 100,000 residents, as well as the clearance rate cannot be the criteria to determine the efficiency of the police operations. In the situation when regulatory enactments of various countries do not state the same results to be achieved, the author proposes to establish satisfaction with the work of the police and the level of latent crime in the country as universal criteria for transnational comparison.

Keywords: police operations, efficiency, transnational, security, safety

Reference to this paper should be made as follows: Kriviņš, A. Towards security and safety: police efficiency across European countries V. 2015. Journal of Security and Sustainability Issues 5(1): 35–44. DOI: http://dx.doi.org/10.9770/jssi.2015.5.1(3)

JEL Classifications: K14, K42

1. Introduction

The Police as one of the oldest government bodies (Encyclopaedia Britannica n.d.), through the centuries has gradually changed its philosophical meaning.

In the 80s of the 20th century the pioneers in economic research on the criminal justice system Llad Phillips and Harold L. Jr. Votey in their work “The Economics of Crime Control” compared the functioning of this system to production process (Phillips; Votey 1984). Nowadays, the police can be seen as a service institution providing public safety service, which in considerable extent impacts processes of secure and sustainable development of societies and countries worldwide (Stańczyk 2011; Lankauskienė, Tvaronavičienė 2012; Tvaronavičienė, Grybaite 2012; Šileika, Bekerytė 2013; Račkauskas, Liesionis 2013; Mačiulis, Tvaronavičienė 2013; Vasiliūnaitė 2014; Zahars, Stivrenieks 2014; Matyasik 2014; Tunčikienė, Drejeris 2015; Giriūnas, Mackevičius 2014; Giriūnienė 2013).

Along with the changes in the perception of the role of the police, the issue of the efficiency of the police work has become topical. Studies have explored a number of aspects - the rate at which an officer has successfully...
detected criminal activity when conducting stop and frisks in the past (Song 2012), effectiveness of the police reform (Drake, Simper 2005), the Relationship between police efficiency and Citizen confidence (Fondevila 2008); the Measurement and Evaluation of Efficiency (Dimofte et al. 2012); the role of collaboration (HMIC 2012), the implementation of policing (Kirby 2013); the Relationship between police efficiency and crime rate (Domínguez et al. 2013), (DeAngelo et al. 2014).

Despite the importance of the issue, no universal approach for determining police efficiency criteria, assessment and inter-comparison has been elaborated yet. The author’s research is focused on the problem of multinational comparison of police efficiency issue. This article will not analyze police efficiency-raising techniques, only criteria for determining the level of efficiency.

The author’s research is based on the USA and the UK researchers’ studies, population surveys, indicators derived from Eurostat.

With help of oxford dictionaries we will proceed with defining the terms applied in this study:

**Effectiveness** (‘Oxford Dictionaries’, Effectiveness): the degree to which something is successful in producing a desired result; success.

**Productivity** (‘Oxford Dictionaries’, Productivity): the effectiveness of productive effort, especially in industry, as measured in terms of the rate of output per unit of input.

**Efficient** (‘Oxford Dictionaries’, Efficient): 1) (of a system or machine) achieving maximum productivity with minimum wasted effort or expense. 2) (of a person) working in a well-organized and competent way.

**Efficiency** (‘Oxford Dictionaries’, Efficiency): the ratio of the useful work performed by a machine or in a process to the total energy expended or heat taken in.

It can be concluded that the terms productivity and efficiency are qualitatively similar (similar in content). However, they are not identical. Productivity reflects the relationship between the resources used and the produced result. Efficiency in its turn relates to the achievement of the required result with minimal resources (Farrell 1957).

Basing on the terminology mentioned above, Efficiency of the Police operations is the achievement of the required (stated by regulations) result with minimal resources.

Though in the case of ‘input’ (resource consumption for operation of the police) in each country it is easily accountable and clearly known, whereas the central problem in assessing the effectiveness remains - identification and measurement of “output” (the achieved result).

Professors Leigh Drake and Dr Richard Simper in their work “An Economic evaluation of inputs and outputs in policing: problems in efficiency and measurement” pointed out that: “In order to produce comparative efficiency measures, however, it is essential that the services provided by police forces (the outputs or outcomes) be related to the resources (inputs) utilised by the forces in delivering these outputs (outcomes). A particular problem, however, is that policing includes many inputs and outputs (outcomes) that could potentially be utilised in an efficiency model” (Drake, Simper 2001).

While determining the “Output” it should be noted that the final result of the operations of the police is public safety. While performing the main objectives (to maintain public tranquility and law and order in society; to protect and respect the individual’s fundamental rights and freedoms; to prevent and combat crime; to detect crime; to provide assistance and service functions) in order to achieve the result the police operations focus mainly into two categories: prevention of offences (New Zealand Police 2012) and disclosing of violations of law (Stelfox 2009), that in conjunction with each other has a significant impact on public safety.

Nowadays statistical data for the evaluation of the effectiveness of the performances mentioned above have been widely used by the police. Given the fact that it is easier to find the evidence of their work productivity in
a repressive segment, the modern police while preparing of annual reports on its operations, focus attention of public mainly to such indicators as the number of crimes registered in the state and its dynamics, clearance rate and its changes, as well as the number of police officers in the country.

We will proceed with a brief analysis of these indicators for the selected set of countries: Belgium, Czech Republic, Denmark, Germany, Estonia, Greece, Spain, Croatia, Italy, Cyprus, Latvia, Lithuania, Luxembourg, Hungary, Malta, Netherlands, Austria, Poland, Portugal, Romania, Slovenia, Slovakia, Finland, Sweden, Iceland, Liechtenstein, Norway and Switzerland.

The choice of countries to be analyzed is determined both by the geographical belonging to Europe, as well as availability of the Eurostat statistics for a sufficient period of time - from 2004 to 2012 for performing of the comparative analysis.

2. The number of recorded crimes

Eurostat database provides the data on the number of crimes registered in certain countries. It shall be admitted that correct cross-country comparisons cannot be made by analysis of the dynamics of the number of recorded crimes without its correlation with the population changes. The criterion “Number of recorded crimes per 100,000 people” has been applied in the study to deal this problem. Basing on Eurostat data, the author has calculated and compiled data for 28 European countries during the period from 2004 to 2012 (Table 1), which allows to get a basic idea and draw some conclusions on the ratio mentioned above.

2.1 The number of recorded crimes

<table>
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<tr>
<th>Table 1. Crimes recorded by the police 2004-2012 (rate per 100,000 population) - derived data</th>
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<td>Switzerland</td>
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It should be taken in consideration that these data provide a summary regarding only recorded crimes and not the number of crimes reported to the police or crimes actually committed in the state.

Statistic data presented in the table show that there are great differences in indicators of the analyzed countries. For example, in 2012 in Romania the number of recorded crimes per 100,000 population was 1,535, whereas in Sweden in 2012 there was 1479 recorded crimes per 100,000 population. Do these data confirm that the Romanian police work more efficiently than the Swedish police?

Prima facie- the logical assumption, that the police is working more effectively in countries with a lower number of recorded crimes per 100,000 residents, does not correspond to the truth.

First of all, it shall be admitted, that the police is not to blame for the increase in the level of crime. Public safety is influenced not only by the operations of the police, but also by a number of other factors: the economic situation in the country, criminal penalty policy, independence of the judicial power, etc. In the European Union the police is becoming only as a supplement to active citizens, this is evidenced by the prevalence of community policing philosophy.

Secondly, low figures of the recorded crimes may indicate either a low crime rate, or the fact that operations of the police are focused on concealment of the crimes (failure to record crime). Whereas the inadequately small number of recorded offenses per 100,000 residents is an indicative of the lack of public confidence in the state police, which therefore results in the high latent crime.

A high number of recorded crimes may reflect not the increase in crimes committed by the people but the fact that people trust the police and actively inform the police about crimes that took place, and the police carefully records all information received.

Each country has its own approach to the recording of the reports on the alleged crimes. Therefore, a special care shall be taken in order the greatest possible number of already committed crimes is registered by the police in each country, i.e. to increase the proportion of recorded crimes. Not only a single methodology shall be developed, but also an accurate compliance with the developed methodology shall be exercised in the analyzed countries to receive reliable and comparable statistical data.

Thirdly, the data on number of recorded crimes per 100,000 population should be assessed only in conjunction with data on citizens’ trust in the police. In 2012, an important study Levels of trust in the police in some countries (ESS round 2012 year) was conducted. Unfortunately, the ESS round 2012 year study did not contain data for all countries analyzed, however, an essential detail can be noticed: in Germany, where the police in 2012 has recorded 7328 crimes in average, the trust in the police is significantly higher than the Slovak indicator, though it is among the countries with the lowest rate of recorded crimes per 100,000 population: 1672 crimes per 100,000 population per year (Table 2).

<table>
<thead>
<tr>
<th>Country</th>
<th>Level of trust</th>
<th>No trust at all</th>
<th>Disparity</th>
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<tbody>
<tr>
<td>Czech Republic</td>
<td>5,10</td>
<td>5,20</td>
<td>-0,1</td>
</tr>
<tr>
<td>Germany</td>
<td>6,84</td>
<td>1,40</td>
<td>5,44</td>
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<tr>
<td>Estonia</td>
<td>5,90</td>
<td>4,00</td>
<td>1,9</td>
</tr>
<tr>
<td>Hungary</td>
<td>5,34</td>
<td>4,00</td>
<td>1,34</td>
</tr>
<tr>
<td>Poland</td>
<td>5,25</td>
<td>5,1</td>
<td>0,15</td>
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<tr>
<td>Slovenia</td>
<td>5,38</td>
<td>6,30</td>
<td>-0,92</td>
</tr>
<tr>
<td>Slovakia</td>
<td>4,15</td>
<td>7,70</td>
<td>-3,55</td>
</tr>
</tbody>
</table>
An assumption can be made that the country in which the number of recorded crimes per 100,000 population is relatively low, public trust in the police is lower. This correlation is confirmed not only by ESS round 2012 year data that have been analyzed, but also by many other sources: ESS Round 1 - 2002, ESS Round 2 - 2004, ESS Round 3 - 2006, ESS Round 4 - 2008, ESS Round 5 - 2010 (European Social Survey 2010), World Values Survey (World Values Survey 2015), EVS-2008 (European Values Study 2008), ECA Region - Life in Transition Survey 2010, After the Crisis (Life in Transition Survey 2010).

In this way, citizens trust in the police “aggravates” the usual statistical indicators (the dynamics of number of crimes recorded, number of crimes recorded by the police per 100,000 population, clearance rate), but at the same time it also confirms the effectiveness of police operations. Increase in the efficiency of the police operations must ensure that the police is interested to record, and not to hide the reports received about the alleged crimes.

For the arguments mentioned above evaluation of efficiency of the police operations should in no way be associated with either a reduction in number of recorded crimes, nor comparison between several countries of a criterion crimes recorded by the police (rate per 100,000 population). However, data for each country on number of crimes recorded by the police shall be carefully compiled to be used for determination of the proportion of latent crime.

The author considers that one of the criteria for efficiency of the police operations would be not reduction of the number of recorded crimes, but reduction of the proportion of latent crime. This approach would allow the police to neutralize the desire to manipulate the statistics by failures to record reports on the crimes committed. On the contrary, the police would be interested in collecting all the information received. The fight against latency of crimes would undoubtedly increase the ability of police to obtain information which would allow to prevent and combat offenses more effectively.

3. Crime detection coefficient (clearance rate)

Crime detection is one of the basic tasks of the police. Therefore often there are attempts to attach the operational efficiency of the police to the percentage of solved crimes. We will proceed with a brief analysis of this indicator to see its role in determination of efficiency of the police operations.

A clearance rate refers to the number of cases that are solved by a particular law enforcement agency. The clearance rate may be divided up in a number of different ways, including the type of crime being committed, or the seriousness of the crime (WiseGEEK 2015).

The author supports the views of the researchers Greenwood, Chaiken, and Petersilia, who already in 1977 argued that variations in defining and recording clearances by individual agencies make the clearance rate an inappropriate measure for comparing investigative effectiveness of agencies (Greenwood et al. 1977).

What is more, this figure should not be applied even within the definite structure, the main reason for this is named by The Encyclopedia of Police Science, “It is possible, that politically motivated police administrators might manipulate data to secure more funding or improve the appearance of organization success” (Greene 2007). Actually, clearance rate is calculated by dividing the number of crimes that are “cleared” (a charge being laid) by the total number of crimes recorded. Against this background, artificial reducing of the number of recorded crimes may result in the increase of the clearance rate. The previous section examined the issue of analytical problems of the number of recorded crimes.

Along with the decrease in the number of recorded crimes the proportion of solved crimes increases (if registered are mainly cases with a good solving perspective; if there is a suspect). Reliability of the Clearance rate is significantly reduced by an artificial increase of this indicator in the practice of the police (Gregory 2009; End Violence 2013).
Clearance rate varies between countries; however, this difference cannot be taken as the basis for comparison of efficiency of the police operations. An important role here plays the credibility of the amount of recorded crimes, as well as the methodology that is used in the calculations.

**The number of police officers and productivity indicators**

A conclusion can be drawn, that the statistics prepared by the police are more suitable for the determination of productivity, rather than for comparison of the efficiency. Measurable criteria that are independent from subjective manipulation of the police are: the number of police officers in the country, its size and resident population. Indeed, operation of the police will be more productive in a country where the police is able to perform similar functions by using fewer human resources.

<table>
<thead>
<tr>
<th>Country</th>
<th>The number of police officers per 100,000 population in 2004</th>
<th>The number of police officers per 100,000 population in 2012</th>
<th>The number of police officers (per 100,000 population) increase from 2004 till 2012</th>
</tr>
</thead>
<tbody>
<tr>
<td>Belgium</td>
<td>356</td>
<td>422</td>
<td>1,19</td>
</tr>
<tr>
<td>Czech Republic</td>
<td>463</td>
<td>364</td>
<td>0,79</td>
</tr>
<tr>
<td>Denmark</td>
<td>194</td>
<td>193</td>
<td>0,99</td>
</tr>
<tr>
<td>Germany</td>
<td>299</td>
<td>298</td>
<td>0,99</td>
</tr>
<tr>
<td>Estonia</td>
<td>258</td>
<td>334</td>
<td>1,29</td>
</tr>
<tr>
<td>Greece</td>
<td>455</td>
<td>491</td>
<td>1,08</td>
</tr>
<tr>
<td>Spain</td>
<td>466</td>
<td>534</td>
<td>1,15</td>
</tr>
<tr>
<td>Croatia</td>
<td>456</td>
<td>499</td>
<td>1,09</td>
</tr>
<tr>
<td>Italy</td>
<td>435</td>
<td>466</td>
<td>1,07</td>
</tr>
<tr>
<td>Cyprus</td>
<td>678</td>
<td>611</td>
<td>0,90</td>
</tr>
<tr>
<td>Latvia</td>
<td>435</td>
<td>317</td>
<td>0,73</td>
</tr>
<tr>
<td>Lithuania</td>
<td>339</td>
<td>317</td>
<td>0,94</td>
</tr>
<tr>
<td>Luxembourg</td>
<td>297</td>
<td>331</td>
<td>1,11</td>
</tr>
<tr>
<td>Hungary</td>
<td>292</td>
<td>368</td>
<td>1,26</td>
</tr>
<tr>
<td>Malta</td>
<td>444</td>
<td>456</td>
<td>1,03</td>
</tr>
<tr>
<td>Netherlands</td>
<td>221</td>
<td>238</td>
<td>1,08</td>
</tr>
<tr>
<td>Austria</td>
<td>333</td>
<td>330</td>
<td>0,99</td>
</tr>
<tr>
<td>Poland</td>
<td>264</td>
<td>250</td>
<td>0,95</td>
</tr>
<tr>
<td>Portugal</td>
<td>455</td>
<td>437</td>
<td>0,96</td>
</tr>
<tr>
<td>Romania</td>
<td>213</td>
<td>264</td>
<td>1,24</td>
</tr>
<tr>
<td>Slovenia</td>
<td>382</td>
<td>359</td>
<td>0,94</td>
</tr>
<tr>
<td>Slovakia</td>
<td>262</td>
<td>448</td>
<td>1,71</td>
</tr>
<tr>
<td>Finland</td>
<td>158</td>
<td>149</td>
<td>0,94</td>
</tr>
<tr>
<td>Sweden</td>
<td>188</td>
<td>210</td>
<td>1,12</td>
</tr>
<tr>
<td>Iceland</td>
<td>231</td>
<td>205</td>
<td>0,89</td>
</tr>
<tr>
<td>Liechtenstein</td>
<td>254</td>
<td>239</td>
<td>0,94</td>
</tr>
<tr>
<td>Norway</td>
<td>178</td>
<td>159</td>
<td>0,89</td>
</tr>
<tr>
<td>Switzerland</td>
<td>210</td>
<td>222</td>
<td>1,06</td>
</tr>
</tbody>
</table>

These data allow us to determine that in 2004 the average number of police officers per 100,000 population in countries that were analyzed was 329, but in 2012 it increased to 339 police officers.
In 2012, the number of police officers was below the average in such countries as Denmark, Germany, Latvia, Lithuania, Netherlands, Poland, Romania, Finland, Sweden, Iceland, Liechtenstein, Norway, Switzerland, but it was above the average in Belgium, Czech Republic, Estonia, Greece, Spain, Croatia, Italy, Cyprus, Luxembourg, Hungary, Malta, Austria, Portugal, Slovenia, Slovakia.

However, the number of police officers as such is not enough to determine productivity for each police officer. It can be estimated indirectly by basing on the number of registered crimes per a police officer and by calculating area of the state (km$^2$) per a police officer (undoubtedly, these indicators will be largely related to climatic conditions, terrain and other national characteristics, still, these data allow us to compare the indicators of states that have similar characteristics).

The collected information suggests that the average number of crimes recorded in 2004 in 28 countries that were analyzed was 19.57 per a police officer, but in 2012 it was 18.35 per a police officer.

In 2012 the number of recorded crimes per 1 police officer was above the average level in such countries as Belgium (22,95), Denmark (40,97), Germany (24,57), Luxembourg (21,68), Netherlands (28,68), Austria (19,73), Finland (52,93), Sweden (70,51), Norway (34,44) and Switzerland (42,56), but it was below the average in such countries as Czech Republic (7,95), Estonia (9,22), Greece (3,55), Spain (9,07), Croatia (3,38), Italy (10,18), Cyprus (1,51), Latvia (7,69), Lithuania (7,90), Hungary (12,93), Malta (8,21), Poland (11,62), Portugal (8,74), Romania (5,80), Slovenia (12,40), Slovakia (3,72), Iceland (17,90), Liechtenstein (13,12).

The indicator of the country’s territory in countries that have been analyzed is ranging from 0.166 km$^2$ per a police officer in Malta to 157.01 km$^2$ per a police officer in Iceland. Undoubtedly, the correlation between area of the country and the number of police officers occurs due to climatic conditions and terrain of the country, as well as to the location of the population. Taken together, the statistics suggests that in the Northern European countries police officer’s service area (in Sweden 22,62 km$^2$ per 1 police officer, in Finland 41.88 km$^2$ per 1 police officer, in Norway 48.50 km$^2$ per 1 police officer, in Iceland 157.01 km$^2$ per 1 police officer) is significantly higher than in other European countries such as the Netherlands (1.04), Italy (1.08), Germany (1.46), Spain (2.02), Switzerland (2.34), Austria (3.02), Poland (3.24).

**Summary**

Such statistical data as crimes recorded by the police (rate per 100,000 population) (clearance rate), the number of police officers (rate per 100,000 population) cannot serve as the criteria for determining the effectiveness of the police operations. Not only these but also other statistical quantitative data that regard prevention of violations of law and the fight against offences have serious shortcomings.

For example, in the area of prevention of violations of law statistics do not take into account the fact that presence of the police, as such, is able to prevent some crimes, and the number of these potentially prevented crimes cannot be clearly defined and calculated. The same is true for such operations of the police as preventive lectures and discussions. Conclusion can be drawn that intensity of patrols and number of lectures delivered as well as time spent for cooperation with neighbours (neighbourhood policing) demonstrate exclusively productivity of the police, rather than efficiency. Also in the segment of fight against offences (such indicators as response time of the police to calls and responding to crime in the form of detention) statistical data can be used to measure productivity of the police rather than efficiency.

Efficiency of the police in theory should correlate to achievement of the objectives stated by the laws and regulations, however, these aims should not be attributed to the reduction in the number of registered crimes, the decreasing number of complaints about work of the police, the increase in percentage of solved crimes.

In a situation when the aforesaid indicators are favourable to the police, but at the same time the public has a negative view of the police, the view of the population is more preferable. Indeed, if the person does not trust
the police, than the person will not turn to the police either with the report of crime that took place, nor with complaints about the conduct of a police officer.

Public safety standard is not and cannot be fixed in laws and regulations, therefore the efficiency can be associated only with the public’s satisfaction with the good name of the police in society. Both residents’ satisfaction with the work of the police and their sense of security are associated with the population’s subjective (internal) assessment. Therefore, the effects the police is leaving to the public can only be studied by sociological research - population surveys. Sociological surveys allow you to clarify with a high degree of confidence at least the following essential aspects:
1. each respondent’s assessment of the police work (e.g., positive, neutral or negative evaluation);
2. the real crime rate in the country and, in conjunction with the recorded number of crimes – proportion of latent crimes;
3. the trust of citizens in the police (also in comparison with other state institutions);
4. the respondents’ view on the public perception of the level of safety;
5. population motives in cases when they did not approach the police with a report on the planned or already committed crime;
6. how often the police itself violates the rights of citizens;
7. whether society is sufficiently aware of operations of the police and it results;
8. Residents’ proposals to increase the efficiency of police operations.

Sociological survey allows stratifying the obtained results depending on the respondents’ experience in cooperation with the police. Applying of the sociological survey eliminates the problem with regard to the division of efficiency of the police in preventing and fighting the violation of law, as this public assessment regards evaluation of the operations of the police in general. To increase the reliability of data, conduction of this research shall not be assigned neither to the police nor state institutions.

Conclusions

The dynamics of the number of crimes recorded in the state, number of crimes recorded by the police per 100,000 residents, as well as the clearance rate cannot be the criteria to determine the efficiency of the police operations. There is no linear dependence between these indicators and the operational efficiency of the police. Statistical analysis may be purely a secondary element to be used in determining secondary values – productivity of the police officers, decrease of the proportion of latent crime.

Taking into account the fact that the police efficiency assessment is related to subjective criteria (sense of public safety, public satisfaction with police work), it can only be determined by a wide range of criminological research - sociological surveys. Such surveys should be carried out by independent institutions.

In the situation when regulatory enactments of various countries do not state the same results to be achieved, the author proposes to establish satisfaction with the work of the police and the level of latent crime in the country as universal criteria for transnational comparison.

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ASPECTS OF CYBERSECURITY: THE CASE OF LEGAL REGULATION IN LITHUANIA

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Received 20 March 2015; accepted 26 July 2015

Abstract. Lately a lot of attention has been given to legal regulation of cybersecurity. This article will review legal regulation of cybersecurity in Lithuania. Historical retrospective of legal regulation of cybersecurity in Lithuania will be discussed, strategic Lithuanian cybersecurity documents will be analysed, and the Law on Cybersecurity of the Republic of Lithuania will be analysed and evaluated. After a comparative analysis of cybersecurity strategies and laws and a review of legal regulation of cybersecurity in Lithuania, gaps of law-making and of other measures were distinguished, and corresponding conclusions were made. The adoption of the new Law on Cybersecurity, which regulates many important institutes, is evaluated positively. But with regard to the current legal regulation on cybersecurity in Lithuania additional measures are necessary (functions of institutions that formulate cybersecurity policy and perform control functions have not been detailed and distinguished, also functions of the Lithuanian national Computer Emergency Response Team (CERT) are not foreseen in the Law on Cybersecurity, etc.).

Keywords: cybersecurity, legal regulation, strategies, law.

Reference to this paper should be made as follows: Štitilis, D.; Klišauskas, V. 2015. Journal of Security and Sustainability Issues 5(1): 45–57. DOI: http://dx.doi.org/10.9770/jssi.2015.5.1(4)

JEL Classifications: K29

1. Introduction

Factors that determine a country’s security and their relation with sustainable development processes are widely analysed in contemporary scientific literature (e.g. Stańczyk 2011; Lankauskienė, Tvaronavičienė 2012; Wahl, M.; Prause, 2013; Vosylius et al. 2013; Wahl 2014; Grubicka, Matuska 2015). Cybersecurity is one of the components of a country’s security.

