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THE NEW STATUS QUO OF UKRAINIAN LABOR MIGRANTS' INTEGRATION IN SPAIN

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Abstract

This article discusses results from recent research on the labor migration of Ukrainians to Spain. We begin with a brief description of migratory flows in European countries in the last decades, Spain as a recent destination for international migrants, the conditions that led Ukrainians to migrate and their volume of growth in the Spanish territory. We then shift focus and present the results of an investigation aimed at the current dimension of integration through employment of Ukrainians residing in Spain; this group represents the largest non-EU immigrant population from Eastern Europe. The data obtained through in-depth interviews are analyzed, and some significant conclusions are drawn. This paper contributes to the literature on migrants' employment and integration and presents novel insights into labor mobility flows from Eastern to Southern Europe.

Keywords: Ukraine, Spain, international labor migration, migration and development, Eastern-Southern Europe migration flows

JEL: *F22, J61*

Introduction

Migration and especially international migration became very important phenomena in today's globalized world. According to the World Bank, more than 215 million people, or 3% of the world population, live outside their country of birth (World Bank, 2011). In fact, the estimated number of migrants living in Europe and Central Asia increased by 5.1 million from 2005 to 2010, and one in three of all international migrants in the world reside in Europe (Council of Europe, 2011).

Immigration into European Union countries has risen rapidly in the last two decades due to a combination of multiple factors, including the economic difficulties following the collapse of communism in many Eastern European countries. In addition, the enlargement of the EU with the admission of 12 new members, primarily former communist countries, in 2004 and 2007 has facilitated labor mobility, leading to significant increases in migration within Europe. These migrations primarily occur from

the eastern region to the western and southern regions. In 2011, 48.9 million foreign-born persons were residing in the EU, 9.7% of its total population. Of these, 66.25% (32.4 million) were born outside the EU, and on the 1st of January 2011, more than 75% of the foreigners in the EU resided in Germany, Spain, Italy, the United Kingdom and France (Eurostat, 2012). If all regions of Europe have shared the increase of the migrant population since 2005, its southern area has received the largest share (3.4 million people, with an annual average growth rate in migrant stock of 5.2%) (see for example Council of Europe, 2011). Southern countries in Europe, including Spain, have only recently experienced immigration because traditionally, they were exporters of labor force. Today, however, these countries in the south of Europe have become immigration destinations.

This article aims to make an original enrichment to academic acquaintance on the concept of integration of labor migrants as a key factor for the future cohesion and development of European societies. Integration, in fact, is considered the most effective way to realize the potential of migration (European Commission, 2011). Labor market integration, however, is considered a central factor for full integration of immigrants into the host society. Indeed, employment has a vital role in integrating migrants into society, as it provides not only the primary source of income but also improves confidence in "tomorrow". Thus, the occupation factor is central to the successful integration of immigrants, particularly in societies with a recent and rapid increase in international migrants like Spain, where the problem of how to manage people originating from very different cultures living together presents a categorical challenge. For example, this challenge can be observed among persons of Slavic origin and background, particularly labor migrants, who are now residing in Spain, since there are often wide socioeconomic inequalities with immigrants encountering greater unemployment, over-qualification, low economic attainment and low income. These inequalities are particularly observed among individuals from non-EU countries living in EU ones.

Bernardi and colleagues state that in reality, the involvement of immigrants in the labor market also depends on some factors, including immigration policy, labor market structure and regulation, and pre-existing ethnic community networks (Bernardi, Garrido and Miyar, 2011). Spanish economic development and the involvement of Spanish women in the labor market improved the living conditions of Spaniards. Moreover, better education of Spaniards encouraged them to look for better job positions, and some domestic labor market sectors became unpopular among the native population. Therefore, employment growth affected both the top and bottom structures of the Spanish labor market characterized by its *segmentation*. There were many opportunities for unskilled workers at the bottom of the labor ladder. Thus, in Spain, there was greater complementarity in the labor market between immigrants and natives. Most immigrants hold low-skilled or unskilled jobs and therefore rarely face competition with indigenous workers.

Taking into account the segmented labor market and preferences of Spaniards to find better occupations, the high activity of immigrants in the labor market and their greater unemployment rate in comparison with the native population led Arango and Finotelli to draw the conclusion that the presence of immigrants is substitutive or complementary, rather than competitive, with the host population (Arango and Finotelli, 2009). Unskilled workers are comprised of 15% indigenous workers and 37% immigrant workers; this figure increases to 42% among immigrant women. Immigrant

workers are heavily concentrated in unskilled and low-skilled jobs. Between 2001 and 2006, there was a marked increase in the number of foreign workers in the service sector, but this industry was also the one with the greatest employment growth among native Spaniards (Council of Europe, 2011).

The scenario in Spain reveals that the majority of foreign workers are temporary or low-skilled immigrants. These immigrants, as a rule, are pressed by debts and necessity to find any job to survive or to send remittances to their home country. In this case, the status of the job or qualification could be irrelevant. As a result, immigrants accept these "lousy jobs" that frequently block access toward upward mobility and better occupations. Fakiolas (2003) argues that immigrants, although suffering from low self-esteem in the host country, realistically understand that they could also have experienced worse conditions or even unemployment in their home country, and this is what produces the so called "informed consent", the situation under which immigrants deliberately perceive non-favorable status in the host country as satisfactory in comparison with the even worse status they would otherwise experience in their home countries. In addition, even unfavorable immigrant status enables them to contribute more to the prosperity and well-being of themselves and their families.

In general, the integration concept of immigrants in Spain is built on a traditional industrial economic model and it must be recognized that the post-industrial economy demands a service-oriented, flexible, mobile, and relatively cheap labor force. Examining the productive structure of Spain, which is characterized by small business, the competitive advantage of this system is based on cheap labor costs in comparison with other EU countries. Moreover, the shadow economy of Spain from 1999 – 2007 was estimated at 22-23% of GDP (Schneider, Buehnand and Montenegro, 2010), and in 2009, the informal economy decreased to 19.5% of GDP (Schneider, 2010). In reality, it is the shadow economy sector where immigrants are typically incorporated (Bernardi, Garrido and Miyar, 2011). At the same time, it must be recognized that regular and irregular immigrants are not the only ones involved in the shadow market, as Spanish citizens also participate in the irregular market (Maroukis, Iglicka and Gmaj, 2011). Álvarez de los Mozos stresses that in reality, it is the labor market that will define the social segment of incorporation of an immigrant into the host society (Álvarez de los Mozos, 2007). The existence of the informal labor market creates an imbalance in economic and social systems. This type of labor market should be considered, as it not only determines informal economic activities and the organization of labor, but it also defines social relations and structures that are connected with it (Maroukis, Iglicka and Gmaj, 2011). Taking into account the lack of the regularization of this labor market segment, immigrants become involved in this field through the shadow economy mechanism. In this situation, immigrants as part of the mainstream population are hired on short-term contracts, and the concept of a "good job" becomes more indefinable. These facts lead to the conclusion that emphasis on short-term employability skills and the building of career trajectories could lead to social mobility (Corcoran, 2006).

According to the Zaragoza Declaration 2010, the employment core indicators of migrant integration are the rates of employment, unemployment, and activity (Council of the European Union, 2010). In 2010, there were foreigners of working age in a greater proportion of assets than in the native population. The foreign population of working-age residents in Spain amounted to 5.2 million people, of whom nearly 4 million of people were working or looking for work. The rate of activity far exceeds that of the native population, for which 57.4% were working or looking for work which confirms

that the search for better employment opportunities is the primary reason for the recent immigration. A second distinctive aspect of foreigners is that in 2010, they were suffering from a significantly higher unemployment rate than indigenous workers in Spain (29.8% versus 18.2%) (IVIE, 2011). Although the impact of the economic crisis was heavily felt in the sectors where immigrants are usually incorporated, the employment rate of immigrants is still high. In reality, Spain focuses more on broader social integration than on labor integration.

The reasons of Ukrainian migration in Spain

Ukrainians being the Eastern European immigrants not belonging to the European Union constitute the largest number of foreigners in Spain. Following World Bank data, in the year 2010, Spain (with 6.9 million immigrants) held the seventh position in the world ranking of the top immigrant destination countries and, in contrast, Ukraine was in fifth place among the top emigration countries (with 6.6 million emigrants) (World Bank, 2011).

Spain has recent experience with international immigration, especially from the turn of the 21st century. According to official data, the number of foreign residents in Spain was 1.86% in 1991 and 12.10% for 2012 (INE, 2012). Thus, foreign residents in Spain have therefore multiplied more than 7.5 times in the last two decades. Today, more than 5.5 million persons residing in the Spanish territory have come from abroad. The transformation of Spain from a sending to a receiving country has been characterized not only by the volume and diversity of immigrants but also by the speed of this process over the last few years. The evolutionary chart of the foreign population in Spain presents an upward trend since 2006, which has continued until January 2012 with its maximum population growth in 2007/2008, with 16.5% (INE, 2012). On the other hand, immigration increases in Spain were accompanied by impressive employment growth. During 1994-2007 in Spain, one of the highest rates of job growth was observed; the number of employed increased from 12 million people to 20 million. The majority of job positions were established in the sectors of construction and consumer service, which can be characterized by the presence of “unskilled” labor. Additionally, factors like informal employment, the predominance of small firms, self-employment, and, in some cases, the more cliental nature of social welfare encourages immigrants to come to Spain in search of a better life (Samers, 2001).

As a result of the marked increase in immigration from other countries, Spanish society has become plural. This is not simply a quantitative issue but also a qualitative one, and the process is not likely to be reversed. The origin of the foreign population living in Spain in 2011 was led by persons from the EU-27 (41.6%). Nearly 19% of immigrants have come from Africa (18.8%), approximately 25% are of Latin American origin (the Caribbean and Central and South America), and 6% are immigrants of Asian origin. The 4.1% are from the rest of the European countries (INE, 2012). Anyhow, the largest group in Spain is Romania and Ukraine is the Eastern European non-EU country that contributes the most immigrants. It was 17th of the nationalities in Spain in 2011, representing 1.5% of the foreign nationals residing in the Spanish territory.

In general, the factors influencing the choice of country of residence can be summarized as a combination of geographic proximity, common or similar language, historical links, labor migration, conflicts and political instability, established migrant networks and opportunities for intra-EU mobility. Migrants ordinarily move to neighboring countries

due to the shorter traveling distances and, in many cases, language and cultural similarities (Eurostat, 2012). However, it is clear that migrants who established themselves in a new country often serve as an example for their compatriots to try to gain access to that same country, hoping to emulate the success of the 'pioneers'. These are often family members, but others also see having a social network with the same cultural background in the new country as a useful tool to increase their chances of a successful future. This *'chain migration'* explains why some European countries have relatively large numbers of migrants from countries with which there are no historical ties (Bijl and Verweij, 2012:16). The geographic proximity of Spain to the African continent explains the important volume of the immigrants from African countries in the Spanish territory and the colonial and historical ties with the countries of origin of many migrants have long played a role, and a very high proportion of international migrants living in Spain therefore originate from the Caribbean and South and Central America. In contrast, the chain migration phenomenon could explain the Ukrainian population in Spain. The history of Ukraine, geographically situated in the center of Europe far away from southwestern area, as an independent state is quite brief because its independence was proclaimed with the collapse of the Soviet Union in 1991 (Vollmer, Bilan, Lapshyna & Vdovtsova, 2010). By the end of the 1990s, after the rupture of the planned economy and ineffective social and economic policy, millions of Ukrainians became impoverished. For Ukrainians, one of the ways to resolve economic difficulties has become emigration. The first migration of Ukrainians was observed in the beginning of the 1990s, and labor migration became a mass trend in the late 1990s. Today, Ukraine is considered one of the largest donors of labor force in Europe. The top ten countries of destination in 2010 for Ukrainians were the Russian Federation, Poland, the United States, Kazakhstan, Israel, Germany, Moldova, Italy, Belarus, and Spain (World Bank, 2011).

Ukraine's central location in the Europe-Asia-Africa region leads to the fact Ukrainians who work in neighboring countries (Russia, Poland, Czech Republic and Hungary) tend to prefer short trips with constant return possibilities to Ukraine, while Ukrainians who work in Southern European countries remain working for a longer period of time. To demonstrate the scale of migration among Ukrainians, the World Bank estimated remittances of US $829 million in 2006 and US $5.289 billion in 2008, a more than 6-fold increase (Word Bank, 2011).

The number of Ukrainians who established themselves in Spain during the 1990s was very small, reaching 584 persons in 1998. The following decade with the start of the 21st century, the number of Ukrainians residing legally in the Spanish territory was multiplied by nearly 150; it jumped to more than 85 thousand in 2012. So, the number of immigrants from Ukraine constituted the largest group of non-EU residents from Eastern Europe in Spain. The sudden and intensive influx from Ukraine into Spain may have been due to the idea that Spain was the most convenient destination due to 'chain migration', despite the cultural and idiomatic differences and the lack of historical ties.

As economic theory predicts, the prosperity impact of immigration both on the emigrant and receiving countries depends on the characteristics of the migrants and on the domestic labor market conditions (Strielkowski, 2012). Therefore, concerning the social and demographic characteristics, the 2010 gender composition of Ukrainian immigrants was extremely biased; females were the majority (54.2% versus 45.8%), and this disparity has increased in 2012 with 43.6% males and 56.4% females (INE, 2012). A gender balance was reached in 2006, whereas males had been dominant since

1998. Nowadays, the migration of Ukrainians to Spain can be characterized as feminized.
The dominant age of Ukrainians in Spain (86%) was the active age from 20 to 64, which represents a typical composition of the labor migrant flow. According to official Spanish data, the second largest age group was those younger than 20 years (12.5%) and the smallest age group was those older than 64 years (1.5%). According to the most recent official data, there were 32.2 thousand Ukrainians with a Social Security number in 2010. The number of contracts entered for Ukrainians was 43,886 and the number of Ukrainian unemployed job seekers was 11,714 (of whom 58% were males) (Observatory of occupations, 2011).

Results of the empirical case study amongst Ukrainian migrants in Spain

To study the involvement of labor migration of Ukrainian immigrants into the Spanish labor market, qualitative methods of research, particularly in-depth interviews, were used. The in-depth interviews were conducted face to face with the respondents, allowing the collection of not only numbers but also life stories that assist in the understanding of the full picture of the migration phenomenon. Respondents were identified using the snowball sampling principle as one of the ways to obtain contacts of further respondents. Their characteristics are detailed in the Appendix and the main variables of Ukrainian immigrants in Spain were considered when selecting respondents.
The focus of the research integration analysis was on employment factors of immigrants, including search for job mechanisms, current occupation, equivalence of current job to the education and qualifications of the respondent. Anyhow, the *first and the primary factor that influences the integration of immigrants is legal or regular status*. So, the first topic that will be described is the regular status of Ukrainian immigrants who participated in the research. The majority of the research participants had regular status in Spain, which means they can participate in the life of the host society in an open way and regular status is an important condition for Ukrainian immigrants, as they would like to be a recognized part of the host society and would eagerly partake therein. Thus, nearly 10% of the interviewees were staying in Spain without a residence permit or citizenship status. There were two primary reasons mentioned for this phenomenon: somebody stays in Spain for less than 3 years and, due to certain reasons, cannot apply for a residence permit (e.g., he/she does not have a permanent job, employment contract, etc.); and somebody stays in Spain with the residence permit of another EU country.

With respect to the fact that *time is one of the most significant variables in the integration process*, respondents were asked the length of time they had spent in Spain. There is a group of respondents (36.6%) who can be referred to as “recent residents”, as they had not lived more than 5 years in the Spanish territory. Another similar group (36.6% of respondents) represents immigrants with an “extended stay” period, as they had lived in Spain for more than 9 years. Those immigrants who had lived in Spain for 5-9 years comprise 26.8% of the research participants. Therefore, the migration of Ukrainians to Spain could be considered a non-recent phenomenon because more than 6 in 10 persons had lived for 5 or more years in the receiving country. Nearly all of the interviewees had immigrated to Spain since 2000, which marked the beginning of the mass labor emigration of Ukrainians. Although, the majority of immigrants believe that

their stay in Spain is temporary, and after having accumulated a sufficient amount of financial means, they will return back to Ukraine.

Many researchers recognize *employment* as a fundamental tool for the integration of immigrants into the host society. Angulo Bárcena (2006) states that employment provides not only a feeling of stability and a regular income but also a feeling of economic independence and confidence. One of the respondents confirms this assertion:

"What is money?!…Money gives you a lot…you can feel yourself confident, independent, it really means a lot."(woman, 56 years old)

The results of our research demonstrate that *Ukrainians, as a rule, are involved in the segmented labor market* that produces special niches of the labor market for immigrants. Many researchers stress that immigrant women are concentrated mostly in the hotel, catering and domestic sector, while men are primarily involved in agriculture and construction (Samers, 2001; Corcoran, 2006; Creticos et al, 2006). More than 30% of the respondents worked in the sector of domestic cleaning, which is a very common job for Ukrainian women. The second largest group worked in the sector of construction, which is the principal sector for men (17% of respondents; all men). The third largest group (14%) were qualified workers in different specialized factories or services: fitter, electrician, mechanic, welder, etc. In total, 12.2% of respondents reported that were unemployed and were looking for a job. Nearly 10% of the interviewees were involved in the food sector, as a cook, assistant in a kitchen, and waitress at a bar. More than 7% of the respondents had their own business, such as a "Russian shop" or a transport company. Approximately 5% of respondents were drivers and worked in the transportation sector. The final sector was the occupational area of "computer sciences".

The reasons for the current labor situation of immigrants should also be investigated with regard to the *productive structure of the Spanish economy*. One of the primary features of the *shadow labor market* is its temporality, and in this situation, immigrants can easily be manipulated or exploited because they cannot protect their rights and are afraid of losing their jobs (Corcoran, 2006). This situation explains why employment in the sectors of informal economy does not move immigrants toward successful integration; it does not guarantee secure conditions on the job and limits access to the formal labor market in the long term (Froy, 2006). The next respondent describes this phenomenon by a real life example:

"In general, I can say that I have been working for 7 years, but officially I have a record of service for 3 years and 6 months...(…). Let us suppose that I work there 10 hours: different days I have a different number of portals (…) and for today I have to do 6 hours, tomorrow – 6 hours, and then – 5 hours, in total I have 45 hours, but I am registered for 36 hours...(…) and what I have in reality …as we have in Ukraine, money in the hands and then a little bit more in the envelope …and I am not the first one, everybody is concerned about this. There are many people who work this way. For example, waitresses are registered for half time, and then they have half of a record of service; well, it is not a kind of novelty, I did not actually discover anything new… in Ukraine, so in Russia, and so it is everywhere, because everybody wants to earn". (woman, 52 years old)

Among those who suffer most from *temporary employment* are immigrants involved in the construction sector of the labor market. The following interviewee illustrates the scheme of temporal employment in the field of construction:

"It is difficult to get a long-time contract. If you get a place at any big enterprise, you will get a contract 'til the end of the project or work. And when you finish, you will be discharged. Then, you start looking for a new job. If there were a "work record card" here as we have in Ukraine, I would have filled several "work record cards"; that is, I have changed many jobs. If you get any big construction project, you will work for six months there. And if you have any small construction project, it will be three weeks, month, to make an apartment. And then you have to look for a new job…" (man, 50 years old)

According to Heath and Li, immigrants are in a disadvantage upon arrival, but with time, study of the host language, understanding the recruitment system and work practices, and obtaining new labor skills and experience, immigrants can improve their position (Heath and Li, 2008). Our results show that some of the women believed they had some improvements in their working status in comparison with the time of their arrival in Spain. Upon arrival to Spain, many women were working for Spanish families as in-house ("intern") workers, which means they were living with Spanish families and performing the work concerning the house and family issues. Some women described it as the most difficult time because they felt like slaves:

"I worked as an intern worker, it was like penal servitude, and we worked as slaves, from the moment alarm rang 'til the late night (woman, 59 years old)

While living with Spanish families, the women studied the Spanish language, which enabled them to look for new jobs. Besides, the social capital network assisted in the learning of Spanish labor market peculiarities. A combination of these factors helped Ukrainian women improve their working conditions. This change from being an intern domestic worker to an extern worker was called by female respondents a big step because extern domestic work was connected with the feeling of liberty.