Development of information technologies and transfer of information into cyberspace increases the quality of information processes and activities as well as ensures better competitiveness and efficiency. But this also leads to negative consequences, such as loss of important electronic information or even cybercrime. As the number of cyber incidents increases (Cyberattacks on the Rise as Confidence Sinks, Finds ‘2015 Cyberthreat Defense Report’ 2015), a threat arises not only to separate subjects but also to the country itself. Cyber attacks can be used as a means of political and economic pressure; in a serious crisis pressure can be exerted as an instrument of influence alongside traditional means of military force (Finland’s Cyber Security Strategy 2013). Assurance of cybersecurity is a very important and specific type of activity that requires consistent and detailed legal regulation. Schjolberg and Ghernaouti-Hele consider cybersecurity to be a cornerstone of information society.
Lately increasingly more attention is given to cybersecurity on the regional level as well as in separate countries, including corresponding legal regulation, and the Republic of Lithuania is not an exception. Some of the main documents in this area are strategic documents, cybersecurity strategies (Mitrakas A. 2006). A national cybersecurity strategy is a tool to improve the security and resilience of national infrastructures and services (National Cyber Security Strategies 2012).

On 7 February 2013 the European Commission and the High Representative of the Union for Foreign Affairs and Security Policy published a cybersecurity strategy (hereinafter – the Cybersecurity Strategy) together with a Commission proposed directive on network and information security. Article 5 of the Commission proposed directive on network and information security advocates for a national cybersecurity strategy in every country (Proposal for a Directive of European parliament and the Council concerning measures to ensure a high common level of network and information security across the Union 2013). In recent years strategic documents in the area of cybersecurity have been or are being adopted in some countries (Štitilis 2013).

Also legal regulation of cybersecurity is very important on the level of legal framework / laws. The importance of a law as such is unquestionable because it sets primary general rules that hold a specific legal power (Ragauskas 2005). The existence of rules of such nature is very important in a country, and their influence is very big. For example, the Federal Information Security Management Act of the USA recognizes the importance of information security to the economics and national security. In this context as new (cyber) threats arise and grow laws that regulate cybersecurity are passed in some countries, although this process is only starting.

Lithuania has also passed several strategic legal acts for cybersecurity assurance (Resolutions of the Government: on the approval of the programme for the development of electronic information security (cybersecurity) for 2011–2019 (“Regarding Approval of Electronic Information Security (Cyber Security) Development Programme for 2011–2019” 2011) (hereinafter – the Lithuanian Strategy), on the approval of the conception of the law on electronic communication networks and information security of the Republic of Lithuania (Regarding Approval of Conception of the Law on Electronic Communications Networks and Information Security 2006), and others). And in December of 2014 the Law on Cybersecurity of the Republic of Lithuania for regulating corresponding relations on the level of legal framework was passed.

As we can see a lot of attention is given to legal regulation of cybersecurity in Lithuania. But these are only the first steps in regulating this important area in Lithuania. Nevertheless, it is important to assess legal norms that have been approved up till now. Therefore the aim of this article is to analyse and assess legal regulation of cybersecurity of the Republic of Lithuania by strategic acts and regulation on the level of laws in Lithuania. First of all, the task raised is to reveal the historical retrospective of regulation of cybersecurity in the Republic of Lithuania. The next task is related to the analysis of Lithuanian strategic legal acts in the area of cybersecurity (including also a comparative analysis with EU strategic cybersecurity documents), and the third task is to analyse and assess the Law on Cybersecurity of the Republic of Lithuania. When analysing and assessing legal regulation the main attention will be given to the cybersecurity model, the institutional system, and the area of application as well as to the implementation of strategic aims and tasks.

Several different methods were used for the research: the method of empirical analysis of legal documents was used for identifying the legal regulation of cybersecurity in force in Lithuania. Strategic legal acts and laws of the Republic of Lithuania were analysed. This method allows, after performing analysis of official documents, to accurately identify and describe the relevant relationship among the existing legal regulation. When analysing strategic legal acts on cybersecurity assurance of Lithuania and the EU, the authors used the method of comparison. When using references to academic literature, the authors used the method of deduction, allowing to draw sufficiently reliable conclusions.
2. Historical retrospective of legal regulation of cybersecurity in Lithuania

Each state may have number of laws and regulations that effect the use of computer technology (Whitman, et al. 2014). In this part of the article we will review the strategic legal acts of the Republic of Lithuania in the area of cybersecurity, and how the corresponding legal regulation changed in Lithuania with passing years.

The need for strategic legal regulation of cybersecurity in Lithuania appeared in 2001 when, on 22 December 2001, the Government of the Republic of Lithuania passed the Resolution No. 1625 “On the Approval of State Strategy for Information Technology Security and Its Implementation Plan” (“Regarding Approval of State Strategy for Information Technology Security and Its Implementation Plan” 2001) (hereinafter – the 2001 Strategy). This resolution established the first national strategy of security of information technologies, but the term cybersecurity was still not used at that time. But the main aim of this Strategy was to regulate security only in public institutions, and security of information technologies in the private sector was not regulated. Having in mind that most often 85-90% of the cyber infrastructure is managed by the private sector (Rosenzweig 2013), also from the point of view of current legal regulation, it is possible to state that at that moment an essential mistake was made by not seeking to regulate IT security in the private sector. This gap of legal regulation in Lithuania was corrected only much later.

When analysing advanced aims of the 2001 Strategy it may be seen that one of the main aims was the development of legal regulation of information technology security. Points 1.1.–1.8. define areas of information technology security that should be regulated; point 1.8. foresees the introduction of a post of a data security representative. So there was already a need of function distribution at that time. Also attention should be given to the fact that not a lot of attention was given in the 2001 Strategy to the institutional regulation model because three institutions were mentioned in the 2001 Strategy as being responsible for information technology security or its implementation but only in the public sector. This may be explained by the fact that the view at the time on cyber threats was inadequate. These drawbacks were corrected a lot later when the attitude towards cyber threats changed.

On 19 June 2006 the Government of the Republic of Lithuania adopted the Resolution No. 601 “Electronic Information Security Strategy in State Information Systems till 2008” (hereinafter – the 2006 Strategy) (“Regarding Approval of Electronic Information Security Strategy in State Information Systems till 2008” 2006). Again it can be clearly seen that this 2006 Strategy was also meant only for regulation of electronic information security1 in the public sector. Here, like in the 2001 Strategy, institutions responsible for implementing the strategy were appointed. When comparing with the previous strategy the institutional model is applied a lot more widely, 7 institutions responsible for the implementation of the measures foreseen in the 2006 Strategy are appointed, but again only in the public sector. Besides, functions of the institutions were not clearly distinguished, especially in the context of policy formation and implementation – the responsible institutions were indicated only as responsible performers of the plan of measures. The main institution in Lithuania in the area of electronic information security was also not named.

When analysing the aims of the 2006 Strategy it can be seen that one of the main extended tasks is to adopt legal acts that would regulate electronic information security – but again only in the public sector. So it is possible to state that the development of the regulation of electronic information security was foreseen in all programmes, because, with the development of information technologies, legal regulation and its improvement were necessary. But improvement of legal regulation was related only to the public sector. Also one of the extended tasks was to ensure the coordination of electronic information security.

Attention should be given to the fact that the 2006 Strategy performed an analysis of law-making implementing the State Strategy for Information Technology Security, adopted by Resolution No. 1625 of the Government of the Republic of Lithuania of 22 December 2001. During the period of 2002-2004, implementing the State Strategy for Information Technology Security, legal acts for regulation of information technology security were

1 As we see, another term is used in the strategic document – not „information technology safety“, but „electronic information safety“. 
passed, security of information systems was evaluated, more than 30 provisions on information systems’ data security were coordinated with the Ministry of the Interior and approved, the organisation of training of security representatives was started, a department to coordinate information technology security in public institutions was established at the Ministry of the Interior (“Regarding Approval of Electronic Information Security Strategy in State Information Systems till 2008“ 2006), but it may be seen that the tasks set by the 2001 Strategy on legal regulation were implemented only partially, identification of security requirements of electronic signature for personal identification and identification of responsibility according to the nature of violations were not regulated.

Apart from the 2006 Strategy another very important legal act was passed in 2006. On 6 December 2006 with the Resolution No. 1211 the Government of the Republic of Lithuania approved the concept of the law on electronic communication networks and information security of the Republic of Lithuania (hereinafter – the concept). This concept had to be the basis for the new law in the area of electronic communication networks and information security in Lithuania2. The concept provided that the law on electronic communication networks and information security of the Republic of Lithuania would regulate relations with electronic communication networks and information security (hereinafter – network and information security), would create conditions for the development of a secure information society, would increase the trust of consumers in information society („Regarding Approval of Conception of the Law on Electronic Communications Networks and Information Security“ 2006). The main aim of the law according to the concept was supposed to be such: to define and embed the basis for legal regulation of public relations related to network and information security. The law was also supposed to fill the legal regulation gaps related to the provision of electronic communication services, as much as it is related to network and information security when providing electronic communication services.

After the approval of this concept a draft of the law on electronic communication networks and information security of the Republic of Lithuania was started to be prepared. A work group to prepare this draft law was created. The work group prepared a draft of the law but the law was never passed. According to the draft the law had to regulate public relations connected with electronic communication networks and information security, determining the general requirements for ensuring security of electronic communication networks and information as well as public relations connected with assessment of audit and technical and software security of electronic communication networks and information security of state and local governance institutions. This draft law already foresaw an institutional structure responsible for security of electronic communication networks and information in Lithuania. But the mentioned draft did not emphasize security of electronic communication networks and information of critical information infrastructures (Štitilis 2013), and it did not foresee a main institution responsible for the corresponding area in Lithuania3.

So the first law for systematic regulation of cybersecurity in Lithuania could have been passed already in 2006-2007 but it wasn’t. The Law on Cybersecurity was passed only in 2014. Although from 2006-2007 till 2014 there were no cyber incidents that would have had a significant impact on critical information structures4 in Lithuania, nevertheless certain cyber incidents were recorded. One of the biggest attacks in Lithuania was the attack against the news portal Delfi in May of 2013, when the number of queries in several minutes reached 50 million, data stream was 6 gigabits per second. The equipment was working under critical limits, and customer service was upset (“Lithuania - cyber war in the trenches” 2014). Also on 27 January 2012 there was a cyberattack of the DDoS type (Distributed denial-of-service) at the Lithuanian Bank. These attacks demonstrated how important it was to identify critical information infrastructure in a country in order to protect it appropriately.

Also it should be mentioned that without a basic cybersecurity legal regulation the cybersecurity culture in

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2 As we see, additional term is used – „electronic communication networks and information security“. This term is in its essence perhaps most associated with the term „Cybersecurity“.

3 As indicated in the Law on Cyber Security of the Republic of Lithuania from January 1, 2015 (National Cybersecurity Centre).

4 However, there is no such infrastructure identified in Lithuania yet.
Lithuania was forming very weakly. That means that at the moment after the passing of the Law on Cybersecurity this area is only in the initial development stage.

Apart from the adopted legal acts the year 2006 was also important because, as part of the implementation of the Resolution No. 315 of the Government of the Republic of Lithuania of 24 March 2005 “On Approval of Lithuanian Government Programme Implementation Measures for 2004-2008” (“Regarding Approval of Lithuanian Government Programme Implementation Measures for 2004–2008“ 2005), the Computer Emergency Response Team (hereinafter – CERT) was established at the Communications Regulatory Authority of the Republic of Lithuania on 2 October 2006. But this CERT department works only with incidents in electronic communication networks, in other words, it receives information about incidents only from Internet service providers. There are doubts if such activity of CERT is of real value. According to the authors, establishment of a national CERT would help to more effectively ensure cybersecurity not only in the area of electronic communications but also in other related areas of cybersecurity including critical information infrastructures of corresponding sectors. According to the authors, in order to efficiently ensure cybersecurity in Lithuania it is necessary to clearly distribute, purify, and centralise the functions of CERT.

Summarizing this part several main problems encountered when seeking to regulate cybersecurity may be distinguished:

- Legal regulation of cybersecurity in Lithuania was initiated and performed quite passively although it was foreseen as one of the priorities in the 2001 and 2006 Strategies.
- These programmes talked about legal regulation of cybersecurity only for state institutions, and the private sector was completely forgotten.
- The 2001 and 2006 Strategies aimed to create cybersecurity coordination, to appoint institutions responsible for cybersecurity, and to separate functions of the mentioned institutions, but in fact it all went on until 2014 when the Law on Cybersecurity was passed, and until then legal regulation was intermittent and not thorough.

Currently according to the legal acts in force the division of CERT in Lithuania exists as a component of the Communications Regulatory Authority of the Republic of Lithuania and works only with incidents in electronic communication networks. Doubts arise if such activities of CERT are of real value. Establishment of a national CERT would help to more effectively ensure cybersecurity not only in the area of electronic communications. Seeking to ensure cybersecurity effectively it is necessary to clearly distribute, purify, and centralize the functions of CERT.

- In the 2001 Strategy not a lot of attention was given to the institutional regulation model because only three institutions were mentioned as responsible for cybersecurity or its implementation in this Strategy; 7 institutions were mentioned as responsible for implementation of the planned measures in the 2006 Strategy, but one main institutions was not named in the 2006 Strategy. So when comparing with the previous strategy it may be seen that the institutional model is applied much more widely, but functions of certain institutions are not detailed especially from the aspect of policy formation and implementation.

3. Strategic legal regulation: strategies of Lithuania and the European Union

This part will analyse the Lithuanian Strategy and will compare it with the cybersecurity strategy of the European Union (hereinafter – the EU Strategy). The Lithuanian Strategy currently in force was approved on 29 June 2011. This Lithuanian Strategy names the main problems of electronic information security (cybersecurity) and set the aims and tasks of development of electronic information security (cybersecurity) (“Regarding Approval of Electronic Information Security (Cyber Security) Development Programme for 2011–2019” 2011). It is necessary to add that the Lithuanian Strategy is the first cybersecurity strategy that foresees not only regulation of the sector of cybersecurity of state institutions but also regulation of the private and personal sector.

First of all, attention should be given to the fact that the Lithuanian Strategy uses two concepts that are treated as synonyms although essentially they are different:
- Electronic information security is ensuring confidentiality, integrity, and accessibility of electronic information (Ministry of the Interior, Electronic Information security, 2015).

- Cybersecurity is a totality of legal, information dissemination, organisational and technical means meant to avoid, find, analyse, and react to cyber incidents, also for restoring the usual activities of management systems of electronic communication networks, information systems or industrial processes after such incidents (Law on Cyber Security of the Republic of Lithuania 2015).

According to the definitions of the concepts it may be seen that electronic information security is a narrower concept encompassing the general features of security but that does not distinguish the measures, incident management, etc. According to the definitions of the concepts it is possible to state that electronic information security is a component of cybersecurity therefore a uniform and wider concept should be used in legal acts that corresponds to the current complex assurance of infrastructure security.

Point 2 of the Lithuanian Strategy identifies a quite specific and ambitious strategic aim that should be reached in 2019: to develop electronic information security in Lithuania, to ensure cybersecurity and to reach that in 2019 the part of state information resources that corresponds to electronic information security (cybersecurity) requirements determined by legal acts would reach 98% of all state information resources, that the average time for liquidating critical information infrastructure incidents would decrease to 0.5 hour, and that the percentage of Lithuanian inhabitants, who feel safe in cyberspace, would reach 60%.

The EU Strategy starts with the following concept “An Open, Safe and Secure Cyberspace” – that is a thorough EU vision how to best prevent disruption of cyber activities and attacks and what responsive measures should be taken. It seeks to promote European values of freedom and democracy and to ensure secure development of digital economy. Specific actions are meant for increasing resistance of information systems to cybercrimes and for strengthening EU international cybersecurity policy and cyber defence (Štitilis D. 2013). Similarly as in the Lithuanian Strategy the main aim of the Strategy is foreseen – which is the assurance of the security of an open and reliable cyberspace, but implementation of the aims of the EU Strategy is not related to percentage numbers of people, who feel safe in cyberspace, which remind of high-sounding slogans because up till now no such research has been performed and the starting point to measure the increasing or decreasing security of the society in cyberspace is not known.

When assessing the provisions stated in points 6-10 of the Lithuanian Strategy it is possible to state that the following main aims and tasks to be reached are determined there:
- To reach that the security of state information resources is ensured. The following tasks are foreseen to reach this aim: to improve coordination and maintenance of electronic information security (cybersecurity); to improve legal regulation of electronic information security (cybersecurity); to widen and develop safe state information infrastructure; to promote implementation of projects of electronic information security (cybersecurity); to develop international cooperation in the area of electronic information security (cybersecurity).
- To ensure efficient functioning of critical information infrastructure. The following task is foreseen to reach this aim: to ensure security of critical information infrastructure.
- To seek to ensure security of Lithuanian inhabitants and people present in Lithuania in cyberspace. The following tasks are foreseen to reach this aim: to raise the culture of electronic information security (cybersecurity); to strengthen the security of the Lithuanian cyberspace; to ensure the protection of the virtual perimeter of the Lithuanian cyberspace from external cyberattacks; to strengthen the security of services provided in cyberspace.

Five strategic priorities are emphasized in the EU Strategy („Cybersecurity strategy of the European Union: An Open, Safe and Secure Cyberspace” 2013):
1. Achieving cyber resilience;
2. Drastically reducing cybercrime;
3. Developing cyberdefence policy and capabilities related to the Common Security and Defence Policy;
4. Develop the industrial and technological resources for cybersecurity;
5. Establish a coherent international cyberspace policy for the European Union and promote core EU values.

When comparing the main priorities of the EU Strategy with the Lithuanian Strategy many similar and priority measures may be seen, although the Lithuanian Strategy was adopted almost 2 years earlier, but attention should be given to the fact that the measures defined in the Lithuanian Strategy are difficult to implement or immeasurable. For example, the annex of the Lithuanian Strategy, next to the sought aims and tasks, identifies the assessment criteria for strategy implementation, their sought values for 2011, 2015 and 2019, and institutions responsible for implementation of these criteria. Specific and ambitious values of assessment criteria are identified, but it is not clear if they can be really implemented because many indicators were never assessed before the adoption of the Lithuanian Strategy: e.g., it is foreseen that the part of information resources that uses secure state infrastructure will reach 70% by 2015 and 100% by 2019, although it is not known what the value of this index was in 2011. According to the authors, with regard to the fact that values of many assessment criteria are unknown, the Lithuanian Strategy had to indicate that the first assessment should be performed a lot earlier than in 2015, seeking to identify the primary values of corresponding indices (i.e., to assess the current situation), and afterwards it would be possible to determine the values that need to be reached in the coming years.

Besides, according to the authors, it might be difficult to precisely assess some indicators, e.g., it is indicated that the part of Lithuanian inhabitants, who feel safe in cyberspace, should reach 40% in 2015 and 60% in 2019. The feeling of social security should be assessed by social research but thorough research in Lithuania in this area has never been performed, except for the research on identity theft (Štitilis et al. 2011).

Point 1.2 of the Lithuanian Strategy also foresees the task “to improve legal regulation of electronic information security (cybersecurity)”, for the implementation of which five criteria are foreseen, according to which it would be possible to judge successful implementation of the strategy:
- the part of passed or changed legal acts from the legal acts which need to be passed or changed, in percentage;
- special laws, determining essential requirements related to ensuring electronic information security (cybersecurity), that regulate specific activity and legal relations (the Law on Electronic Communication Networks and Information Security of the Republic of Lithuania among them) are passed;
- the part of passed or changed law implementing legal acts from the legal acts which need to be passed or changed, in percentage;
- requirements for the provisions of services of a secure state data transmission network are approved;
- classification of identification measures (methods) and service reliability (coordinated with that of other Member States of the European Union), technical and procedural requirements, the order of accreditation and use are approved.

When analysing these criteria, e.g., 1 and 3, it seems that these criteria can be implemented only formally, because we did not succeed in finding statistics on the need of legal acts that need to be changed related to cybersecurity in the public space, therefore a conclusion may be made that institutions responsible for the changing of such legal acts can implement these task formally only because that after the passing of the Law on Cybersecurity a natural legal need to change legal acts related to cybersecurity appeared with the appearance of additional legal regulation.

The EU Strategy clearly foresees institutions responsible for cybersecurity on the national as well as EU level. It is shown in Fig 1.
Fig 1. Institutions responsible for cybersecurity.


There was a lack of such clear distribution of responsibility and functions in the Lithuanian Strategy because institutions responsible for implementation of certain measures for reaching certain aims were foreseen in it, but specific functions were not defined. When comparing the provisions of the EU and the Lithuanian Strategies it may be seen that the aims are common, they do not distort or contradict the principles of cybersecurity regulation of EU and Lithuanian law.

It is necessary to mention that in the context of the EU and Lithuanian Strategies it is possible to see three main aims:
- protection of information society;
- ensuring cybersecurity in the public and private sectors;
- fight with criminal offences in cyberspace.

So it is possible to state that priorities of the strategies are uniform, and the objective is common, but the implementing means of the Lithuanian Strategy to reach these aims are not always real or sometimes only formal, differently from the EU Strategy.

Summarizing this part it is possible to state that the main priority purposes and the common objective of the Lithuanian and the EU Strategies are the same, but there is no clear distribution of functions for responsible institutions in the Lithuanian Strategy, some tasks cannot be implemented or can be implemented only formally. The chosen criteria are not clear because there are no specifically identified research-based starting points that could be used to assess timely and efficient implementation of the Lithuanian Strategy. When analysing the measures foreseen in the EU Strategy it is possible to state that the legal regulation of the Republic of Lithuania corresponds to that of the EU because it implements the measures foreseen in the EU Strategy. Priorities of the EU and the Lithuanian Strategies are uniform but the implementation measures of the Lithuanian Strategy are not always real or only formal.

4. Analysis of the Law on Cybersecurity of the Republic of Lithuania

This part of the article will analyse the provisions of the Law on Cybersecurity and will try to assess if the Law on Cybersecurity will help to implement the aims and tasks foreseen in the Lithuanian Strategy, if the legal regulation gaps were filled after the passing of this Law. Also the Law on Cybersecurity will be assessed in the
context of EU strategic legal regulation.

As mentioned above, on 11 December 2014 the Seimas of the Republic of Lithuania adopted the Law on Cybersecurity of the Republic of Lithuania (Law on Cyber Security of the Republic of Lithuania 2015). It was an especially important event for Lithuania although the concept was approved on 6 December 2006 by the Resolution No. 1211 of the Government of the Republic of Lithuania. It is necessary to draw attention that the Law on Cybersecurity was passed practically without a relevant concept because the concept of 2006 was morally obsolete during the discussion of the Law on Cybersecurity. The concept adopted 9 years ago did not reflect the current situation of cybersecurity as information and communication technologies were quickly marching ahead, the National Cybersecurity Centre, established almost without any basis, was not foreseen in it. The adoption of the Law on Cybersecurity without a basis that corresponds to realities of the present is not a good initiative being the reason why gaps in the law may become apparent in the future that may have a negative impact on cybersecurity in Lithuania.

The Law on Cybersecurity that is currently in force consists of 5 chapters: general provisions, institutions, responsible for policy formation in the area of cybersecurity, responsibilities of participants of cybersecurity, basis for inter-institutional cooperation, exchanging of information and responsibility, and final provisions.

Part 1 of Article 1 of the Law on Cybersecurity determines institutions that form and implement cybersecurity policy, their competencies, functions, rights and obligations, obligations and responsibility of managers and (or) processors of state information resources, managers of critical information infrastructure, public communication networks and (or) public electronic communication service providers and electronic information hosting service providers and measures of ensuring cybersecurity (Law on Cyber Security of the Republic of Lithuania 2015). The Law distributes the limits of responsibilities of the public sector institutions for cybersecurity quite consistently and clearly. Also it is important that the Law on Cybersecurity is applied not only to the public but also to the private sector, obligations are foreseen separately not only for electronic communication service providers but also for hosting service providers, and, most importantly, the Law foresees critical information infrastructure, a big part of which is managed by the private sector.5

According to the authors, critical information infrastructure protection is especially important seeking to avoid consequences destabilizing infrastructures after cyberattacks or incidents of other nature. A more detailed regulation of critical information infrastructure will be consolidated in accompanying legislation.

Part 1 of Article 4 of the Law on Cybersecurity foresees that strategic aims of cybersecurity policy and measures necessary to reach them are set by the Government of the Republic of Lithuania. So it is possible to state that the Government is the main institution that formulates strategic policy in the area of cybersecurity.

Part 2 of Article 4 of the Law on Cybersecurity foresees institutions responsible for cybersecurity, shown in Fig 2.

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5 According to article 2 part 2 of the Law, Critical information infrastructure shall mean an electronic communications network or a part of such a network, an information system or a part of such a system, a group of information systems or an industrial process control system or a part of such a system, regardless of whether it is managed by a private or public administration entity, where an incident occurring in any of the above may cause serious damage to the national security, the country’s economy, national and public interests.
As we can see according to the presented diagram this part of the law clearly distinguishes public institutions responsible for cybersecurity in Lithuania and the implementation of the provisions of the Law. The presented diagram shows the role of responsible institutions in the area of cybersecurity, but there are quite many responsible institutions, and functions of the institutions that form cybersecurity policy and perform control functions have not been detailed and specified. Also the national Computer Emergency Response Team CERT is not foreseen in the Law on Cybersecurity because, as mentioned, at the moment CERT is under the Communications Regulatory Authority. It is not clear if such department and its subordination should remain in the future or if the CERT, which is a part of the Communications Regulatory Authority, should be joined to the National CERT Department when such is established in the future.

Although the EU Strategy mentions aspects of cyber defence and resistance, cyber defence and its basics are not regulated in the Law on Cybersecurity of the Republic of Lithuania. Elements of cyber defence in Lithuania will most certainly be determined in the accompanying legislation; nevertheless, the basics of this defence should be consolidated on the level of a law.

More detailed legal regulation of certain narrow areas is also missing, e.g., point 3.1. of the Lithuanian Strategy foresees the task to “raise the culture of electronic information security (cybersecurity)”, which can be reached, in our opinion, by educating the information society, raising consumer culture, etc., but this is mentioned in the Law on Cybersecurity only in point 9 of Part 2 of Article 10, in the functions of the National Cybersecurity Centre: “performs dissemination of information related to cybersecurity” (Law on Cyber Security of the Republic of Lithuania 2015). Several institutions were responsible for implementation of this task in the Lithuanian Strategy: the Ministry of the Interior, the Communications Regulatory Authority, the Ministry of Education and Science, the State Data Protection Inspectorate, but the Ministry of Education and Science is not even

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Fig 2. State institutions responsible for cybersecurity

Compiled by the authors.
It is clear that when seeking to educate the society on the questions of cybersecurity it is necessary to create continuous publicity programmes so that the society would be constantly informed on the subject of cybersecurity. Education should be a continuous process as well as the development of the legal basis for cybersecurity; therefore more detailed regulation of this area is called for. The law should establish the main legal norms on public education in the area of cybersecurity.

Implementing the provisions of the Law on Cybersecurity, the National Cybersecurity Centre at the Ministry of National Defence was established on 1 January 2015 (hereinafter – the Centre) with the aim to analyse the national cybersecurity situation, to prepare reports on the condition of cybersecurity, to provide consultations and recommendations on cybersecurity and to ensure cybersecurity of state information resources during cyber incidents (National Cyber Security Center, 2015). Such centre was not mentioned neither in the Lithuanian Strategy nor in the Concept but its necessity for the assurance of Lithuanian cybersecurity is unquestionable.

Summarizing it is possible to state that the Law on Cybersecurity formally filled some gaps of the Lithuanian national legal regulation in the area of cybersecurity, but more detailed regulation of certain narrow areas is missing. The provisions of the Law regulate the functions of the Government and state institutions responsible for cybersecurity, but the institutional structure of the law is not perfect, there are quite many responsible institutions, and functions of the institutions that form cybersecurity policy and perform control functions have not been described in detail. Also the national Computer Emergency Response Team CERT is not foreseen in the Law on Cybersecurity because currently a functioning CERT is a part of the Communications Regulatory Authority. Also attention should be given to the fact that the Law on Cybersecurity does not talk about public education, which is very important seeking for cybersecurity. It is necessary to mention additionally that the Law on Cybersecurity does not foresee any basics for cyber defence; it does not mention any requirements for equipment manufacturers, which are very important. Also a lot of attention is given in the Law to critical information infrastructure protection, which is very important seeking to avoid outcomes destabilizing infrastructures after cyberattacks or incidents of another nature.

5. Conclusions:

When analysing legal regulation of cybersecurity it is possible to point out several main problems encountered when seeking to regulate cybersecurity:

Legal regulation of cybersecurity in Lithuania was initiated and performed quite passively although it was foreseen as one of the priorities in the 2001 and 2006 Strategies.

These programmes sought to establish legal regulation of cybersecurity only for public institutions, and the private or personal sector was completely forgotten.

The 2001 and 2006 Strategies sought to create coordination of cybersecurity, to appoint institutions responsible for cybersecurity, and to distinguish functions of the mentioned institutions, but in reality it took until 2014 when the Law on Cybersecurity was passed – before that legal regulation was intermittent and incomplete.

CERT works with incidents in electronic communication networks. Doubts arise if such activities of CERT are of full value? In our opinion the establishment of a national CERT would help to ensure cybersecurity more efficiently not only in the area of electronic communications. When seeking to effectively ensure cybersecurity it is necessary to clearly distribute, purify, and centralise functions, giving the technical functions of ensuring cybersecurity to the national CERT.

The 2001 Strategy did not give much attention to the institutional regulation model because only three institutions were mentioned in the 2001 Strategy as responsible for cybersecurity and its implementation. There were 7 institutions responsible for the implementation of the foreseen measures in the 2006 Strategy, but this strategy also did not appoint one institution that would be specifically responsible for cybersecurity. So, when
comparing with the previous Strategy, it may be seen that the institutional model is applied a lot more widely but functions of specific institutions are not described in detail.

The main priority purposes and the common objective of the Lithuanian Strategy and the EU Strategy are the same but there is no clear division of functions for responsible institutions in the Lithuanian Strategy, and some tasks cannot be implemented or can be implemented only formally. The chosen criteria are not clear because there are no specifically identified research-based starting points that could be used to assess timely and efficient implementation of the Lithuanian Strategy. When analysing the measures foreseen in the EU Strategy it is possible to state that legal regulation of the Republic of Lithuania does not formally fall behind the EU regulation because it implements the measures foreseen in the EU Strategy. Lithuania has an already adopted Law on Cybersecurity in force since 2015 that distributes functions to the institutions responsible for cybersecurity. Priorities of the EU and Lithuanian Strategies are the same, but the implementing measures foreseen in the Lithuanian Strategy are not always real or only formal.

The Law on Cybersecurity formally filled some gaps of the Lithuanian legal regulation in the area of cybersecurity, but more detailed regulation of certain narrow areas is missing. The provisions of the Law regulate the functions of the Government and state institutions responsible for cybersecurity, but institutional structure of the law is not perfect, there are quite many responsible institutions, and functions of the institutions that form cybersecurity policy and perform control functions have not been described in detail. Also the national Computer Emergency Response Team CERT is not foreseen in the Law on Cybersecurity because currently a functioning CERT is a part of the Communications Regulatory Authority.

Also attention should be given to the fact that the Law on Cybersecurity does not talk about public education, which is very important seeking for cybersecurity. It is necessary to mention additionally that the Law on Cybersecurity does not foresee any basics for cyber defence. A positive feature is that a lot of attention is given in the Law to critical information infrastructure protection, which is very important seeking to avoid outcomes destabilizing infrastructures after cyberattacks or incidents of another nature.

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FOREIGN DIRECT INVESTMENT: IMPACT ON SUSTAINABLE DEVELOPMENT IN REGIONS OF SLOVAK REPUBLIC

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Received 16 February 2015; accepted 30 May 2015

Abstract. The Žilina region is located in north-western Slovakia. Considering the amount of GDP, unemployment, employment and average wage, it belongs among the medium-performance regions in Slovakia. FDI is considered one of the factors promoting its sustainable development, economic performance and balancing regional differences. A positive aspect of FDI in terms of regional development is the fact that they contribute to an efficient allocation of resources, as investors are directing their investments in those regions where they expect the achievement of economies of scale. FDI began to increasingly flow to the Žilina region after 2004, in connection with the arrival of KIA Motors and establishing its subcontracting partners. The aim of this article is to point out the condition and development of economic performance and FDI in the Žilina region, and to demonstrate a causal relationship between FDI and the sustainable development of the region.

Keywords: foreign direct investment, sustainable development, gross domestic product, unemployment, employment, average wage.


JEL Classifications: O10, R11, F63

1. Introduction

Globalization may be defined as the broadening and deepening linkages of national economies into a worldwide market for goods, services and especially capital (Tvaronavičienė, Grybaitė et al. 2013; Travkina, Tvaronavičienė 2015). A foreign direct investment represents the accompanying character of the current globalization economic and political and social processes in the world. According to the OECD, foreign direct investment is a category of investment, which reflects the permanent interest of an enterprise (direct investor) in another enterprise (foreign investment enterprise), which is resident in a different economy, as the direct investor is. Interest imports the existence of a long-term relationship between the direct investor and direct investment enterprise and the corresponding degree of impact (not necessarily control) on the management of the enterprise. The ownership of 10% or more of the voting rights in the company of another resident of the country
as the residence of the investor is deemed to be proof of this relationship. “A direct investment enterprise can be a subsidiary, an associate or a branch in accordance to the direct investor’s share in the basic capital. The concepts of a subsidiary, an associate or a branch used in the statistics of foreign direct investment differ from the definitions of these concepts used in the internationally applicable accounting standards. The subsidiary represents more than 50% of the direct investor’s share in the basic capital or voting rights, considering the associate it is the share from 10 to 50 percent. The branch is a 100% owned by a direct investor, while there may be a permanent office or representation, land and buildings directly owned by non-resident and mobile device, which the economy is operating at more than one year. Reinvested profits and other capital associated with various intercompany credit operations are considered, in addition to the contribution to the basic capital, as a part of foreign direct investment.” (National Bank of Slovakia)

2. Development of foreign direct investment in Slovakia

Slovakia was situated in the volume of FDI in last place in the V4 countries until to 1998. Since 1998, FDI’s inflow to Slovakia have grown faster than in the past, while after Slovakia’s accession to the European Union, FDI inflow has intensified. In 2004, FDI was 16.1 billion Euros. In 2008 it was only 36.5 billion Euros. This was reflected in an increase in FDI. Turnover, however, occurred in connection with signs of economic recession. Although FDI in Slovakia continues to grow, after 2008, the dynamics has significantly reduced. The state of FDI represented 42.6 billion Euros in Slovakia in 2013 (Fig. 1).

![Graph](image)

**Fig. 1.** Development of FDI in Slovakia in the years 2000-2013 (in mil. EUR)

*Source: NBS*

By 2006, FDI flows were directed mainly to the traditional industries. Significant investments went to Slovakia within restructuring in the banking sector in banking. At present, FDI is mainly aimed at sectors of electrical, engineering, automobile, rubber, metal processing, wood processing, furniture and paper industry and wholesale trade, expecting further investment in energy and IT sector. A positive feature in FDI enterprises is the development of production with higher added value (Kucharčíková 2013).

3. Foreign direct investment in the regions of Slovakia

In terms of regional distribution in Slovakia in 2006, FDI directed mainly to the western part and in the vicinity of Bratislava, despite the fact that it was the most (Fig.2) developed region. This fact was mainly due to territorial proximity and excellent transport connections to the countries of Western Europe, new motorway, high level of human capital, given and influenced by a large number of universities in Bratislava.
However, for the purposes of equitable economic and social development, it is necessary for FDI to come into less developed regions with high unemployment. There was a reversal in the direction of investments during the years 2006 and 2007 and investors focused in considerable extent to the Košice, Nitra, Trenčín, Žilina and Banská Bystrica regions. In spite of the fact that investments have recently flown from abroad to other regions as in Bratislava, FDI represented cumulative to 31.12.2012 in the Bratislava region to 70% of the total volume of investment. While in the regions with the highest unemployment, lowest performance and efficiency in the use of productive resources, it was paradoxically the smallest shares. It was 3% in the Banská Bystrica region and only 1% in the Prešov region of the total volume of FDI in the Slovak Republic (SR). The share of FDI represents 8% in the Trnava region, 6% in the Žilina and Košice region, 4% in the Nitra region of the total FDI in Slovakia.

4. Sustainable development of Žilina region

The Žilina region is an important international crossroad, connecting the transport networks of the three countries - Slovakia, Czech Republic and Poland. Industrial character of the Žilina region is affected by the lack of fertile soil. Industry contributes significantly to economic growth, employment and development of the region. Industrial companies in this region are mainly focused on the automobile industry, engineering and food industry. Automobile industry considerably boosted the development of subcontractor capacities for the production of components and spare parts for the automobile industry. The best performing companies in the region are working in the industries of metallurgy, engineering, and production of wood, cellulose, paper and related products. Electrical engineering and telecommunications have a relatively important position in the region, too. Due to different historical, geographical, climatic, socio-economic and political conditions in the development, there have emerged regional disparities in the indicators of economic development.

4.1. Gross domestic product

A regional difference in the development of GDP is characteristic of Slovakia. A disadvantage of its compilation is the fact that the regional GDP includes the performance of citizens who commute to a region and are involved in the formation of its GDP. Therefore, no account shall be taken of the fact that there is a certain percentage of the population commuting. A major problem in comparing the statistical development of regional GDP is relatively large time delay of dissemination of statistical data. In December 2014, there were available the “latest” data on the development of regional GDP in 2011. Then, it is very difficult to adopt a decision about the future direction of development of the region with obsolete data.
Counts in the western part of Slovakia, near the capital (the Bratislava region, the Trnava region, the Nitra region) are characterized by higher level of GDP (Fig. 3). There are more reasons of given state, in addition to different natural conditions, demographic structure, social, cultural and historical conditions, it is also the level and quality of transport infrastructure. The development of the sectoral structure of the economy, which in the transformation process after 1990 and after the division of the state in 1993 underwent in both countries through extensive structural changes as well as the allocation of foreign investment significantly, affects regional disparities in GDP. These factors ultimately led to the increase of performance in Slovakia, but also to the deepening of regional disparities (Fig. 4).

Regional differences began to deepen in the period of the transformation process, which saw the conversion of military production, which had been linked to many businesses spread all over Slovakia. Those without replacement production program went bankrupt; some were transformed into several smaller companies. Many agricultural and manufacturing cooperatives that were major employers in the country and contributed to the reduction of regional disparities did not survive during the transformation. Problem for the investment process in agriculture and profitability of agricultural investments projects are also involved in a number of authors in their research, for example Oana (2013). The consequence was a decline in GDP and increase in unemployment with significant differences between regions.

Žilina region share in the total GDP of the country slowly increased, and in 2011 reached 11 %. The District maintains a stable share of industrial production, around 30% of GDP. Industry is diversified with representation from all sectors. Significant production mainly includes cellulose and paper, mechanical engineering, food
industry, and wood processing industry. Arriving KIA Motors in Žilina, it also includes the automobile and electronics industries. In recent years, construction sector has been gaining in importance, which increased its share from 8% in 2000 to 15% of GDP in 2011. This increase is mainly due to the construction of road infrastructure, motorway D1, to the east. GDP in the Žilina region in the period 2000 – 2011 increased more than twofold. While it stood at 3 279 thousand Euros in 2000, it expanded to 7 605 thousand Euros at the end of 2011. Considering the performance, the region is ranked at the third place within the regions of Slovakia. Creation of GDP in the years 2000 - 2004 was an upward trend, suggesting a progressive development of the region in the future.

4.2 Unemployment

The problem of unemployment is serious socio-economic problem in many countries. Slovakia, where unemployment is manifested early in the process of economic transformation and this problem persists to this day is no exception. Unemployment represents a result and demonstration of imbalances between supply and demand, emerging in the labour market. This reflects not only economic, but also social situation in the country, which is reflected in worsening health, increase in divorce demography, crime, drug addiction and so on.

Unemployment in Slovakia is characterized by a high proportion of long-term unemployed people and significant regional differentiation. Unemployment rate in Slovakia in 2013 was 14.2 %. While Bratislava region (6.4%) and western regions of Slovakia (Trnava and Nitra region) have lower level of unemployment, southern and eastern regions (regions of Banská Bystrica, Prešov, Košice) are characterized by persistently high level (about 18 %) of this indicator. There are many reasons. Unfinished motorway network in the direction of west-east discourages foreign investors to seek business opportunities in the east. A high proportion of unemployed of Romany origin with low level of education leads to their low competitiveness in the labour market. Since this is a predominantly long-term unemployed people, they lose their work habits and willingness to look for a job, on the other hand, due to the above facts, there is also a low willingness of entrepreneurs to employ these people. When comparing the development of unemployment rate between the regions, there is an interesting fact that, despite the low cost of labour force in the east, it does not lead to a significantly higher level of employment. It is just caused by a low level of qualification of the labour force. People with higher qualifications tend to commute to work either in the capital or abroad. Despite the fact that from 2003 to 2008, unemployment in Slovakia was constantly decreasing, due to launching economic reforms and inflow of foreign investors, regional differences were maintained. We assume that it was the arrival of major investors of automobile and electronics industries in the Trnava region (PSA, Sony, and Samsung) and the Žilina region (KIA) that reduced the gap in the level of unemployment compared to the Bratislava region and these regions got under average of Slovakia with the amount of unemployment rate.

Considering the amount of unemployment, the Žilina region is at the fifth place. Unemployment in the years 2000-2004 was falling very slowly, it dropped by only 1% for four years. Reducing unemployment rate has gained the intensity in 2004 when the investment of KIA Motors was announced. It can be assumed that its arrival just occurred the recovery in the region, there started intensive work on completing motorway D1 from Bratislava to Žilina, as a condition of arrival. There were created new supply companies. In the period 2004-2008, unemployment fell from 17.5% to 7.7%, It is an improvement of about 10% in four years. However, with the arrival of economic recession the unemployment rate began to rise again (Fig. 5) (Kucharčíková et al. 2015).
4.3. Employment

Employment rate is more appropriate indicator, which reflects the economic performance of the region as well as the level of utilization of the production factor of labour. “Employment is the state of the labour market, where the subjects able to work find the application and actively enter work process, whether as staff employed or self-employed.” (Kucharčíková et al. 2011). Employment may rise as a result of the growth of labour market flexibility, which has a positive impact in the long term. The development of employment is influenced by the development of GDP, but the problem in Slovakia is that whether a country is in the situation of economic growth or decline, regional disparities in development indicator of employment are maintained.

The employment rate in the Žilina region gradually increased from 2000 to 2008, while the milestone is the year 2004. There have appeared large changes that can be attributed to the growth of employment and the economy, and it is to improve the business conditions of the adoption of the tax reform, the adoption of Slovakia to the European Union, the adoption of the new Law on Employment Services and KIA Motors notification to build a factory for automobiles in Žilina, thereby creating 2 400 new jobs. Within the arrival of the following producers, there were created more jobs. After 2008 there are beginning to show the effects of the global recession and the number of employed is rapidly declining for two years about 25 000 people to the level of 253 642 employees in 2010. Employment is growing slowly again from this year (Fig. 6).

According to particular industries of SK NACE Rev. 2 development of employment represents a decrease of employment in industry and increase of employment in wholesale and retail trade. In the period 2000-2010, the number of employed in industry dropped by 4% to 29% and employment in wholesale and retail increased by 5% to 27%. The construction sector has significantly increasing trend in the Žilina region, from 8% in 2000 to 11% in 2010. This increase is supported by the construction of road infrastructure. The most important employ-
ers in the region include (with respect to foreign ownership) INA Kysuce, KIA Motors Slovakia, Mobis Slovakia, DONG HEE Slovakia, ECCO Slovakia, Panasonic Electronic Devices and Mondi SCP. Positive feature for the development of the region is slowly but steady increase in the employment rate since 2010.

4.4. Average wage

Average gross nominal monthly wage reflects the average monthly level of employee wages as the price of his labour in the labour market (without managerial and entrepreneurial income). It is independent variable, where its development and characteristics is derived not only from the number of employees, but the number of unemployed.

![Graph of average nominal monthly wage in Žilina region (ŽK) and Slovakia (SR) in 2013 (in Euro)](image)

Source: Statistical Office of the Slovak Republic

The average nominal salary in Slovakia has a tendency to continuous growth (Fig. 7). However, the dynamics of growth significantly slowed down in relation to the signs of recession in 2008.

Recession is a difficult period not only for employees but for employers as well. Employees with the key competences, responsibilities should be able to motivate their team also during recession. When the first signs of the financial crisis appear in the organisation, most of traditional methods applied by the enterprise in the area of employee motivation before this period are not suitable for new situation or cannot be carried out at all. Incentives, extra holidays, corporate entertaining and rewards as the most commonly used tools of motivation seem to be less important in the atmosphere of insecurity (Hitka, Balážová 2015). However many employers reduced working hours to four days a week and employees were given the day off on Friday with compensation for wage about 60% of the average wage.

The average nominal salary in Slovakia has a tendency to continuous growth. However, the dynamics of growth significantly slowed down in 2008. This is linked to the economic recession, in which many employers reduced working hours to four days a week and employees were given the day off on Friday with compensation for wage about 60% of the average wage. This measure maintaining the employment, however, resulted in the statistics as decrease in the dynamics of growth of the average nominal wage. If employers reduced, employment would decrease, but average wages would increase, because employers release less skilled workers with lower wages first. As far as all the indicators of regional economic performance monitored, there persist significant regional differences in Slovakia considering the state and development of average nominal monthly wage. The Žilina region was at the fourth place in 2013 considering the amount of the average nominal wage. The positive is that the development of this indicator is constantly growing. In Bratislava region this indicator in 2013 amounted to € 1,049. Žilina region of € 732 conquered fifth place. The increase of dynamics occurred after 2007, which may be related to the overall economic recovery in the region, however, there already arose significantly slowdown of the growth of average wages in 2009 in comparison with the year 2008, up to 8%. The growth of wages fell from 9.7% in 2008 to only 1.7% in 2009 (Fig. 7). However, development of average wage is lagging behind the high dynamics of growth in labour productivity in the region.
5. FDI – impact on the sustainable development of the Žilina region

Foreign investment began to flow in Slovakia in the period after 1997. Initially, they went solely to a western Slovakia near Bratislava. After 2006, investments were directed more to the north and centre of Slovakia. Due to lack of transport infrastructure, unfinished motorway, investors allocate their investment in the east with a much smaller willingness. Therefore, regional differences in the level of GDP still remain (Kucherčíková et al. 2011).

The Žilina region, one of the eight regions of Slovakia, located in the north-western part, is in third place of the state of FDI. Since 2000, the amount of FDI has gradually increased to 2.5 billion Euros in this region (equity capital and reinvested profit) in 2012.

Currently, most FDI leading to the Žilina region is recorded in the automobile industry, thanks to particular location of KIA Motors and VW Bratislava branches in Martin. In connection therewith, there have been entrenched many companies in the region that make them subcontractors such Mobis, Hysco, Glovis and Donghee. Therefore, almost 86% of FDI was directed into the automobile industry between the years 2002-2008. Other significant investments were directed into electrical, chemical industry and cellulose.

There may be more motives abroad for investors to invest. For example, it is a finding new business opportunities towards the specific needs of customers, trying to get new natural and human resources at a lower price than the domestic economy. It may be looking for new opportunities to market products, ultimately it is growth of production efficiency and increase of own revenues (Tokarčíková 2011; Travkina, Tvronavičienė 2015).

5.1. FDI – impact on GDP

According to several authors, dealing with regional aspects of FDI, FDI represent an important factor in the regional economy, competitiveness and regional development (Dunning, Gugler 2008; Jones, Wren 2006; Turnock 2011; Antanavičienė 2014; Šabasevičienė, Grybaitė 2014; Travkina; Tvronavičienė 2015). Second, Alfaro, L., et al. (2006) conducted an empirical study on which did not confirm beliefs economic policy makers about the positive impact of FDI on economic growth. They see more growth effect when the goods are produced by domestic firms and multinationals operate only as a supplement. Therefore, the implementation of policies aimed at attracting FDI, legislators should be careful.

According to Mačiulis and Tvronavičienė (2013) investment is context sensitive, and direction toward FDI attraction is not unconditional. Nevertheless, the direction itself remains clear enough: additional capital inflows are seen as important driving force of secure and sustainable development of country. Foreign direct investments are one of the life-forces for economic growth. Foreign investors use local labour, capital, and natural resources that are constantly running out and limited. However, global companies that translocate their production process often devastate the nature of the host country (Šimelytė, Antanavičienė 2013; Travkina, Tvronavičienė 2015).

Supporting the development of the regions and overcoming their regional disparities, a differentiated approach depending on the level of the economic performance of the region is necessary. Although the weaker regions have a certain supply of labour, or certain mineral or energy resources available, however, there is necessary starting cash capital for their activation, optimal combination and effective use.

It is possible to promote development in the regions with labour force with higher level of qualification, presence of universities producing a workforce with a high level of human capital through a focus on support for science, research, development and innovation, building research and innovation centres, which would pull the weaker regions with the developmental activities and their connection with the practice in the future. However, support for science, and research requires a high volume of financial resources from private and state sector.
With regard to the financial undersizing of private domestic business sector and financial sophistication of government’s measures adopted in connection with the resolution of the effects of the economic recession, a significant source of funding for research and innovation programmes at regional, interregional and international levels is considered resources from European Union funds and foreign direct investment, although it must be admitted that countries spend considerable resources in the form of investment incentives in order to attract foreign investors.

We have estimated and deduced the positive impact of FDI on the economic performance so far. The aim of the article is to prove or disprove this estimated dependence using regression analysis. One of the most important analyses is finding the impact of foreign direct investments on the level of gross domestic product in the Žilina region. According to the macroeconomic theory, investments have multiplier effect on the output of the economy. Without the multiplication effect of the investments, state granted investment support for foreign investors would be inefficient. Identifying the impact of FDI on GDP we used linear regression and time series obtained from statistics of the National Bank of Slovakia and the Statistical Office of the Slovak Republic. For a more objective confirmation of the relationship between FDI and GDP there have been used all available data, in this case data from 1997-2011.