Moreover, 12.2% of the interviewees who participated in our research were unemployed, and one of the reasons for this level of unemployment could be the economic crisis. Angulo Bárcena explained a *high level of unemployment* among immigrants by economic processes and restructuring. Being concentrated in the sectors of the economy that are more affected by economic changes, immigrants especially feel these fluctuations (Angulo Bárcena, 2008). Therefore, immigrants could experience *more employment discrimination* during times of high unemployment and economic uncertainty in the host country (Fakiolas, 2003).

More than 7% of the respondents had their own business. Ethnic entrepreneurs are often considered to be creative people, as they discover new profit-making niches to fill. However, Ålund insists that immigrants, in reality, do not hurry to open their own business, but they are forced toward entrepreneurship by the risk of unemployment (Ålund, 2003). For example, Drbohlav and Dzúrová found that Ukrainians prefer being employees over employers; they prefer to be hired than to open their own business (Drbohlav and Dzúrová, 2007). One of the positive effects of ethnic entrepreneurship is the avoidance of discrimination and other employment complications (Fakiolas, 2003). At the same time, Portes emphasized that the self-employment of immigrants or ethnic

minorities has a common dependence on social networks and social capital (Portes, 1998). The following respondent supports this view:

"One Portugal employer owed me 9200 Euro, I left these money to him. That is why; I wanted to work for myself… Friends, in reality, helped me; they lent me money in order to start my own business, in order I started to work for myself" (man, 46 years old)

Thus, the majority of Ukrainian immigrants to Spain are incorporated into the secondary sector of a segmented labor market which implies low skilled jobs, low paid, worse employment conditions and high level of temporality. Sánchez Urios (2008) explained the involvement of immigrants in the low-paid sector of the economy by *psychological factors*. Among the psychological problems that immigrants encounter during the first-time-stay in the host country are the fear of lacking documents for their legal stay, the language barrier, and the lack of accommodation; many people stress psychological problems as there are many fears and feelings of insecurity. However, the primary psychological problem is the self-evaluation of immigrants. A lack of information on how to use their knowledge and skills make them accept positions that are given, and positions that they occupy move them toward very low self-evaluation; they feel that "nobody needs them":

"The problem of language… the problem of money, the problem that nobody needs us, the problem that everybody smiles at you, but nothing does for you…it's an eternal problem, you are told a lie. Here people are very well-bred, they pay attention to you, very well-bred, promise you a lot, as everybody, but, in reality, we are not needed to anybody except ourselves, isn't it?" (woman, 52 years old)

The problem of worthlessness provokes this undervaluation among immigrants that constructs another barrier for the integration process, as under these conditions, immigrants do not strive for a better job position and accept the situation as unchangeable.

However, it must be recognized that among the key reasons for this observation is not only the productive structure of the Spanish economy but also *the mode of job searching* that is used by these immigrants. Therefore, the following section will be focused on the job search mechanisms of immigrants. Nearly 30% of Ukrainian residents mentioned that searching for a job was the primary problem for them, which was the second most reported difficulty that immigrants faced upon their arrival to Spain (the first difficulty was the lack of language command). The majority of respondents stressed that they obtained their jobs because of their own social capital. This situation could be explained by difficulties of isolation and the lack of a network that could provide more information on the job search.

Ukrainians, as a rule, rely on their social capital system in the process of job searching. The variety of contacts expands from the friends and familiars, church assistance, network of job search up to the recommendations of Spaniards, for example, former Spanish employers. Only a few people placed information about themselves in newspapers and found their job through these announcements.

Outcomes of the present research indicate that only 14.6% of the interviewees had a job that corresponds to their job or education in Ukraine. Nearly 12% of the respondents reported that their job is partially correspondent with their qualifications. *The majority*

of participants (73.2%) reported that their job in Spain did not correspond with their job position or education in Ukraine. To understand the nature of this phenomenon, it is helpful to compare the current jobs of respondents with their home positions. The Ukrainian immigrant respondents were occupied in the following sectors of the Spanish labor market: Cleaning Sector, Construction Sector, Food Sector, Transport Sector, Proper Business, Qualified workers at different types of enterprises, Computer Sciences, and those who were unemployed. The work fields of the interviewees revealed differences by gender. Women were concentrated in Economics, Pedagogy, Medicine, Music, the Food sector, and 18% had technical professions in the construction and mining industries and metalworking. Men were locksmith-plumber, locksmith, toolmaker, mechanic, electrician, tractor driver, plasterer-tiler, builder, and cinema engineer. Men had more technical education/training, and 10% had university degrees in Economics, Automation and Electrification or Computer Sciences; 27% of the women had a university degree. Hence, 12% of Ukrainians who participated in the study consider their current job to partially correspond with their education/experience, and only 15% of the interviewees mentioned that their current job position corresponded to their education or experience gained in Ukraine.

Spain is considered to be among the countries that do not stress the importance of the recognition of skills and qualifications of immigrants, and one of the reasons for this could be that the primary *focus of Spanish policy in this regard is placed on wider social integration rather than labor market integration*. Therefore, immigrants typically fill the lowest-skilled positions. The positive side of this situation is that low-skilled positions are occupied and immigrants start their integration process into the labor market. However, a negative side also exists: skilled immigrants who have low-skilled positions experience frustration and an inferiority complex (Froy, 2006). As nearly 32% of the women worked in the sector of cleaning, we can observe the discrepancy between their actual qualifications and their current working positions. Among those who have work that corresponds to their skills and experience, most are men who continue to work in the transportation sector or as qualified workers in different factories.

Along with the huge amount of *difficulties that immigrants encountered upon their arrival* to the host country, including the *lack of skills in a job search*, difficulties connected with family responsibilities, and social and psychological barriers to work, they experienced additional difficulties connected with the *recognition of their education and qualifications* in the host country (Froy, 2006). This recognition of education or qualifications is a way to find an appropriate job that corresponds to the education and qualifications obtained in the home country. In reality, skilled immigrants need short trainings to coordinate their skills and knowledge with the host country's system. According to the data of our research on Ukrainians in Spain, *nobody received validation of educational documents or work experience*. None of the respondents had their diplomas validated in Spain due to the belief that this would not assist in finding a better job position. As the interviewees mentioned, the primary problem was that their surname was Ukrainian (even if not identified by the hosts as a genuine Ukrainian surname, it could easily be identified as one of Slavonic origin). In other words, the immigrants believed they would have been treated unequally because of their "foreign-looking/sounding" surname, even if their validated diplomas could have enabled them to be treated equally. The interviewees who had been considering searching for employment within their professional field communicated that this would be impossible without the support and recommendation of native Spanish-speaking friends. Building

the basis for such a recommendation acquirement is a matter of accessing the social capital of Spaniards, and accession to this social capital is time consuming. Moreover, throughout the period of acquiring language proficiency, the immigrants have no other choice than to occupy "deaf-and-dumb" working positions to survive and be able to safeguard their accommodations. This language-learning phase is hardly short in temporal terms. In addition, technologies develop within this time, and immigrants may partially lose their qualifications and skills, potentially requiring them to undertake additional professional training or upgrade their skills to be professionally competitive. However, only a small number of the participants attempted to find an occupation commensurate to their education level and qualifications.
One of the primary factors that discourage Ukrainians from obtaining validation of documents is the belief that validated documents will not help achieve a better job in Spain. This case illustrates that immigrants believe the possibility of finding better employment depends not on the education of the person, but on the network of personal contacts or social capital of each immigrant.

"No, I did not make and would not recommend to anybody. As I know too few people who tried to do it, and anyway to get a good highly paid job without familiars that would push you, you will not be able."(woman, 52 years old).

Another barrier that complicates the validation of educational diplomas or work experience is the lack of knowledge of the host language upon arrival to the host country. Studying the host language to the required proficiency level requires many time:

"While you do not know the language more or less normal, it is difficult to find normal work, and with a diploma – it's a very long process... I considered that I did not need it. Especially now I know: I have familiar Spaniards, and a boy, also graduated from Biology Department, but he works for some company, which trades metal, metal products. I asked him "Why do you not work on your specialty?" And he said," Because of little payment." (…) So, he found a hole for himself and settled himself in other way, it is good for him, convenient, and he considers that it can be in this way..." (woman, 47 years old)

However, during the process of language study, it is not only the time that will be lost but also some professional skills. As the next respondent mentioned, technologies move very fast, and immigrants could be out of this sector of the labor market:

"One surely could try, but now electricity went up (rised) at the top level for the time that I am not an electrician. Every time electricity is moving, going up, and again you have to study something ... it's like your computer once and today…" (man, 41 years old)

Moreover, some professions require additional training in the functioning of the host country, as a legislative basis for those whose activities are connected with law:

"The matter is that with my education here, it is very difficult .., here an economist must know very well local laws: you have to retrain – it's the first. Secondly, our diplomas are not valid here, therefore, it should be spent some time for learning, but this time is absent, as here it is necessary to earn dough. Therefore, there is no possibility to study now. And in addition, it ought to be perfect knowledge of Spanish in

order to work in this area, so, it turns out to look for something that does not require advanced knowledge of Spanish and ... as well as Euskera, of course." (man, 25 years old)

Another obstacle mentioned by respondents is the procedure of the validation that requires substantial time, money, and strengths. Moreover, some respondents described in depth the procedure of document validation and all of the difficulties that could be met in the home country, the necessity of regular travel, and the differences in the names of subjects or hours of study, all of which place the topic of validation of educational documents in question. However, even having Spanish professional training or courses does not guarantee better employment, as the surname of an immigrant is still not Spanish:

"And sometimes you come to pass CV to residences or any offices, you bring your CV and you are asked "What is your surname?", and it is Ukrainian one, "Ah…- that is all –" Good bye, we will call you", and at the same time, in your presence they throw your data to the garbage." (woman, 42 years old)

None of the Ukrainians who participated in the research had their educational diploma or working experience validated, as the process is long and requires power and large amounts of money. Moreover, science and technology constantly move forward, and the time required for host language study makes immigrants lose some professional skills in the meantime. Therefore, immigrants need additional courses or training to upgrade and update their knowledge and skills. However, the primary barrier to validating one's education is the belief that this validation will not help with finding a better job that corresponds with the qualifications of the immigrant.

Conclusions and policy implications

To determine the integration of labor migration flows from Eastern to Southern European countries, a qualitative methodology based on in-depth interviews was conducted in Spain with Ukrainian immigrants in 2010, yielding some interesting outcomes.

Ukrainian immigrants were selected because they represent the first group originating from Eastern European countries that are not members of the European Union, and because, in general, immigrants originating from non-EU countries have more difficulties with integration. The volume of Ukrainians residing legally in Spain was multiplied by nearly 150 in the last two decades. According to official data in 2012, there are more than 85 thousand Ukrainian migrants in Spain and a typical one tends to be of working age, female, educated, living in Spain for 5 years or more , and married, with children who are not living with him/her. The factors influencing that intra-European mobility can be explained by the *'chain migration' phenomena.*

The *Ukrainian labor immigrants are faced to some barriers for the integration process* in Spain, a country with a productive structure characterized by small business and with a type of labor market with an important informal sector and very *segmented* that produces special niches of the labor market for immigrants with low-skilled and temporary jobs. This kind of immigrants employments also drive migrants to psychological problems where the self-evaluation of immigrants is the main one.

Many interviewed Ukrainian immigrants mentioned that at their arrival, they accepted poorly paying job positions, worked under difficult conditions, and sometimes even experienced discrimination during the initial period of their life in Spain due to their illegal status. Therefore, obtaining legal status was very important, as it opened up new options in the labor market. We determined that one of the greatest proportions of the respondents worked in the cleaning sector, which was a typical occupation for the female participants. Another labor market sector highly represented by Ukrainians is construction, which is considered a primary professional sector for men. The economic and financial crisis heavily influenced the lives of Spaniards and the lives of immigrants in Spain: 12% of the respondents were unemployed and were looking for a job at the time the interviews were conducted. Other respondents worked in various specialized fields; for instance, women worked in the food service sector (e.g., in restaurants and bars), while men worked in the positions of fitter, electrician, mechanic, welder, driver and in entrepreneurship.

Comparative research into the working positions of the interviewees in Spain and their original education and professional curriculum unveiled a vast discrepancy. Three in every four interviewees had been employed non-correspondingly with their level of the education, professional experience and/or knowledge. A vast share of this discrepancy is subject to the female job positions, as women worked, as a rule, in the domestic cleaning sector although they were educated and experienced in Economics, Pedagogy, Medicine or Music in Ukraine. So, female immigrants did not manage to find employment in the fields of their original professions. Among the male respondents, the situation in the labor market appears to be better, as the majority of them worked in fields that completely or partially correspond to their native education and qualifications (e.g., the fields of construction, transportation, mechanics and IT). *The dissimilarities by gender of the Ukrainian migrants were considerable.*

Such a *discrepancy in the potential/actual occupation* has unfortunately been observed not only within the initial stage of the immigrants stay in the host society. Even though, there was some movement up the professional ladder by Ukrainian immigrants since their arrival to Spain, as the case of many female research participants. At the same time, the female respondents still did not manage to occupy a position commensurate to their original professional level reached in Ukraine.

The *answer to the discrepancies* in terms of qualifications and professions can be reasoned in several ways. The first reason is the economic niche that is shaped *by immigrants for immigrants* and is then maintained by the host society. Nearly 93% of respondents mentioned that they chose Spain as a destination country because of experiences communicated by their friends, relatives, family members or received via special contacts, etc. In other words, the respondents migrated to a “pre-arranged place”, and in this way entered the entry-ready system that has already functioned for many years. This is a relatively safe mode for launching the “new life” in the host country, when immigrants do not yet possess the legal status and do not speak the host language. Language fluency and legal status secured by the residence permit encourage immigrants to look for better opportunities; however, these very often occur in the same framework (i.e., within the known labor niche).

The majority of Ukrainians continue to work in the labor niche that does not correspond to their qualifications, as they believe they will temporarily stay in Spain. This reason can be referred to as the second main obstacle in the immigrants’ path to labor integration. In the beginning, the majority of immigrants believe that their stay in Spain

is temporary, and after having accumulated a sufficient amount of financial means, they will return back to Ukraine. Confidence in the inevitable return to Ukraine makes immigrants comply with and feel satisfied by the current situation and does not stimulate them to look for changes and better employment. The unfavorable job conditions might encourage immigrants to search for better professional opportunities, but these opportunities are often looked for within the same labor niche.

Therefore, even after having learned the Spanish language and having been familiarized with Spanish traditions and customs, the host culture, and the lifestyle of the host people, immigrants still occupy their previous positions. The latter groups seem to satisfy immigrants in terms of financial rewards, but it also seems to make them realistically understand that they could also have experienced worse conditions or even unemployment in their home country and this is what produces the so called "informed consent".

In conclusion, the immigrants' future plans with regard to the host country are among the central factors influencing immigrants to search for better employment and living conditions in the receiving society, which, in turn, is a step forward on the path to integration. As previously mentioned, the host society is also involved in shaping the integration of labor immigrants, and the development of the shadow economy in the host country, with its special niches for immigrants, does not support the inclusion of immigrants into the lives of mainstream society.

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Appendix

Table A: Overview of socio-demographic characteristics of the respondents in Bilbao, Irun, San-Sebastian and Vitoria from June 16, 2010 to September 22, 2010 (language of interviews: Ukrainian)

No	Gender	Age (years)	Administrative Status	Time in Spain	Civil Status	Educational Degree	Origin in Ukraine
1	woman	59	Legal	9 years	Separated	University degree in Economics	Chernivtsi
2	woman	56	Legal	9 years	Divorced	Technical in Mining Industry	Gorodok
3	woman & man	35 36	Legal Legal	14 years 14 years	Spouses	Vocational training in Pedagogy; University degree in Economics	Ternopil
4	man	32	Legal	4 years	Single	Technical School (locksmith)	Sokal
5	woman	38	Legal	10 years	Married (Spaniard)	University degree in Pedagogy	Uman
6	man	53	Legal	6.5 years	Married	Vocational training (locksmith)	Uman
7	woman	59	Legal	10 years	Married	University degree in Economics	Lviv Region
8	woman	52	Legal	8 years	Married	Vocational training in Economics	Kyiv Region
9	woman	27	Legal	2 years	Married	Academy of Music	Luhansk
10	woman	34	Legal	4 years	Married	Technical in Building Industry	Komsomolsk, Poltava Region
11	man	42	Legal	10 years	Married	Technical in Cinema Engineering	Lviv Region
12	man	33	Legal	3.5 years	Single	University degree in Economics	Ternopil Region
13	woman & man	44 44	Legal Legal	7 years 6 years	Spouses	University degree in Economics; Vocational training: mechanic	Mykolaiv
14	man	38	Legal	5 years	Married	Vocational training: Driver	Burshtyn, Lviv Region
15	man	46	Legal	5 years	Married	University degree in automation and electrification	Lviv Region
16	man	41	Legal	4 years	Married	Vocational training: electrification	Ternopil Region
17	woman	44	Illegal	2.5 years	Married	University degree in Pedagogy	Ternopil Region

18	woman	34	Legal	10 years	Divorced	Primary education	Ternopil Region
19	woman	47	Legal	8 years	Civil marriage	University degree in Biology	Ivano-Frankivsk Region
20	woman	51	Legal	5 years	Married	University degree in Medicine	Ternopil
21	woman	23	Illegal	0.5 years	Single	University degree in Pedagogy	Ternopil Region
22	man	22	Illegal	1.5 years	Single	Did not graduate from University	Cherkasy Region
23	woman & man	22 24	Illegal Illegal	2 years 2 years	Civil marriage	Did not graduate from University; Primary education	Transcarpatia Chernivtsi Region
24	man	42	Legal	6 years	Married	Vocational training: Mechanic	Khmelnytsky Region
25	woman	37	Legal	5 years	Divorced	Primary education	Kirovograd
26	man	48	Legal	10 years	Married	Did not graduate from University	Chervonograd
27	man	30	Legal	4 years	Married	Vocational training: plasterer- tiler	Lviv
28	man	33	Legal	12 years	Civil marriage	University degree in Computer sciences	Dnipropetrovsk
29	man	25	Legal	2 years	Married	University degree in Economics	Donetsk
30	woman	28	Legal	5 years	Married	Vocational training in Medicine	Frankivsk
31	woman	41	Legal	10 years	Civil marriage	Technical school: metal working	Cherkasy Region
32	man	46	Legal	6 years	Married	Vocational training: driver	Kolomyja
33	woman	42	Legal	12 years	Married (Spaniard)	Technical school: Building technician	Kamyanets-Podilsky
34	woman	31	Legal	10 years	Married	Vocational training: seller- cashier-inspector	Ternopil Region
35	man	42	Legal	10 years	Single	Vocational training: locksmith – toolmaker	Kamyanets-Podilsky
36	man	50	Legal	10 years	Divorced	Primary education	Lviv Region
37	woman	28	Legal	2 years	Married	University degree in Economics	Lviv Region
38	woman	32	legal	9 years	Single	University degree in Economics & Law	Vinnytsya
39	woman	49	Illegal	2 years	Divorced	University Degree in Pedagogy	Znamyanka, Kirovograd Region
40	man	50	Legal	8 years	Married	Vocational training in Construction	Lviv
41	man	30	Legal	10 years	Single	Primary education	Lviv Region

Source: Own compilations.

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MIGRATION AND UNEMPLOYMENT: A CASE STUDY OF DENMARK

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Abstract

Our paper analysis the link between migration and unemployment based on the case study of selected municipalities in Denmark. Until recently, Denmark has been very generous in terms of opening its doors to migrants from all over the world. As a result, it became one of the favorite destinations for migrants, especially those of non-Western origin.
We employ the cross-sectional econometrics analysis with two time dummy variables and measured the effect which entails the level of the total immigration on the unemployment rate, as well as the effect of presence in the economy of non-Western immigrants, on the unemployment rate as a dependent variable. The influx of immigration on the unemployment rate is not a one measurement of the immigration impact on the economy of the host country. There are many other effects such as a net contribution of immigration to the public sector, effect of immigration on the wage level participation rate and many others.
In general, our results show that changes in the foreigner-born population does not cause the significant changes in the unemployment rate

Keywords: migration, unemployment, wages, cross-sectional data, regression models, public policy

JEL classification: *F22, J33, J61, Z18*

Introduction

In the beginning of the 21st century international migration became an important issue of social and economic agenda in the majority of the world's developed countries. This is of no surprise, as far as today about 100 million people in the world live in a country other than their own. Although immigration is often associated with such traditional immigration-receiving countries as Australia, Canada and the U.S. it has also started to play an important role in Europe. In many EU countries, such as France or United Kingdom 11% and 9% of population respectively are foreign born (Borjas, 1994).
Denmark is perhaps one of the most attractive countries in the world for incoming international migration. It has a really large multicultural society with approximately 5% of foreign population mainly from North Africa, Middle East, and countries of former Soviet Union. In addition, Denmark boasts a high level of employment, as well as developed social and health systems (Statistics Denmark, 2011).