To find out the dependence we have calculated the regression line in the form: \( y = a + bX \). Independent variable \( X \) represents the state of FDI in the region affecting economic growth, the amount of GDP, which is expressed by dependent variable \( Y \). Using statistical calculations we obtain the value of the constants \( a, b \), in order to obtain a particular regression line. Regression line for the Žilina region calculated is in the form (1):

\[
y = 2653.06 + 2.11103X
\]

\( (83.1339), (0.06349) \)

\( R^2 = 0.989261; F_{a} = 1105.418 \)

If FDI increased by 1 million Euros, this increase would increase GDP by 2.11 million Euros. If foreign investors would not invest their capital in the Žilina region, the level of gross domestic product would correspond to the value of 2 653 million Euros. On the basis of tests, we found that the model and its parameters are statistically significant and, according to the coefficient of determination \( (R)^2 \) we can say that the explanation rate of the variability of the data model is 98.92%.

Thus, we can confirm the theory of the positive impact of FDI on the GDP growth in the region. Foreign investors bring capital that domestic companies do not have available and, therefore, they are an important source of economic growth (Kucharčíková et al. 2015).

### 5.2. FDI - impact on unemployment

Some authors consider that the conditions on the labour market are the key in deciding the direction of FDI (Demel, Potužáková 2012). In regression analysis of the impact of FDI on the unemployment we once again identified the state of FDI as independent variable \( X \) and unemployment rate as dependent variable \( Y \). Regression analysis was carried out of the available data for the period 2000-2012. The specific regression line of the impact of FDI on the unemployment rate for the Žilina region has the form (2):

\[
y = 19,1857 – 3,38847X
\]

\( (1,4262); (0,8885) \)

\( R^2 = 0,5925; F_{a} = 14,5418 \)

When investing 1 billion Euros of FDI, the unemployment rate in the Žilina region will be reduced of 3.39%. If, however, it was about not to invest, the unemployment rate would be at the amount of 19.18%. Tests of significance have confirmed the relevance of the model and its parameters. Therefore, FDI contributes to a decline in unemployment in the Žilina region. Explanation rate of the variability of the data model is, however, in the amount of 59.25%. The amount of the explanation rate of data model is caused by exclusion of all the variables that have an impact on unemployment.
Regression analysis confirmed the positive impact of FDI on the unemployment rate in the Žilina region and we can confirm that foreign direct investments support the decline in the unemployment rate.

### 5.3. FDI - impact on employment

The impact of foreign investment on employment seems to be clear. Investors increase the production capacity, build new production plants, and thus create new jobs, which need to be filled. In regression analysis, we examined the impact of FDI on the employment rate. For the independent variable, we set out the state of FDI again and the dependent variable $Y$ we consider the employment rate. Data available from the period 1997-2012 were subject to regression. Regression line of the impact of FDI on the employment rate in the Žilina region has the form (3):

$$y = 56,6007 + 1,1424X$$  
$$R^2 = 0,2590 \quad F_r = 3,4955$$

If there was invested 1 billion Euros of foreign direct investment in the Žilina region, the employment rate would be increased of 1.14%. If it was about not to invest in the region, the employment rate would be 56.6%. On the basis of the tests of significance we found that the parameters are significant, but the model as a whole not. Explanation rate of the variability of the data model is low, only 25.9%.

Using regression analysis of the impact of FDI on the employment rate we cannot confirm with certainty the positive impact of FDI on the employment. Since the coefficient of determination is too low, only 25.9%, it means that the greater part of the model is not explained by the equation, and in the case of the Žilina region, the model is insignificant. The orientation of the regression line indicates that while increasing FDI the employment rate is rising, however, the employment rate is affected by many other factors and FDI is only one of many. The reason that it is not possible to clearly confirm the positive impact of FDI on employment growth may be the fact that initial state of unemployment in the context of the comparison was high. We can assume that after reaching a certain lower level of unemployment, the employment begins to increase in a greater extent in the next inflow of FDI. Also many citizens of the region are travelling to work in the Bratislava region or employed abroad.

### 5.4. FDI - impact on average wages

Increasing performance of the economy that FDI has a demonstrable impact on brings the pressure on wage growth, which makes stronger the population welcomed and it strengthens the growth of GDP through consumption. Despite the fact that foreign investors are attracted by qualified cheap labour force to the territory of Slovakia, they often offer their employees higher wages than domestic employers and it's precisely because of the attraction of a highly qualified labour force to their enterprise. On the other hand, higher wages for foreign investors put pressure on increasing wages for domestic entrepreneurs.

While assessing the impact of FDI on wages, we set the state of FDI once again for the independent variable $X$ and average nominal wage represented a dependent variable $Y$. We calculated coefficients of the variables and determined the specific form of regression line (4):

$$Y = 322,627 + 141,842X$$  
$$(9,147); (5,69882)$$  
$$R^2 = 0,9841; F_r = 619,49$$

Increasing FDI of 1 billion Euros, the average nominal wage is increased of 142 Euros in the Žilina region. FDI at zero, the average wage would be 322 Euro. According to the tests, statistical significance of the parameters has been confirmed. Explanation rate of the variability of the data model is 98.41%, which means a high degree of explanation of the phenomenon of the model.
On the basis of the regression analysis of the impact of FDI on the average nominal wage we can conclude the positive impact of increasing FDI on the amount of average nominal monthly wage in the Žilina region.

There was confirmed the impact of foreign direct investments in the above analysis on several indicators of sustainable development in the Žilina region. It was confirmed that with the arrival of foreign investment the growth of GDP increases, unemployment rate decreases and average wage increases.

The impact of FDI on GDP has been evident since 2004, when KIA Motors came to the county, together with its subcontractors. Since 2004, dynamic growth of GDP has occurred; each invested billion of foreign direct investment has been reflected in the growth of GDP, on average twice.

Impact on the unemployment rate is also shown to be positive. Regression analysis revealed that investing 1 billion Euros reduces unemployment by an average of 3.4%. The decline in unemployment occurs mainly with the boom of Greenfield investments, when production capacity is expanding and investors need new employees. To reduce unemployment, the character of the investment projects has also affect. Investments were mainly assembly character, which is labour-consuming, but high qualification of employees is not required. A low labour cost in Slovakia helps to reduce unemployment.

Increasing FDI in the Žilina region, the average nominal monthly wage also grew. Foreign companies in the region offered 15% higher wages than domestic employers. This difference is forcing domestic employers to raise wages to prevent employees to get to foreign employer. Using the regression we found out that investing 1 billion Euros wages increase by 140 Euros.

Using regression analysis of the impact of FDI on the employment rate we cannot confirm with certainty the positive impact of FDI on the employment. The reason may be the fact that initial state of unemployment in the context of the comparison was high. We can assume that after reaching a certain lower level of unemployment, the employment begins to increase in a greater extent in the next inflow of FDI. Also many citizens of the region are travelling to work in the Bratislava region or are employed abroad.

Conclusions

The growth of technology intensity of production, opening of markets and continuing growth of competition require that companies are interested in technological improving of their production processes, improving quality of production and services, introduction of information technology and innovation (Kucharčíková 2014). FDI have a major impact on the significantly economic undercapitalized environment and often represent in the circumstances the only possible development incentive (Soviar, Lendel, Kocifaj, Čavošová 2013).

The major benefits of Foreign Direct Investment include: economic development, transferring technologies, creating new jobs, raising the productivity of the host country and others (Antanavičienė 2014).

With regard to the future, positive effect of FDI is that new technologies are coming to the region with them, which require employing people with higher levels of qualification. It supports innovative activities of domestic competition in the region and the willingness and the need for people to educate themselves. As far as domestic enterprises become subcontractors for foreign investor, there is a possibility for them to expand in the foreign markets, which usually an investor has already carried out. Using promotion of tourism in the region can attract tourists from the country of origin of the foreign investor. This is an opportunity for regions with lower level of economy to revive production, reduce unemployment and improve the standard of living of the citizens of the region in the longer term. It is very convenient, as long as the enterprise of foreign investment is allocated in the border regions. Then, the positive impacts of FDI on both sides are multiplied. Therefore, considering the positive impacts on the economic performance of the region it should be remembered positive impacts not only in the field of introduction of new technologies, but also in the field of increase of education and the standard of living in the future.
On the basis of observations and statistical data, it can be stated that negatives of foreign direct investment in the Žilina region observed include in particular one-way orientation on automobile and related electronics industry. Foreign investors take advantage of our cheap labour force in the activities undemanding on employees’ qualification – working on line, assembly. These activities do not force employees to further training. In a globalised environment, investors decide very quickly, whether to maintain its production at the place where the price of work increases and the conditions of business worsen or move their production capacity to territories with a better business environment. With the growth of the economic performance our primary advantages will be getting smaller and if we do not offer investors good reason to remain in the country, investors will leave, and even generous state aid, which has a considerable volume of use, will not help. A significant negative in promoting inflow of FDI is also the unequal distribution of state aid, which is, at first glance, offering foreign investors as well as domestic. The government in an attempt to increase employment is spending public resources to the detriment of domestic producers.

Regression analysis confirmed the impact of foreign direct investments in the above analysis on several indicators of sustainable development in the Žilina region. It was confirmed that with the arrival of foreign investment the growth of GDP increases, unemployment rate decreases and average wage increases. However, regression analysis did not confirm positive influence FDI on employment increase in Žilina region. This may be due to the fact that many citizens of Žilina region leaving for their work in the capital city Bratislava or abroad, especially in the Czech Republic.

The problems that actually discourage foreign investors from the activity in Slovakia, however, do not have economic, but more ethical and moral nature. It is weak law enforcement, delays in legal proceedings, instability of legal environment, which is related to frequent legislative changes, corruption and bureaucracy in the public sector. As long as these deficiencies are not consistently removed, Slovakia will become unconvincing partner for many foreign entrepreneurs.

Acknowledgements

This article was created as part of application of projects: Innovation and internationalization of Education – Instrument to increase the quality of the University of Žilina in the European educational area. Modern Education for the Knowledge Society/Project is funded by EU; VEGA No 1/0421/13 Attribute efficiency and the human capital; VEGA 1/0526/13 Modelling of the multilateral relations of economic entities and improving the quality of their decision-making processes with ICT.

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STOCK EVALUATION METHODS AND THEIR APPLICABILITY IN LITHUANIA ENSURING SUSTAINABLE CAPITAL MARKET DEVELOPMENT

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Received 20 March 2015; accepted 15 August, 2015

Abstract. The article discusses the situation in Lithuania’s stock market, stock valuation methods and their applicability in the capital market. Stock market data reveals that it is still under the development phase and that determines that a few stock valuation methods can be applied for this Baltic country. Statistical data shows that the most suitable valuation methods according to current market conditions are discounted cash flow to equity and equity economic value added methods. These two methods and their variables were analyzed deeply in order to ensure correct, objective and precise valuation and contribute to sustainable development of valuation practice in Lithuania.

Keywords: stock valuation, capital market, discounted cash flow to equity, economic value added, sensitivity analysis

Reference to this paper should be made as follows Kulišauskas, D.; Galinienė, B. Stock evaluation methods and their applicability in Lithuania ensuring sustainable capital market development, Journal of Security and Sustainability Issues 5(1): 73–86. DOI: http://dx.doi.org/10.9770/jssi.2015.5.1(6)

JEL Classifications: G15, G17

1. Introduction

Share valuation methodology and methods practical application is widely analyzed topic in western countries scientific literature. Meanwhile there is a lack of academic literature covering this subject and its practical application in Lithuania’s capital market. As a capital market in Lithuania is still under the conditions of development, it is important to define the most appropriate stock evaluation methods for this Baltic country in order to contribute and ensure sustainable growth of capital market. The main purpose of this article is to analyze stock valuation methods and their applicability in Lithuania’s stock market. There are used alternative valuation, structural, dynamic, regression and coefficients analysis methods. Based on the above mentioned research methods logical conclusions were made about stock valuation methods applicability in Lithuania’s capital market.

2. Stock valuation methods

Business valuation literature offers lots of ways to determine the value of company. Most of them can be applied for stock valuation. It is important to state that company’s share valuation can be also called as business valuation because shares of the company give an ability to control the business (Galinienė 2005). This means that stock valuation can be considered as the business valuation. The main stock valuation methods are listed in the Figure 1:
One of the most popular approaches used in stock valuation is income approach and its discounted cash flow methods. The main idea of this valuation methodology is to convert projected future cash flows into the present value of the stock. There are three main variations of this approach and the result of each of the variation depends on the chosen cash flow type. The scientific literature states that the discounted cash flow methods are used widely in developed economies for large and medium-sized enterprises assessment and is applied in 80 – 90 percent valuation cases (Galinienė 2015). As an alternative for discounted cash flow methods there is suggested recently invented method named as an economic value added method. This valuation type suggest a calculation of a benefit for the shareholders where shareholders’ investment costs are deducted from the company’s net revenue. This benefit is treated like projected future cash flow and is converted to present value of the share (Valez – Pareja et al. 2007). There are also other types of income approach valuation methods but their application is more complicated because of special conditions needed (for example income capitalization method where company is expected to generate constant free cash flow forever and etc.).

Another widely discussed and broadly used valuation approach is a relative valuation. The main principle of this technique is to find the same or very similar assets whose prices are known for the analyst (International Valuation Standards 2013). In order to use this method, the market must be active in shares trades with a reasonable amount of comparable assets and it must contain sufficient information about transactions conducted with these assets (Peterson 2013). International Valuation Council and Lithuanian legislation states that the minimum number of comparable companies has to be three in order to use this technique. As the stock market usually provides the historical information about the transactions in securities it is expected that this method can be easily applicable by a business evaluator.

The short review of the evaluation methods and their main principles shows that the stock valuation quality is highly dependent on capital market development level. The number of listed companies in stock market, the abundance of transactions, volumes, amount of information available for the analyst is the main basis for successful and accurate valuation. In order to examine the basis for stock valuation in Lithuania’s capital market there will be presented the main characteristics of it. It will help to decide which valuation methods have to be analyzed in detail according to the market conditions.

3. Characteristics of Lithuania’s Capital Market

The first thing which is noticed when analyzing the main features of Lithuania’s capital market is short period of existence of stock market. This market changed significantly in 20 years but still can be described as underdeveloped market. The findings about the underdeveloped capital market were made by Kuodis and Garbaravičius, 2001, but the situation from that year till nowadays has not changed substantially. The main indicators defining Lithuania’s stock market development are presented in a Table 1.
Table 1. Nasdaq OMX Vilnius main indicators, 2014
(Estimated and created by the authors)

<table>
<thead>
<tr>
<th>Indicators</th>
<th>Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>Market capitalisation</td>
<td>5,718,639,579 EUR</td>
</tr>
<tr>
<td>Equity market capitalisation</td>
<td>3,330,429,916 EUR</td>
</tr>
<tr>
<td>Number of listed companies</td>
<td>33</td>
</tr>
<tr>
<td>Number of contracts in market</td>
<td>57420</td>
</tr>
<tr>
<td>Average number of contract per company</td>
<td>1740</td>
</tr>
<tr>
<td>Market capitalisation to GDP</td>
<td>15.76%</td>
</tr>
<tr>
<td>Constant dividend payers</td>
<td>3</td>
</tr>
</tbody>
</table>

The data presented in the table confirms that Lithuania’s stock market is still in the development phase. Small number of publicly traded companies, modest number of contracts shows that there is still small activity in the stock market. What is more, market capitalization to GDP ratio is just about 16 % and is far away from numbers in developed capital markets. According to World Bank data, stock market penetration in western countries such as Germany, Great Britain and United States amounted to 43,4 %, 122,2 %, 114,9 % respectively. Even the neighbor country Poland has significantly higher level reached the stock market (35,8 % in 2012) despite the fact that both Lithuania and Poland are almost at the same economic development stage (according to World Economic Forum data). These number leads to the conclusion that just a part of previously mentioned stock valuation methods can be used in Lithuania’s capital market. Firstly, it is clearly visible that relative valuation methods cannot be applied when making valuation of shares in Lithuania’s stock market because there is missing needed number of the same or very similar companies (see Table 2):

Table 2. Companies listed in Nasdaq OMX Vilnius by sector, 2014
(Prepared by the authors based on Nasdaq OMX Baltic data)

<table>
<thead>
<tr>
<th>Sector</th>
<th>Number of companies</th>
<th>Sector</th>
<th>Number of companies</th>
</tr>
</thead>
<tbody>
<tr>
<td>Personal &amp; Household Goods</td>
<td>4</td>
<td>Oil &amp; Gas</td>
<td>1</td>
</tr>
<tr>
<td>Banks</td>
<td>1</td>
<td>Basic Resources</td>
<td>1</td>
</tr>
<tr>
<td>Financial services</td>
<td>1</td>
<td>Industrial Goods &amp; Services</td>
<td>3</td>
</tr>
<tr>
<td>Utilities</td>
<td>5</td>
<td>Construction &amp; Materials</td>
<td>2</td>
</tr>
<tr>
<td>Food &amp; Beverage</td>
<td>10</td>
<td>Telecommunications</td>
<td>1</td>
</tr>
<tr>
<td>Retail</td>
<td>1</td>
<td>Technology</td>
<td>1</td>
</tr>
<tr>
<td>Real Estate</td>
<td>2</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The information about a distribution of listed companies by sectors are presented in the table above. The data shows that there are only a few sectors with number of three or more operating companies. It is hard to find a comparative company even in food and beverage sector where operates 10 companies. As the main idea of relative method is to find very similar business in the same sector with the similar in risk level, growth potential and similar cash flows (Damodoran 2012; International Valuation Standards 2013) it is obvious that three needed companies in Lithuania’s stock market cannot be find. This leads to the conclusion that relative valuation methods applicability is complicated in Lithuania’s stock market.

Another important feature of the market, directly linked with the valuation is dividend payments. In the academic literature it is emphasized that the dividend payments have to be constant with a clear trend of such payments (Fernandez 2002; Damodaran 2005; Maness 1988). Information about paid dividends has been started to be published since 2005. Starting from that year only 3 of 33 (“Lietuvos dujos”, “Pieno Žvaigždės”, “TEO LT”) currently listed companies in stock market paid dividends every year.
Fig. 2. Dividend companies and the amount of payout 2005 – 2014 years
(Prepared by the authors based on Nasdaq OMX Baltic data)

The statistics above show (Fig. 2) that there are no possibilities to use discounted dividends method although it is very popular way to determine the share values in developed financial markets. Taking into account all above mentioned information about the stock market development stage in Lithuania, it is clear that the most suitable way to determine the value of shares is to use discounted cash flow methods. As an alternative the analyst can use equity economic value added method. These two methods and their application in Lithuania stock market will be analyzed in details later in this article.

4. Methodological part

It takes very important role in valuation process as there are many assumptions and variables which have to be chosen by the valuator. They have to be described clearly, reasonably and objectively because the selection of these variables has a huge impact on increasing or decreasing the final results. In order to ensure the objectivity, accuracy and practical application of the research there will be described all calculation techniques and the models’ variables.

**Calculation models.** The authors have chosen to analyze two methods for share value calculation. The first one is traditional two stage discounted cash flow to equity method because this calculation method is more flexible compared with one stage discounted cash flow method as it takes the fast growth period cash flows and stable long term growth cash flow. The method description is presented below by formula (1) (Damodoran 2012):

$$\textit{Stock value} = \sum_{t=1}^{t=n} \frac{(\textit{CF to equity}_t)}{(1+k_e)^t} + \frac{(\textit{CF to equity})_{t+1}}{(k_e-g)(1+k_e)^{t+1}}$$

where \(CF\) – cash flow, \(k_e\) – cost of equity, \(g\) – stable growth rate.

As the alternative for the above mentioned calculation economic value added to equity method will be used. It has two differences compared to the discounted cash flow to equity method. The first one is that instead of cash flow to equity there is used economic value added to equity and the second one is that the value consists of nominal share price and the present value of future calculated economic value added. (Fernandez 2007; Valez – Pareja et al. 2003). The method description is presented below by formula (2):

$$\textit{Stock value} = \sum_{t=1}^{t=n} N + \frac{(\textit{EVA to equity}_t)}{(1+k_e)^t} + \frac{(\textit{EVA to equity})_{t+1}}{(k_e-g)(1+k_e)^{t+1}}$$

where \(N\) – nominal share price, \(EVA\) – economic value added, \(k_e\) – cost of equity, \(g\) – stable growth rate.

All the variables, their values or calculations will be described in detail in the later chapters.
**Research period.** It was mentioned that capital market is functioning for a fairly short period of time. Because of that it is hard to find companies operating for the longer period of time and its statistical information. What is more, companies started to prepare their financial reports according to International Accounting Standards only from 2003 or later. Considering the short period and quality of available and comparable financial data it was chosen to analyse 2003 – 2014 period in stock market. Another important issue related to research period is the period of forecasted cash flows. In the academic literature it is debated what length of cash flows forecast should be. For example, some authors (Galinienė 2015) believes that for developing market it is acceptable to calculate 3 years cash flows and to transform to present value of the company shares. The others (Damodaran 2012) believes that the valuator have to calculate forecasted cash flows from five to ten years and just then to calculate the value of share capital. Considering suggestions from both of the authors there will be chosen five years length of cash flow prognosis. It is inappropriate to choose the longer period because of short history of statistical. What is more, it is believed that five years cash flow will give accurate results. The authors also want to point out that five years cash flow calculation means that company will be growing at the fast pace for four years and starting from year fifth it will be growing at the stable pace; see formulas (1) and (2).

**Discount rate.** Discount rate or \( k_e \) (in different sources discount rate also can be called as a cost of capital) is one of the most important variables which has a big impact for the valuation results. There are two significant things which have to be taken into account when calculating the discount rate. Firstly, the cost of capital should represent the risk of company’s cash flow and secondly, it has to be matched with the cash flow. As this research is oriented to calculation of stock value, there will be used traditional Capital Asset Pricing Model (hereinafter – CAPM). Researchers who are interested in valuation methodology discusses if CAPM is still the most suitable way to calculate the cost of capital (Fama *et al.* 1996). There are two strong arguments why it will be used CAPM for discount rate calculations. The survey which was conducted among the finance specialist and analyst showed that 75 % of them are using the CAPM for cost of capital calculation (Welsh 2008). Such a high level of usage proves that discount rate calculated using CAPM is appropriate. Another reason for such a choice is another researches whose results show that CAPM is the most suitable discount rate calculation method for developing markets (Butvilas *et al.* 2012; Begovic *et al.* 2013).

As the suitability of CAPM is proved, the description of this cost of capital calculation method is presented below (3):

\[
(3) \quad k_e = R_f + \beta \times (R_m - R_f), \text{ where } R_i – \text{return on risk – free assets, } R_m – \text{market return, } \beta – \text{systemic risk coefficient.}
\]

All the variables mentioned in the formula (3) can be found or calculated from the official statistical sources. Return on risk – free assets can be taken as government long term bond yields (Damodaran 2012; Gilbert 1990; Galinienė 2015). This is a reasonable measure of the risk-free rate return of the country because country risk premium is already included in it. Another significant part of cost of capital calculation is \( \beta \) coefficient. It is company’s systemic risk coefficient which shows the risk level of company compared to the market (Damodaran 2012; Galinienė 2015). The coefficient is calculated dividing the standard deviation of particular stock price changes by the standard deviation of the stock market index value changes and multiplying this ratio by the correlation coefficient between company’s stock and stock market: \( \beta = \rho \times \frac{\sigma_{pp}}{\sigma_{m}} \). Systemic risk coefficient also can be calculated in different ways and these ways depends on the length of statistical data and data periodicity. For example, Odabasi analyses 2 and 4 years data for \( \beta \) calculation while Damodaran suggests using at least 5 years data (Odabasi 2003; Damodaran 2012). Another issue which needs clarification is the periodicity of changes. It is usual to analyze weekly and monthly stock price and market index changes. For instance, in developed financial markets it is suggested to use changes from 1 to 5 weeks in order to calculate \( \beta \) values (Ryu 2011). Taking into account that activity in Baltic stock market is low, it is reasonable to investigate quarterly data changes in order to calculate reliable \( \beta \) values. The third part of cost of capital (\( R_m \)) can be calculated as a yearly change of stock market index. It is up to the analyst what index will be used when calculating market returns but it would be appropriate to use the index which reflects moves in company share prices the best.
Cash flow. Another part of chosen evaluation methods are cash flow calculation. In this article there is analyzed stock valuation techniques so cash flow to equity and economic value added to equity will be calculated. Cash flow to equity assesses company’s net income, depreciation and amortization, capital expenditure, net working capital change and debt change (Damodaran 2012; Reilly et al. 2006; Bodie et al. 2013) (4):

\[
\text{FCE} = \text{NI} + \text{DA} - \text{CAPEX} - \Delta \text{NWC} + \Delta D, \text{where FCE – free cash flow to equity, NI – net income, DA – depreciation and amortization, CAPEX – capital expenditure, NWC – net working capital, D – company’s debt.}
\]

There are no big discussions how to calculate net income, depreciation and amortization and change in debt but capital expenditure and net working capital are more complicated rates. For example, CAPEX can be calculated in several ways. The easiest one is to calculate the change in fixed assets during one year period (Graham et al. 2010). Another way to compute the CAPEX is to analyze company’s cash flow sheet and find out the amount of investments to fixed assets (Brealy et al. 2009). But this calculation method is not suitable for all cases, and especially in comparison of a few valuations as the investments to fixed assets in different companies’ financial statements can be treated in the different way (for instance some companies include investments into intangible assets in fixed assets and others not and etc.). In order to avoid different accounting policies in the companies there the first one alternative will be used. Net working capital calculation also has one aspect, which is under discussions. Scientists do not agree if cash and cash equivalents have to be included into or eliminated from net working capital. Damodaran explains that increase in cash or its equivalents cannot be treated as the investment, so cash has to be excluded from net working capital (Damodaran 2012).

Economic value added (some authors call this method as residual income method (Valez – Pareja et al. 2013) calculation is simple compared to FCE calculation (5):

\[
\text{EVA} = (\text{ROE} - k_e) * \text{IC} = \text{NI} - k_e * \text{IC}, \text{where ROE – return on equity, k_e – cost of equity, IC – shareholders’ invested capital.}
\]

This type of cash flow looks like more conservative as it takes into account only net income and excludes the cost of shareholders’ invested capital. The further research will show the results and accuracy of both calculation techniques.

Stable growth rate. The last one variable which takes important role in stock value calculation technique is stable growth rate g. It is usually calculated as a long term nominal GDP growth rate (Damodaran 2012; Bodie et al. 2013). But this stable growth calculation method might not represent objectively the long term period as Lithuania’s economy and capital market is developing for a short period of time during which they grew at a very fast pace (it is calculated that the average annual growth rate in nominal GDP were 7,6 % in 2000 – 2013 years). But it is not likely that such a fast growth rate will be for a very long time. On the other hand, stable growth rate can be divided in two different parts: one of them corresponding to long term real country growth (measured as a real GDP growth) and the other corresponding to a long term price level changes. The first one part can be taken from OECD long term real GDP perspectives (OECD, 2012). Despite the fact that Lithuania is not a member of this organization, it calculates the long term real GDP growth perspectives to similar countries according to the level of economic development. For example, it is expected that average yearly growth rate for Estonia will be 2,4 %, for Czech Republic 2,1 %, Poland 1,6 %, Slovakia 2,0 %, Slovenia 1,8 % and etc. According to the given data, the authors decide to make an assumption that real GDP in Lithuania in long term perspective will be growing in 2,0 % yearly. The second part of stable growth rate is the price change level which makes the stable growth rate a nominal variable. After the joining the European Union, Lithuania became a member of European Central Bank System which has an aim to keep the price level at 2,0 % in a middle term (ECB 2011). Combined these two parts there will be used 4.0 % stable growth rate variable in calculation.

Analyzied companies. In order to evaluate stock valuation techniques is Lithuania’s capital market there was chosen two companies which are listed in Nasdaq OMX Baltic capital market – “Apranga” and “Pieno
žvaigždės”. The main criteria why these companies were chosen are their business volumes, market share, performance results and data availability. What is more, these companies operate in different economic sectors. “Apranga” is the biggest retail seller of clothes and shoes in Lithuania (also operating in Latvia and Estonia with significant part of the market share) while “Pieno žvaigždės” is the biggest producer of dairy products. The first one company is operating in economic sector which is very sensitive to business cycles (Morningstar Global Equity Classification Structure 2011). It is expected that such company will face bigger fluctuations in its cash compared to the second company which is operating in less sensitive economic sector. Evaluating the different type of companies will allow to make objective conclusions about the most suitable valuation technique in Lithuania capital market.

5. Analysis of valuation technique results

In this chapter there will be performed valuation of the above mentioned companies according to the criteria described in the previous chapter. In the beginning, there is presented the statistical information which was used when calculating stock values. After that, the shares value for both companies are calculated using two different techniques. Finally, the results are analyzed and sensitivity analysis is performed in order to make objective and precise conclusion about the most suitable valuation technique in Lithuania’s stock market.

It was mentioned that cost of capital parts can be calculated from the public statistical sources. Firstly, it is presented the long term government bond yields which represent risk – free rate $R_f$:

![Table 3. Long term Lithuania’s government bond yields, %.
(Prepared by authors according to Eurostat data)]

<table>
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<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>%</td>
<td>5.3%</td>
<td>4.5%</td>
<td>3.7%</td>
<td>4.1%</td>
<td>4.5%</td>
<td>5.6%</td>
<td>14.0%</td>
<td>5.6%</td>
<td>5.2%</td>
<td>4.8%</td>
<td>3.8%</td>
<td>2.8%</td>
</tr>
</tbody>
</table>

According to the data presented in the Table 3, Lithuania’s government bond yields fluctuated in the interval 2.8% - 5.6% in 2003 – 2014 period except 2009 year when the country faced the deep impact of economic crisis and government bond yields increase to 14.0%. But it is clear that this number is just the statistical exception so it will be excluded from the calculations. Calculating the average of data (except 2009 year) gives the average of 4.2% of government bond yields which will be used instead of exception.

Systemic risk coefficient $\beta$ was also calculated using 2003 – 2014 years data which is available on nasdaqomxbaltic.com. Two indexes were used in order to calculate $\beta$ value (OMX Vilnius index, representing only Lithuania’s capital market and OMX Baltic Benchmark index, representing the Baltic capital market as a whole). That would allow comparing the results using different data inputs. As it was expected earlier, “Apranga” $\beta$ coefficient exceeded the number 1 (which means that company is riskier and more sensitive to changes in the market) while “Pieno žvaigždės” $\beta$ was below number 1 ($\beta$ results are presented in the Table 5)
The results show that different indexes reflect companies’ stock prices changes the best (see figure no. 3). In this particular case, “Apranga” price changes has to be compared with OMXV index changes ($R^2 = 0.62$) while “Pieno žvaigždės” has to be compared with OMXBBGI index changes ($R^2 = 0.46$).

The third part of the cost of capital is return on stock market $R_m$. It was also calculated using OMXV and OMXBBGI indexes. Analysis period for market return was 2003 – 2014. Because of big fluctuations during this period, it was decided to choose compound annual growth rate formula to calculate the average yearly return on stock market. Results are presented in the Table 4:

**Table 4.** Return on stock market, %.

(Prepared by authors according to Nasdaq OMX Baltic data)

<table>
<thead>
<tr>
<th></th>
<th>OMXBBGI index return (Baltic market)</th>
<th>OMXV index return (Lithuania’s market)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average yearly return</td>
<td>11.67%</td>
<td>10.52%</td>
</tr>
</tbody>
</table>

Given data in the table no. 4 reveals that two markets were developing at a little bit different pace. The average annual growth rate in Baltic capital market (which is a sum of Vilnius, Riga and Tallinn markets) was faster compared to Lithuania’s capital market growth which was about 10.5%. Once again it is important to state that when calculating the cost of capital it is necessary to use the index which explains the company price changes the best in order to get the accurate results. By inserting risk – free rate return, β coefficient and return in market into the formula (3) it is calculated discount rate which will be used calculating stock values:

**Table 5.** Discount rate, %.

(Calculated and prepared by authors according to Nasdaq OMX Baltic, Eurostat data)
The other part of the valuation model is cash flow which is calculated according to the formula (4) and its detailed description. The forecast of cash flow parts is the most difficult stage in calculation technique as there is just a short period of available data in Lithuania’s capital market (the data can be found from 2003 year). What is more, during this period of time, the companies faced different situations in the market (economic expansion in 2003 – 2008 years, recession in 2009 – 2010 years and recovery starting from 2011). That is one of the main reasons why the cash flows of the companies were very unstable, fluctuating in a wide range. Because of such conditions, the analyst is put to inconvenience when making the forecast of the cash flow. In order to use such data, there is the need to make data “alignment”. The types of the “alignment” were discussed by Damodaran (Damodaran 2009). The authors chose to align company sales according to average yearly growth rate (calculated by CAGR formula). Taking into account the above mentioned facts, it is logical to calculate cash flow parts as a percentage of the company sales (the bigger turnover means that company can make the bigger amount of net income, but also it will need more capital and working capital in order to maintain the increase in sales and etc.). Adding all the calculated/forecasted variables in the calculation methods, the results of the companies’ stock prices can be calculated:

Table 6. “Apranga” stock value, €.
(Calculated and prepared by authors)

<table>
<thead>
<tr>
<th></th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
<th>2014</th>
</tr>
</thead>
<tbody>
<tr>
<td>Value_CF</td>
<td>2,14</td>
<td>2,42</td>
<td>2,78</td>
<td>2,21</td>
<td>2,39</td>
<td>2,59</td>
<td>2,72</td>
<td>2,84</td>
</tr>
<tr>
<td>Value_EVA</td>
<td>1,35</td>
<td>1,56</td>
<td>1,84</td>
<td>1,57</td>
<td>1,71</td>
<td>1,86</td>
<td>1,97</td>
<td>2,07</td>
</tr>
<tr>
<td>Actual price</td>
<td>5,01</td>
<td>2,21</td>
<td>0,62</td>
<td>3,98</td>
<td>1,70</td>
<td>1,83</td>
<td>2,49</td>
<td>2,71</td>
</tr>
</tbody>
</table>

Table 7. “Pieno žvaigždės” stock value, €.
(Calculated and prepared by authors)

<table>
<thead>
<tr>
<th></th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
<th>2014</th>
</tr>
</thead>
<tbody>
<tr>
<td>Value_CF</td>
<td>7,69</td>
<td>4,64</td>
<td>3,58</td>
<td>5,32</td>
<td>5,94</td>
<td>7,17</td>
<td>8,03</td>
<td>8,90</td>
</tr>
<tr>
<td>Value_EVA</td>
<td>2,28</td>
<td>1,51</td>
<td>1,26</td>
<td>1,79</td>
<td>2,15</td>
<td>2,37</td>
<td>2,66</td>
<td>2,94</td>
</tr>
<tr>
<td>Actual price</td>
<td>1,55</td>
<td>1,33</td>
<td>0,71</td>
<td>1,15</td>
<td>1,58</td>
<td>1,77</td>
<td>2,02</td>
<td>1,78</td>
</tr>
</tbody>
</table>

The main idea of this article is not just to calculate the values of stock and compare them with actual stock prices in the market, so only short comment on the results provided above will be given. Both evaluated enterprises have two similarities:
1. The actual prices in the market were lower than calculated values (using cash flow to equity technique) and that means that analyzed companies are undervalued. The reasons of such situation are:
   • low activity (and liquidity) in the market;
   • fluctuating cash flows and companies results which makes forecasting complicated;
   • uncertain dividend payment policy.
2. Values calculated by EVA to equity were lower compared to calculated values using FCFE technique. The difference can be explained by comparing the benefits which are addressed to shareholders in FCFE technique and EVA to equity technique as the first one option has the wider range of these benefits.

As the main purpose of this article is to evaluate valuation methods techniques and their applicability in Lithuania’s capital market, the sensitivity analysis will be provided which will allow to make a final decision about the most suitable calculation method.

6. Sensitivity analysis

As it can be seen from the previous chapters, the analyst or valuator has to make some assumptions in order to perform stock valuation. There are 3 key variables whose changes due to the inaccuracy of assumptions/calcu-
lation results can determine deviations from calculated stock values increasing them or decreasing:
- Cash flow and the assumptions associated with the forecast of it;
- Discount rate assumptions;
- Stable growth rate assumptions;

In order to assess the impact of the changes in the stock evaluation techniques, the sensitivity analysis will be performed. It will also allow to underline the most essential parts when choosing valuation variables and their values.

There will be tested all three variables in the sensitivity analysis. All of them will be checked under the conditions of increase and decrease by 1 % compared with calculated/chosen value:
- Cash flow change by +/-1 %;
- Discount rate change by +/-1 %;
- Stable growth rate change by +/-1%.

The results are presented in the Figures 4 and 5:

![Figure 4](image)

Fig. 4. “Apranga” value change because of variables changes, €

(Calculated and prepared by the authors)

![Figure 5](image)

Fig. 5. “Pieno žvaigždės” value change because of variables changes, €

(Calculated and prepared by the authors)

Sensitivity analysis shows that discount rate changes in cash flow to equity technique have the most significant effect on calculated values. The cost of capital change by 1 % determined changes in “Apranga” stock value by -11,1 % when the discount rate increased and +14,2 % when the discount rate decreased by 1 %. The effect of cost of capital changes for “Pieno žvaigždės” company was even bigger as the increase of discount rate reduced the value by -16.4 % while the decrease in discount rate made value bigger by 24,1 %. The
changes in stable growth rate were also significant but the effect for the results were lower compared with discount rate changes (see Figure 4 and 5). When analyzing “Apranga” case, the change in stable growth rate by 1% affected the value -7.7% and +9.8% while in “Pieno žvaigždės” case the values were -12.9% and 18.9% respectively. The lowest impact for the value was made by cash flow changes. The change of 1% had almost the same effect in value change. Although the cash flow changes were least significant, the fluctuations of cash flow parts in analyzed companies were reasonable. Furthermore, the cost of capital and stable growth rates are more predictable and do not have a tendency to change significantly over the long period of time (for example standard deviation for “Apranga” cost of capital was 0.25% and for “Pieno žvaigždės” 0.86%).

A little bit different situation was with economic added value valuation technique. The most significant variable was stable growth rate according to sensitivity analysis. 1% change in stable growth rate affected value -6.7%/+8.5% and -11.7%/+17.1% for retailer and dairy producer respectively. The effect of cost of capital were reasonable lower and resulted from -3.7% to 3.8%. The change of calculated EVA to equity increase or decrease by 1% had very low impact resulting in less than 1% for both companies.

The sensitivity analysis leads to the conclusion that cost of capital and stable growth rate changes has significant effect on final result. That means that analyst should pay a lot of attention when making assumptions and calculating these variables. But the concluded analysis also reveals that the discount rate is not fluctuating in a wide range (see Table 5) – the standard deviation of cost of capital for “Apranga” is 0.25% and 0.86% for “Pieno žvaigždės”. The long term stable growth rate should also remain also at the same level as projected because its calculation is based on the long term statistical data. Although the cash flow or EVA variables have low impact for the final result compared to discount rate or stable growth rate, it is expected to have more significant fluctuations in these variables. The historical data reveals that variations in cash flow or EVA can be very high so and it is hard to predict them precisely. What is more, it was mentioned that using various calculation techniques is complicated because of the level of market development. Taking into account the all above mentioned facts, it is suggested to calculate the range of share value considering basic scenario (standard forecast of cash flows or EVA), optimistic scenario (using more optimistic than basic forecast when calculating cash flows or EVA) and pessimistic scenario (using more optimistic than basic forecast when calculating cash flows or EVA). Authors have chosen -10% and +10% change of basic scenario cash flow as statistical data proves huge fluctuations in analyzed period. Final results are presented in Table 8:

<table>
<thead>
<tr>
<th></th>
<th>Pessimistic scenario</th>
<th>Basic scenario</th>
<th>Optimistic scenario</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>“Apranga”</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Value_CF</td>
<td>2.56</td>
<td>2.84</td>
<td>3.13</td>
</tr>
<tr>
<td>Value_EVA</td>
<td>1.89</td>
<td>2.07</td>
<td>2.25</td>
</tr>
<tr>
<td><strong>“Pieno žvaigždės”</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Value_CF</td>
<td>8.01</td>
<td>8.90</td>
<td>9.79</td>
</tr>
<tr>
<td>Value_EVA</td>
<td>2.68</td>
<td>2.94</td>
<td>3.21</td>
</tr>
</tbody>
</table>

The calculated values according to pessimistic and optimistic scenarios do not defer significantly from the basic scenario (the calculated values fluctuated from -10.0% to 10.2%). Depending on the calculated value, the basic scenario value and optimistic/pessimistic scenario value deferred up to 0.89 € but such a difference is acceptable. Because of the situation in Lithuania’s stock market authors believe that included value range in valuation reports/analysis can be practically implemented. This would contribute to sustainable development of valuation system in this Baltic country.
Conclusions

Stock valuations techniques are sophisticated processes which include different variables from internal and external environment. Statistical data from the internal and external environments determines the availability of methods usage. Because of low development level of stock market in Lithuania it was found that only two calculation techniques can be applied: cash flow to equity method and economic value added to equity method. The attention was paid to three valuation techniques’ variables as they play the main role when calculating the final results. Large fluctuations of companies’ cash flows led to the assessment of long term cash flow parts’ trend and its application in cash flow calculation. Taking into account the current situation in the capital market it was decided and suggested for readers to use CAPM method when calculating the discount rate. Because of low activity in the market, it was suggested to use quarterly changes when calculating β coefficient and to calculate β and market return according to the market index which represents chosen equity the best. When determining the value of long term growth rate it was considered Lithuania’s current economic conditions and according to them was chosen to use a combination of real GDP and inflation rate.

By adding these three variables stock values in two different methods were calculated. The results show that values calculated using economic value added to equity technique were lower than values calculated using cash flow to equity method. The main reason of such difference was the wider range of benefits included for shareholders in cash flow to equity method. As economic value added to equity method is more conservative compared to cash flow to equity it was advised to use the liberal one option as the main calculation technique and the conservative one as the alternative calculation.

In order to prove the objectivity and preciseness of the results the sensitivity analysis were conducted. It revealed that discount rate and stable growth rate changes had reasonable effect on final result while cash flow changes were not so significant. Although the cost of capital and stable growth rate had the bigger impact compared to cash flow changes, the further analysis showed that cash flow fluctuations were more likely to happen and the range of these changes were significant. As the valuation techniques are based on cash flow forecasts and these forecasts can be with an error it was decided to suggest calculating three forecast scenarios. It is believed that such the range of calculated stock value will add additional objectivity, preciseness and trustworthiness for valuation results.

Considered the above mentioned things, authors believes that proper and applicable calculation technique can be created for Lithuania’s stock market. The methods which were described in details can contribute sustainable development of Lithuania’s valuation system.

References


TECHNOLOGY TRANSFER PHENOMENON AND ITS IMPACT ON SUSTAINABLE DEVELOPMENT

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Received 20 June 2015; accepted 15 August, 2015

Abstract. The aim of the presented paper is to examine how technology transfer is being approached in the latest scientific literature, and whether interrelations of technology transfer and sustainable development are being elaborated. Clusters in this context are perceived as networks (not necessarily proximate in geographic terms), which serve as technology transmittors. Efficiency of clusters is being addressed. The ultimate aim of the research is to develop framework, which would allow proceeding analysis of links between technology transfer phenomenon and sustainable development process.

Keywords: technology transfer, innovations, sustainable development

Reference to this paper should be made as follows: Tvaronavičienė, M.; Černevičiūtė, J. Technology transfer phenomenon and its impact on sustainable development, Journal of Security and Sustainability Issues 5(1): 87–97. DOI: http://dx.doi.org/10.9770/jssi.2015.5.1(7)

JEL Classifications: O1, O3

1. Introduction

Sustainable development is research area, which embrace myriads of its facets e.g. (Lapinskienė et al. 2014; Scaringelli 2014; Travkina, Tvaronavičienė 2015). Naturally, factors, impacting sustainable development process can are analyzed from different perspectives and could be grouped into various driving forces e.g. entrepreneurial behavior (Caurkubule; Rubanovskis 2014; Dalati 2015, Šabasevičienė, Grybaitė 2014; Rasudeliūnienė et al.. 2014; figurska 2014), availability of innovative solutions (Grubicka, Matuska 2015; Ala-Juusela et al. 2015; Guruz, Scherer 2014; Cuneo et al. 2014; Barberis et al. 2014), sustainability of business (Garškaitė-Milvydienė 2014; Bonetto et al. 2014; Tvaronavičienė et.al. 2014); business environment (Tunčikienė, Drejeris 2015).

Alas, impact of technology transfer phenomenon, level of its significance is for sustainable development phenomenon does not receive proper attention and remain comparatively unexplored (e.g. Iganatavičius et. al. 2015)

This fact can be explained in the following way: both phenomena are multi-faceted therefore examination of links requires prior indication what is under investigation. Hence, on the one hand, it is necessary to specify, how sustainable development is being understood, what span (business unit, industry, cluster, regional or global) is being analyzed. On the other hand, technology transfer has got many dimentions and being analysed taking into account variety of actors with different characteristics, technologies in different industries of different complexity are being transferred, process of technology transfer is not necessarily equally beneficial for technology transferers and recipients, impact of technology transfer can be considered from different perspectives.
Hence, in order to formulate insights about interrelation between technology transfer and sustainable development, the paper is organized in the following way. At first, critical review of the very latest (2015-2014) literature on technology transfer is being provided. The second, the technology transfer evaluation approach, which could be instrumental of searching links with sustainable development phenomena suggested, sustainable development span, suitable for this type of analysis indicated. The third, insights will be provided.

1. Approaches towards technology transfer analysis

One of the latest papers on technology transfer belong to Varun Rai and Erik Funkhouser, published in Renewable and Sustainable Energy Reviews, 2015 September. Despite authors elaborate specifically low-carbon technology (LCT) transfer, their paper provides an approach to technology transfer process analysis, which can be adopted for technology transfer in any area. They organize synthesis of literature „under under three overarching themes: intellectual property rights; recipient country characteristics; and the role of international partnerships” (Rai, Funkhouser 2015, p. 351).

Hence the authors analyze cases when technology is being transferred internationally, one country is transferer, another recipient. By choosing “overarching themes” they admit that intellectual property (IPR) and international partnership composition are the most important factors affecting technology transfer phenomenon. They provide schematically organized factors, among which, they focus their attention IPR institution, recipient country and international partnership (network or cluster in the broader sense indicated above). Their schematically organized system of factors impacting technology transfer process is provided below (Fig. 1).

Factors that increase the likelihood of international technology transfer. Adapted from Rai et al. 2014 by Rai, Funkhouser 2015
Further in their paper the authors provide perception of international transfer (Fig. 2)

Fig. 2. The contents of international technology transfer (Rai, Funkhouser 2015)

If to evaluate the approach towards technology transfer analysis, it could be stated that it is very close to literature on impact of foreign direct investment (FDI) on economic development. In the strand of literature on FDI a lot of considerations about knowledge and know-how spillovers in case of one, more developed, country’s investment into less developed country are found. In that context characteristics and institutions (including IPR institution) of recipient country are very important, as to some extent determine if those spillovers would take place. Elaborating related but at the same time different process – technology transfer phenomenon, it is needed to state rather firmly, that the latter is broader because embrace team level, companies level, industries, clusters, regional and only later on international level. Impact of FDI on sustainable development has been discussed a lot, while impact of technology transfer on sustainable development phenomenon remains an area open for further ongoing discussion.

The next approach toward technology transfer represents different focus. Here the authors tackle issues related to so called ‘alliance of partners’. Here we can specify that meaning of alliens of partners is very close, if not the same, as ‘network of partners’, which is engaged into technology transfer or ‘cluster’, if cluster is perceived in broader sense than just cooperating companies located in the same geographic area.

Hence Contractor and Woodley in their recent paper (Contractor, Woodley 2015) elaborate question of value sharing among alliance partners. Comapies are cross-border partners, which act as technology providers and capture the higher share of returns. Value appropriation determinants, according the authors are: (1) technology and partner characteristics, (2) host nation mandates, (3) alliance structure and (4) other agreement provisions. Those determinant are reflected model summary depicted in Fig. 3. (Contractor, Woodley 2015).
Hypothesis 1 (H1).
The poorer the technology recipient partner’s relative technical capabilities, compared to the technology providing partner, the greater will be the share of alliance value appropriated by the technology providing partner. (Note: The expected sign of the coefficient is positive because of the way the variable is constructed.)

Hypothesis 2 (H2).
There will be a negative relationship between the technology transfer and agreement execution costs borne by the technology provider and the share of net alliance value appropriated by them.

Hypothesis 3 (H3).
The presence of a government mandate, that foreign firms must accept a local partner, will have a negative effect on the share of overall returns from alliances accruing to technology providing firms based outside such nations.
Hypothesis 4a (H4a).
When investing in an alliance as an equity partner, the technology providing firm will receive a larger share of returns generated through the alliance, all else being equal.

Hypothesis 4b (H4b).
When the technology providing firm has a majority equity stake in the alliance, they will receive a larger share of returns generated through the alliance, all else being equal.

Hypothesis 5 (H5).
The presence in the alliance agreement of contractual minimum compensation or returns for the technology providing firm will lead to a lower overall share of alliance value appropriated by the technology providing firm.

Hypothesis 6 (H6).
A higher risk (i.e.: more volatile) ‘portfolio’ of compensation streams for the technology providing firm (as written into the agreement) will lead to a higher overall share of alliance value appropriated by the technology providing firm

(Contractor, Woodley 2015)

Here let us recall the aim of provided resarch: our purpose is to compare approaches toward technology transfer analysis adopted by different authors in the most recent papers. The approach, just provided above again fall into research area very close to research area associated with foreign direct investments. The main difference among Contractor, Woodley 2015 and. Rai, Funkhouser 2015 is focuss: the formerly analyzed authors (Rai, Funkhouser 2015) considered IPR as main factor affecting technology transfer process, while latter authors (Rai, Funkhouser 2015) immersed value appropriation nuances. Despite the different focuss direction both authors see technology transfer process as cross-border process, directed from stronger partner to weaker one.