The impact of incoming migration on different socio-economical coefficients is a very hot-debated topic in Denmark. This discussion entailed some restrictions which were introduced in the immigration law in 2002 and permanently strengthen since that time. Recently, the government of Denmark received an accusation in breaching human rights while strengthening immigration law from international society (Bowlby, 2011).
The main objective of our paper is to study the relationship between unemployment rate and immigration level in Denmark during three years, namely 2007 to 2009. We focus on measuring the influx of total amount of immigrants and immigrants with non-Western origin on the unemployment rate.
The influx of immigration on the unemployment rate is not a one measurement of the immigration impact on the economy of the host country. There are many other effects such as a net contribution of immigration to the public sector, effect of immigration on the wage level participation rate and many others. Our analysis is also limited to include yearly Danish economical data running from 2007 to 2009. It is possible to expect that results would vary if we take into account different time periods.

Immigration and unemployment in economic theory

In general, economic theory predicts that the welfare impact of immigration on the emigrant-receiving countries depends on the characteristics of the migrants as well as on the domestic labour market conditions: if high-skilled native workers are complementary inputs to low-skilled immigrants, then the presence of migrants positively affects labour productivity, economic growth and real wages in the target countries.
Results across the studies are not very consistent, however, most of the studies agree on rather negligible effects, either insignificant or small in the extent. Longhi, Nijkamp, Poot (2005) examine 18 studies of the effect of migration on wages and pointed out that results vary across countries and they are related to the modelling approach. Negative and very small effect appears to be robust across studies. The wage response in Austria on the inflows from CEE was found negative, whereas German wages did not show the decrease as a result of immigration (Zimmermann and Winter-Ebmer, 1998).The result from Germany is in line with finding of Lemos and Portes (2008) who did not find adverse effect of CEE migration on UK labour market as a result of EU enlargement in 2004. US labour market was examined very intensively. Butcher and Card (1991) did not find support adverse effects of immigrants' inflows in eighties, concentrating on lower tail of wage distribution as the group of foreign workers was mainly created by less educated persons. Little negative effect was discovered as a result of mostly unskilled migration in Cyprus but only for the group of natives with similar attributes of skills. Influx of foreign workers, on the other hand, results in quite substantial increase in wages of high-skilled natives (Christofides et al., 2007).
Card (2001) in his study highlight that studies usually does not make distinctions among groups of immigrants and use national level of wages and employment for research. Local labour markets and certain occupation mirror the impact more accurately. Borjas (2003) criticises that studies also usually define groups of skill according to the education, while job experience plus education characterize skill groups in much more detail. Both authors concentrate on the examination of the effect of migration within the group they actually enter and their results discover the negative effect on wages and

employment – in competing group of workers, which is basically in line with theoretical models.

Once we consider the quantification of this effect, there are always several facts we have to take into consideration. For example, immigrants may choose their destinations according to the ability of absorb the additional labour supply they are about to provide. But in this case when immigrants place themselves into certain cities, the inter-city migration of natives could offset adverse effects of immigration. As migrants may also self-select themselves into high-wage areas, the impact on wages and employment may be underestimated (Card, 1990; World Bank, 2006). The results from empirical literature may depend on econometric approach taken. The reason why only weak impacts are found in the literature the most often may be the use of cross-sectional attitude. Panel data models that are employed in the analysis of these effects often bring different results (World Bank, 2006).

The assessment of possible effects of inflows of migrants on labour market is not a trivial task. Markets are subject to various shocks and cycles and there are many other factors that play crucial role in determining the result. One of the methods that help to eliminate problems associated with these multiple factors and influences would be running an experiment. This is in principle mostly impossible when it comes to the labour economics of migration; however, there were events in history that allow researchers to study the effect by so called natural experiment. One of the most well-known examples of an experiment in labour economics is the research paper by Card (1990) where the effect of so called Mariel Boatlift and its impact on Miami labour market in 1980 is studied and described in detail. The influx of Cuban workers increased the labour supply by 7 % as half of migrants settled down in Miami. Card (1990) compares the evolvement of unemployment and wage levels with four other American cities and argue that the influx did not have significant impact. Nevertheless, he did not forget to add that Miami had more specific labour market conditions and ability to absorb new labour force comparing to control cities and given its history of immigration (Card, 1990).

The impact of immigration on unemployment rate

According to the available information from the Danish authorities the unemployment is the rate which comes from the full-scale survey of registered unemployed persons. An unemployed person is the one who receives officially benefits with the reasons of unemployment. Unemployed can be considered a person who has actively been searched for the job four weeks prior to the reference date and is able to start his/her job within two weeks after the reference date (Statistics Denmark, 2011). Unemployment rate in Kingdom of Denmark from 2007 to 2009 is shown in Table 1.

Table 1: Full-time unemployed persons over time in Denmark (%)

Year	2007	2008	2009
Denmark	3.7	2.7	5.0

Source: own results

Pischke and Velling (1997) predicted negative effects of immigration on the base of the competitive model. But there are many objections and reasons why it will change the

situation to the neutral or even positive. Labour market could be highly segmented and some low-skilled positions could be unattractive for the native employees (Piore, 1979). Another reason is that the market of labour force could be not well enough explained by the competitive model. If the wages of low skilled employees controlled by the labour unions, hence the result would depend on the union's setup. In this case the increment of immigration could lead to decrease unemployment when native employees and immigrants are complements on the labour market and wages are regulated by the labour unions (Schmidt, 1994). Foreigners could be inclined to enter the secondary market when native employees prefer to be employed on the primary one. If the spillovers effect is limited then substitution effect for the natives on the primary market will be infinitesimal. Apart that, it is worth to distinguish between immigrants and temporary or guest workers who can affect unemployment in different manner in short and long run (Blanchflower and Shadford, 2007). All above-mentioned reasons can crucially change the effect of immigration (Pischke and Velling, 1997). It must be mentioned as well that the immigrants demand some goods and consequently create additional consumption of goods which were created by native labour.
Apart from that, most of immigrants are in the labour active ages and during the employment they pay taxes which could be distributed around native populations. (Ekberg, 1999)

Empirical model: data, variables and model

For our empirical model we collected the data for 99 Danish municipalities for 3 consecutives years: 2007, 2008, and 2009. All the data was received from the official web source of the Statistics Denmark (statbank.dk). Assuming that the dependent variable will be influenced by the compilation of independent variables, we composed the collection of independent variables which captures the local labour market structure.
The unemployment rate is a dependent variable in our model and it is concerned all population in Denmark, together people of the Danish origin, immigrants and descendants. We defined two control predictors to observe the effect of immigration on unemployment rate. These variables are the total amount of foreigners in the labour age in the economy divided by the labour force population and amount of foreigners of non-Western origin divided by the labour force population. In accordance with the fact that dependent variable is impacted by the ample combination of independent variables, apart the influence of the control explanatory variables, the set of the other independent variables involves the variables which explain the local labour market structure. These variables embrace the share of employed on the high, medium and low qualified positions as well as self-employed persons, fractions of people with high (master or PhD level), medium (population with associate degree) and low education (school and vocational education), labour force above 55 and the share of female employees as well as the ratio labour force divided by the total population in the age from 16 to 66 (Galoloway and Josfowicz, 2008).
The impact of immigrations on the unemployment rate is obvious. Immigrations increase the supply on the labour market and increase the unemployment rate. But generally, the unemployment rate is typically affected by the set of independent variables other than the immigration of Western and Non-Western citizens. In fact, unemployment rate can be affected by the structure of labour market, including the

educational, qualification, gender and age structure of the labour force (Galloway and Jozefowic, 2008).

Variables representing the professional structure of the labour force were included into the model to capture the shares of workers employed on the high and low-qualified positions and share of self-employed persons. The sign of HESH and MLESH is ambiguous. It depends upon the requirements of particular labour market. At the same time, the sign of SESH is expected to be positive.

Variables HESH, MESH and LESH entered the model to capture the educational structure of labour force. It is impossible to say clearly about the expected effect of educational variables. It depends upon the requirements of local labour market.

Variables FESH and OELSH were included into the model to measure the effects of presence of female employees and employees who are above 55 years on the unemployment rate. It is impossible to predict the sign of these variables as well.

The variable representing share of labour force in the total population should positively affect the unemployment rate. The bigger the amount of labour forces in total population, the bigger the supply of labour force. It should leads to the consequent increase in unemployment rate.

The form of the model and the list of variables are based on similar models by Pischke and Velling (1997), as well as with Galloway and Josefovics (2008). Although they used panel data analysis with the lagged independent variable, we applied pooled cross-sectional analysis with the introductions of two time dummies.

UR is unemployment rate. FORSH is the total share of foreigners in the labour force. FORNOWSH is the share of immigrants of non-Western origin in the labour force. POPRAT is the ratio of the labour force to the total population in the ages 16-66. SESH is the share of self-employed in the labour force. HESH is the share of employees, who occupied high-skilled positions in the labour force. MLESH explains the share of labour force which occupied medium and low-skilled positions. HESH is the share of labour with high education. MEDSH is the share of labour force with medium education. LEDSH is the share of labour with low education. FESH is the share of female labour in the labour force. OELSH represents the share of the labour elder than 55 in the labour force. $У_1$ and $У_2$ are time dummy variables, where reference year is 2007.

This is the basic model which was used to measure an influence of the immigration on the unemployment rate, where some variables contained multicollinearity. Due to this reason, we represented four adaptations to this model. The additional models were created by the substituting the corresponding one by one each of the control independent variables (FORSH or FORNWSH) without changing the form of the model for two sets of independent variables. To prove the result of the previous model, we constructed the model with the lagged independent variables. We run the models for two sets of years to measure the effect of immigration on unemployment before and after shock.

The aim of second model was to capture the effect of lagged independent variables on the unemployment rate. The model was run for two period of time: before and after the crisis to check the effect of immigration within two periods. The results of this model were consistent with the result of running previous pooled cross-sectional model with two time dummies. We decided to use log-linear functional form of our model because this form is most appropriated for the proceeding of the collected data.

Variables responsible for measuring the socio-economical position and education are likely to cause multicollinearity. With this purpose, we split up our set of independent

variables in two sets with the purpose to avoid obvious multicollinearity between independent variables (Studenmund, 2005).

- **Set 1:** Dependent variable: LnUR; Key independent variable: FORSH or FORNWSH; Independent variable: POPRAT, SESH, MLESH, FESH, OESH

- **Set 2:** Dependent variable: LnUR; Key independent variable: FORSH or FORNWSH; Independent variable: POPRAT, SESH, MEDSH, LEDSH, FESH, OESH.

Because of the economical and social reasons most of the immigrants are low-qualified or with the comparatively low educational level (Ekberg, 1999). Therefore, the variable which represents the share of the population with the high education (HEDSH) and variable which represents the share of the population who obtained the high-skilled positions (HEDSH) were excluded from the regression model.

Preliminary running regression model revealed harmful multicollinearity in general model. To solve this problem we excluded variables applying criteria of logical absence of cause ─ consequence relationship between explanatory variables. It is possible to see that variables representing educational structure (HEDSH, MEDSH and LEDSH) are perfectly correlated. There is also perfect linear relationship between variables representing professional structure of employees (SESH, HESH and MLESH). So, one of the variables from each of abovementioned group needs to be excluded from regression model. Apart that, it is possible to observe imperfect correlation between these two groups of variables. It does not allow using them together. The explanation could be the requirements of labour market. In the most cases they do not allow to move upward and take positions without appropriate level of education.

In accordance with the aim to evaluate and compare the regressions models, we utilized Adjusted R^2. Adjusted R^2 determines the percentage of explanation of the dependent variable in the model by the set of the independent variables (Studenmund, 2006). In our case the dependent variable in all four models are explained very well by the set of independent variables.

The application of the F-test is the testing regression model for the overall significance, or the casualty of relationship between dependent and independent variables. It is used together with its related P-value revealing acceptability of the model on the adopted level of significance (Kennedy, 1998). In our case, all four models are acceptable due to the fact that P-value is equal 0.000. The examination of the t-statistics performance revealed the significance level of the each separately taken independent variable (Studenmund, 2006).

The preliminary regression model revealed some heteroskedasticity which we noticed during the inspection of the scatter plot. We detected heteroskedasticity by the applying Breusch- Pagan test, and White test. According to the outcome of these tests, the heteroskedasticity within our model was proved (Gujarati, 2004). We have made several improvements as a remedy for the heteroskedasticity problem. Firstly, we modified the model by transforming it into the log-linear form. Secondly, we used the robust standard errors. The heteroskedasticity-corrected standard errors are applied to avoid misleading results due to heteroskedasticity. The advantage of the applying the robust standard errors method is that, it provides opportunity to derive estimators that being biased are more precise than ordinary least square standard error (OLS) estimators (Studenmund, 2006).

As it was stated before, preliminary running of the general model indicated the harmful multicollinearity. In order to solve this problem we improved the specification of the model, and split up the variables between 2 sets using the criteria of logical absence of cause-consequence relationships between independent variables. These steps decreased the VIF to the acceptable level. In all four models VIF was less than 6 (Greene, 2008).
The OLS estimation in the first and third models showed that the control variable FORSH is positive and insignificant, which means that the increase of the share of foreign employees in the labour force leads to the increase of the unemployment rate insignificantly.
The second control estimated coefficient share of foreigners on non-Western origin in the labour force (FORNWSH) is positive and insignificant in the second and fourth models. Other relevant studies revealed the correspondent effects (Pischke and Velling, 1997).
In the first and second model the share of medium and low-skilled employees (MLESH) is significant at the 5% level of significance. This fact implies that with the increase the share medium and low skilled employees by one unit the unemployment rate will increase for the 10%.
The medium educated (MEDSH) share of labour force is negative but insignificant in the third model. The same result was obtained from the regression in the Model 4.
The low educated share (LEDSH) of labour force is significant at 10% level and has a positive impact on the dependent variable within the Model 3and Model 4.
The share of female (FESH) employee in the labour force is significant at the 5% level of significance and affects positively the unemployment rate, in all four tested models.
The population of the labour force older than 55 years old (OELSH) is significant at the 5% significance level and negative in all four tested models.
First time dummy variable ($У_1$) is significant at the 5% level of the significance. It has a negative sign indicating by how much unemployment rate in 2008 differs from benchmark year.
Second time dummy variable ($У_2$) is also significant at the 5% level of significance and positive in all four run models and indicates the difference between unemployment rate in 2009 and reference year.

Conclusions and policy implications

Our paper attempted to estimate the influence of the total immigration and immigration of the people of non-Western origin on the unemployment rate in Denmark. Previous studies revealed different effects of the immigration on the unemployment rate. We collected the data which allowed us to observe and measure the present impact of the immigration. Our results are consistent with previous study made by Galloway and Josefociz (2008) in relation of the neutral effect of the immigration of foreigners of non-Western origin on employment situation. But, it turned to be inconsistent in terms of the influence of total amount of immigrants on the unemployment rate. In comparison with earlier studies, made by the Pischke and Velling (1997), our results revealed some other effects. The explanation of these differences could be the various labour situations in Germany and Denmark, divergent economical conditions, structure of the labour force and financial crisis which impacted all field of the economical life in Denmark. Apart the economic and geographical reasons our results appear to be different because of the

technical reasons such as: short period of analysis, obvious shock of the economy in 2008, choice of variables and other reasons.
In accordance with obtained results it is possible to say that immigrants make no detrimental effect on the situation of the labour market. Though, recently Danish government adopted the set of reforms which made some effort to complicate the procedure of immigration and limit the immigration inflow.
Generally, it is impossible to state definitely about the neutrality of immigration effect. There was not taken into consideration many other causes which could drastically affect the relationship between unemployment and immigration. Adjustment time, language proficiency, cultural differences, trap of benefits and many other reasons can impact the participation rate and consequent unemployment in the short and long run perspective.

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EUROPEAN UNION AND BELARUS: A NEED FOR MORE PRAGMATIC APPROACH?

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Abstract

This paper aims to assess limits of the European Union's ability to prompt the process of reforms in Belarus as a function of the conditionality approach's effectiveness. The Republic of Belarus stands out among other EU neighboring countries and represents a certain dilemma for the European Union. The EU's commitment to democratic values determined that the Union's policy towards Belarus has been mostly based on the principle of political conditionality. In the light of the present state of relations, the recent experience of political rapprochement during 2008-2010 should be interpreted rather in context of a number of external factors which shifted the EU's policy towards Belarus to a more pragmatic approach.

Keywords: European Union, Belarus, Eastern Partnership, political conditionality

JEL classification: *H77, Z18*

Introduction

Following the disintegration of the Soviet Union, the EC and later the EU aimed at ensuring security and stability in the politically reorganized Eastern Europe region. At the same time, being a 'normative power', the EU aimed at spreading its political values across the region, acting as the most active promoter of democratic principles and human rights in Eastern Europe (Manners, 2002).

Among all newly independent states (NIS), Belarus has never expressed its interest in European integration. In this way, Belarus represents a certain dilemma for the EU in terms of finding an appropriate policy approach towards the country.

The EU's attempted different approaches in developing an effective policy towards Belarus: from reactive policy of isolation and sanctions to active policy of constructive engagement. Both domestic political developments in Belarus and wider geopolitical situation in the region have determined the EU's policy approach.

Up until now, Belarusian authorities having substantial political and economic support of Russia proved to be unresponsive to the EU's pressure. The implications of new energy-political model of the Belarus-Russia relations and the Caucasian military conflict of 2008 created strong incentives for rapprochement between the EU and Belarus. Following a short period of political rapprochement and constructive dialogue during 2008-2010, the EU-Belarus relations returned to the square one of factual isolation.

The paper at first describes the EU's aims in the 'shared neighborhood' region in the context of the European Neighborhood Policy (ENP) and the Eastern Partnership (EaP) initiative. Second, it presents the evolution of the EU's reactive, based on the principle of political conditionality, policy towards Belarus. Third, in order to explain the reasons of inefficiency of the EU's conditionality approach, the determinants of the Belarusian foreign policy are discussed. Forth, the paper interprets the recent improvements in the EU-Belarus relations as a result rather of external factors. Finally, the paper concludes with the negative assessment of the EU's leverage to prompt the process of democratic reforms in Belarus in the context of the present state of relations.

European Union as a regional player in Eastern Europe

In the aftermath of collapse of the Soviet Union and the disintegration of Warsaw Pact, the geopolitical situation in Eastern Europe changed dramatically. The newly independent states of the post-Soviet area emerged as sovereign political subjects. Following the process of recognition, the European Communities (European Union) had to reconsider its policy towards the post-communist countries and develop a new model of relations with them. While some of the countries (Poland, Hungary, Czech Republic, Slovakia and the Baltic States) clearly expressed their aspiration for the EU membership, the others, including Belarus, were not considered as a potential member states. Thus, the EU enlargement policy determined relations with one group of the countries, while the others were targeted as objects of the eastern dimension of the Union's foreign policy.

Against the background of the planned 2004 EU enlargement the ENP created a competition for the Russian-led Commonwealth of Independent States project in the 'shared neighborhood' region. The Kremlin perceived those countries as traditional Russian sphere of influence and interests, using the term of 'near abroad' with regard to the new EU's eastern neighbors. Official Moscow welcomed the ENP with a caution, as it considered the EU-Russia relationship as a ‘zero-sum game’, in which greater influence of the EU over the region would necessarily mean lesser influence of Russia (Adomeit, 2011).