Again, let us put emphasis here, discussed spins on rather narrow case of technology transfer phenomenon. Here is propriate to add one brief remark: the strand of literature on technology transfer, which is very similar or overlapping with FDI problematic is rather ample (e.g very recent paper of Newman et al. May 2015; Costantini et al., October 2014)

IPR as factor, affecting technology transfer process is discussed rather frequently; e.g. as well very recent article Intarakumnerd; Charoenporn September 2015 could be mentioned here. One more significant difference, that authors analyze technology transfer between business and academia. Authors come to conclusion that investigation of Thai authomotive industry daoes nor allow to claim that the stronger patent regime has visible impact on technology transfer process between public reasearch institutes and business companies.

Another strand of contemporary scientific literature on technology transfer is devoted to analysis of network characteristics. This new stand is well represented, or possibly introduced, by Kafouros and Wang 2015. The authors focus on configuration of technology transferring groups, the geographic dispersion and concentration. It is claimed that the ability and willingness to transfer technology depends on geographic configuration of networking business groups. Authors distinguish such network characteristics as “network breadth” and “network concentration”. Authors define those characteristics in the following way: “Network breadth refers to the geographic dispersion of the units of a group within a country and can be measured by looking at the number of cities in which the group operates and the diversity of their locations country-wide. Network concentration captures the concentration of a group’s business units in each given city. The higher the number of business units that a group has in a given city, the higher the level of network concentration. The two constructs therefore reflect differences in the geographic scope and scale of the operations of the groups” (Kafouros, Wang 2015) Fig. 4 summarizes the theoretical framework and hypotheses.
Hypothesis 1.
The breadth of a group’s network of business units has a curvilinear moderating effect (taking an inverted U-shape) on the relationship between the group’s technological knowledge stock and its business units’ operational performance.

Hypothesis 2.
The concentration of a group’s network of business units has a curvilinear moderating effect (taking an inverted U-shape) on the relationship between the group’s technological knowledge stock and its business units’ operational performance.

The authors arrive to the conclusions that besides such widely discussed factor as absorptive capacity of technology transfer actors, other factors such as configuration of alliance, or cluster, we can add, affect and even shape technology transfer process. Authors claim that due to the fact that some alliance members invest in similar products and technologies competition arises. Competition diminishes willingness to transfer knowledge, what naturally diminishes efficiency of knowledge transfer. Authors provide interesting findings related to network breadth and concentration. They point out that in emerging markets, which typically do not psses...
strong technological capabilities, too big breath" makes the combination of diverse ideas and technologies less efficient, and can be detrimental for innovation and capability development. As the empirical findings confirm, network breadth has a curvilinear (inverted U-shape) moderating effect" (Kafouros, Wang 2015)

Concentration of companies in alliance affects efficiency of technology transfer in the following way: while big concentration increases potential or ability to transfer knowledge, it diminishes willingness to do so. Hence, according authors’ recommendations, it is necessary to control the concentration factors in order to have right trade-off between ability and willingness to transfer knowledge in order to have the highest possible technology transfer efficiency. Authors’ indicated that those findings contribute to research on innovation, clustering and agglomeration (Kafouros, Wang 2015).

Efficiency of technology transfer represents another rather autonomous research question embraced by broader technology transfer research area. Here we wanted to refer to latest paper of Bozeman et al. February 2015.

In this paper the authors update Bozeman’s Contingent Effectiveness Model of Technology Transfer published in year 2000. The authors indicate, that “the term “contingent” is key in both the original and revised model because of the assumption that technology transfer by definition includes multiple parties and these parties generally have multiple goals and, ergo multiple effectiveness criteria. Effectiveness is considered in terms of multiple criteria including (1) out-the-door (was anything transferred?), (2) market impact, (3) economic development, (4) political advantage, (5) development of scientific and technical human capital, and (6) opportunity cost considerations” (Bozeman et al. 2015). The updated model incorporates so called public value (Fig.6)

![Diagram of Revised Contingent Effectiveness Model of Technology Transfer](Image)

Fig. 6. Revised contingent effectiveness model of technology transfer (Bozeman et al. 2015)
In Table 1 authors describe their criteria of technology transfer effectiveness. Newly added *public value* criterion is being described as well (Bozeman *et al.* 2015)

**Table 1.** Technology transfer effectiveness criteria (Bozeman *et al.* 2015).

<table>
<thead>
<tr>
<th>Effectiveness criterion</th>
<th>Key question</th>
<th>Theory base</th>
<th>Major advantage and disadvantage</th>
</tr>
</thead>
<tbody>
<tr>
<td>“Out-the-Door”</td>
<td>Was technology transferred?</td>
<td>At theoretical or classical organization theory</td>
<td>Advantage: Does not hold transfer agent accountable for factors that may be beyond control. Disadvantage: Encourages cynicism and focuses on activity rather than outcome</td>
</tr>
<tr>
<td>Market Impact</td>
<td>Did the transferred technology have an impact on the firm’s sales or profitability?</td>
<td>Microeconomics of the firm</td>
<td>Advantage: Focuses on a key feature of technology transfer. Disadvantage: Ignores important public sector and nonprofit transfer; must accommodate market failure issues.</td>
</tr>
<tr>
<td>Economic Development</td>
<td>Did technology transfer efforts lead to regional economic development?</td>
<td>Regional science and public finance theory.</td>
<td>Advantage: Appropriate to public sponsorship, focuses on results to taxpayer. Disadvantage: Evaluation almost always requires unrealistic assumptions.</td>
</tr>
<tr>
<td>Political</td>
<td>Did the technology agent or recipient benefit politically from participation in technology transfer?</td>
<td>Political exchange theory, bureaucratic politics models</td>
<td>Advantage: Realistic. Disadvantage: Does not yield to systematic evaluation.</td>
</tr>
<tr>
<td>Opportunity Cost</td>
<td>What was the impact of technology transfer on alternative uses of the resources?</td>
<td>Political economy, cost–benefit analysis, public choice</td>
<td>Advantage: Takes into account foregone opportunities, especially alternative uses for scientific and technical resources. Disadvantage: Difficult to measure, entails dealing with the “counterfactual”</td>
</tr>
<tr>
<td>Scientific and Technical Human Capital</td>
<td>Did technology transfer activity lead to an increment in capacity to perform and use research?</td>
<td>Social capital theory (sociology, political science), human capital theory (economics)</td>
<td>Advantage: Treats technology transfer and technical activity as an overhead investment. Disadvantage: Not easy to equate inputs and outputs.</td>
</tr>
<tr>
<td>Public Value</td>
<td>Did technology transfer enhance collective good and broad, societally shared values?</td>
<td>Public interest theory, public value theory</td>
<td>Advantage: Excellent and easily sanctioned criteria for public policy. Disadvantage: Extremely difficult to measure systematically</td>
</tr>
</tbody>
</table>

Here we wanted to provide several comments on the latter approach towards technology transfer analysis. Differently than above presented authors, these scientists tackle technology transfer impact, which they name as “effectiveness”. Recall that above this paper presented approaches were very different by their focus. One group of authors focused technology transfer driving forces, such as IPR, what could be attributed to institutional factors, technology transfer participants (counties or companies) and value sharing among technology transferer and recipients (ability and willingness to participate in technology transfer). This, the very latter paper focuses on technology transfer outcomes. The author attempt to systemize and classify those outcomes. Despite the authors do not introduce sustainable development term, their insights already indicated some constituents of sustainable development phenomenon (economic development, political criteria of technology transfer effectiveness). Attempts to introduce additional rather tacit criterion *public value* signal of a need to for more extended framework, which could be used for technology transfer analysis.

To put in other way, we witness attempts to relate technology transfer and sustainable development constituents.

**2. Technology transfer and sustainable development linkages**

If to enter keywords of technology transfer and sustainable development it search of Science Direct powered by Elsevier, only one very recent paper pops out. This is article of Julian Blomke “Technology complexity, technology transfer mechanisms and sustainable development, Energy for Sustainable Development” (2014).
The paper is devoted to analysis of technology transfer processes resulting in climate change mitigation by reducing greenhouse gases. Author describes "the aspects which technology transfer mechanisms should integrate in order to ensure sustainable development induced by technology transfer" (Blomke 2014). The author looks at the technology transfer process from the cost-benefit analysis point of view. Complexity of technology is being considered, allowing naturally that more complex technology is respectively more costly. The authors' consideration are the following: provides the following. “Let us assume for example that technology 1 and technology 3 cost the same (same mitigation effect per Euro invested), but the various components (e.g. wind blades, wind tower, PV solar glass, metal mounting structure of PV modules) have different technology complexity properties across the respective technology system (see also annex for a detailed rating of the technology components). Then, the technology, which has a higher amount of components ranked with lower complexity, in monetary terms, can bear a higher economic development potential. The reason is that components with lower complexity but high economic demand impact, can induce domestic demand for technology goods. The sum of the yellow bubbles, representing the investment of technology 1, is the same as the sum of the blue bubbles, making up the investment of technology 3 (Fig. 7)—each of the technologies summing up to 1 on the x-axis. Because the individual components of the technology 1 are ranked with lower complexity (below the complexity value of 2 on the y-axis), it is assumed that the domestic demand for technology goods could turn out to be higher. The reason for this is that it is more likely that components with lower complexity can be manufactured by domestic industries in developing countries. The potential domestic demand effect of technology 1 is higher than that of technology 3. Overall, technology 2 is more costly per mitigated unit of GHG. Thus, the sum of the grey bubbles is larger than the sum of the blue or yellow bubbles (2 instead of 1)” (Blomke 2014).

Illustration: Climate Mitigation Technology for Sustainable Development

![Illustration](image_url)

**Fig. 7.** Indexation of technologies and components (Blomke 2014).

**Conclusions**

Analysis of the latest papers on technology transfer let us indicate that authors in this research area tackle rather different aspects of technology transfer phenomena. By many authors technology transfer is still associated with foreign direct investments, when more developed country transfer technology into less developed one. Some authors tackle impact of institutional environment (IPR regulations) on technology transfer process, other analyse relationships of technology transfer participants network (which we call clusters here). Effectiveness of technology transfer is being described (we would call that impact).

Impact of technology transfer on sustainable development is being analyzed only in the context of greenhouse gas effect mitigation. We claim that there is still gap in this research area in the field of structuring linkages between technology transfer and sustainable development. More specifically, impact of technology transfer should be described on all main constituents of sustainable development (economic, social, environmental) on...
regional and, later, international level. Despite some attempts to work towards this direction, the more universal framework is still missing.

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NECESSITY OF PUBLIC AND PRIVATE INTEREST HARMONISATION IN PUBLIC SERVICE FOR THE AIMS OF SUSTAINABLE DEVELOPMENT OF THE STATE

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Received 10 March 2015; accepted 20 August 2015

Abstract. The aim of this article is to analyse the essence of the harmonisation of public and private interests in the public service. The necessity of the harmonisation of public and private interests in the public service is based on the following features: civil service reliability and implementation of its purpose in order to guarantee the public interest; clear, binding standards of conduct applicable to all persons employed in the public service, regardless of their duties and career development nature; aim to prevent the emergence and spread of corruption in the public service; constitutional requirements for the implementation of public service. The article reveals that there are two key elements of a conflict of interest: 1) official duties that ensure the implementation of a public interest; 2) private interest which may negatively affect the performance of official duties. It follows that if a conflict of interest in the public service is not resolved or addressed properly, sooner or later it turns into corruption, and cause significant damage to the state itself. It is therefore very important timely identification, removal and management of the conflict of interest.

Keywords: sustainable development, civil service, public service, conflict of interest, private interests, public interests, public procurement.


JEL Classifications: O1, K00, K2

1. Introduction

In public sector, one of the most important challenges in the implementation of the concept of sustainable development is a conflict of interests that are hardly avoidable in this field and require professional and responsible management. Although the issue is urgent and common for the whole activity of the public sector, the institution of public service is extremely sensible to it. It is necessary to distinguish between a possession of any interest and a situation of conflict of such interests as well as to learn which social needs and other informative signs lead to such a situation.

Each situation where a decision-making person must choose certain behaviour bears high risk of a conflict between his personal interest and interest of a legal entity represented by him. This issue is highly acute for persons serving in public sector. Former Vice-President of the Office of Values and Ethics of Canada Public Service Agency R. Heinzman clearly defined the essence of private and public interest conflict in public service:
“Avoiding situations that may cause a conflict of interest or an impression of a conflict, or preventing such situations - what is equally important for the public sector - is one of the main tools in order to maintain public confidence in objectivity and impartiality of public service and government decisions, and that is our main task.” (Palidauskaitė, 2005). Therefore, public service and successful functioning thereof in democratic states highly depends on public trust.

In this article, the object is being analysed using an example of legal relation of public procurement as emerging in an environment favourable for occurrence of conflict of private and public interest as well as highly dependable on negative social factors.

In the study, the theoretical research methods of systematic analysis, analysis of documents, comparative, and generalisation have been applied. The method of analysis of documents was used in order to get information through qualitative investigation of scientific publications, legal acts and documents of various institutions that are related to the subject of the research. The systematic analysis method was used for the examination of the essence of private and public interest conflict in civil service, in the levels of scientific doctrine, substantive law and legal practice. The comparative method was used for comparing positions of different scientists, provisions of the legislation and case-law documents related to the subject of the investigation. The generalisation method was used for summarising data collected and analysed as well as for defining of conclusions.

2. Factors of obligatory harmonisation of private and public interest as a condition of sustainable development

Harmonisation of public and private interest in public service is relevant to the application of the provisions of the concept of sustainable development in relation to institutional, functional and procedural regulatory approaches to the country’s development processes. Moreover, actualisation and addressing of these legal and regulatory issues is related to the professed values of the society, social and especially legal practices, human and financial resources, as well as identification of components of prevention and adverse effects of other social conflicts.

In terms of value, causes, problems and solutions of a conflict can be addressed in three interrelated social macro (general public, national, complex organisations’ aspects), meso (local community, organisations, government, group of individual officials’ aspects) and micro (individual, small group aspect) levels.

It is recognised that the concept of sustainable development involves a balanced economic, social and environmental development in order to minimise the damage done to humans and the environment. Thus, harmony of economics, society (humans), and environment is those objects of value that together make a public interest in the activity of people, society and state. In this activity, in macro, meso and micro levels it is necessary to ensure harmonisation of public and private interests in public service, where implementation of objectives of sustainable development usually takes place, both in the preparation of strategic documents, coordinated with social partners and the public concerned as well as in the accurate implementation thereof. For example, feasibility of implementation of valuable provisions of public and private interest sustainability focuses in public procurement. Therefore, conflict of public and private of interest can include a range of forms of emerging sustainable development dysfunctions, both criminal such as abuse of office or corrupt practices, and non-criminal, such as misconduct (due to carelessness or negligence), “improper” behaviour of public officials for incompetence, override of institutional ethics guidelines, principles or values, subjectivism, etc. In that sense, it is evident that in decisions taken by public servants, the discrepancy between the values of sustainable development (in public interest levels), which could lead to responsible behaviour of public servants, and the purposeful duties to be performed by a civil servant in order to avoid public and private interests conflict, can increase.

Public and private interest conflict adversely affects the civil service system. First, public and private conflicts of interest undermine the reputation and professionalism in the performance of official duties of the specific person in public service, show failure to recognize their share of responsibility and comply with institutional
ethics standards. **Second**, conflict of interest of a single person working in the public service affects not only that person, but also the state or municipal institution or agency to which they belong, authority and performance. **Third**, uncontrolled or poorly managed conflicts of interest undermine public confidence in civil service and the state itself. Having assessed all the above, it is very important to ground the necessity of harmonisation of public and private interests in public service and the need to provide a characteristics of such conflicts in the levels of scientific doctrine, positive law and legal practice.

In modern democracies the prevailing concept of public service is inextricably linked with the role of the state as a whole society organisation, and enshrined in national constitutions to ensure human rights and freedoms and to guarantee the public interest (Constitutional Court of the Republic of Lithuania, 2004) (eg. Czech Republic, Chile, Greece). Therefore, inappropriate public officials conduct and non-addressed or poorly managed servants’ conflicts of interest destroy expectations of individuals and public and undermines faith in the civil service capacity to protect the public interest in responsible manner.

Having in mind the above, we can formulate the first feature of necessity to harmonise public and private interests in public service, i.e. reliability of public service and implementation of its purposes, in order to guarantee the public interest of society (see Fig. 1).

**Fig. 1** Compatibility and conflict of interest and society’s (non) trust in public service

In each country of advanced democracy, common ethical standards that shape and foster a mature approach of civil workers to their appointments, a feeling of personal responsibility and accountability for their actions (inaction) are raised to a public service fulfilling the needs of the society. The public reasonably expects that public servants (especially heads of institutions) will comply with institutional ethics requirements in defending and protecting the public interest. For example, the Lithuanian Supreme Administrative Court has repeatedly noted that the heads of state institutions are held to a higher performance and accountability standards than ordinary officers. The public has a legitimate expectation that the heads of public institutions are not only of higher professional qualifications, but also act in accordance with higher moral and official ethics principles (eg., Case No. A3-750-2004 etc.).

It must be accepted that in the process of implementation of assurance of public interest in the civil service, the role of the highest state politicians is unique. The political power is acceptable to the people, if the community combines civil and political interests of society and therefore involves the ability to avoid antagonism of interests. First, the politicians can spread proper ethical behaviour model for their example and so increase society’s confidence in public service. If the most important leaders fail to comply with generally accepted standards of official ethics, it is difficult to expect that persons accountable thereto comply with those standards. Second, being directly elected and acting on behalf of society, they must be proactive and may require the avoidance of conflicts of interest and responsibility from public servants in lower positions.

Summarizing the ideas above, the second feature of necessity to harmonise public and private interests in pub-
lic service can be distinguished, i.e. clear, binding standards of conduct applicable to all persons working in public service, regardless of the nature of their official duties and activities.

The analysis of legal provisions shows that the Law on the Adjustment of Public and Private Interests in the Public Service, and other legislation associate arising conflict situations mostly with possible infringements of established standards of professional ethics and the ongoing investigations and decisions upon thereof. In these cases, a contradiction between performance of official duties, governed by the rule of ethics, and the public interest, where the official meets the private interest, is determined. It seems that less attention is paid to other circumstances of emergence of public and private interest conflict that require not less study than directly supervised professional ethics. These include conflicts of interest arising between public institutions and performance of their servants and the people, the society, public expectations and needs. Studies performed by public opinion and market research centre Vilmorus show that the courts, the prosecutor’s office, the National Audit Office are particularly distrusted. Distrust in other government agencies is lower (Vilmorus, 2015). Some state authorities have increased i.e. specific professional ethics of civil servants’ rights and duties, but their performance (what professional duties require to act in the field of public interest) does not satisfy the public. There is a plenty of causes and their interactions for such social conflict. This, of course, is a subject for a large separate research - to act ethically and together professionally in the interest of a human, a society, and a state. In this regard, a certain professional ethical decision-making and control system should be implemented, the main objective thereof should be to keep the goals of moral, professional and state behaviour sustainability, the necessity of their compliance with for all parties concerned. But attention should be also drawn to solely repetitive and not clearly addressed problems. The researchers found that ‘position’s economic motivation’ of some public servants (Misiunas, 2010) determines a passive, irresponsible carrying out of duties, reduce efficiency of agencies’ performance and raise the public’s confrontational distrust in public service. The aim of efficiency of legal status of the servant is “to produce quality in the execution of institutional functions, to acquire necessary qualifications, to enjoy set rights and duties, to have reasonable limits of liability and receive a maximally motivating remuneration and social guarantees” (Misiūnas, 2010). Thus, the lack of effective public servants’ legal status is a factor which can raise conflicts of interest of a servant and a public in the macro, meso and micro levels. We think that can be clearly observed during civil servants’ ‘simulated activities’, such as a preparation and implementation of various national concepts, programmes, projects and other documents. As a rule, the national social programmes formulate goals in abstractive manner, not itemised, and where more detailed it is limited to one or another random measure that will not cause substantial positive social change. As A.Kiškis and A.Kuodytė noticed, such objectives as “to enhance the security of the rural population”, “to improve preventive work” does not show any specific results to be achieved through the implementation of these programs, as the stated objectives are vague. While formulating preventive action objectives in this way, one does not take any responsibility for ensuring objectives to be achieved. Program execution report indicating that it was succeeded to increase the security of the rural population, seems to suggest that the target of the prevention programme has been achieved, however it is unclear whether this had any impact on crime (Kiškis, Kuodytė, 2012).

It should be noted that the issue of conflict of public and private interest is involved in a number of anti-corruption measures and review mechanisms, including those of the United Nations (UN) Convention against Corruption (UNCAC), Organisation for Economic Co-operation and Development, hereinafter OECD, Council of Europe Group of States against Corruption (GRECO) and other international organisations’ scope of legislation. It is generally recognized that if conflicts of interest in public service are not resolved or addressed properly, sooner or later they become abuse of office and turn into corruption, and cause significant damage to the state itself.

Public procurement make an illustrative example. According to the European Commission, conflicts of interest in decision-making, allocation of public funds and public procurement, particularly at local level, form a recurrent pattern in many Member States (European Commission, 2014). Legal relation of public procurement occurs between the supplier and the contracting authority. The vast majority of contracting authorities are public entities represented by public servants. Meanwhile, most of suppliers are of the private sector, intending to sell their goods, services or works, and to receive the greatest possible financial benefits. The relation between these
two entities, due to sufficiently broad discretion of public servants coordinating the procurement procedures develops in the environment where exist many factors encouraging violation of laws and other legislation and taking decisions which violate the public interest. It is in public procurement due to the direct relationship between the beneficiary and the provider of the benefit, conflicts of interest are extremely common and difficult to manage. Their scale is surprising taking into account financial flows (annual public authorities and public bodies spend approximately one-fifth of the EU’s GDP for goods, works and services procurement) (European Commission 2012). Thus, public procurement is one of the key areas which are vulnerable to corruption and conflicts of interest in the logical probability of occurrence (identifying the likely truth in comparative terms such as “more”, “less”). Haven’t ensured prevention of conflict of interest or precluded conflicts in public procurement, it is difficult to expect rational and efficient use of public funds, as well as to ensure equal treatment of suppliers. This conclusion is also confirmed by empirical data, eg. the research identifying and reducing corruption in public procurement in the EU, made in 2013, states, that the overall direct costs of corruption in public procurement in 2010 for the fivesectors studied (Road & Rail, Water & waste, Urban/ utility construction, Training, Research & Development) in the 8 Member States (France, Italy, Hungary, Lithuania, the Netherlands, Poland, Romania and Spain) constituted between EUR 1.470 million and EUR 2.247 million. (Identifying and Reducing Corruption in Public Procurement in the EU, 2013). It should be noted that within public procurement, not only the public interest of the society and the state (in the example above identified as the direct costs of corruption), but also the private interest of honest suppliers are to be protected as collateral for fair competition. Taking into account the above, in the public procurement context, it can be said that harmonisation of public and private interest in public service is one of the most important anti-corruption and abuse of office prevention policy instruments. This feature is striking in many other areas as well (in the control of construction sector, migration institutions, licensing of certain activities, and many others). Thus, the third feature of the necessity to harmonise public and private interest in public service is an intention to prevent the emergence and spread of abuse and corruption in public service.

It has been mentioned that in democratic states, for persons working in public service, the Constitution makes an operational basis. The purpose of public service determines public servants, as a professional group with a special procedure of formation, special features of the legal status thereof, as well as their different responsibilities to the public for the performance of the assigned (entrusted to them) areas of activity, eg., to avoid public and private interests conflict, not to act voluntarily and abuse the service, to comply with ethical requirements, to protect its reputation of a public servant, and the reputation, prestige and so on of the institution where he works. (Case No. I-4245-171/2013). It raises a major feature of the necessity to adjust public and private interests in public service, which connects all the other above-mentioned features: proper implementation of the constitutional requirements for public service. If these requirements are not met, then there is no idea of public institutions serving the people, and there is no society’s confidence in public service, its potential to fulfil its mission.

Analysing the Lithuanian example, it seems that the legislator is aware of the need to adjust public and private interest. It is obvious from the purpose of the Law on the Adjustment of Public and Private Interests in the Public Service: 1) adjustment of private interests of persons employed in the public service and public interests of the community (the idea is to pursue to distinguish those interests, avoid conflicts, and upon identification thereof - to manage and eliminate in time); 2) ensuring that holders of public office should make decisions solely in terms of the public interests (the authors believe that priority should be given to the public interest not only in decision making but also in their preparation, considering, performing other official functions); 3) securing the impartiality of the decisions being taken (we think that the principle of impartiality should be respected not only in decision making but also on any other matters relating to the official activities); 4) preventing the emergence and spread of corruption in the public service.