In December 2002, President of the European Commission Romano Prodi declared: *“we have to be prepared to offer more than partnership and less than membership” to the countries not covered by the EU enlargement policy”* (Prodi, 2002). Therefore, the ENP offered its partner countries the opportunity to take part in a number of EU activities through greater political, security, economic and cultural cooperation, albeit below the membership level. The aim of the emerging ENP policy was to extend to the neighboring region a set of principles, values and standards which define the very essence of the European Union, namely market economy, liberal democracy and the rule of law.

In March 2003, the European Commission in its communication to the Council and the European Parliament proposed that “the EU should aim to develop a zone of prosperity and a friendly neighborhood” (European Commission, 2003). The communication, emphasizing the EU's aspiration to establish the “ring of friends”, which would share common political and economic values, formed the basis of the following Strategy Paper on the European Neighborhood Policy.

In May 2004, the European Commission presented the Strategy Paper on the ENP, in which the common principles and objectives were laid down. Since the policy was

launched, the ENP aimed at "sharing the benefits of the 2004 EU enlargement with neighboring countries in strengthening stability, security and well-being for all concerned" in order "to prevent the emergence of new dividing lines in Europe" (European Commission, 2004). The ENP pragmatic interest aimed at strengthening stability, security and well-being, while establishing the ring of friends with common political and economic values became an another priority.

An important feature of the emerged ENP was its asymmetrical character. The EU, aiming to promote its values, political and economic standards, in practice created the situation, when partner countries, being in the policy-taker position, were expected to comply with the EU's conditions. As a point of reference in this context will serve the opinion, that throughout the 1990s the prospect of joining the EU provided the decisive incentive for CEECs to comply unilaterally to the acquis communautaire (Gänzle, 2008). From that perspective, the EU's transformative power in its neighbourhood without the membership 'carrot' was less evident. Some researchers argued, that there was a certain disproportion between the number of commitments and tasks that the partner countries must carry out and the benefits promised by the EU (Pełczyńska-Nałęcz, 2005).

Without promise of future membership the ENP was not able to accelerate intended partner countries' reform process by itself. Thus, success of the ENP was dependent on the policy takers' willingness to accept the 'carrots' lesser value than the membership prospect. Against this background, external factors acquired a great significance for the partner countries' reform process. In this context, factors such as economic crisis and growing tensions in relations with Russia, could seriously affect the political and economic developments in the countries in question in the positive direction for the EU.

The Eastern Partnership initiative, being the extension of the eastern dimension of the ENP, aimed at increase of the EU's political influence in the six post-Soviet states in between Russia and the EU. The Eastern Partnership Declaration stated the necessity to sustain stability in the region and to create the appropriate conditions for political association and further economic integration between the European Union and its Eastern partners (The Council of the EU, 2009). In the context of Russian-Georgian military conflict of August 2008, the EaP acquired a distinct geopolitical shade. Even though the rhetoric of Russian threat had been left out, the Kremlin's geopolitical concerns determined that Russia's stance on the Eastern Partnership project was clearly negative (Adomeit, 2011). Russian Foreign Minister Sergei Lavrov statement illustrated such Moscow's position: "*what is the Eastern Partnership, if not an attempt to extend the EU's sphere of influence, including to Belarus*" (EU Observer, 2009).

Although 'sphere of influence' term is not present in the official EU political discourse, the Russian Foreign Minister's assessment was right. The EU's Eastern Partnership programme essentially aimed to expand its political influence over the partner countries by "support political and socio-economic reforms of the partner countries, facilitating approximation towards the European Union" (Council of the EU, 2009). Moreover, the Kremlin was concerned with the economic component of the partnership, as it might compete with Moscow's plans on Customs Union of Belarus, Kazakhstan and Russia.

Evolution of the EU's policy towards Belarus

Belarus was the last post-communist country to sign the PCA with the European Union in March 1995, but ratification of the agreement was postponed and it never entered into

force as a result of domestic developments in Belarus. Before the November 1996 referendum in Belarus, the European Parliament in its resolution urged Belarusian authorities to fully respect basic democratic and human rights in order to proceed with the PCA ratification (European Parliament, 1996). However, the 1996 referendum brought amendments to the 1994 Constitution putting a stop to first practice of the EU's conditionality approach.

In September 1997, the European Union froze the ratification of the PCA and the Interim Agreement (regulating EU-Belarus trade), refused its support for Belarus' membership in the Council of Europe, refrained from high level official contacts with Belarus, suspended all assistance except humanitarian and regional projects and projects directly supporting democratization process (The Council of the European Union, 1997). De facto those measures led to the country's isolation from the West: Belarus became the only European country to have no formal treaty relations with the EU and to be refused membership of the Council of Europe. The isolation de facto turned into an isolation de jure, when as the result of the so-called 'Drozdy diplomatic conflict' in the summer 1998 the diplomatic relations had been broken for more than one year (Van Elsuwege, 2010).

In 1998, the OSCE Advisory Monitoring Group to Minsk recommended to remove gradually the EU's restrictive measures. The AMG achieved certain success in promoting dialogue between governmental institutions and representatives of opposition and in approximation Belarusian electoral legislation with international norms, reporting improvement of domestic situation in Belarus (OSCE 1999). Subsequently, in early 2000 the EU broadened its assistance to Belarus by supporting the small private enterprises, low-level authorities contacts, educational exchanges and cross-border cooperation.

In May 2000, Belarusian Ministry of Foreign Affairs adopted a concept of responsible neighbourhood, which stressed the necessity of finding “a civilized, balanced compromise on matters of common interest” and suggested the EU to refuse its policy of sanctions in favor of “constructive and mutually beneficial cooperation” in line with the “principle of noninterference in the internal affairs of another state” (Sharapo, 2006). In other words, the Belarusian authorities aimed at unfreezing of economic relations with the EU and its detachment from the country's domestic politics.

However, the so-called 'step-by-step' approach, introduced in 1999, was based on the principle of political conditionality as well. It implied that “clearly identified steps of the Belarusian authorities towards the democratization would be paralleled at each stage by gradual resumption of dialogue with the Belarusian government and broader assistance

, ending with full normalization of relations” (European Commission, 2007). Thus, the proposition of the Belarusian authorities to detach economic relations and functional cooperation from domestic political developments at the time turned out to be unsuccessful.

As the following parliamentary and presidential elections fell short of being free and fair according to the European observers (OSCE, 2000, 2001), the EU's offer of normalized relations under the 'step-by-step' approach was insufficient to promote the process of democratization in Belarus as well. Potential benefits of normalization of relations with the EU were not adequate to the EU's demands, which posed a threat to the Belarusian leadership's grip on power.

In response to the results of the parliamentary elections in 2004, the EU introduced a visa ban on a number of high-ranking Belarusian officials, decided to minimize official contacts with the country's authorities and encouraged its Member States to do so in their bilateral relations with Belarus (Council of the EU, 2004). The visa restrictions and minimization of the official contacts strengthened the isolation of Belarus from Western Europe and undermined the possibility to find a ground for a "mutually beneficial cooperation".

The European Neighborhood Policy, introduced in 2004, preserved the principle of political conditionality: "Belarus and the EU will be able to develop contractual links when Belarus has established a democratic form of government, following free and fair elections. It will then be possible to extend the full benefits of the European Neighbourhood Policy to Belarus " (European Commission, 2004). In accordance with the dual-track approach, the EU limited its contacts with the official Minsk to required minimum, while at the same time intensified its contacts with opposition and strengthened its support for civil society.

The document titled "What the European Union could bring to Belarus" brought more clarity in terms of what reform measures are requested and what kind of benefits can be expected. The EC presented 12 conditions to be fulfilled by the Belarusian authorities, among which were the release of political prisoners, organisation of free and fair elections, abolition of the death penalty, respect for the basic human rights and freedoms, halt to persecution of the opposition activists and oppositional media (European Commission, 2006). The above mentioned demands were clearly not realistic for the Belarusian officials, posing potential threat to his political future. In this light, it is hardly possible to find an adequate set of benefits in exchange. Thus, the lack of balance between the EU's great aspirations to influence the Belarusian politics and weak offer in exchange was evident.

On the whole, up until recently, the Belarusian leadership has proved remarkably unresponsive to external criticism, influence and pressure, prompting the European Union to describe the international isolation of Belarus as 'self-imposed' (Rontoyanni, 2005). Having significant economic and political backing from Russia, Belarusian authorities were not willing to take any steps that might threat his political power for the sake of improving relations with the West, neglecting political demands and proposing pragmatic cooperation in economic sphere. Belarusian authorities insisted on EU's noninterference in the domestic political situation, arguing that Belarus does not pose any problems to the EU.

Moreover, the dual-track approach with the possible 'stick' in a form of economic sanctions constituted another controversial issue. It was quite difficult for the EU to find a balance between a strict policy vis-a-vis the official regime on the one hand and supporting the Belarusian people on the other. Clear example of such a challenge would be the exclusion of Belarus from the EU's Generalised System of Preferences, which had a negative effect on labour in certain sectors of Belarusian economy.

Against this background it is worth to mention the lack of consensus in the European Union on the issue of political conditionality. The non-compromising approach, presented in the November 2006 Non-Paper, was not shared by all the EU Member States. Some of them, particularly neighbouring Poland and Lithuania, adhered to the strategy of engagement with the official Belarusian authorities in order to encourage them to start desired transformation process. The logic of such an approach is based on conviction, that the dialogue itself would stimulate the process of reformation. In this

context, the proposition of former Polish president Aleksander Kwasniewski (2006) “to give Belarus a chance to leave behind its isolation and open itself to possibilities for cooperation” could be illustrative.

Determinants of the Belarusian foreign policy

In the early years of its independence, Belarus, like the other former Soviet republics, witnessed a debate on changing the geopolitical orientation and choosing the appropriate models of relations with Russia and the Western Europe. However, the proposition of strengthening the country’s independence by distancing it from Russia did not gain a determining influence over the official policy. Starting from 1994, the idea of re-integration with Russia became a cornerstone of Belarusian foreign policy. The official Belarusian leadership has never shown the appropriate interest in joining the process of European integration focusing mainly on Russia.

Due to its long history of subordination to Moscow and consequent suppression of its cultural identity, it became widely accepted that at the time Belarus lacked a firm national identity (Ioffe, 2008). Therefore, close integration with Russia, leading potentially to the re-unification process, gained widespread support in the Belarusian society of the early 1990s.

As another factor determining Belarusian foreign policy, it worth to mention the country's extreme economic dependence on Russia, due to the country's structure of production and trade, extremely high level of energy consumption, as well to the fact of absence of essential natural and energy resources (Zlotnikov, 2009).

Belarus inherited form the Soviet Union an extremely industrialized economy: being known as the ‘assembly plant of the USSR’, only a small part of the Belarusian economy worked on domestic needs and the majority of the goods produced in Belarus were exported mainly to Russia and to other Soviet Republics. Belarusian industry used raw materials, energy resources and components, delivered by central plan at non-market prices from different parts of the Union. With gaining independence, the loss of well-established economic ties caused significant economic downturn during the transformation process.

Within the Union State framework, Belarus and Russia have developed a very specific energy-political model of relations, ironically characterized by commentators as “gas and oil in exchange for kisses” (Klaskouski, 2010). The Union State integration project provided Belarus with a serious economic concessions while Russia gained Belarusian geopolitical loyalty and promises of further integration. Belarus was able to maintain this very advantageous relationship with Russia mainly because of its unique political and military-strategic significance finding itself in the position of 'Moscow’s last ally' (Balmaceda, 2009).

While Belarusian authorities were mostly concentrated on obtaining economic benefits flowing from the integration process, the Kremlin perceived the relations with Belarus as tool to recover the international prestige of Russia. Rapprochement with Belarus was in a way a response to the crisis of the Commonwealth of Independent States project and was intended to become a success story for other counties of the region (Eberhardt , 2008).

Consequently, economic benefits of integration with Russia made a substantial contribution to the so-called Belarusian 'economic miracle': cheap gas guaranteed vital level of competitiveness for obsolete enterprises, while duty free re-export of Russian

oil ensured positive trade balance. This significant economic backing from Russia allowed a specific Belarusian political regime to withstand the external pressure from the European Union. Belarusian leadership was not willing to take any steps that might threat its political power just for the sake of improving relations with the West, while the EU was clearly unable to offer comparable economic concessions.

The status quo, preserved up until 2006, when Russia, announced the intention to redefine its relations with Belarus in order to make them more pragmatic. Russian leadership was prone to generously subsidize Belarusian economy with the long-term goal to incorporate the country (Kononchuk, 2008). Not seeing any greater commitment from the Belarusian side to deepen the integration within the Union State framework, the Kremlin decided to use its most powerful lever of influence, namely increase in the prices of energy supplies.

According to estimates by the International Monetary Fund, in 2004 the preferential prices of Russian energy resources subsidised Belarusian economy to the effect of 10 percent of its GDP (IMF, 2005). Therefore, changing the energy-political model of relations with Russia threatened to undermine the factors of economic growth and stability in Belarus. Following the impressive GDP growth over past 10 years, Belarusian authorities' inability to satisfy growing economic aspirations of its citizens could lead to a rapid political destabilization of the country. While uncontrolled change of the Belarusian authorities was not of the Russian interest as well, official Minsk and Moscow found a way to soften an economic shock. Belarus was offered a gradual, set in advance, transition to European gas prices in exchange for further geopolitical concessions.

Since 2007, when Belarus started taking measures to offset the effects of the energy crisis as much as possible, the issue of multi-vector foreign policy came back to the official discourse. Belarusian authorities called for opening up the markets and closer cooperation with the EU in mutually beneficial fields, especially energy. However, such a reorientation of the country's foreign policy should be analyzed in the wider context. Taking into account, that geopolitical loyalty of Belarus is the main lever of pressure in the bilateral relations with Russia, the announced rapprochement with the West was rather a bargain with the Kremlin (Gromadzki, 2009).

The negative effect of the above mentioned change in the energy-political model of relations with Russia was not the only factor prompted the Belarusian authorities to redefine its relations with the European Union. In 2008 some new factors appeared which implications contributed significantly to reorientation of the Belarusian foreign policy (Gromadzki, 2009).

First of them is the Russian-Georgian military conflict. The issue of recognizing the independence of South Ossetia and Abkhazia become a subject of political bargaining between Belarus and the European Union. Belarusian leadership, being involved in the political union with Russia, was naturally expected to fulfill the political ally's duty. In the context of announced Eastern Partnership initiative, the EU concentrated its efforts rather on Belarus refraining from recognition of South Ossetia and Abkhazia, that on democratization of the country. Despite enormous pressure from Russia, Belarus still is not among countries recognizing the independence of the two break-away republics.

The global economic crisis and its implications on the country's economy were another important factors in the context of the Belarusian foreign policy reorientation. Decrease in global demand, especially on the Russian and European markets, immediately resulted in trade balance problems for a small and relatively open Belarusian economy.

In order to cover growing trade balance deficit Belarusian government urgently needed to attract external financial resources to the country. In order to obtain the Western capital in the form of credits and investments, Belarusian authorities became more amenable to start gradual liberalization of its economy in accordance with the IMF suggestions. This created a possibility to influence political developments in the country through economic conditions. However, the political concessions Belarusian authorities made in order to revitalize the economic ties with the European Union, have had a merely cosmetic character (Silitski, 2009). Such a tendency complies with the official Minsk' logic mentioned above: while closer economic ties with the EU are essential in the context of the Russian subventions' cut, broadly understood democratization could relinquish Belarusian leaderships' grip on power.

The Belarusian government maintained the position that improved relations should be beneficial for the European Union not less than for Belarus. According to Belarusian officials, engagement with the West was a purely geopolitical exchange, therefore the EU should not consider Belarusian leadership under obligation to pay for the dialogue with painful political reforms, but rather its willingness to strengthen the Western vector of the country's foreign policy should be rewarded by the EU (BISS, 2009).

New opening in EU-Belarus relations during 2008-2010

The energy rows of the beginning of 2007 between Russia and Belarus, which affected directly the interests of the EU, together with changed geopolitical situation in the region after the Russian-Georgian military conflict, prompted the EU to rethink its approach towards Belarus. The stakes were high enough for the EU to give up some democratic demands in order to engage the Belarusian leadership further (BISS, 2009).

Previous EU's strategy, based on the principle of conditionality, in total appeared to be unsuccessful and produced almost no results. The incentives were not strong enough to encourage Belarusian authorities to start a painful process of the country's democratization. By august 2008, the Belarusian government met only one of the demands, namely the release of all internationally recognized political prisoners. Nevertheless, in the light of the above mentioned factors the EU's policy towards Belarus shifted to a more proactive one: the dual-track approach, implying limits on official contacts, was replaced by policy of constructive engagement with the official Belarus authorities. Accordingly, as Sabine Fischer (2009) precisely characterized, in 2008 Belarus-EU relations started to “back from the cold”.

In October 2008, the Council of the European Union noted “with satisfaction” the progress made during the parliamentary electoral campaign compared with previous elections (Council of the EU, 2008). Consequently, in January 2009 five new conditions for Belarusian authorities in order to improve its relations with the EU (European Parliament, 2009). The demands represented a potentially more realistic to comply with conditionality, and despite the fact of a very selective liberalisation of the political and economic life in Belarus, the EU gave an early signs, that it would continue its engagement with the Belarusian leadership.

Thus, it is possible to conclude, that trend of further rapprochement with Belarus, inspired by the concept of 'soft power', was fairly strong in the European Union at the time. The logic of a ‘soft power’ implies that even a limited engagement, primarily in the economic and humanitarian spheres, would help to open Belarusian society and promote a political change in the country in the long-term perspective (BISS, 2009).

The Eastern Partnership project, formally launched on 7 May 2009 at Prague Summit, became a new stage in development of the EU-Belarus relations. Inclusion of Belarus in the initiative, being from the very beginning a controversial issue, as the European Commissions in its working document made reservation: "the level of Belarus' participation in the EaP will depend on the overall development of EU – Belarus relations" (European Commission, 2008).

The fact, that Belarus was invited to take part in the Eastern Partnership as a full member in a way legitimized the official Belarusian authorities. The EU made an advance payment for the country, as the official Minsk had not taken any considerable steps to liberalize the country's political system during the preliminary six-month suspension of visa ban. The context of the recent military conflict in Georgia and the issue of recognition of South Ossetia and Abkhazia independence might explain the EU's decision.

The Belarusian authorities in particular welcomed the Eastern Partnership initiative as they considered this geopolitical project as a break from the conditionality-driven ENP. When the language of shared values and conditionality was brought back to the EaP discourse, Belarusian officials declared that Belarus would take part only it the programs that it finds suitable (BISS, 2009). Naturally, Belarusian authorities were trying to preserve control over domestic situation, has shown much more interest in economic and infrastructural parts of the EaP, rather than in those related to human rights and political transformation.

Taking into account serious economic problems of the country, Belarusian authorities strategically needed to cooperate with the EU and made it clear that in exchange for the tangible economic dividends they are ready to discuss the issues of political liberalization. The European Union tried to make use of this momentum. It appears to be clear, that economic environment influences the political one and vice versa, thus, in order to stimulate the process of desired reforms in Belarus, the EU should at first force the Belarusian authorities to start liberalization of the economy. At the same time, above-mentioned forced steps, as a part of undertaken commitments, obviously diminish possible room for maneuver for the Belarusian authorities in its relations with both Russia and the EU.

The European Union treated the 2010 presidential elections in Belarus as a test of the official authorities intention to improve relations with the EU and to start domestic political liberalization. The elections were supposed to cause a breakthrough in the mutual relations, which confirms intensity of the high-level contacts on the eve of the presidential campaign. Following the November 2010 visit of Polish and German Ministers of Foreign Affairs to Minsk, the Belarusian authorities got a clear message: free and fair elections would lead to establishment of a full-fledged relations between Belarus and the EU. Moreover, ministers on behalf of the EU offered EUR 3 billion in a form of financial assistance to the official Minsk, however, given the EU's financial framework 2007 - 2013, credibility of this offer was questionable.

Keeping in mind the aforementioned perspective of beneficial cooperation with the EU, Belarusian authorities were doing every effort to gain the international recognition of the 2010 elections, tolerated the most liberal electoral campaign since 1994 (Melyantsou, 2011). Given that, the brutal crackdown of opposition protests on the elections night and consequent arrests of the ex presidential candidates did not complied with the logic of the events.