After summarizing the points made above, it follows that the necessity of harmonisation of public and private interests in public service in macro legal level is determined by the following general features: reliability of public service and implementation of its purposes in order to guarantee the public interests of the society; clear, binding standards of conduct applicable to all persons working in public service, regardless of the nature of
the position or the office; the prevention of abuse of office, the emergence and spread of corruption in public service; proper implementation of constitutional requirements raised for the civil service of Lithuania. In this respect, “Lithuania accumulated sufficient capacity of the central government, needed for public service policy coordination and control” (Meyer-Sahling, Nakrošis, 2009a). Research shows that the country’s civil service career system confidently meet the principles of the European public administration, because “62.07 percent of Lithuanian servants support that in their ministries, promotion depends on good individual performance” (the average of the new EU members is as much as 42.25 percent)” (Meyer-Sahling, Nakrošis, 2009b).

In meso legal level, requirements of harmonisation of public and private interest in public service, alongside the general signs gain certain features specific for individual groups of officials, sectors, communities. These requirements can be found in legal acts of different institutions of public service. For example, the Public Procurement Office indicate what measures (Public Procurement Office, 2011) must be taken by the official-carrying out or participating in Office's public procurement to adjust his official activities with the Law on the Adjustment of Public and Private Interests in the Public Service of the Republic of Lithuania. Among public and private interest conflict-causing situations the Recommendations (paragraph 11.1-11.2.2.) indicate:

1. An employee of the Office and (or) their close person or a legal entity in which an employee of the Office and (or) their spouse, cohabiting, partner is a member, and (or) hold office and participate in the activities of a legal entity;
2. An employee of the Office or their close person:
   2.1 possesses a part of authorized capital, or property contribution to it of the egal entity participating in public procurement procedures;
   2.2 receives from a participant of public procurement procedures, the natural or legal person, any kind of income;
   2.3 any other conditions that may cause a conflict of interest or appearance of conflict of interest turn out.

Among circumstances causing conflict situations recommendations separately mention gifts. It is stressed that “the staff of the Office can not accept gifts or services that are given for their own functions in the Office, unless the Office employee receives gifts or services in accordance with international protocol or traditions that are normally associated with a person working in the civil service duties, as well as entertainment gift (state, institutions and other symbols, calendars, books and other informative printed matter), the value of which does not exceed LTL 100” (paragraph 13).

In terms of conflict prevention, the Public Procurement Office also governs the behaviour of civil servants in the events of duty leave, vacations, permission to work in another job, prevention of nepotism (13). Conflict prevention system, no matter how effective in a strategic point of view, can not fully protect against potential conflicts of interest situations. Therefore, in the micro legal level it is necessary to be able to assess each situation unconventionally, separately and take the appropriate procedural steps to subtly address the conflict of interest, to assess the employee’s practices, expectations, goals and other important subjective and objective information, sometimes revealing duplicity of servant’s behavioural objectives. Evaluating all the above considerations, it should be noted that they have common features to the entire civil service system, make the conditions for sustainable development, so their further regulation must be unified in currently prepared the Civil Servants Code of Ethics.

3. Definition of conflict of public and private interest in public service

The category of conflict of interest1 was commenced to use in legal texts as late as in seventh decade of 20th century (Case No. I-4245-171/2013). Notably, in different countries, a conflict of public and private interests is understood in different ways. This is caused by uneven level of economic development, democratic maturity, historical, political experience, culture, legal tradition and other factors (Kiškis, Kuodyte, 2012), eg., in the

1 The conflict term comes from the Latin word conflict, meaning the clash. In social sciences, the conflict is seen as a struggle for social and legal status, authority, goodies or own values. For example, J. Guščinskienė (2001) names the social conflicts as “various kinds of struggle between individuals which purpose is to reach (or retain) the means of production, economic position, power or other values that are valued in society, as well as compulsion to obey, neutralisation or elimination of perceived or real enemy.
Southwest Asian region, the obligation to the family is considered the most important, so in those states it is normal that people start to work in the civil service, using family-position, although in advanced democratic countries it is prohibited by law (Meyer-Sahling, Nakrošis 2009b). Therefore, what in some countries (including Lithuania), in the civil service is considered nepotism, favouritism, protectionism and violation of the principle of evaluation for the ability, in other countries is recognised as the usual “help our neighbour”. Due to such “help” as estimated by World Bank, in public procurement it is paid 2-3 times more than the market price (World Bank 2000, p. 16).

European Council defines conflict of interest as a situation “in which a public official has a private interest which is such as to influence (or appear to influence), the impartial and objective performance of his or her official duties”, where private interest is understood as “any advantage to himself or herself, to his or her family, close relatives, friends and persons or organisations with whom he or she has or has had business or political relations” (Committee of Ministers to Member states, 2010). OECD, which member Lithuania seeks to become, provides such a definition of a conflict of interest: “A conflict of interest involves a conflict between the public duty and the private interest of a public official, in which the official’s private-capacity interest could improperly influence the performance of their official duties and responsibilities.” (OECD, 2005). A conflict of interest is also defined as a conflict of direct or indirect personal benefit and professional obligations (European Commission, 2014), as a situation in which public servants operate, intend to operate or make an impression operating in private interest (Stevenson, 2010). In the Law on the Adjustment of Public and Private Interests in the Public Service, a conflict of interest means a situation where a person in central or local public service, when discharging his duties or carrying out instructions, is obliged to make a decision or participate in decision-making or carry out instructions relating to his private interests (Law on the Adjustment of Public and Private Interests in the Public Service, 1997). Noteworthy, the term ‘decision’ includes any action, eg., a person carrying out duties or assignment (of his immediate superior etc.) is involved in the activity of task forces, commissions, committees, writes official letters, prepare orders, sanctions the documents etc.

The analysis of these definitions of conflict of interest, it is possible to distinguish these two essential elements of the conflict: 1) duties, which are to ensure the implementation of the primacy of public interest; 2) private interest which must comply with the public interest guarded by public service, as might otherwise dysfunctionally affect the performance of official duties (see Fig. 2).

If any element is missing, there is no conflict of interests. In this regard, it is appropriate to quote the first US president’s words, spoken in response to a friend’s request to appoint him to some public office, which very clearly reveals the primacy of ensuring the public interest: “You are welcome to my house, you are welcome to my heart, however my personal feelings have nothing to do with the present case. I am not G. Washington, I am the president of the USA. As George Washington I would do anything in my power for you. As President I can do nothing.” (Palidauskaite, 2010). This example shows that public and private interests are closely related, and the public service workers have a dual role - public and private. The performance of official duties is attributed to the public role, but at the same time, the person does not cease to be a private person, eg., a member of a family, a relative, a friend, a business partner etc. This creates a different, and in many instances contradictory subsystems of values (eg., a civil servant’s main value is a public interest, serving people and that of an entrepreneur is to gain personal benefits and so on), that could adversely affect the performance

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2 In dictionaries in Lithuanian language, nepotism is generally defined as the recruitment of relatives by using official position.
of official duties and the general image of public service. Thus, the concept of conflict of interest is related to the collision of public and private roles and together interests, when a person employed in public service is to impartially, objectively and fairly carry out his duties, however he is affected by personal preferences based on personal interest (his own or his close persons’ business; close relatives work at the same institution; work in other enterprises, institutions and organisations; professional or individual activities; membership, relationships and responsibilities in various associations; financial or moral obligations (debt) to other persons, other civil relationships; hostility (dispute or competition) to other persons or groups; search for a new job, negotiations with a prospective employer etc.). It is therefore clear that persons working in public service, can realise their private interest in a private capacity only and in the performance of official duties they must always give priority to the public interest.

To illustrate the above thoughts, in the example of public procurement, it is necessary to say that the people of the contracting authority responsible for the implementation of public procurement have the right to take decisions, practically anyone of which can implement or damage the public interest. Decisions made for personal gain if they were taken in an official capacity, generally violate either the public interest (in the narrow sense) or private interest of other supplier (public interest in a broader sense, as a fair and equitable competition enforcement tool). In any case, it is a threat to the authority and general grounds of functioning of public service, which are largely based on public trust.

In addition, it should be noted that any conflict of interest must be direct and obvious. For example, violation of the principle of impartiality can be found only after recognition that the person acted in circumstances that gave rise to a conflict of interest, i.e. having a personal (or of a person closely associated) pecuniary or non-pecuniary interest. Assessment of those facts can not be based on assumptions, unrealistic and unlikely, hypothetical conclusions and suppositions upon possibly gained or potentially emerging in the future interest of a public servant (eg., Case No. I-4245-171/2013 etc.) (LVAT 2006). From the other hand, paragraph 2 of part 1 of article 3 of the Law On the Adjustment Of Public And Private Interests In the Civil Service (1997) stipulates the general duty of a public official - “to avoid conflict of interest in accordance with the procedure and measures laid down by legal acts, and act in such a way as to avoid suspicions about the existence of such a conflict.” In this case, there is an issue of alleged or potential conflict of interest as the standard of appearance.

In this respect, it should be noted that the OECD identifies three types of conflicts of interest: 1) an actual conflict of interest, in which the public official’s private-capacity interests improperly influence the performance of their official duties and responsibilities; 2) an apparent conflict of interest, where it appears that an official’s private interests could improperly influence the performance of their duties but the fact of such conflict is subject to investigation; 3) a potential conflict of interest that occurs where a public official holds a private interest which are not important or not influence their duty, but would become important if the relevant circumstances were to change in the future (OECD, 2003).

Such classification of conflicts of interest is not a new phenomenon. As early as on May 8, 1965, US President L. Johnson in Executive Order 11222 - Prescribing Standards of Ethical Conduct for Government Officers and Employees formulated a standard of appearance that prohibited to act in the way that gives the appearance of private gain from using the office (Johnson, 1965). Lithuanian case law also recognises the appearance standard, eg., SACIL in its ruling of June 10, 2013 in the administrative case No. A525-998 / 2013 made it clear that the Law On the Adjustment Of Public And Private Interests In the Civil Service in its essence is preventive and public servant must avoid even the appearance of bias. On the other hand, it should be noted that Lithuanian administrative courts clearly distinguish the circumstances which may give rise to a conflict of interest and conflict situation already emerged: in the first case there is an obligation to declare such circumstances, in the second case it is necessary to opt out, eg., SACIL in the ruling of November 2, 2010 in the administrative case No. A442-1422 / 2010 noted that: “The circumstances which may give rise to a conflict of interest in itself does not mean a conflict of interest. They describe a common position of a person working in the civil service (his previous or existing relationship with others, participation in non-official activities, transactions or the like) and in its essence it is just an assumption for a conflict of interests. When certain specific circumstances occur in the
office of a public servant (when needed to prepare or adopt a specific decision, upon a particular order, and so on), those circumstances, expressing the assumptions of conflict of interests, in conjunction with these specific official circumstances become a conflict of interest.”

It was already mentioned that adjustment of public and private interests is one of the most important anti-corruption instruments, therefore it is appropriate to briefly discuss interfaces of corruption and conflict of interest. Scientific literature distinguishes the following differences between corruption and conflict of interest: 1) the ‘corruption’ term is used to identify large forms of venality and self-serving, and minor cases are covered by conflict of interest; 2) corruption is considered a crime, and conflict of interest in most cases, is not seen as a crime; 3) corruption is related more to large financial benefits, and conflict of interest pertains to the social relationships and behaviour, which is assessed as biased performance of official duties (Palidauskaitė, 2005).

Thus, corruption and conflict of interest is not the same phenomenon: corruption in all cases involves a conflict of interest, but a conflict of interest does not necessarily mean corruption, eg., bribe is aimed at property or other personal benefit for himself or another person, it is offered, promised, given for a public servant’s or an equivalent person’s legal or illegal act or failure to act in discharge of duties, however, a conflict of interest is not necessarily associated with economic gains, biased behaviour of an employed in the civil service is enough. Furthermore, criminal responsibility is prescribed for acts of corruption (ex. the Criminal Code of the Republic of Lithuania (2000), articles 225 ‘Bribery’, article 226 ‘Bribery of an Intermediary’, article 227 ‘Graft’ etc.), and violations of conflict of interest do not cause such severe legal consequences. Possible transformation of conflict of interest into corruption is illustrated in Fig. 3.

Figure 3. How a conflict of interest can turn into corruption (Palidauskaitė, 2010)

However, it is considered that conflicts of interest are neither less dangerous nor cause smaller negative effects on development of the state than corruption. First of all, conflicts of interest are almost always associated with personal advantage that, even if not pecuniary, may be tangible. For example, loyalty, giving no current financial profit, but possibly awarding in the future. Secondly, conflicts of interest being not addressed in time, have a tendency to degenerate into corruption. Third, the society and the state should attach importance not to a fact of gaining of pecuniary advantage, but to the breach of desirable standards of behaviour, both equally inevitable in the event of conflict of interest and corruption.

Considering the circumstances, it is very important for timely identification, disposal and management of conflicts of interest. In this regard, it is appropriate to quote words of the president of the USA J. F. Kennedy from the Special Message to the US Congress of April 27, 1961: “Criminal statutes and Presidential orders, no matter how carefully conceived or meticulously drafted, cannot hope to deal effectively with every problem of ethical behavior or conflict of interest. Problems arise in infinite variation. They often involve subtle and difficult judgments... And even the best of statutes or regulations will fail of their purpose if they are not vigorously and
wisely administered.” (Kennedy, 1961)

Summarising the above, it can be concluded that conflicts of public and private interest in public service occur when a person is required to perform certain duties, which should ensure the implementation of the public interest, but the person’s actions (inaction) are related to his private interest, which may adversely affect the performance of official duties. If conflicts of interest in public service are not resolved or addressed properly, sooner or later they turn into corruption, and cause significant damage to the state itself, so it is very important for timely identification, disposal and management of conflicts of interest.

Conclusions

The necessity of harmonisation of public and private interests in public service is determined by the following features: reliability of public service and implementation of its purposes in order to guarantee the public interests of the society; clear, binding standards of conduct applicable to all persons working in public service, regardless of the nature of their position or the office; the aim to prevent an abuse of office, the emergence and spread of corruption in public service, and the need of proper implementation of constitutional requirements raised for the civil service. These features show significance of conflicts of interest in public service and the need for more attention to this issue.

The analysis of the categories of public and private interest conflict in public service reveals that two essential elements of conflict of interest can be distinguished: 1) the duties that ensure the implementation of the public interest; 2) private interest which may negatively affect the performance of official duties. With these two elements, a significant risk of public and private interests conflict is identified. A conflict of interest must be direct and obvious, however it is generally recognised that the person employed in public service must avoid even the appearance of improper behaviour. This shows that public servants are subject to higher requirements in order to prevent inappropriate behaviour. Conflicts of interest and management thereof should be the priority area of every state’s internal public policy, because if conflicts of interest in public service are not resolved or addressed properly, sooner or later they turn into corruption, and cause significant damage for the state itself and inhibit its development.

In terms of implementation of the purposes of sustainable development, causes, problems and solutions of public private interest conflict shall be addressed in three interrelated social macro (general public, national, complex organisations’ aspects), meso (local community, organisations, government, group of individual officials’ aspects) and micro (individual, small group aspect) levels.

Conflicts of interest arising between the state authorities and their officials for the performance hit (what is required by a professional obligation to act in the public interest) and the people, the public, public expectations and needs are insufficiently researched and evaluated.

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Viešųjų pirkimų tarnybos rekomendacijos dėl priemonių, kurių asmuo turi imtis, kad savo tarnybinę veiklą suderintų su Lietuvos Respublikos viešųjų ir privačių interesų derinimo valstybėje tarnyboje įstatymo nuostatomis [Public Procurement Office Recommendations on Measures to be Taken by the Person in order to adjust his public duties with the provisions of the Law On the Adjustment Of Public And Private Interests In the Civil Service]. Patvirtinta Viešųjų pirkimų tarnybos direktoriaus 2011 m. gruodžio 30 d. įsakymu Nr. 1S-202 (Viešųjų pirkimų tarnybos direktoriaus 2013 m. gegužės 31d. įsakymu Nr. IS-444).

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SUSTAINABILITY IN HIGHER EDUCATION: DISCOURSE ON DYNAMIC CAPABILITIES OF PRIVATELY RUN HIGHER EDUCATIONAL INSTITUTIONS (HEI) IN LATVIA

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Abstract. The demographic decline, economic uncertainty and high unemployment rate allow predicting the exit from the market the weakest privately run HEIs. The aim of the paper is to identify strategies that privately run HEI might pursue in current high-velocity environment sustaining competitive advantages. Author applied the dynamic capabilities framework as a theoretical foundation and pro pounded four research questions. Having investigated the stage of Latvian privately run HEI industry consolidation, authors answered the first research question: what should be the cornerstone of a HEI long term strategic plan in current industry consolidation stage? Then authors conducted the survey of students’ opinions among different privately-run Latvian HEIs and answered second research question: what educational philosophies have been adopted by many privately run HEIs: customer or product oriented approach towards students? Next, the research paper identifies the necessity of product oriented approach and determined dynamic capabilities for such strategic move. Finally, authors answered on the forth research question: is it possible to develop and sustain the competitive advantage, pursuing international strategies by exploiting a HEI’s resource and capabilities? The paper has potential to generate a scholar’s discussions and might lead to further research.

Keywords: VRIN resources, dynamic capabilities, customer oriented approach, product oriented approach, international strategy

Reference to this paper should be made as follows: Čirjevskis, A. 2015. Sustainability in higher education: discourse on dynamic capabilities of privately run higher educational institutions (HEI) in Latvia, Journal of Security and Sustainability Issues 5(1): 111–122. DOI: http://dx.doi.org/10.9770/jssi.2014.5.1(9)

JEL Classification: I23, M10, M13

1. Introduction

1.1 Topicality of research

In contemporary European business environment, characterized by economic uncertainty, demographic decline and rapid technological changes, the marketplace requirements are a constantly moving target. Therefore, it is essential that European Higher Education Institution’s (HEI) constantly update their curriculum and re-evaluate their pedagogical approaches (Emery et al.2000). Latvian HEIs are not the exclusion from this rule. The paper explores the new challenges and opportunities for the privately run HEIs in Latvia. There are no any indicators, showing that the HEIs market in Latvia can grow. The demographic decline, economic uncertainty and high unemployment rate allow predicting the exit from the market the weakest HEIs. The complex settings of Latvian HEIs shape the topicality of the research. The aim of the paper is to identify strategies that privately run HEI might pursue in current high-velocity environment sustaining competitive advantages. The research comprises two parts – the theoretical one, including the literature review, determining the theoretical frameworks of the research and defining the methodology of the investigation, and the practical part assuming the data collection and interpretation of results. In the process of investigation the cross-sectional and time-series data were used.
The unit of analysis is privately run HEIs of Latvia. The state-run HEIs are not taken into consideration and only several notes are done on them, although the authors realize the difference between these institutions.

1.2. Literature review

Latvia successfully participates in the establishment of a European Higher Education arena and the majority of Bologna Process Reform is successfully implemented (Ministry Education and Science of Latvia 2012). Higher Education makes a three-fold contribution to a country’s economic health. First it is beneficial for employment rates, second it is a key driver for long-term economic growth and third it appears to be beneficial for social cohesion. At present we, unfortunately, can conclude that the most of its goals were not achieved yet. The European countries have to improve the percentage of students enrolled in tertiary education and the educational quality of Europe’s students. The reasons of the problems of HEIs in Latvia are similar and it’s analyzed by many organizations and prominent researches (Foreign Investor Council 2010; Dombrovskis 2009). The outcomes of those researches are not very optimistic. Firstly, recent statistics from Eurostat, the EU’s official statistics agency, have found that the Baltic States - particularly Latvia - are at the forefront of Europe’s well documented demographic crisis. The report found that Latvia suffers both the lowest fertility rate in the EU and has the second lowest life expectancy, after Bulgaria (EU demography report 2010). Secondly, the intellectual brain drain has been going on in Latvia since about 2004, and then rising economic hardship forced many to search for better jobs abroad. Demographic problems are reflected on the number of students in Latvia that is constantly declining from maximum 131072 of HEIs’ students in 2005/2006 academic year to minimum 85881 students in 2014/2015 (Latvian statistics 2015). Moreover, the World Bank estimates that by 2025, the number of students in HEIs will shrink more than primary and secondary schools, by a staggering 40 percent, due to emigration (Hanley 2011). Thirdly, the share of scientists aged 65 years old or more in universities was 25%, and in university research institutes 35%. Only 7 percent of scientists were under 36 years old (EU demography report 2010). Finally, there is a strong competition in the market for higher education among 35 higher education establishments, of which 18 HEIs are privately run (Dombrovskis 2009; Latvian statistics 2015). It means that the demand will be shrunk whereas the supply side is already overinvested. Privately run HEIs need new business strategy and new educational approach to survive in new economic conditions. Thus, the understanding where in the consolidation cycle or/and concentration ration of an industry is should be the cornerstone of a company’s long term strategic plan.

Investigation of published researches on the problems of Latvian HEI’s industry has identified one unexplored important area of HEIs activity: what education philosophy towards students the HEIs employed so far: the product oriented and the customer oriented ones? Both approaches have their adherents. Many HEIs suppose the student is the customer of the HEI. If the students are supposed to be the customers, it means, they are “always right”. The students are “buying” the program; they have the right and the responsibility to state what they want from the programs and how they think they should get it (Gordon 1996; Jones 1997). This maxim fully corresponds to the idea of obtaining the economic advantage in the short term: the students “customers” are satisfied, and the approach becomes as the profit-gaining approach. But any HEI is to weigh out the consequences of this approach. Some scholars researches seek to evaluate the arguments for and against the proposition that students in higher education are “customers” and should be treated as such (Eagle & Brennan 2007). 80% of all students prefer easy tasks, short and not demanding material and good marks (Gordon 1996; Jones 1997). Money goes after the student and lecturers wishing continue their employment show indulgence towards the students’ ambitions (Gordon 1996; Jones 1997). The quality of education falls, and as a result, poor reputation decreases the rating of the HEI and the number of students. They want to have the diplomas of a prestige university! The vicious circle is closed! The “customer” concept into higher education degrades educational standards and damages educator/student relationships (Eagle & Brennan 2007). How the HEIs should turn the young people having no special knowledge and skills into well-educated, well-trained and well-qualified employee? The product-oriented approach allows achieving these aims. Notturno wrote, that the product oriented approach in the HEI settings is “…the deliberate attempt to design a system whereby students begin as natural inputs and work their way through a program of study from which they emerge as more knowledgeable and capable individuals” (Notturno 1997). Employer is a person or/and organization who is to evaluate the level of
the HEIs from the outlook of potential to employ the graduates in the nearest future. Under such approach the students agree to keep to the program strictly because they believe, they will be prepared to face any challenge the real life gives them in the future. The rating, the reputation and the flow of the students will rise. However strategic shift from existing short term the customer oriented approach towards long term product oriented approach requires the contemporary strategic management of organizational resources and capabilities.

The exploration on how to manage organizational resources and capabilities to sustain competitive advantages remains the intrigues unit of research of strategic management science. Two major frameworks to identify the sources of competitive advantages are: the resource based view (RBV) (Barney 1991) and dynamic capabilities view (DCV) (Teece, Pisano & Shuen 1997) on competitive advantages have been successively developing since 1991 year. Barney defines that sustained competitive advantages must be found in the valuable, rare, imperfectly imitable, and non-substitutable, so called VRIN resources already controlled by a firm (Barney, 1991). Barney called VRIN resources as “idiiosyncratic firm attributes” of the firms’ competitive advantages. According to RBV the HEIs compete on the market managing three major heterogeneous idiosyncratic resources: academics possessing a tacit knowledge, often called “know-how” with individual tuition methods (Grant 2010) and providing scientific researches, the programs of HEI and HEI’s reputation. Reputation, programs and academic personnel of HEI are important VRIN resources so they are imperfectly immobile: path dependent, socially complex and casually ambiguous. What is more, the HEI has to realize the advantages of these VRIN resources and capabilities and takes to gain competitive advantages by operating in multiple markets simultaneously. International strategy simply refers to the concept of operating in multiple countries simultaneously (Barney 2012). The critiques of RBV argue that it seems to tell managers to obtain VRIN resources and develop appropriate competitive advantages of organization, but it is silent on how this should be done (Connor 2002; Miller 2003). Proponents of RBV recommend developing the RBV into a more viable theory of competitive advantage, especially if it is moved into a genuinely dynamic framework (Kraaijenbrink & Wijnhoven 2008). It is clear that in high-velocity environment HEI has to follow the changes very quickly and be dynamic in terms of strategic management of VRIN resources. Dynamic capability is defined by Teece, Pisano & Shuen as “the firm’s ability to integrate, build, and reconfigure internal and external resources to address rapidly changing environments” (1997). The first capability is creation of the strategic assets by the way of quick learning of both: organization itself and the employees. The second capability is integration of new strategic assets, created by the first capability, within the organization. The third capability is transformation of the existing assets. In case the HEI implements these capabilities for adjusting to the existing approach the HEI can dynamically change the strategy and sustain or at least create a series of temporary competitive advantages (Teece 2009).

1.3 Theoretical framework of research

The research investigates one dependent variable. The primary interest of the research is to identify strategies that privately run HEI's might pursue to generate competitive advantages. Privately run HEI's competitive advantage has become the dependent variable in our research. The following independent variables are supposed to be of primary significance for this investigation: demographic decline and competition consolidation stage of industry. VRIN resources and dynamic capabilities of HEIs are the moderating variables. The moderating variable is one that has a strong contingent effect on the independent variable-dependent variable relationship (Sekaran & Bougie 2009). Educational philosophies (customer oriented approach or product oriented approach) and international strategies are two separate mediating variables. The mediating variable (or intervening variable) is one that surfaces between the time the independent variables start operating to influence the dependent variable and the time their impact is felt on it (Sekaran & Bougie 2009).