Recent developments and conclusions

In the aftermath of the December 2010 presidential elections, the European Parliament adopted one of the toughest resolutions on Belarus. It called to review EU policy towards the country including consideration of targeted economic sanctions and suspension of all the macro financial aid provided the country (European Parliament, 2011). The European Council conclusions on Belarus provided a more moderate response, reestablishing visa restrictions and an asset freeze against expanding list of Belarusian officials (Council of the EU, 2011). Much more softer tone of the latter document could be explained by the EU's willingness to leave the door open for possibility of another 'warming' of relations.

Nowadays the EU-Belarus relations remain at a low point. Since December 2010 the EU have sticked to the policy of critical engagement. Once again contacts with the official Belarusian authorities were limited to the minimum required. Belarus was not excluded from the Eastern Partnership, however, an appropriate level and scope of its participation in the programme are at issue. The most recent September 2012 parliamentary elections were found to be inconsistent with democratic standards as well. Therefore in October 2012 Council of the EU decided to maintain the restrictive measures against certain Belarusian officials for a further 12 months (Council of the EU, 2012).

In March 2012, the EU launched a European Dialogue on Modernisation with Belarusian opposition and civil society (European Commission, 2012). While the official Belarusian authorities are excluded from the dialogue and the representatives of opposition have no channels to influence domestic politics, the effectiveness of the EU's initiative is questionable again.

Looking through the history of the relations between Belarus and the European Union, it is evident, that in total the EU's approach, based on political conditionality, has appeared to be rather inefficient. The EU offered the prospect of closer relations conditional on the gradual improvement of democratic standard in the country. The EU demands of democratic transformation, in essence, threatened the political future of the Belarusian leadership, while the offer in exchange was not of vital interest for Belarusian authorities. Against this background, the EU's leverage to prompt the process of democratic reforms in Belarus is negligible. The Kremlin's geopolitical concerns with the 'spheres of influence' and its great leverage on Belarusian politics represent another factors, undermining the EU's ability to prompt the process of reforms in Belarus.

The period of rapprochement during 2008-2010 was rather too short to evaluate the effectiveness of the EU's policy of pragmatic engagement, in terms of democratic transformation of Belarus. However, it is arguable, that such an approach ensured a favourable background for the process of the country's democratization in the longer perspective. However, the nature of the Belarusian political regime and the implications of wider geopolitical situation did not allow the tendency to develop at the time.

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SUBJECTIVE REASONS OF POVERTY AND POLITICAL ORIENTATION IN THE CZECH REPUBLIC

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Abstract

Subjective causes of poverty can be divided into two groups – internal and external. The internal group explains the existence of those in need by laziness of the last. The possible consequence of such a belief is that the assistance to poor should be limited. The external group of causes is based on the assumption that poverty is not fault of the poor. They either did not have enough opportunities in their lives or were the victims of technological change. Thus, help of others is justifiable. In this paper we test to relation of subjective reasons of poverty, as classified above, to the political left-right orientation of the respondents and subjective degree of responsibility they have in their life. Belief in God is the other important factor considered. The results suggest that leftist political orientation is associated with a beliefs blaming lack of luck for the poor economic situation of the others. Subjective degree of individual responsibility for one's economic well-being is positively related to the belief, that poor are responsible for their poor situation themselves. Belief in God did not prove to be related to any of the subjective causes of poverty.

Keywords: attitudes to poverty, political orientation, responsibility, role of state, belief in God

JEL classification: *D14, D31*

Introduction

According to the last available data (Eurostat, 2010) 16% of the population of the European Union are at risk of poverty. In six European countries (Bulgaria, Spain, Lithuania, Latvia, Greece, Romania, Croatia) more than fifth of population of the countries are considered to be in the danger of poverty. The problem of poverty gains at importance also in the view of current tendency to control government deficit by reduction of government spending which may, and in some countries will, be reflected in diminishing social safety net. In this light the question about the reasons of poverty, and, consequently, about who or what is meant to be responsible for the poverty becomes even more necessary to answer.

There is a difference in understanding inequality and poverty which is commonly confused. From the economic perspective, the simplest definition states that inequality is a lack of equality or in other words, it is the growing inequality between rich and poor. Inequality "requires examination if one believes that the welfare of individuals depends on their economic position relative to others in society" (Haughton & Khandker, 2009, p. 9-10). Poverty is of a different meaning. According to Haughton & Khandker (2009) poor people are those who do not have enough resources, in monetary terms, to fulfill their basic needs. This is called as a lack of commands over commodities. Another angle of understanding poverty reaches beyond income and questions whether those considered poor have proper living conditions such as housing, food, obtaining health care or accessing education defined as "a pronounced deprivation in well-being" (Haughton & Khandker, 2009, p. 9). In this paper we study subjective reason of poverty of others leaving the respondents to define the maximal income or other criteria which would distinguish poor people from middle class.

The paper is organized as follows. In next chapter we discuss the theoretical background of subjective causes of poverty and attitude towards poor. Then we present an econometric logit model, where we study subjective reasons of poverty divided to two categories external and internal depending on whether poor is meant to be responsible for his poor state (internal reason), or not (external reasons of poverty), from the point of view of political affiliation of the respondents (left-right), subjective opinion concerning the role state should play in provision of its citizens and belief in God of the respondents. We use data from the European Value Study for the Czech Republic (2008). Our results suggest that adherence to left political ideology of the respondent sis associated with external reasons of poverty, while voters of right side political parties are more inclined to believe in internal reasons of poverty. People believing, that state should take more role in provision for its citizens are more inclined to believe, that poverty is caused by external reasons, while respondents who this, that people should not rely on state that much are more likely to believe that poverty is caused by internal causes. Belief in God did not prove to be statistically significant. We control for sociodemografic variables, out of which only secondary education proved to be statistically significantly related to subjective reasons of poverty.

Theories of causes poverty

Theory of social stereotypes

A simplified way of understanding subjective causes of poverty and, consequently, attitudes towards the poor, is proposed by the theory of social stereotypes, which explain using stereotypes used by different groups to characterize other groups. According to this theory for example, in many cultures minorities are expected to have lower level of future success due to their laziness or cultural devaluation of education or for example, women are assumed to be less logical (see Reyna, 2008). In many cultures there is also a perception, that social benefit recipients are lazy (Weiner et al, 2011). On the other hand, stereotypes depend not only on the culture one belongs to or country one lives in, but also on sociological and personal characteristics of the holder. For example Reyna (2008) states, that people of a higher status group blame those poor for their inability and "can justify denying members of low-status groups opportunities to better their social position" (Reyna, 2008, p. 444). According to Louise Bamfield and Tim

Horton (2009) the attitudes toward poor of the respondents in UK, who placed themselves to middle income group, "were often more negative and punitive than their attitudes towards those at the top"(Bamfield and Horton, 2009, p. 6). They would think that these recipients do not contribute to the society enough, even though more than a half of respondents proved to be compassionate towards the lower income group. Interestingly, the respondents belonging to middle class, comparing to lower and upper classes, were most likely to complain about inequality and demand social benefits and, at the same time, different taxation for the rich. 79 % of respondents belonging to the middle class believed that they work hard, but without the rewards of the rich and without the benefits of the poor"
(Bamfield and Horton, 2009, p. 12).

Individualistic, structural and fatalistic causes of poverty

Feagin (1975) proposed three dimensional classification of causes of poverty: individualistic, structural, and fatalistic. Individualistic explanation primarily state, that outcome depend purely on individual effort. Structural group of causes employ socioeconomic factors such as inadequate education to explain low performance on the job market. Fatalistic perspective emphasizes unfortunate circumstances which may lead to poor economic state of being (Feagin 1975). The perception about which of the causes is the major one, depends on many factors on micro and macro level of analyses.
According to Feagin (1975) in individualistic countries and among people within privileged groups, there was a tendency to prefer individualistic explanations (Feagin, 1975).According to Hopkins (2009), respondents living in highly conservative areas are more likely to believe, that poor are responsible for their poverty (Hopkins, 2009). On the other hand, respondents living in traditional and, often, considerably poorer areas, tend to favor structural and fatalistic explanation of poverty. Van Orschoot and Halman (2000) studied subjective explanations of poverty with respect to the level of collectivism and traditionalism prevalent in the country "Studies of perception in countries with a more collectivistic culture and traditionally higher level of state intervention, like the countries of continental Europe, might reveal a more pronounced fate of societal explanations" (van Orschoot & Halman, 2000, p. 19). According to Nasser and Abouchedid (2001), attitudes towards poverty in a highly individualistic country such as United States were rather individualistic implying that poor are responsible, while respondents in third world countries would rather favor structural explanations (Nasser and Abouchedid, 2001). Other studies of attributions of poverty in non-European countries such as Turkey, Philippines, Hong Kong, India, and Iran showed, that in these countries people are more inclined to believe in structural reasons of poverty comparing to Western" countries (Bobbio et al, 2010). Similarly, the author found, that 37% of respondents answered that the cause of poverty is injustice in society, 20% of Europeans think that people are in need because they are lazy and lack willpower, bad luck was a reaction of 19% of Europeans and 13% viewed poverty as an inevitable progress in the society. Answers varied depending on the country (Bobbio et al, 2010).
In this paper we contribute to the wide range of literature on the subjective causes of poverty by analyzing subjective causes of poverty in the Czech Republic with respect to political affiliation of the respondents, one's belief as for the role the state should play in provision for its' citizens and belief in God of the respondents. But before we

start with the explanation of our data and methods it seems to be necessary to mention psychological theories of poverty.

Psychological theories

According to Lehning and Turner (2007) the early discussion about psychological factors of poverty in academic literature had the following steps. In the 70's researchers, mainly Ginsburg (1972) and Pearl (1970), speculated that poverty could have been caused by low intelligence but soon these findings were criticized with the argument that intelligence is not a measurable construct. Another theory suggested that language deficiencies may have led to poor results and falling into a poverty. This theory was dismissed as there was little or no evidence to support the idea. McClelland approach, mostly popular in the 60's, claimed that the poor luck is important. Another important characteristic discussed in the context psychological causes of poverty was Need for Achievement. Shortly after in the 80's psychologists developed the attribution theory as a key to explaining poverty, this attribution theory is based on the idea that some events are caused by internal factors and some to external; this is also discussed throughout my thesis. Other theory "identified poverty as a manifestation of moral deficiencies or psychological sickness" (Lehning and Turner, 2007, p.60). In addition to that, there has been a question if poverty could have been caused by a psychic conflict which forces the individual to act much like a child who is trying to satisfy his sexual and aggressive desires. This seemed to be very popular among social workers who were trying to find answers in psychology to help welfare recipients. Additionally, theories regarding explanation of the culture of poverty i.e. by Lewis (1975) were presented who claimed the poor have a different culture. This emerged along with cultural-relativist theories i.e. Rainwater (1970) that claims that there is no better or worse culture, even though the poor might be seen in a different light (Lehning and Turner, 2007).
While we realize, that there are many approaches to study subjective causes of poverty, from various perspectives, in this paper we will use the simplified internal-external approach for, to our knowledge, this approach is the most useful for our purposes. We build on Cozzarelli et al (2001), and Zucker and Weiner (1993) who found out, that rightist people have strong work ethics and poverty is seen as a personal failure. According to Jost et al (2008) rightist people are considered to be social Darwinists and supporters of inequality. The question of the belief in God remains complex. Some authors claim religious people consider those in poverty lazy while others state that religion creates compassion (Guiso, 2003; Brooks, 2003) According to Guiso (2003) religious people are more likely to consider poor people as being lazy and as lacking willpower (Gusio, 2003). On the other hand, according to Weiner et al (2010) poverty caused by external factors such as bad luck or injustice can create sympathy and compassion (Weiner et al, 2011). Thus, religious people are compassionate and helping (Brooks, 2003). Contrary to this, poverty caused by internal factors such as laziness or progress creates anger and may be the attitude of a non-believer in God.

Data and Methods

We use data from the European Value Study for the Czech Republic (2008). The overall sample consists of 1821 respondents. The survey was conducted from 5th May 2008 to 2nd November 2008 and was managed by Faculty of Social Studies at Masaryk

University in the Czech Republic. The sample is representative from people aging 18 years and older regardless of nationality and citizenship or language. Sampling selection method was stratified probability sampling. Data were collected by face-to-face interviews with standardized questionnaire.
In this paper we use logit analysis to test the following hypotheses:
The more leftist is the political orientation of the respondents the more they will be inclined to believe, that poverty of others is caused by external factors
The more the respondents believe, that the responsibility for provision of necessary material goods lies on the state rather than the individual the more they will tend to believe, that poverty of others in caused by external factors
There might be a correlation between the belief in God and the belief about for the internal or external cause of the poverty of others. The direction of this correlation is however unclear.
We control for sociodemographic variables (year of birth, town size, monthly income, sex, education) of the respondents.

Indicators

Subjective Causes of Poverty

In this paper we distinguish external and internal causes of poverty. Internal are those, which would imply personal responsibility of the needy of their poor state. External are those, which explain poverty by the causes which are mot under control of the poor such as luck, injustice or consequences of modern progress. The list of causes listed in the survey data with the classification whether the cause in external or internal the reared can find in the Table 1.

Table 1: Indicators of subjective causes of poverty of others

Subjective cause	Internal/external
People in this country live in need because they are unlucky	external
People in this country live in need because they are lazy and lack willpower.	internal
People in this country live in need because of injustice in our society.	external
People in this country live in need because it is an inevitable part of modern progress.	external

Source: own results

The indicator for subjective causes of poverty was recomputed in the way, that the resulting variable was equal to one, in the case, that the respondent has chosen one of the external factors and zero if the respondent has chosen internal factor.

Political affiliation

In the case of political affiliation the respondents were asked to subjectively place their views on the left-right political scale (1 – left, 10 – right). The resulting data were not recomputed in any way.

Individual-State Responsibility for Providing

In this question the respondents were asked to place their view on the following scale:
1 – individuals should have more responsibility for providing for themselves
10 – the state should take more responsibility to ensure that everybody is provided for

Belief in God

The respondents were asked whether they believe in god (1 – yes, 2 – no)

Results

The results of logit analysis are summarized in Table 2. As the results suggest, adherence to left political ideology is associated with the external subjective reasons of poverty, in which the poor are not meant to be responsible for their poor state, while right political ideology is associated with internal subjective reasons of poverty. This outcome corresponds to Weiner et al. (2011) who concluded, that those who positioned themselves to the right of the political spectrum tend to blame the poor for their difficulties (Weiner et al, 2011). Similarly, according to Cozzarelli et al, (2001) rightist people tend to be more authoritarian and have stronger work ethic, thus they are likely to adhere to internal reasons of poverty such as laziness (Cozzarelli et al, 2001). Further on, according to Zucker and Weiner (1993) adherence to right political ideology is associated with the belief that poverty is a personal failure (Zucker and Weiner, 1993).

Table 2: Subjective reasons of poverty (internal-external). Logit parameter estimates

Variables	Estimate	Std. Error	Sig.
Threshold	3,561	8,095	,660
Opinion variables			
Political view (left-right)	-,107***	,029	,000
Individual-state responsibility for providing	,080***	,029	,005
Belief in God	,209	,144	,146
Sociodemopgraphic variables			
Year of birth	,002	,004	,648
Town size	-,031	,027	,259
Monthly income	-,053	,063	,401
Male	,187	,138	,176
Primary education	,356	,296	,230
Secondary education	,378*	,223	,090
Model fitting information (significance level)	,000		
Valid observations	933		

Link function: Logit.
Notes: Significance levels: (*) 0,05 < P < 0,10; (**) 0,01 < P < 0,05; (***) P < 0,01.
In the reference group female, do not believe in god, tertiary education.
Source: own results

The idea, that state should be more responsible to ensure that everybody is provided for, is associated with external reasons of poverty, while the notion that individuals should have more responsibility for providing for themselves is related to internal reasons of poverty. Similarly, Weiner et al. (2011) found out that that laziness and a lack of willpower are considered as internal and controllable causes of poverty. Thus, individuals should be responsible for themselves (Weiner et al. 2011).

Belief in God did not prove to be statistically significant. As for sociodemographic variables, the only significant variable is secondary education. People with secondary education proved to be slightly more inclined to believe, that poverty is caused by external reasons (significant at 10% level).

In general our results are in line with current literature on this topic. The non-importance of God might be explained with specificity of the Czech Republic, which is often viewed as one of the most atheistic country in Europe.

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GAS INDUSTRY IN SOVIET UNION AND RUSSIA: A HISTORICAL OVERVIEW

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Abstract

In order to understand the present situation of the natural gas industry in Russia and the dynamics of its relations with the CIS countries, one shall thoroughly understand the past development of the industry. This paper briefly describes the major milestones of the Soviet gas industry's development, ranging from the early stage of development in the 1940s until Vladimir Putin's rise to power in the year 2000, followed by reforms in the energy sector of the 2000s.The work includes analysis of the exploration of the main gas producing regions, such as Volga-Urals, North Caucasus, Central Asia, as well as their roles in the Uniform Supply System of the USSR and its further development. The research includes data about the main fields, pipelines and routes, contributing to the general understanding of the former Soviet Union's industry composition. The paper is intended to be a helpful overview for further research of the industry.

Keywords: natural gas, industry, Soviet Union, Russia, CIS, regional development

JEL classification: *L7, Q3, R10*

Introduction

The natural gas industry is one of the most strategic in terms of international security. It also plays a major role in international business, involving and interacting with various fields and industries, influencing financial markets all over the world. Therefore it is no wonder, that the natural gas industry of Russia, a country which holds significant amount of the world's reserves, is of importance to everyone involved in international business of any kind. This article looks into development of the industry in the early stage of the Soviet Union, its major milestones, as well as exploration of the main gas producing regions. The analysis is performed in a chronological time sequence. In addition, it contributes to the understanding of the economic relations, which Russia and the CIS countries today.

Soviet Gas Industry

Unlike the oil and coal production, the Soviet gas industry and its exports had a rather late development. The first period, the 1940s till the beginning of 1960s, is associated with the exploration of individual groups of associated gas deposits, such as of Saratov, Krasnodar, Stavropol, East Ukraine (Shebelinka district) and West Ukraine (Dashev-Lvov district). Those fields were small in volume and situated close by the potential consumers; so, separated pipelines were constructed, which were intended to connect

each of them to the proper consumer. In the second period, the 1960s, the major gas-bearing districts were brought into development, Central Asia and Komi Republic. Due to the significant remoteness of the regions from the main consumers in Ural, central and western European districts of the country, the first long-distance pipelines, Bukhara-Ural, Central Asia- Center, Vuktyl – Torzhok, were constructed. The pipe being used was bigger in diameter and, therefore, had a higher productivity. To increase reliability of the system, the multistrand systems had to be constructed. The increased gas production made it timely and logical. The main consequence of the multistrand systems' introduction was creating the crossover of the pipelines in the Moscow district and Ukraine. Thereby, the idea of creating uniform gas-supply system in the country became real. (Grebcova,)

The significant production begins in the year 1970, after a more or less elaborated net of pipelines has already been constructed to carry the transportation of gas. The biggest production field, West Siberia, which is over 1000 miles, is situated between the Yamal Peninsula in the north and Tyumen region. The area was of a crucial importance for the Soviet gas industry, as it accounted for an 82 percent increase of the production for the whole country between 1975 and 1980 ("Technology & Soviet energy availability", p 24), ending with the figure of 34 trillion cubic meters in 1980 (Jensen, Shabad, Wright, p 257). The extraction itself in the district of West Siberia began in the year 1963, starting with small gas deposits on the left bank of the lower reaches of the Ob River. Urengoy's gasfield, being one of the biggest in the world and one of the supergiant fields, standing for reserves larger than 1 trillion cubic meters, was discovered three years later in 1966. The other big fields are Medvezhye, 130 km from Urengoy, which was opened in 1972, and Yamburg. The last one is the second largest among the West Siberian supergiants in the better accessible dry gas-bearing Cenomanian strata at depths of 3,400 to 3,900 feet and even more in the deeper Neocomian gas condensate horizons at 8,200 to 10,000 feet. Other supergiants are Zapolyarnoe, east of Urengoy, Bovanenko field, on the Yamal Peninsula, and Kharasavei field, which reached the status later (Jensen, Shabad, Wright, p 258). Due to the insufficient infrastructure (delays in construction of gas-processing facilities, shortage of living facilities for gasfield workers for instance) and specifics of the northern location, framed with the Arctic Circle from the both sides, a few hundred miles north of the oil fields (Jensen, Shabad, Wright, p. 257), the West Siberian gas production was put in rather difficult conditions. The decline of exporting activity in the district was correlated rather with the decline in the demand for Siberian oil at the time, than with the gas reserve itself ("Technology & Soviet energy availability", p. 24).

Volga-Urals Region

The location of the Volga-Urals region, stretching between the Volga River and the Ural mountains, is more advantageous in terms of climate and accessibility. The production is centered in Orenburg, the field of which was discovered in 1966. Orenburg is the latest supergiant gasfield in the more temperate European area, hence, the gas of which is more accessible to the industrial users. Only partly staying in the domestic market, the gas of the Orenburg field is transported to Eastern Europe using 1, 700 mile "Soyuz" pipeline. It goes, springing from Orenburg, to the Czechoslovakian border at Uzhgorod. The Orenburg project originated as a joint Council for Mutual Economic Assistance (CMEA) with East European countries (Czechoslovakia, East Germany,

Hungary, Poland) providing labor and materials in exchange for eventual gas deliveries. The Orenburg pipeline was scheduled to carry 28bcm/yr of gas at full capacity, 15.5 bcm of which would be sold to Eastern European countries. The rest would go to the Western Europe. Romania and Bulgaria would have their gas delivered with a different pipeline coming from Ukraine. Production in the Orenburg gas field is linked to the capacity of the gas-processing plants, which are responsible for the gas-purifying process before it can be transported.

North Caucasus Region

The production on the two biggest deposits of the North Caucasus gasfields, Stavropol and Krasnodar, began in the 1950s, reached its peak in 1968, increasing the level of depletion every year since. By the year 1975 output fell by 5 bcm/yr and 16 bcm/yr at Stavropol and Krasnodar respectively. Between 1960 and 1975, the largest Soviet gas-producing region was Ukraine. Shebelinka field, opened in 1956, produced 68 percent of Ukrainian gas by year 1965. It reached its peak in 1972, declining ever since. By the year 1980, the output was 51 bcm ("Technology & Soviet energy availability", p. 27).

Central Asia Region

The Central Asia district, with the main fields in the Uzbek and Turkmen Republics, become of particular importance since the mid-1960s with the opening of Gazli deposit in Uzbekistan, which by the year 1965 produced 12 percent of Soviet gas. The district peaked in 1971, however remaining stable since then. The Shatlyk deposit (situated in the Turkmen Republic) is one of the 10 largest in the world, which constitutes one-half of the area production. The other large producer was Komi Republic, whose giant gas field Vuktyl was opened in 1968. It lies 120 miles east of Ukhta on the right bank if the Pechora River. By the year 1980 the republic's output was 18 bcm ("Technology & Soviet energy availability", p. 30).

Uniform Supply System and Gas Industry Development

By the end of the 1980s the uniform gas-supply system of the Soviet Union had assumed the aspect of the system we have today, becoming the biggest gas-supply system, satisfying 40 percent of the Soviet fuel demand and a significant part of the demand in Eastern and Western Europe (Feigin V, № 1). The uniform gas-supplying system reached its mature stage of development in the second part of the 1980s. By that time, the scale of the gas production field and its role had become important enough to be able to influence the healthy functioning of many large industries and even regions. The Planned economy was orienting the gas industry towards huge growth by any means. Along with the consumer position, the qualitative gas supplying, such as reliability and reaction to the changing working conditions, began to play an important role. It led to the more complex functioning and to the increased role of regulation and reservation of gas supplying. Numbers of the deposits and even the whole gas producing regions had reached the phase of decreasing productivity against the background of impetuous growth and the formation of new regions and construction of the new large gas thoroughfares. As a result, the new need of adjustment of the functions and roles of the existing production capacities appeared. It had shown the maturity of the system from the other side. The realization of this potential, with the aim

to minimize the overall expenses, enhanced the significance of the system modeling for the development and reconstruction of the uniform gas supply system. In order for it to be an effective decision making process, this system modeling had to take into consideration all the working factors as a complex.

At the end of the 1980s, the ongoing crisis at that time had an influence on the gas industry as well. It had to do with a lack of investments (centralized at the time), the first signs of unstable demand, which showed up in the form of a sharp drop of that demand. Nevertheless, the lag effect of the processes and accumulated potential of the development favored the well-being of the industry in the period 1985-1990. (Feigin, № 6)

The total investments into the gas industry reached 10-11 billion rubles per year in the middle of 80s. However, to name the precise figure in dollar terms or at least in modern Russian rubles is quite difficult, as a considerable part of the investments had been received through imports, particularly of big diameter pipes, assessment of which was done using an artificial conversion coefficient. Therefore, the investments were clearly undervalued, leading to the price of the stocks being undervalued as well. One can speak about a figure no less than 100 billion dollars. Only 17 gas-main pipelines from West Siberia to Central Russia and other countries, of a length no less than 2500 km each (taking into consideration the complexity of construction in the conditions of the North) cost 70-80 billion dollars. Amortization of those stocks does not decrease the amounts significantly, as the investments were made mainly 6-12 years ago.

Hereby, the bulk of the funds were directed towards the development of the uniform gas-supply system. It has to be mentioned, that the gas industry was adapted to the "state mode" during the period of the intensive growth, mainly because of the relative simplicity of the technological processes, needs of large-scale and concentrated capital investments, and the necessity of risk guarantees (including political) connected to those investments.

By the beginning of the 1990s, the gas transport system was almost completed. It allowed the transportation of more than 600 billion cubic meters of natural gas per year within the Russian borders, and was the biggest of its kind. (Alekseev, Kuznetsova, № 6)

Gas Industry in post-Soviet Russia

In the beginning of the 1990s, the gas production was based in the Urengoy, Yamburg and Medvezhye deposits, whereas only the last one was gradually moving towards the phase of declining production. It ensured the necessary reserve of stability for the system in general. (Feigin, №1.)

During the period from 1990-1991, the time of dramatic political and economic instability, the development process of the uniform gas-supplying system was held up, preceding the significant crisis in the gas industry. The crisis manifested itself in the following:

- Vagueness of the organizational forms of the industry, "acquisitions of sovereignty" of the particular parts of the uniform gas-supplying system, located in the territories of the different republics;
- Cessation of the centralized investments, constituting the main financing of the industry at the time, followed by high inflation, which led to the depreciation of

the domestic funds. ;

- Interruptions in supplies of the equipment from the CIS countries, payments for the supplied gas inside and outside Russia and unsettled questions concerning transit.

In the existing situation at the time, consolidation of the core of the industry in the face of "Gazprom" seemed like an important achievement. The prerequisite for that was the unity of the structure of the gas-supplying system, which was achieved through a systematic approach in the planning of its development.

The last ten years of the 20th century appeared to be the most difficult ones, in both the history of the oil and gas industry and the history of the Russian economy as a whole. Dramatic setbacks in production, which drew back only after 2000, was only the external expression of the crisis. The most painful part of it was the sudden slowdown of the innovation processes in the industry. Compared to the world tendencies, the Russian gas production sector was not moving forward, but backwards instead. The decelerating factors had an effect from both the demand side of innovative resources and the supply side. Due to the ongoing reforms, the formerly centralized system of research and development was demolished. Many of the sectoral and academic research and development organizations found themselves useless. All of this became the attribute of the crisis period which was influencing the whole country. The crisis was coupled with the demolition of the old frameworks, redistribution of property, defaults in payment, the complications of the entry to the world free market system and many other things. Some of the negative trends, which also affected the situation and the outcome, were actually long-dated and originated in the "prosperous" times of the centralized economy. Those trends were of the maintenance nature of the excessively expanded production sector. Undermining of the research potential was due mainly to two reasons. First one is the unprecedented cutback in the state financing of the whole scientific and technical progress complex. The second reason was the extremely low demand for science-intensive production from the consumers, the oil and gas sector's enterprises and companies. (Krukov, Sevastianova, p. 22).

None of the spheres of the former soviet economic system were as conservative and as unprepared for the transition to the new conditions as research and development was. Therefore, the market of the research and development resources had to be created from scratch. The characteristic feature of the transitional period was an overall lack of investments in the whole economy. The only available, very limited, resources were going not to the innovation of the production and technological machinery, but to the maintenance of it. The outcome was the critical level of physical and moral obsolescence of the machinery from one side, and the total potential depletion of the implemented scientific backlogs from the other. (Krukov, Sevastianova, p.23). The rate of wear of machinery and equipment was particularly high. This way, the percentage of the obsolescence for the fuel and energy complex by year 2000 fluctuated between 22 % and 38 %, whereas in total for the national economy the number was 12.5 %. It was rather obvious, that in order to stabilize and provide steady development in the future, substantial re-equipment of the production was necessary.

The Russian Energy Strategy, which described the Russian view on its own and the world's energy industry and its needs, was adopted by the government on 7 December 1994. It was formed by the government of the first Russian president Boris Yeltsin in year 1995, and later followed by the approval of the provisions 'Main Provisions of the

Russian Energy Strategy' and finally 'Programme of Means for Structural Reconstruction, Privatization and Reinforcement of Control in the Field of Natural Monopolies' on 7 August 1997. (Fredholm). After Vladimir Putin came to power in the year 2000, the first changes were made, preceding the latest version of the strategy, which was finally approved by the government on 28 August 2003. (Fredholm) The problems discussed there examine both domestic and foreign market strategies, pointing out the key goals for Russia in the energy sector.

The analysis provided the reader with details of the development of the natural gas industry and its basic interdependency on the territory of the former Soviet Union. The research conducted in the paper serves as a historical overview base of the natural gas industry and is intended to be helpful for further analysis, which is welcomed and encouraged.

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CZECH EXPERIENCE IN USING CULTURE SATELLITE ACCOUNT

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Abstract

This paper focuses on the economic impact of tourism, specifically on the economic evaluation that includes its impact on jobs creation and economic growth, exportation of EU best practices to developing countries, its contribution to the generation of spin-offs, and the development of tourism and other cultural industries.
The paper analyzes the best practices of implementation is the creation and utilization of the so-called satellite accounts of culture and various countries and describes the Czech experience with using culture satellite account. It appears that the share of culture in the value added of the Czech economy is oscillating around 2% which is comparable with the other EU countries. Nevertheless, our analysis point at advantages and disadvantages of currently used methods, and suggests ways for further improvement and development.

Keywords: culture satellite account, cultural economics, cultural heritage, tourism economics

JEL classification: *L83, L84, Z1*

Introduction

The economic effects of tourism are typically considered within a framework of the overall tourism spending and with allowances made for any leakages from the economy, ideally with some estimates of any displacement effects (see e.g. Jones and Munday, 2007). Thence, approaches to calculating the economic effects of tourism might include simple addition of estimated tourist expenditure and more complex analyses that employs economic models of reference economies to gauge net tourism expenditure effects and any multiplier impacts caused by spending on local inputs (see e.g. Dwyer, Forsyth, and Spurr 2005; Fletcher 1989; Surugiu, 2009). Very often, this analysis concentrates on quantifying the economic impact of major sport events (see e.g. Kirkup and Major, 2006, or Madden, 2002).This approach often faces problems in terms of accuracy of primary survey data on the number of visits, definitions of visitors and the reference area in questions, as well as the issue of what precisely is the value added of tourism in the national economy. In this context, the scale of direct and indirect economic effects of tourism activity is very often linked to absolute numbers and residential origins of visitors, visitor spending patterns and length of stay, as well as levels of local spending of tourism-facing industries (see e.g. Mondello and Rishe 2004).
From an economic point of view it becomes apparent that culture, whether in the form of tangible or intangible cultural heritage, or in its other form and realms, creates

significant incentives for the development of tourism and other business activities. Cultural sectors is one of the most dynamic and fast-developing generator of new jobs and as stated in "The Economy of Culture in Europe" report (KEA, 2006), the labor force in this sector must be flexible, mobile and skilled. In addition to that, one must remember about the importance culture in taxation and its role in generating taxes for the state budget.

There is no doubt that culture has all the potential to increase its competitiveness in comparison with other sectors of the national economies. With this regard, growing importance of monitoring and evaluation of the economic dimension of culture is gaining special importance. National governments undertake several steps in order to enhance the role of culture in national economies and in the value added of national economic development. For instance, in 2008 the Czech Republic adapted the Government Resolution No 1452 on the National Cultural Policy for the years 2009-2014 which assigned the task of evaluating the contributions of culture, including economic evaluation. One of the ways how to deal with that outlined in the resolution was the creation and utilization of the satellite account of culture. The aim the account was to identify the resources of culture, its production volume analyze and to measure productivity or efficiency of individual branches of culture.

It goes without saying that the issue of credible expression of the economic importance of culture still remains a very complex problem. In accordance with the definition of UNESCO, culture is defined as a set of distinctive spiritual and material, intellectual and emotional features that characterize a society or social group; culture contains in addition to art and literature, the ways of life, ways of living together, value systems, traditions and beliefs (UNESCO, 2005).

Economic quantification of the value added of culture in the national accounts through the attempt to create comprehensive cultural satellite accounts has been undertaken by several countries, most notably by Canada, Finland, Scotland and Spain (see e.g. Hayes and Boag 2004; Meis, 1999; Ministry of Education of Finland, 2009; Ministry of Culture of Spain, 2010).

Overview of culture satellite accounts

The attempts of creating culture satellite accounts can be traced back to the 1980s. For instance, in 1986 Maryvonne Lemaire of the French National Institute of Statistics and economic Studies (INSEE) drew up a proposal concerning culture satellite accounts, which is internationally considered to be one of the earliest examples. It was never implemented because of the debate over the demarcation of the subject and other conceptual issues and most of all due to a lack of resources. However, it has been said that Lemaire's unimplemented proposal profoundly affected the fact that the "creative chain" perspective has since been adopted for culture statistics worldwide.

Currently, several countries in Latin America are planning satellite accounting. Its aim is to promote the development of a cultural economy[4] in these countries. In Chile, the calculations are already applied and, for example, Columbia, Mexico and Uruguay are following suit. The intergovernmental organisation, Convenio Andrés Bello, has supported and coordinated satellite work with assistance from UNESCO and the UNDP. A handbook of satellite accounting is also being drawn up.

There are also ongoing cultural economy development projects in the Asia-Pacific region with concomitant culture satellite projects. In addition to UNESCO, WIPO and

the World Bank are also participating in these projects (Ministry of Education of Finland, 2009)

A proposal including the idea of satellite accounting for the calculation of culture's economic and social significance was drawn up by the OECD in 2006 (Gordon and Beilby-Orrin, 2006). The assessment of economic significance was among the features that were seen as essential for the internationally used SNA framework[5]. The multilevel satellite draft by Statistics Canada was used as the model. The OECD organised an international seminar on the basis of the proposal in autumn 2006, but since its funding was terminated the project has not progressed.

Statistics Canada has done several surveys on the relationship between culture and economy. Surveys about the role of culture in the national economy include those conducted from the perspectives of added value, employment and foreign trade (Meis, 1999).

There are three groups of variables in the general framework of cultural activities in Canada: producers of culture (business units, consumers/employees, the public sector, support services and the third sector), mechanisms of cultural activities (transmission mechanisms, supply value chain, demand (participation and consumption)) and economic and social ramifications.

In spring 2007, the Spanish Ministry of Culture published a book on the role of culture in the Spanish national economy 2000-2004. The book comprises two surveys, the first of which deals with methodological principles with which the value of culture is calculated and the second with the calculations. The calculations have been done, on the one hand, to show the value of domestic production of cultural industries and, on the other hand, to show the value of production of industries based on copyright. Import or demand of cultural products has not been discussed (Ministry of Culture of Spain, 2010).

Culture account surveys: methodology

In general, culture satellite account surveys aim at creating a computational framework to provide content to culture satellite accounts. In addition, the surveys enable making proposals on the satellite model, assessing the preconditions for regularly producing satellite accounts and conducting test calculations for a given period of time (Carson et al., 1994). The implementation of the satellite usually requires determination of various cultural industries and products which enable us to calculate the model for measuring the effect of culture on the national economy (see Jones and Munday, 2007).

The UNESCO recommendation for the statistics of public funding of culture from 1980 and the draft recommendation for the framework of cultural statistics from 1986 have seen the central points of departure in the statistical demarcation of culture. The UNESCO framework has also been the basis of development and harmonization work of cultural statistics in the EU (UNESCO, 2005). Finland has participated actively both in the UNESCO and EU development work.

In the UNESCO framework, culture has been divided into eight categories:

- Cultural heritage
- Printed matter and literature
- Music and the performing arts
- Visual arts
- Audiovisual media (cinema, photography and video, radio and TV)

- Socio-cultural activities (e.g. NGOs, communities and family life)
- Sports and games
- Environment and nature.

All these categories are studied from the perspective of various functions: creation and production, transmission and dissemination, reception and consumption, preservation and registration, and participation.
Typically, the system of National Accounts is used as a framework for the satellite account. The system determines the so-called production boundary, that is both the activities that will be included in the calculations and the issues that are omitted from calculations and consequently from the key figures produced by the system; the most significant things left outside the production boundary are household production, growth of natural resources that takes place without input of labour, and voluntary work producing services, which probably is very significant particularly in the areas of culture and sport. The concepts used in the system are independent of economic or political systems and they can be produced utilising a variety of source data.
Key concepts in the national accounts include output, intermediate consumption and value added, as well as the division between market and non-market producers. The producer type (market/non-market) determines how output and value added are calculated (see Table 1).

Table 1: Supply and demand framework in the economy

Supply = output + imports		**Use (including exports)**
Imports		Intermediate consumption
		Government consumption
Intermediate consumption		Private consumption
		Investments
Value added		Exports

Source: own results

In addition to that, the input-output analysis is often used as the standard method for measuring the spread effects of changes in the final demand for the product of an industry or sector (including the economic value-added of tourism and cultural heritage).
The structure of each sectors' production activity is represented by appropriate structural coefficients that describe in quantitative terms the relationships between the inputs it absorbs and the output it produces. The interdependence among the sectors can be described by a set of linear equations that express the balance between total input and output of each good and service produced.
The core of input-output analysis is the input-output table (Table 2). Thus, input-output analysis is concerned with the description and analysis of the production structure of an economy. Production processes in an economy are always interdependent. The products of one process are used in another while the product of that process may be used in many others. In a time of global markets with more competition and interdependent production, deeper division of labour and greater diversity and complexity of products, the exchange of intermediates becomes more important and, consequently, so does input-output analysis
A very general and simplified overview of an I-O table presented in Table 2 comprises four quadrants.

Quadrant I (intermediate consumption) is the basis for the input-output model itself and includes the matrix of intermediate flows. It represents the transactions for intermediate sales and purchases of goods and services among firms.
Quadrant II shows the final use of goods and services by households (HH), state and local governments units (Gov), investments (Inv) and exports (Exp).

Table 2: General approach to an input-output model

<table>
<tr><td colspan="2">PRODUCTS BRANCHES</td><td>1 2 3 … n</td><td>HIH</td><td>Gov</td><td>Inv</td><td>Exp</td><td>Output</td></tr>
<tr><td colspan="2">1</td><td rowspan="4">X_{11} X_{1j} X_{1n}
Quadrant I
……
X_{n1} X_{nj} X_{nn}</td><td colspan="4" rowspan="4">Quadrant II
Final demand</td><td rowspan="7"></td></tr>
<tr><td colspan="2">2</td></tr>
<tr><td colspan="2">..</td></tr>
<tr><td colspan="2">n</td></tr>
<tr><td colspan="2">Gross Value Added</td><td rowspan="5">Quadrant III</td><td colspan="4" rowspan="5">Quadrant IV</td></tr>
<tr><td colspan="2">a. Compensation of employees</td></tr>
<tr><td colspan="2">b. Gross operating surplus</td></tr>
<tr><td colspan="2">c. Taxes on production (-subsidies)</td></tr>
<tr><td colspan="2">Imports</td></tr>
<tr><td colspan="2">Input</td><td></td><td colspan="4"></td><td></td></tr>
</table>

Source: own results based on Eurostat (2003)

Quadrant III contains the requirements of each sector for primary inputs (labour, capital, land). It includes the inputs absorbed by the national branches from the rest of the economic system and outside of the country (imports). Here we include the labour expenses (i.e. compensation of employees), other taxes less subsidies on production, consumption of fixed capital and net operating surplus.
These payments are also called value added; since they are so hard to identify individually, these incomes are frequently recorded as one value-added row.
In quadrant IV no transactions are denoted, as very few market transactions are reported in this sphere.
The system of national accounts describes economic activities measured in monetary value within a certain production boundary; this satellite describes part of cultural activities falling within that production boundary – excluded from the study are, for example, some of the activities within the production boundary (the most conspicuous examples being vocational education and training and other lower-level educational institutions as well as numerous associations and organisations), activities falling outside the production boundary (particularly voluntary work producing services) and all manner of multiplicative impacts on the economy and well-being.
The reliability of results can be assessed, for example, on the basis of the method and the data used. The actual computational methods used in the culture satellite comply with the methodological description of a given country's national accounts and are as such approved both in the EU and internationally. With regard to the methodology, the biggest questions arise from the definition of culture and the handling of the industries chosen. When the data in available sources are classified on the basis of industry and sector, it is very difficult to come up with a more accurate division: there are surely a great deal of cultural activities that have been excluded from the calculations, which is what is done in other industries than those now included, and correspondingly there is a great deal of non-cultural activities in the industries now chosen for inclusion.