Four research questions to achieve the aim of the paper have been posted. First research question posed as follows: what is the consolidation stage of an industry of privately-run HEIs and what should be the cornerstone of a HEI’s long term strategic plan? Second research question authors defined as follows: what educational philosophies have been adopted by most of HEIs in Latvia so far: the customer-oriented approach or the product-oriented approach? Third research question is what educational philosophy should be adopted by HEIs and what specific VRIN resources and dynamic capabilities will be needed to sustain competitive advantages?
Forth research question defined as is it possible to develop and sustain the competitive advantage, employing international strategies by exploiting a privately run HEI’s resource and capabilities?

1.4. Research design and methodology

Research comprises two types of data: cross-sectional data, describing the situation for the previous academic year 2014/2015 and time series data contains data for the academic years starting from 1991/1992 till 2014/2015 academic years. The survey was conducted among the students of different Latvian universities during two weeks and 52 students took part in this poll. Sample sizes larger than 30 and less than 500 are appropriate for most business research (Sekaran & Bougie 2009). The group of students for polling was randomly selected. The questionnaires site was open for fortnight. The students were asked to visit the site and answer the questions. The students were asked to evaluate every of 28 statements according to the 10 points interval scale from “strongly disagree” to “strongly agree”. The questions were logically divided into three sets for the purposes of research. First set of questions was designed to identify how the students of HEIs perceive themselves- as the customer or as the product of HEIs, the second set was designed to define how students perceive the knowledge and competences delivered by the HEIs, and the last one was designed to find out what is the real motivation for them to receive the HE diploma. The received data has been possessed and interpreted by the researchers below.

2. Data analysis and interpretation of results

To answer first research question, authors have applied the Consolidation curve theory developed by Deans, Kroeger and Ziecel (2001), degree of inequities of market shares of privately run HEIs and Herfindhal-Hirschman index. Dean and colleagues has identified that industry move through four stage of consolidation: Opening, Scale, Focus and, finally, Balance and Alliance. They predicted that an industry will take on average 22-25 years to progress through all four stages and in the future they expected it to be even quicker. Every company in every industry will go through four stages or disappear. The privately run HEIs Latvian market is represented by 18 privately run HEIs with 17223 students in 2014/2015 academic year. Higher School of Business TURIBA (BAT) controls 24% of the market, Transports and Communication Institute (TSI) has got 17% and Riga International School of Economics and Business Administration (RSEBAA) has reached 15,6%. The table 1 below demonstrates the market share of every commercial HEE in Latvia. The bigger is the market share of these companies, the higher is the concentration on the market of HEI. Competitive Ratio 3 (CR3 ratio) by Deans et al.2001 is the combined market share of the three largest companies in an industry. Thus, the CR3 ratio of HEIs equals 57% in 2014/2015 academic year (Latvian statistics, 2015). That means HEIs industry is moving through third stage called Focus. Company in Focus stage industries need to emphasize their core (dynamic) capabilities, focus on profitability, and either shore up or part with weak business and attacking profitable niches (Deans, Kroeger & Zeisel 2001). Because the most privately run HEIs started up in 1991-1992 and taking into consideration average 25 years progress through all four stage, we might predict the industry HEI will go to stage 4 “Balance and Alliance” ((Deans, Kroeger & Zeisel 2001) in the nearest future. Company must be alert to the potential for industry regulation and the danger of being lulled complacency by their own dominance.

An privately-run HEI industry in this range is likely an oligopoly. However, the received coefficient does not show the gap between the shares of the biggest companies and the gap between the biggest companies and other representatives if the industry. This disadvantage can be eliminated by computing the indicator of the market shares dispersion. It is used for measuring the inequality degree of the companies’ size.

\[
\sigma^2 = \frac{1}{N} \sum_{i=1}^{N} (y_i - \bar{y})^2
\]

Where \( \bar{y} = \frac{\sum y_i}{N} = \frac{1}{N} \) is the average market share, and

\( N \) – is number of companies in the industry.

For calculation of this indicator the market shares of the HEIs presented in table 1 were employed. The aver-
age market share is $1/18 = 0.0556$. The difference between the HEI market share and the average market share on the market is taken to the second power and then the results are summed up. This dispersion of the market shares shows the inequality in the market shares distribution and the high level of concentration in the industry as shown in table 1.

<table>
<thead>
<tr>
<th>Latvian privately run HEIs</th>
<th>Number of students (2014/2015 academic year)</th>
<th>Privately run HEI's market share (Sk)</th>
<th>$S_k^2$</th>
<th>Degree of inequality of privately run HEIs</th>
<th>Dispersion of inequality of privately run HEIs</th>
</tr>
</thead>
<tbody>
<tr>
<td>BAT</td>
<td>4183</td>
<td>24.3%</td>
<td>589.9</td>
<td>0.1873</td>
<td>0.0351</td>
</tr>
<tr>
<td>TSI</td>
<td>2759</td>
<td>16.0%</td>
<td>256.6</td>
<td>0.1046</td>
<td>0.0109</td>
</tr>
<tr>
<td>RSEBAA</td>
<td>2697</td>
<td>15.7%</td>
<td>245.2</td>
<td>0.1010</td>
<td>0.0102</td>
</tr>
<tr>
<td>BSA</td>
<td>2269</td>
<td>13.2%</td>
<td>173.6</td>
<td>0.0761</td>
<td>0.0058</td>
</tr>
<tr>
<td>ISMA</td>
<td>1339</td>
<td>7.8%</td>
<td>60.4</td>
<td>0.0221</td>
<td>0.0005</td>
</tr>
<tr>
<td>EKA</td>
<td>1019</td>
<td>5.9%</td>
<td>35.0</td>
<td>0.0036</td>
<td>0.0000</td>
</tr>
<tr>
<td>RAI</td>
<td>520</td>
<td>3.0%</td>
<td>9.1</td>
<td>-0.0254</td>
<td>0.0006</td>
</tr>
<tr>
<td>REA</td>
<td>497</td>
<td>2.9%</td>
<td>8.3</td>
<td>-0.0267</td>
<td>0.0007</td>
</tr>
<tr>
<td>RJA</td>
<td>492</td>
<td>2.9%</td>
<td>8.2</td>
<td>-0.0270</td>
<td>0.0007</td>
</tr>
<tr>
<td>BPMA</td>
<td>439</td>
<td>2.5%</td>
<td>6.5</td>
<td>-0.0301</td>
<td>0.0009</td>
</tr>
<tr>
<td>STA</td>
<td>360</td>
<td>2.1%</td>
<td>4.4</td>
<td>-0.0347</td>
<td>0.0012</td>
</tr>
<tr>
<td>LKA</td>
<td>161</td>
<td>0.9%</td>
<td>0.9</td>
<td>-0.0463</td>
<td>0.0021</td>
</tr>
<tr>
<td>ETA</td>
<td>161</td>
<td>0.9%</td>
<td>0.9</td>
<td>-0.0463</td>
<td>0.0021</td>
</tr>
<tr>
<td>SPPA</td>
<td>108</td>
<td>0.6%</td>
<td>0.4</td>
<td>-0.0493</td>
<td>0.0024</td>
</tr>
<tr>
<td>RARZI</td>
<td>101</td>
<td>0.6%</td>
<td>0.3</td>
<td>-0.0497</td>
<td>0.0025</td>
</tr>
<tr>
<td>LA</td>
<td>59</td>
<td>0.3%</td>
<td>0.1</td>
<td>-0.0522</td>
<td>0.0027</td>
</tr>
<tr>
<td>MESI</td>
<td>47</td>
<td>0.3%</td>
<td>0.1</td>
<td>-0.0529</td>
<td>0.0028</td>
</tr>
<tr>
<td>RTI</td>
<td>12</td>
<td>0.1%</td>
<td>0.0</td>
<td>-0.0549</td>
<td>0.0030</td>
</tr>
</tbody>
</table>

Herfindhal-Hirschman index 1400

Sources: developed by author based on Latvian statistics (2015)

Thus the second indicator Herfindhal-Hirschman index (HHI) presents information about the comparative opportunities of the HEIs to affect the market.

$$HHI = \sum_{k=1}^{m} S_k^2$$

Where $S_k$ is the share of the individual HEI, and $m$ is the number of HEIs.

The essence of this indicator is in the fact that then bigger companies on the market, then higher is the value of HHI index and higher the level of companies concentration on the market. (Kircner 2001). In evaluating the significance of a particular HHI, the results can be broadly characterized into three regions: unconcentrated (HHI below 1000), moderately concentrated (HHI between 1000 and 1800), and highly concentrated (HHI above 1800). The value of the index is rather high; it is higher than the average market share indicator in 2.8 times and HHI index equals almost 1400. It also proves that the concentration of privately run HEIs is moderate. Thus our ….. Thus, we have answered on the first research question. It is important to mention that only the privately-run HEIs are considered in this research, and the state-run HEIs are beyond the issue of the paper. The privately-run HEIs take only about 20 % of all the higher educational establishments of the country.

Having answered second research question we have carried out a survey of students’ opinion among different HEIs. The most spectacular results are as follows: 90 % of the students recognized the HEI programs are to ful-
ly correspond with the practical demands of the market. 80% of the students answered that they are a customer of the HEI service and only 20% that they are a product of the HEI. Students who view themselves as customers are likely to hold attitudes and to engage in behaviours that are not conducive to success (Finney 2010). Almost 88% said they have possibility to evaluate the knowledge and competences of the tutors, but only 40% of the students say they are to trust in the tutors’ competences and knowledge. For solving the conflict 70% of students answered it is admissible to attract the HEI authorities. It is clear the tutors will try to avoid the situation when the authorities are involved in conflict. It means, the tutor will try to solve the problem himself, and she/he will not stand against the students’ trend. Even more serious is the fact that the students have possibility to evaluate the lecturers. From one hand it is logical, that the HEI’s management wants to know the degree of students’ satisfaction with the lectures’ work. From the other hand, the most demanding tutors are at risk to receive low marks, as far as students do not like lecturers who put them low marks or demand serious assignments. Then, 85% of the students said that knowledge is important for the career but chance, opportunity and VIP protections have got higher importance. Only 45% of the students answered that the theoretical knowledge adopted at the HEI are applicable in practice. 75% of the students said that the HEI’s reputation has a primary importance for choosing the HEI to study at. Finally, 68% of the students answered that it is not interesting to study at the HEI but the graduation and diploma of the prestige HEI can bring additional advantage to their career. It became clear that the majority of students do not highly appreciate the higher education and diploma of HEI per se, but as supportive one in their career. Answer on the second research question became obvious: HEIs adopt the customer-oriented educational philosophy with minor elements of the product-oriented approach.

The third research question was what educational philosophy should be adopted by privately-run HEIs and what specific VRIN resources and the set of dynamic capabilities will be needed to sustain or create a series of temporary competitive advantages? Survey identified the following capabilities and resources are needed to sustained competitive advantages for the customer-oriented approach: knowledgeable and good educated lecturers, ability to give professional knowledge with fun and without great efforts from the students’ side; relatively low level of requirements; the abilities to combine delivering lectures and own researches outcomes, to disseminate research results on the international scientific conferences and publish proceedings in good rating scholar journals and therefore facilitate to increase the rating and reputation of HEI that are in demand among the potential students. If the HEI practices the customer-oriented approach, the end products are diplomas itself for above mentioned 80% of the students and knowledge and competences for the best 20% of the students. The product oriented approach doesn’t deny the VRIN resources needed for customer oriented approach but plus lay stress on new set of dynamic capabilities: to conduct cutting edge researches and to publish in high quality international scholarly journals; employ the up-to-date technologies and the modern methods of the training and be able to prepare students to solve the challenging and demanding innovative tasks corresponding to the modern business life requirements and workplaces. If HEI employs product oriented strategy, the end products are 80% of graduates with the outstanding capability to exploit received knowledge and skills, their creativity and innovativeness to solve contemporary issues of present and future employers whereas for the last 20% of graduates a product is a very prestige diploma itself. In demographic decline and highly consolidated competition on the marketplace this approach seems the best prospective to HEIs to survive and to compete successively. The HEIs should be able to make strategic shift and quickly reorganize its VRIN resources as well as to transform them and renew the competitive advantage they had. That means that HEIs need dynamic capabilities. The primary dynamic capabilities of HEIs are to sense the necessity of changes of strategy and involve scanning and research of what the employers (customers) needs (Teece 2007). The employers of the companies who use knowledge and skills of the graduates are the customers in the product oriented approach. The dynamic capabilities determine, what technologies to attract for creating the new knowledge and skills for meeting the changing demands of the customers employers, what features new products should comprise, they observe the HEIs structure of cost structure and profit formula and decide how to “redesign” the business model satisfy the market segment which is in need of new products (graduates) and define, how to deliver this products. Practically, the dynamic capabilities are the organizational procedures such as generation of the new products, signing new partnerships, creating the new business models contributory to creating the additional value for the HEIs by the way of manipulating
the existing idiosyncratic resources: HEIs academic personnel, program and reputation. The time lag between the real changes on the market and sensing and seizing by the HEIs is at least 2-3 years, as the HEI has not only to sense the future market changes and to seize the opportunity to change, but also renew the threshold resources like licenses and accreditations certificates. This great time lag differ the HEIs from other companies operating on the market. It gives the special importance to sensing and predicting of opportunities that becomes of primary important dynamic capabilities for the HEIs who wants to survive and develop. Thus, the important task for the HEIs today is switching from the student-customer to the student-product approach. To begin with the forecast of the future market needs and reorganized the existing HEI’s resources. HEI is to decide what VRIN resources are to be transformed to face the new demands, what VRIN resources or organizational assets are to be taken as the new ones and getting rid of resources unable to add value any more. It concerns the curriculum, programs and syllabi first of all. Changes in programs and syllabi can result in necessity to change the equipment, technologies and other tangible assets. When the process of changing the programs, syllabi and infrastructure has finished the HEI faces the problem of supplying the new syllabi with corresponding tutors. When the syllabi and tutors are ready, the process of the students’ competitive selection starts. In case the programs are ready and tutors know what level of knowledge and what specific skills and competences they want to see in their students, the competition among students itself becomes clear. If it is a really competitive selection, the potential students should have the incentive to enter this HEI. Next step of this HEI is to develop competitive advantages on the international scale. Last but not least, the stage is employment assistance. It can be the most problematic for Latvia nowadays, but it is clear, it is the absolutely necessary condition for the long term success. Taking in consideration of average unemployment rate in Europe and particularly in Latvia this stage seems absolute utopia for many small privately run HEIs. We have contributed scientific discussion of dynamic capabilities view by demonstrating new conceptual framework: “ITTO construct” by visualizing how the change of higher educational paradigm can lead toward sustain competitive advantages (see, table2).

Bileišis argues that “…universities themselves have stakeholders who have agendas for profitability (in case of private institutions) while businesses can go about training personnel and developing technology in-house. The value that can be provided to a business by university is problematic in a sense that the product is seldom tangible” (2012, p.181). However, we have excellent illustrative case study of Riga Higher Economic School, the branch of Stockholm School of Economics which underpins our opinion on product oriented approach. The best example of product oriented approach toward students as well as successful international strategy development to sustain competitive advantage is privately runs Stockholm Economic School, having its branch in Riga. The Stockholm School of Economics operates in such countries as Japan, Latvia, Russia and Finland. Latvian branch is Riga High Economic School (School) been started functioning in 1994. The high level of service provided is proven by accreditation with the European Quality Improvement System (EQUIS), which shows that this school meets the most rigorous international criteria. The school cooperates with the best business schools all over the world like London School of Economics and HEC Paris; it also cooperates with a great number of multinational corporations. This fact makes the product of this school (graduates) highly prestigious, the diploma of this school makes the employment in the best world corporations possible, and potential students are ready to choose it among the others. The School presents the programs and syllabi that are the same in all the countries, but they use absolutely different strategies for sweeping the market. The school sets itself as an elite school with very high fees in Russia and in Japan. In Finland, where the education is generally financed by state, the service is practically free of charge for the most categories of students. In Latvia the School implemented hybrid strategy – they started with free admission, but with very rigorous selection of students, thus it created the reputation of really strong and prestigious business school with no sentiments, and to graduate from this school the student should be the best as the product.

Then when the position became strong enough and the school gained its reputation in the Baltic countries, they started charging the service with high fees as well. At first the School employed only the tutors from the head university, and only after several years of operating on the market they start employing the lecturers from the Baltic countries. Certainly, it is possible only in case the HEI has a robust financial support and has ambitions not only to survive but to thrive first of all.
SSE Riga is an example of successful export of famous Sweden University, however Latvian HEIs do not export intensively their educational service, but they quite actively import this service. We want to know: would Latvian HEIs be able to develop and sustain the competitive advantage, pursuing international strategies by exploiting an existing HEI’s resource and capabilities? This forth research question will be answered by using resources based view (RBV) on competitive advantages. Having jointed to the European Union, Latvian HEIs have become a part of the European HEIs. The new status, meaning nothing for our European counterparts, opens new possibilities in the Eastern side. How privately run HEIs can to attract international students? There can be several scenarios – inviting them in Latvia, entering the educational market of target countries and hybrid strategies. All of them have their own pros and cons. Inviting students to Latvia brings a benefits to the country – export increase, but the scale is not impressive so far: 5293 foreign students are studying in Latvian HEIs within 2014/2015 academic year whereas only 1166 students (22.0%) study in big four privately run HEIs (BAT, TSI, RISEBA, BSA). The leading role here is playing by Latvian state run HEIs (Ministry Education and Science of Latvia 2015). For instance, one state run RSU university has got 1233 students from other countries in 2014/2015 academic year.

Entering the market of one of the eastern countries can bring the scale, the great amount of students, but the difficulties are more serious than in the first case. Exporting the HEI to other countries, the HEI faces the issue of employing the new academic staff. The easiest one is employing the local tutors. It has certain advantages – people live in the region, they integrated into local society. Moreover, they know the cultural context of the region, the stereotypes the students have and they are psychologically ready for working in this European branch of the Latvian HEI. The problem is connected with the above discussed VRIN resources: programs, tacit knowledge of tutors and reputation of HEI as the sources of sustained competitive advantages. Tacit knowledge of the personnel of Latvian HEI put forward the comparative advantage, and it can be prolonged and sustainable. Obviously, an organization that wants to develop a successful business in foreign markets should take into account that a competence of employees must be adequate foreign partners’ staff competence (Dzemyda,

Table 2. Dynamic capabilities at privately run HEI: ITTO (input; tool and techniques; output) construct

<table>
<thead>
<tr>
<th>Input (Triggers): What strategic challenges faced privately run HEIs?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sensing Capabilities: What technologies to attract for creating the new knowledge and skills for meeting the changing demands of the customers (employers), what features new products should comprise. It concerns the curriculum, programs and syllabi first of all.</td>
</tr>
<tr>
<td>Seizing Capabilities: Changes in programs and syllabi can result in necessity to change the equipment, technologies and other tangible assets. When the process of changing the programs, syllabi and infrastructure has finished the HEI faces the problem of supplying the new syllabi with corresponding tutors. When the syllabi and tutors are ready, the process of the students’ competitive selection starts.</td>
</tr>
<tr>
<td>Transforming Capabilities: In case the programs are ready and tutors know what level of knowledge and what specific skills and competences they want to see in their students, the competition among students itself becomes clear. If it is a really competitive selection, the potential students should have the incentive to enter this HEI.</td>
</tr>
<tr>
<td>Reinventing of business model: Last the stage is employment assistance. It can be the most problematic for Latvia nowadays, but it is clear, it is the absolutely necessary condition for the long term success</td>
</tr>
<tr>
<td>Output (Result): Product oriented approach of privately run HEIs put in place.</td>
</tr>
<tr>
<td>Table 2. Dynamic capabilities at privately run HEI: ITTO (input; tool and techniques; output) construct</td>
</tr>
</tbody>
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Sources: developed by author.
However, the local tutors have no possibility to adopt the tacit knowledge of Latvian HEI, and it is an insolvable issue. It is quite possible their qualification is high, even sometimes higher than their colleagues in Riga have, but in any case the implicit competences of the Latvian HEI will be lost, and it might become crucial. Another VRIN resource is Latvian HEI reputation. The absolutely natural idea of local students is the following: why should we go to the Latvian HEI, if the same local tutors work there? Local students can enter the local HEI and receive the knowledge from same tutors but for little money. Certainly, the diploma will be of European, but it is the only difference! Under these circumstances it is obvious the competitive advantages will not be sustainable.

The best exit from this situation is seemed to be in employing tutors from the Latvian HEI, they can support the tacit knowledge existing in the head HEI and the reputation of the HEI does not collapse. Here, the problem is of cultural nature. These countries are significantly different from the European ones in cultural dimension (Hofstede 2001; Blodgett, Bakir & Rose 2006). The culture distance seems to be important; it is not easy to sustain advantages if you do not understand the cultural context of the country. Since the work with the students always involves interpersonal component, it might become crucial for the successful teaching processes. This choice might have the problems, existing in the previous case: lack of belief from the local students’ part, lack of exploiting tacit knowledge of head HEI’s personnel and possibility to loss of reputation. The third type of the problem solution is the hybrid strategy. It means the tutors from the head HEI work in the new branch together with the local lecturers. The local lecturers open the mental, cultural and national peculiarities of the local students, and this allows conducting the teaching process much easily and successfully. At the same time the lecturers from the head HEI share their experience and the tacit knowledge existing in the home HEI. The branches are supported through the scientific scholars’ projects, guest lecturers and seminars for local tutors, students and lecturers exchanges. This approach is supposed to be the most pragmatic. With the certain time lag this will result in opportunities to employ only the local tutors. Having answered fourth research question, privately run Stockholm School of Economics should be mentioned a convincing example of successful international strategy in Latvia.

3. Conclusion and future work.

Sustainable development, covering economic, social and environmental development, is gaining the increasing significance in the modern changing world (Belevičienė & Bilevičiūtė 2015). Excellence in higher education is of paramount importance in an increasingly global and competitive economy. The higher education system of Latvia is in need of strategic shift if it is to become internationally competitive, prevent ‘human capital flight’ and turn into a key driver of Latvia’s economic development (Foreign Investor Council 2012). On the organizational level HEIs need new business strategy and the shift of current education philosophy. Latvian HEIs possessed the heterogeneous idiosyncratic VRIN resources to sustain position in the market in past decade. But now the situation has been dramatically changed. The dynamic capabilities of sensing and seizing new external environment as well as transforming of VRIN resources have became strategically important for HEIs. New education philosophy comprises the competitive selection of students, selection of new lecturers, assistance in the graduates’ employment and the feedback from them and their employers, in other words, execute the product-oriented approach. What is more, the privately run HEI would be able to develop successful international strategy. This strategic shift might permit to increase the quality of education, to concentrate financial resources on creation the up-scale HEIs and to provide the real opportunities of the human capital development in Latvia and contribute country’s economic health.

Regarding the limitations, it also seems to be important to attract the tutors to the survey, as their opinion is much more reliable in this respect. We hope the idea presented in the paper has potential to generate a lot of scholars’ discussions and needs to be further researched extending geographical area of research.

The paper made several theoretical contributions. In addition, with respect to dynamic capabilities for sensing, seizing and transforming in particular, we have presented logical structure of competitive advantage paradigm as ITTO (Input, Tools & Techniques, Output) construct for application of dynamic capabilities view (figure 1).
that can be useful to decision makers in shaping business to overcome the challenges and harvest the opportunities presented by the changing dynamics affecting the industry. Failure to adjust to the dynamics arising from the changes would result in the HEIs being left behind and losing out on the opportunities generated by the changes.

**Figure 1.** Conceptual model of research: ITTO construct’s application for dynamic capabilities and business model views on competitive advantages

![Conceptual model](image)

Source: developed by author.

What we can learn beyond the Latvian privately run HEIs industry context from our paper is that to outperform competitors in the long run, successful companies need to continually developing and strengthening their dynamic capabilities and being able to effectively and timely to re-orchestrate and re-transform their resources when opportunities or challenges arises. What’s more, “strong dynamic capabilities alone are unlikely to result in competitive advantage. Difficult-to-imitate (idiosyncratic) resources and good strategy are necessary, too. The strength of a firm’s dynamic capabilities determines the speed and degree to which the firm’s idiosyncratic resources can be aligned and realigned consistent with the firm’s strategy” (Teece 2014, p.330).

4. Acknowledgement

I would like to thank Alija Šaripova-Litkina for research assistance, data collection and analyses for this paper. The article’s preparation would not have been possible without her cooperation. The paper has been supported by the National Research Program 5.2. “Economic Transformation, Smart Growth, Governance and Legal Framework for the State and Society for Sustainable Development - a New Approach to the Creation of a Sustainable Learning Community (EKOSOC-LV)”.

References


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