Cultural satellite account results for the Czech Republic

In the case of the Czech Republic, it was found that the public sector is involved in the incomes of cultural institutions by CZK 28.3 billion (i.e. less than 14%) with the fact that these resources are invested primarily in the area of cultural heritage living art. According to the household survey, expenditures from family budgets on culture, especially in the field of media and live creation, amounted at CZK 50.2 billion (almost a quarter of total resources). The share of non-profit institutions which perform particular administrative activities in culture represented 8.7 billion CZK (4.3% of total resources). Other sources (115.6 billion or 57% of total) flowed into the culture of the companies (especially in the sphere of media) and the international environment (especially in the cultural heritage).

Table 3: Macroeconomic indicators on cultural satellite account for the Czech economy in 2009 (billions of CZK)

Area	Revenues	Intermediate consumption	Gross added value	Share of GAV in %
Cultural heritage	6,768	2,707	4,061	5.0
Performing arts	12,734	6,224	6,510	8.0
Fine arts	4,627	2,639	1,988	2.4
Books and printing	37,610	23,622	13,988	17.1
Audio-visual and interactive technology	38,184	20,852	17,332	21.1
Desing and creative services	96,355	64,344	32,011	39.1
Operation and maintenance	6,498	513	5,985	7.3
Total	**202,776**	**120,901**	**81,875**	**100.0**

Source: Czech Statistical office (2012)

It appears that various cultural areas differ significantly in the degree of application of market principles and in this context also the level of management, as well as the associated levels of average wages, investment activity, etc. Any deepening of this differentiation will depend on technological development on the one hand and the extent of support for non-profit activities (cultural heritage, part of the living creation, library) from public sources on the other hand.

With regard to the economic results of the above mentioned cultural areas, some problems are perceived as caused by the limited possibilities of financial indicators for expressing the range and quality of performance of certain activities (e.g. preservation of cultural heritage, educational activities of cultural institutions, between culture and its values on the individual and society). In this context, it is appropriate to supplement economic indicators in kind from which the most suitable because of its complexity indicator appears number of visitors.

In the medium run, it becomes apparent that with the exception of objects of cultural heritage the attendance of other providers of cultural services increased. Unfortunately, the lack of time series of economic indicators prevents further comparison of financial statement output range of cultural sector and its social importance.

The cultural sector in the Czech Republic has also been studied from a macroeconomic perspective. As it turns out its weight or share of the Czech economy as a whole in several important indicators oscillate around 2%.
Public resources spent on culture represent about 1.73% of the total consolidated public spending. This is less than a percentage point higher share of household expenditure on culture to the total household expenditure. The number of employees in the cultural sector is 1.9% of total employment in the economy. Finally, the estimated shares of output and gross value added in the culture slightly exceed the level of two percent (2.3% and 2.5%), while the estimated gross domestic product of culture in amount of national level indicators slightly below (1.76%). These numbers are comparable with the similar results on other EU countries.

Main conclusions

It appears that the share of culture in the value added of the Czech economy is oscillating around 2%. This result is comparable with the similar studies conducted for instance in Finland or Spain, although one might wonder why the result is so small in the case of the Czech Republic – the country with well-preserved cultural heritage and a major destination on European tourist map. Perhaps, this is due to the fact that culture is still not considered to be one of the most important sectors of the economy (as in the case of assembling or brewing industries) and the monetary inflow into it remains at a low level.
The share of culture in the value added of the whole economy is still remaining more or less at the same level during the period under discussion. There is no exceptional growth to be seen, rather the share has decreased slightly: thus, the results do not support the supposition that growth in cultural industries has been more rapid than average.
The tourism satellite includes only the share of tourism from the industries containing tourism-related activities and this is what should be done with the culture satellite as well. Cultural activities from non-cultural industries should also be taken into account in order to include whole economic impact of culture. Unfortunately, in many countries the comprehensive data needed for this kind of computation simply do not exist at the moment. A perfect culture satellite would also include cultural activities that would be classified outside the production boundary of the national accounts even though it is the part that is more uncertain and difficult to price. Current attempts for calculating culture satellite account in the case of the Czech Republic revealed the advantages and disadvantages of the methods used for its computation and enabled us to pinpoint the areas for improvements and further development of statistical methods employed here.

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ANALYSIS OF THE SITUATION ON THE RUSSIAN MARKET OF MERGERS AND ACQUISITIONS: THE GROWTH PROSPECTS

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Abstract

The concentration of production and capital are interrelated and are a prerequisite for consolidating the economic actors. The main problem of a market system is in the process of formation of the competitive transformation of the national economy which is only achieved with the effective use of forms of capital concentration and production.
One of the levers on the consolidation of production and competitiveness are the mergers and acquisitions (M&A). Based on a review of the literature on Russian market of mergers and acquisitions this article shows the dynamics of the M&A market processes in Russia. While the domestic M&A market is still very different from both the American and the European market, our analysis reveals some positive trends.

Keywords: concentration of capital, economic transformation, competitiveness, mergers and aquisitions
JEL classification: *G34, G38, P31*

Introduction

Analysis of the socio-economic development of Russia in the last few years shows that in Russia in a globalized world a long-term forecast of economic planning system is being created. During the period from 2004 until today, many industries and regions of Russia have developed strategic plans and long-term concept of socio-economic growth (CRA). According to the concept of the Russian Socio-Economic Development developed by the Government of the Russian Federation until 2020, a key strategic goal was identified - to reach the level of socio-economic development appropriate for the Russia's status as a leading world power of the 21st century at the forefront of global economic competition. In forthcoming years, the country's economy should be innovative, attractive for investors, socially oriented and efficient. The priority should be to develop basic, raw material industries in Russia, where the already established production capacity. Formation on their basis of modern processing facilities will facilitate a gradual transition from the export of energy resources and raw materials to the export of high value added products with high added value, which will give a quick and significant effect. Therefore, large-scale projects to be implemented by the restructuring and transformation of the economy from the export of raw materials to the innovation-oriented type of social development, undergoing structural changes and modernization of key sectors as manufacturing and agriculture. Naturally, under these conditions is particularly important to use methods and tools for structural change management model at the micro, mezzo and macro levels.

In the period of crisis and post-crisis development, the number of Russian commodity markets witnessed a structural change caused by increased integration trends in the globalization of the world market and the need to expand the business activities of economic entities. This is an objective process, as in the original basis of large businesses are able to provide constructive competitiveness in a fast growing globalization. As some researchers note, the process of economic globalization, increasing international flow of ideas and knowledge, merging cultures, education, global civil society and the environment, the integration of the economies of the countries in the world through the flow of goods, services, capital and labour. Placing the main task of improving living standards worldwide, providing access to less developed countries and the ability to operate in the global market, globalization can bring enormous benefits to both developed and developing countries. But as evidenced by the actual practice in the race for the lead, many countries focused primarily only on their own interests.

The positioning of the country and the company in the market depends on their level of competitiveness. Toughening global competition makes it necessary to consider not only the specifics of the actual processes of integration of economic entities, and their impact on the global economy. Integration and centralization are needed globally.

With regard to the above, it is characteristic that in nowadays Russia such important forms of integration such as mergers and acquisitions are gaining particular attention

Trends of structural change of business in Russia

Generally, there are two major forms of expanding the scope of business organizations:

- Concentration, based on the accumulation and expanded reproduction;
- The strategy and tactics of mergers and acquisitions.

Both tend to the formation and development of both large businesses and small and medium business. This is one of the features of the formation of integration businesses.

With all the growing diversity of the forms of inter-firm cooperation mergers and acquisitions (M&A) are today one of the most effective mechanisms to facilitate the implementation of the redistribution of resources, business structures (see e.g. Shimizu et al., 2004; Faccio and Masulis, 2005; or Nayyar, 2008).

According to Gokhan (2007), objective condition for mergers and acquisitions is always the competitive environment - or rather, the changes it makes to the technology and the structuring of industries. Competitiveness allows, or rather forcing companies and organizations to attract investment, to seek new strategic approaches to the management, effective use, and reduce production costs without compromising product quality.

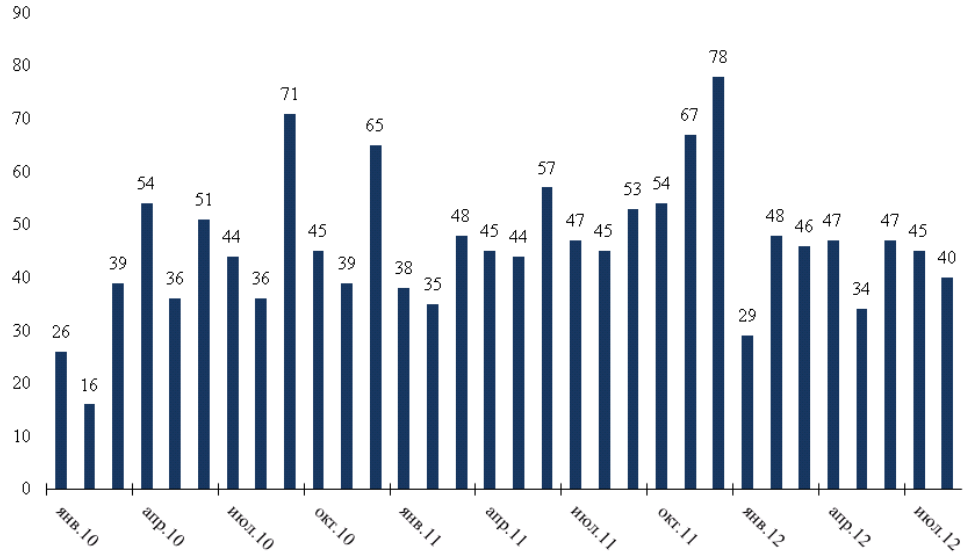
Therefore, in order to create corporate associations after the economic crisis of 2008, mergers and acquisitions can be considered as one of the possibilities success of Russian companies and organizations in the global competitive market (Gvardin and Tschekun, 2007). According to the analytical portal mergers.ru for only 2008-2010 there have been already recorded 58 such deals with the value of $ 4.2 billion (M&A in Russia, 2011).

Analysis portal mergers.ru marked 564 completed transactions, which is 23% more than last year, but still lower than pre-crisis data 2006-2008 for the first half of 2012 (M&A

in Russia, 2011). Almost all of the excess of the years up to 2011 was due to the increasing number of privatization deals - 240 deals instead of 58 the year before. As for the value of the Russian market for M&A, in January-June 2012 there was an estimated of $28.9 billion, and in the past year the drop was 54% (in the 1st quarter the noted decline was 12%). This data is close to the highest in the history of the Russian market, and second only to the 2007, 2008, 2011 (Russian Heights, 2012).

A very characteristic feature is that, despite the positive trend of growth in the Russian market in 2011, at the beginning of 2012, a decline in the trend of structural changes based on business transactions M&A. Compared to the same period last year, when a 38 deals for $ 3.9 billion, the volume of transactions fell in January 2012, by 24.6%, the number of transactions - by 23.7%, i.e. on both measures by almost a quarter. This trend does not in any way reduce the relevance of our assumptions about the growth prospects of the market, and explains the effect of the traditional New Year holiday and the large number of transactions in December last year when it was signed a record number of transactions - 80 per month, which caused glut in the market. (M&A Market, 2012).

Figure 1: Dynamics deals on the Russian M & A market



Source: M&A in Russia (2011); M&A market (2012)

Let us analyze the components of the Russian market on the main branches. In January 2012, the M&A-activity in engineering was not high - took place just one transaction for $10.3 million (estimated), whereas in the same period of last year was 4 in the amount of $40.1 million on the back of high results of the January 2011 figures look modest. However, in February the activity in mergers and acquisitions in the sector has grown considerably: it was completed the purchase of 100% "EMAlliance" "Power Machines" in March 2012, M&A-activity in engineering has increased in comparison with previous months. During this period there were five transactions totalling $107.8 million, while in January and February, the number of transactions per month was 1-2 transactions. In the 1st quarter of 2012, the industry has shown good growth in annual comparison. For the same number of deals (8 transactions in the first three months of each year) the amount of transactions in January-March 2012 increased by 84%, to $530.3 million versus $287.9 million for the same period a year earlier (M&A market, 2012).

In the steel industry in 2011, registered a decline in activity of the processes M & A. January 2012 did not change the situation - took place just one transaction for $48 million, but in March 2012 M & A-activity in the industry rose slightly: on 3 deals for $183.4 million, while in January, the deal was only one, and in February, there was not one.

However, the severe recession M & A processes in the industry, marked since August 2011, is preserved. In the I quarter of 2012, the total amount of transactions in the industry reached a total $231.4 million, while for the same period last year, it was $1,197 million This weak due to unfavourable market dynamics in the global steel market, in particular, the overproduction of steel globally .

In the food industry in the 1st quarter of 2012 noted 10 transactions totalling $1,870.2 million, which is 3 times the volume of transactions I quarter of last year, when on 7 deals worth 630 million dollars when it should be noted that almost 67% of the current amount provided the March merger brewer SABMiller assets and Anadolu Efes estimated at $1.25 billion is noteworthy that in two of the largest transactions in March with assets in the food industry in Russia and sell, and buy side (or both sides of the merger) were foreign companies.

In agriculture, in the 1st quarter of 2012, 13 transactions were noted compared to 7 transactions in the same period last year. But, despite the increase in the number of transactions, the total amount was reduced by almost 2-fold - from $386.4 million to $203.9 million average deal value in January-March 2012 was only $15.7 million versus $55.2 million last year.

In insurance recovery continues M&A-activity from the beginning of 2012. Despite the fact that in the 1st quarter of 2012 consisted of only two of the transaction (in the previous year during the same period - three), the total amount was $76 million, which is more than 6 times higher than in I quarter of 2011 ($12, 1 million). Another interesting fact: if throughout 2011, all transactions in insurance were extremely domestic, then both transactions 1st quarter of 2012 - is to buy foreign investors in Russia. An additional incentive for the activity was introduced in the beginning of April, a bill to increase the quota of foreign capital in the capital of Russian insurance companies from the current 25% (fully selected) to 50% (M&A market, 2012).

Chemical and petrochemical industry is now one of the most active sectors in the Russian market of mergers and acquisitions. Only in the I quarter of 2012 the industry was held on 5 transactions for $1,569.2 million, while for the same period last year there were only 3 for $15.2 million is the most active segment of the production of mineral fertilizers.

In I quarter of 2012 in trade recorded 15 transactions totalling $1,553.4 million, which is 1.7 times higher than the same period last year, the number of transactions and 1.3 times - in terms of (9 deals worth $1184, 6 million in the 1st quarter of 2011). The average value of the deal, however, decreased from $131.6 million to $103.6 million for the largest net of transaction (sale of the shopping centre "Gallery" in January for $1.1 billion), the average value of the transaction in January-March 2012 amounted to only $32.4 million.

However, it should be noted that despite the positive growth trend of mergers and acquisitions in Russia in 1st quarter of 2012 (January-August 2012, almost all sectors, even those traditionally active as engineering, financial institutions and transport, have demonstrated declines in the annual comparison.

In January-August 2012, the Russian M&A market transactions were 336 in total, which is 6.4% less than in the same period a year earlier (359 transactions). Such a small difference can be explained by the growth of the dollar to rouble exchange rate. But the value of transactions declined significantly - by 32% in the annual comparison (up to $35.32 billion from $52 billion in January-August 2011). Given the correction in the dollar decline is about 25%. Thus, for the eight months of 2012, the Russian M&A market lost a quarter of the volume of transactions. The average deal value in the Russian market M & A (net of the largest) in the eight months of 2012 decreased by 14%, to $59.1 million from $69 million a year earlier. Given the decrease in foreign exchange gain was about 4% (M&A market, 2012).

In August 2012, the fuel and energy complex in the rating industry rose to first place from second in July. The industry took place just one deal, but for $1316 million (44% of the market). A number of factors present in the fuel and energy sector ensure that the flow of deals will not weaken in the coming year. The formation of the demand in this segment elevation located on M&A market has an impact for many countries need to address energy security due to lack of own resources. Typically, a buyer of energy assets with favour the national oil companies, such as the Chinese company CNOOC and Sinopec. The second highest volume of transactions in August 2012 was a trade (14% of the market), which took place on 4 deals for $404.4 million in third place on the volume of transactions in August 2012 were construction and development (13% of the market) where there was a three deals for $385.3 million in fourth place in August was the service sector, where a four deals for $325.8 million (11% of the market). In fifth place in August 2012 was mining, which were 5 transactions for $197.2 million (7% of the market).

As can be seen from the above analysis, the activity of the Russian businessmen in various sectors is unstable, but shows positive trends indicate that Russian business structures to adequately respond to changes in the world market, even with the difficulties of post-crisis development, and use the resource potential of Russia to improve its competitiveness, although in our view, it is necessary to reduce the raw materials to the management and not just deliver raw materials to the world market, and produce on the basis of their products with high added value in order to increase its national competitiveness.

Conclusions

It should be noted that the Russian M&A market is considered one of the largest and most dynamic of all in Eastern Europe, but in terms of the specifics of the processes proceeding it is very different, both from the U.S. and the European markets. On the European market, the main priority is given to the purchase of the new technologies available to the target company whole in Russia it is still a trend in transactions only beginning to emerge and grow. The takeover of the Russian market of mergers and acquisitions more prevalent speculative tendencies, desire, above all, to get material benefit. The most attractive acquisitions are big industry with access to natural resources, as well as companies that own large real estate, which is typical of large cities, such as Moscow. A distinctive feature of the Russian market as is the presence of hostile mergers and acquisitions, which certainly does not contribute to its further development. It is caused by many aspects, including either more or inadequate role of the state in the regulation of these processes, as well as the relevant legislative acts.

According to many authors, for the success of M&A market in Russia, corporate leaders need to clearly strategize upcoming merger or acquisition, evaluate all possible perspectives and damages that may result from the transaction. Also, at the present stage of market transformation companies must transition for innovative development, relying less on the industrial sector, how much and on technologies that are used in industries as well as the social aspect, which at present has seen an upward trend. At this stage, "the revolution in information technology," the issue of training of highly qualified personnel, who are able to generate, process, and use information effectively, based on knowledge, it is very relevant. This implies not decrease the concentration of capital and production in the real sector of the economy, but rather increases its growth in the application of new technologies, which corresponds to an overall positive trend of growth of capitalization of post-crisis economy.

One more factor that can affect both positively and negatively on the economic system of Russia should be mentioned on the background on positive trends in the Russian market of mergers and acquisitions. Global change can bring to the economy of our country - Russia's accession to the WTO. For Russia, it could face increased competitive ability of domestic enterprises, which do not have to compete with the average statistical abstract foreign companies, with the strongest players in the world. In the context of rising competition, inevitable absorption of relatively weak production causing the absorption of Russian-made foreign companies is inevitable. As a result, the Russian market may be flooded by the multinationals which will strengthen the presence of already working. Increase competition in all sectors of the economy, which will lead to a decline in industrial and agricultural production and further strengthening commodity specialization Russia.

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GENERATORS' STRATEGIC BEHAVIOUR RESERCH BASED ON THE AGENT APPROACH TO THE POWER MARKET MODELING

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Abstract

This paper is devoted to the modeling of power markets and the generators' strategic behavior, and to the application of market power strategies, in particular.The generator's market power is its ability to influence the price of the offer and sale conditions in the power market without a reaction from competitors. The human factor leads to irrational features in the decision-making. That fact does not allow us to describe the behavior of market agents in the form of the optimization problem. So agent-based modeling of the complex economic systems is being actively developed now.

Keywords: wholesale power market; agent-based modelling; market power; generator; strategic behavior.

JEL classification: C63, L11, L13, M48

Introduction

A great number of studies over the past decade refute one of the fundamental used approaches to modeling - the rational behavior of market agents (see Thaler, 1980, Kahneman and Tversky, 1981, Rubinstein, 1988, Lowenstein, 1999, Camerer, 2002). In reality, their behavior is influenced by many factors, including the interaction between the agents and their ability to accumulate their experience - self-learning.
Understanding of this fact has led to the development of new dynamic models of the electricity market, which are based on agent modeling. A variety of commercial agent-based frameworks are now available for the study of restructured electricity markets; see, for example, the EMCAS framework developed by researchers at the Argonne National Laboratory (Conzelmann et al., 2004). In addition, researchers such as Bower and Bunn (2001), Nicolaisen et al. (2001), Veit et al. (2006), and Widergren et al. (2004) have used agent-based models to study important aspects of restructured electricity markets. (see Tesfatsion, 2007a). The problem of agent-based approach is not to find the optimal economic balance, but try to understand the nature of the complex socio-economic phenomenon.

The authors show that the modern electricity markets models are based on the economic-mathematical model of Wholesale Power Market Platform, proposed by the Federal Energy Regulatory Commission of the United States (see FERC, April 28, 2003). This fact is true for the most of the national energy markets of leading countries, including the electricity market of the Russian Federation. It allows to develop and apply general computing systems to model the national electricity markets. The free software resource AMES (Agent-based Modeling of Electricity Systems) developed in Iowa State University (see Tesfatsion, Leigh, 2007 c) was chosen to develop a model of the Russian electricity market and its dynamic performance evaluation.

Test results of the experiments show that all of the AMES generators learn over time to implicitly collude on the reporting of higher-than-true marginal costs, thus considerably raising the equilibrium market price.

The meltdown in the restructured California wholesale power market in the summer of 2000 has shown what can happen when a poorly designed market mechanism is implemented without proper testing. The California crisis is believed to have resulted in part from strategic behaviors encouraged by inappropriate market design features (see Borenstein S., 2002). Therefore, key research focus is the complex interplay among structural conditions, market protocols, and learning behaviors in relation to short-term and longer-term market performance.

The AMES framework is being currently used to investigate the intermediate-term performance of wholesale power markets operating under the WPMP market design. In particular, we are exploring the extent to which this design is capable of supporting the efficient, profitable, and sustainable operation over time of existing generation and transmission facilities, despite possible attempts by some market participants to gain individual advantage through strategic pricing, capacity withholding, and induced transmission congestion.

This paper is organized as follows: First, the main principles of the power market organization and pricing will be described. Second the basic strategies of market power will be presented. And third, AMES framework will be presented. Finally, in the conclusions the main outcomes of our research will be clearly stated.

Power market organization

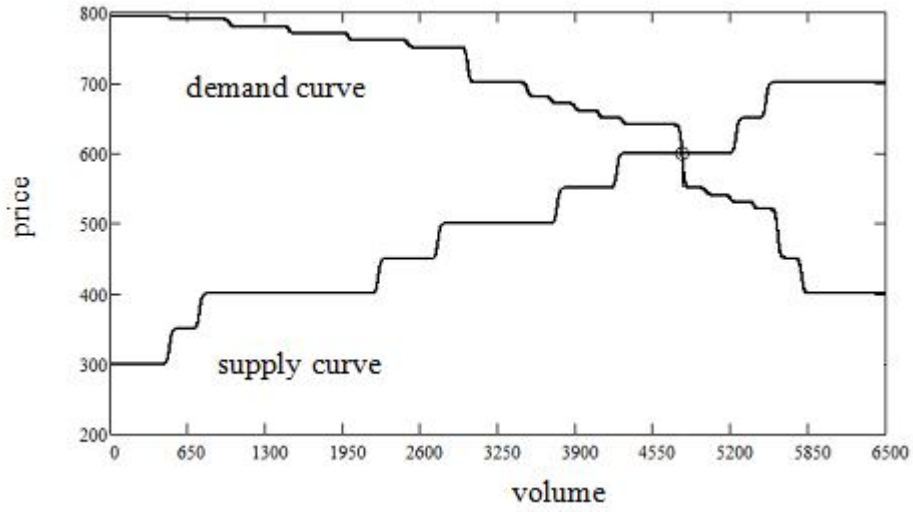
In spite of the differences in the organization of power systems in various countries, the energy market structure necessarily provides the interaction of the following systems: technological (system operator), commercial (power market exchange or the administrator of the market) and network operators that control the network switch. Under market conditions a system operator acts as a regulator aimed to identification of the strong players misuse and to reduction market power influence on the electricity market situation.

Every power system also has a separation of the market phase on time. The market model usually consists of several sectors. These are the most common of them: the day-ahead market (spot market), the real-time market (balancing market) and the market of long-term contracts.

The day-ahead market is the most important sector in terms of pricing and commitment schedule management. The balancing market is a regulatory mechanism of the differences between real-time conditions and the dayahead financial contracts. As it is a real-time market it’s not interesting for strategic planning. Market of long-term

contracts is in fact a mechanism of risk insurance of both parties, so do not allow participants to get high profits.
Most volume of the electricity generators sell on the spot market, as it is the free trade sector. being the most competitive it allows participants to get the maximum possible revenues (see S. Stoft, 2002).
The spot power market is based on a mechanism of a double-auction trade. This sets the equilibrium price for each node of the computational model for each hour of the day taking into account losses and system constraints (see S. Stoft, 2002). The equilibrium price is determined by matching the buyers submit demand bids and sellers submits supply offers approfpriate price zone with the need for power flows.
Generator submits supply offers into the electronic trading system of the energy market for each hour and for each of its equipment, which indicate the selling price per unit of electricity and the volume, which is planed to sell at this price. The electronic system sorts the offers by ascending price. As a result, the supply curve is formed. The consumers' bids determine the demand curve for electricity. They are submited into the electronic trading system every hour, and are ranked in descending order.
The intersection of demand and supply determine the equilibrium market price and the equilibrium volume. At this price and in this volume electricity will be sold in a predetermined node of the market model (see Figure.1).

Figure 1: Pricing on the spot electricity market



Source: Lisin (2012)

The marginal strategy is a traditional strategy of generator's behavior in the electricity market. Marginal strategy implies that the bids are based on the marginal cost of electricity for each equipment. It allows to considerably reduce the risks of generators' bids rejection by market. At the same time, if the demand prevails over supply (inelastic demand), generators can use market power strategies in order to maximize their income.

The application of market power strategies in the electricity market

In the electricity market generators can implement a number of strategic innovation based on the market power of the company, that allows them to maximize their income (see Lisin, 2012). The basic market power strategies are presented in the Table 1.

Table 1: The basic market power strategies

name of the strategy	mechanism of application	the result
Financial withdrawal	Sellers submit supply offers at a higher cost (above the marginal cost of electricity generation).	Under the condition of inelastic demand, this should lead to an increase in the equilibrium market price, and the potential generator's income
Capacity withholding	Sellers submit supply offers with the reduced volume in comparison to the one that can be worked out on the generating equipment of the company.	Withdrawal of a certain amount of power from the market, and thus an increase in the equilibrium market price.
Capacity withholding by free bilateral contracts.	Part of the "cheap" volume is removed from the market by free bilateral contracts	Under the condition of the growth in electricity consumption, this leads to an increase in the equilibrium market price.

Source: own research

The application of market power allows generators to influence the price of the offer and the electricity sale conditions with no response from the competitors. Under the certain conditions it leads to the increase of the electricity sale price in the spot market, that eventually affects the consumer rates. So the special organizations must carefully monitor the application of market power by generators.

Agent-based framework (AMES)

Table 2: The core elements of the WPMP market design that have been incorporated into the AMES framework

The elemets of the model	Characterization
Time	The AMES wholesale power market operates over an AC transmission grid for DMax successive days, with each day D consisting of 24 successive hours H = 00, 01, . . . , 23
Agents	The AMES wholesale power market includes an Independent System Operator (ISO) and a collection of energy traders consisting of Load-Serving Entities (LSEs) and Generators distributed across the nodes of the transmission grid
Market organization	The AMES ISO undertakes the daily operation of the transmission grid within a twosettlement system consisting of a Real-Time Market and a Day-Ahead Market, each separately settled by means of *locational marginal pricing*
Power commitments, pricing	During the afternoon of each day D the AMES ISO determines power commitments and *locational marginal prices (LMPs)* for the Day-Ahead Market for day D+1 based on Generator supply offers and LSE demand bids (forward financial contracting) submitted during hours 00 − 11 of day D
Commitment schedule	At the end of each day D the AMES ISO produces and posts a day D+1 commitment schedule for Generators and LSEs and settles these financially binding contracts on the basis of day D+1 LMPs
deviation control	Any differences that arise during day D+1 between real-time conditions and the dayahead financial contracts settled at the end of day D must be settled in the Real-Time Market for day D+1 at real-time LMPs for day D+1
Transmission grid congestion management	Transmission grid congestion in the Day-Ahead Market is managed via the inclusion of congestion components in LMPs.

Source: Strielkowski, Grigoryeva, Lisin (2013)

Junjie Sun and Leigh Tesfatsion, the American scientists, have created the computational model of the wholesale power market specially for testing the dynamic efficiency and reliability of theWPMP market design. This framework – referred to as AMES (Agent-based Modeling of Electricity Systems) – models strategic traders interacting over time in a wholesale power market that is organized in accordance with core WPMP features and that operates over a realistically rendered transmission grid
The core elements of the WPMP market design that have been incorporated into the AMES framework are presented in the Table 2.
Tht advantage of the AMES model is the reinforcement learning representations for the electricity traders that are based on findings from humansubject multi-agent game experiments conducted by Roth and Erev (1995). The application of learning algorithms allows the generators to select the best way of forming supply offers (marginal cost functions and production intervals), that they daily report to the AMES ISO for use in the WPMP day-ahead market.
AMES is the non-commercial open-source framework, that allows to make some changes in order to adapt the model to the specialties of the national markets and improve the model to increase the efficiency of its application.

Resume

More and more opportunities appear for generators to use their market power, that allows them to influence the price of the offer and the electricity sale conditions. So it's expedient to improve the existing energy market models by developing a separate computer module that will describe the strategies of market power.
During the work with AMES system some of the computing scenarios based on the description of the mechanisms of physical and financial withdrawal of supply offers from the trading system were made. Investigation of these scenarios showed that similar mechanisms of market power allowed to significant increase of the generators' income by increasing the equilibrium price in the electricity market, that, eventually, affect the consumers' rates.
Creating the additional module will allow regulatory organizations to monitor the behavior of generators, as well as to develop and test the arrangements to reduce the influence of market power.
The AMES could be useful in various aspects. Academic researchers and teachers could use this framework to increase their qualitative understanding of the dynamic operation of restructured wholesale power markets. Industry participants should be able to use the framework to familiarize themselves with market rules and to test business strategies. And policy makers should find the framework useful for conducting intensive experiments to explore the performance of actual or proposed market designs from a social welfare viewpoint. In particular, if the design encourages the efficient and reliable operation of existing generation and transmission capacity in the short term, and if it provides appropriate incentives for investment in new generation and new transmission capacity in the longer term

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ON THE SIGNALLING EFFECT OF CLUSTERS: CLUSTERIZATION AND INFLOW OF FDI INTO POLISH NUTS-2 REGIONS

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Abstract

Presence of functioning industrial clusters increases the overall attractiveness of regions for foreign direct investments or FDI inflows. The entry of one investor at the same time increases the likelihood of further inflow, which is referred to in the literature as a result of the signaling or agglomeration effect of FDI. The present paper tries to identify the signaling effect of clusters for foreign direct investors linking the data on the overall clusterization pattern and its different aspects gathered during sophisticated cluster mapping study for Poland to data on FDI stock and number of foreign direct investments.

Keywords: industrial clustering, FDI inflow, signaling effect, Poland

JEL classification: *L16, R12, R15*

Introduction

The concept of industrial cluster has received well-deserved attention in the last 20 years or so. M. Porter (1998) adopts a broad definition of industrial cluster defining it as a geographic concentration of interconnected companies, specialized suppliers, service providers, firms in related industries, and associated institutions (for example universities, standards agencies, and trade associations) in particular fields that compete but also co-operate." There is a large variety of cluster-related concepts in the literature of the subject which are frequently utilized interchangeably such as industrial district (Becantini, 1991). The Porterian definition of a cluster is often regarded as rather imprecise and vague or even chaotic (Martin and Sunley, 2005).
For the purpose of the clusters mapping project we defined clusters as spatial concentrations of interlinked firms in vertically or horizontally related areas of economic activity. The significant features of clusters include:

- regional concentration of vertically/horizontally linked firms in related sectors
- critical mass of market and non-market institutions (proxied by number of enterprises)
- dense network of formal and informal relations between market agents (spatially bounded)
- fierce competition with simultaneous cooperation in some fields
- detectable benefits should be also present:
    - for the participants of the cluster (internal effects)
    - for the regional economy (external effects - positive externalities)

Martin et al. (2008) postulate that the concept of Porterian cluster is not very far away from agglomeration as utilized in economic literature. Industrial districts and clusters result mostly from endogenous processes emerging over time as self-organized phenomena and are mostly bottom-up initiatives. There is however a clear path-dependency and regional embeddedness involved. For instance Paul Krugman in his Nobel Prize lecture noted that industrial centers in the US developed once industrialization commenced in places with significant tradition in manufacturing industries.

The frequently unrealistic expectations of large potential gains through the external effects associated with the functioning of regionally-embedded industrial clusters in terms of higher revenues, greater innovative potential, higher productivity led to emergence and implementation of cluster-based policies (CBP). With time CBP became an important element of policy making both at regional, national as well as supranational levels in many areas of the world. Surprisingly, there is very little actual evidence of the supposed virtues of industrial clustering both for participating firms as well as regions of their location. This applies in particular to CEE countries. Martin et al. (2008) find for French data that doubling the size of a cluster as measured by employment results in a very modest increase in productivity of 4 per cent for an average cluster firm. The relationship between cluster size and associated benefits is of an inverted U-shape – the benefits start to decrease as congestion cost set in. However, the question remains here: should welfare-maximizing government intervene in the market in order to boost the development of clusters?

Functioning industrial clusters are frequently considered to be drivers of regional growth, however, the actual impact of clusters on regional development and growth is unclear – Martin & Sunley (2005). We lack methodologically sophisticated analysis both for Poland and the EU. The first major attempt by Rodriguez-Pose and Comptur (2010) led to the conclusion that the role of clusters in regional growth outweighed by the role of the social-filter. Previously, Ciołek and Brodzicki (2012) using more sophisticated approach find some empirical support for positive impact of industrial clustering on the level of development of Polish NUTS2 regions.

Due to its structural and behavioral features and a higher level of attractiveness of regions of location of cluster is a potential place for foreign direct investments or FDI inflows (Goetz 2009). The entry of one investor at the same time increases the likelihood of further inflow, which is referred to in the literature as a result of the signal or agglomeration effect of FDI. De Propris and Driffield (2006) show in addition that the probability of diffusion of knowledge and technology from foreign to domestic companies is higher if they both function within a single cluster. We thus expect a positive and statistically significant impact of overall clusterization on the FDI inflow/stock within a particular region.

The reminder of the paper is the following. Section 2 describes the results of cluster mapping analysis for Poland and the development of clusterization indices. Section 3 employs simple statistical and econometric methods and links the clusterization indices to data on FDI inflow/stock in NUTS 2 regions of Poland. The results of the models are then are briefly discussed. Final section concludes and provides short policy implications.

Cluster Mapping in Poland

It seems that the overall methodology of cluster mapping has to be adjusted in order to fit the nation-specific elements (data availability, differences in definitions etc.). General methodology must be optimized to suite specific national circumstance (Brodzicki 2010). Clear and precise definition of cluster should be adopted first but than scrutinized. In defining clusters one should acknowledge the level of technological advancement of a given economy – the scope, the type and extent of linkages could be different for an integrated economy close to world technological frontier and relatively backward small economy in transition. This necessitates comparison of frequently adopted definitions of cluster categories of Porter (2003) with the national features. At least both should be crosschecked.

The analysis should be carried out at the finest possible level of sectoral and spatial disaggregation – data allowing. It seems that for Poland a minimum are 3-digit NACE sectors analyzed at the level of LAD 4 or powiats. Furthermore, at this level potential spatial autocorrelation must be taken into account. In identification of local high points (above average concentrations) methods typical for market potential literature should be utilized. We should take into account the influence of bordering or proximate concentrations. These could be utilized with the implementation of spatial weighting matrices.

The data analyzed should not be limited to employment data only. A minimum requirement is the information on the number of firms by sector type and their distribution by size of employment within a given sector.

Taking the above issues into account, the cluster mapping was performed by a team consisting of M. Tarkowski, D. Ciołek, T. Brodzicki. The analysis was performed at LAD 4 level (powiat) in spatial dimension and 3-digit NACE rev. 2 in sectoral dimension. We utilized data on employment, no of enterprises, no of enterprises by employment size for 2006 (data source: GUS). Spatial autocorrelation was taken into account through the use of spatial weighting matrices (first neighborhood matrix was chosen after extensive testing due to I Moran tests). In defining cluster sectors several methods of bundling were considered:

- analysis of sectoral agglomeration patterns at different levels of spatial disaggregation,
- analysis of input-output tables for Poland (methodology of Titze et al. 2010, NUTS3 – 2-digit NACE => vertical clustering)
- analysis of co-localization patterns for Poland (horizontal clustering)
- adoption of cluster sectors definitions of Porter et al. (2003).

General conclusion reached was that patterns of agglomeration and collocation for Polish sectors do not deviate significantly from American patterns (technological convergence). Thus Porter et al. (2003) cluster sectors definitions were adopted for comparability of results.

Identification of clusters was performed in several steps. Location quotients for spatially-weighted employment in cluster sectors bundles (LQ_EW) were calculated and linked to number of enterprises in core sectors of clusters (it was accordingly spatially-adjusted N_CORE). Threshold levels for key parameters were adopted by the analysis of actual distribution of LQ_EW and N_CORE and the use of the Fisher-Jenks method. Cluster mapping followed. Adjustments were made for clusters with low numbers of enterprises in the core cluster sectors (potential hub-and-spoke clusters) as

well as for existence of municipal and non-municipal (rural) local administrative districts.

Table 1: Clusterization indices for Polish NUTS2 regions

Region	Cluster specialization quotient (SQ)	Cluster diversification index (DIV)	Cluster significance index (SIGMA)
dolnośląskie	0.645	0.600	122.55
kujawsko-pomorskie	0.950	0.600	264.13
lubelskie	0.220	0.257	34.29
lubuskie	0.239	0.229	43.79
łódzkie	0.966	0.600	276.46
małopolskie	1.189	0.886	337.01
mazowieckie	1.615	0.857	806.82
opolskie	0.527	0.286	177.75
podkarpackie	0.243	0.314	29.59
podlaskie	0.159	0.171	20.88
pomorskie	0.903	0.600	277.42
śląskie	1.465	0.657	803.69
świętokrzyskie	0.504	0.257	183.79
warmińsko-mazurskie	0.220	0.314	24.70
wielkopolskie	0.847	0.857	131.96
zachodniopomorskie	0.553	0.371	148.23

Source: Own elaboration on the basis of GUS data on total employment – REGON – Main Statistical Office of the Republic of Poland.

All in all more than 250 potential clusters have been identified for Polish regions within 39 different Porterian cluster classes.
Information on cluster was aggregated and several clusterization indices were calculated in order to account of patterns of clusterization of regional economies at NUTS2 level. The indices included:

- specialization quotient (SQ) - indicating how specialized in respect to national economy average is respective region,
- significance index (SIGMA) - showing how important for regional economy are the identified clusters
- and finally diversification index (DIV) - showing how diversified are clusters within a given region (cluster-mix).

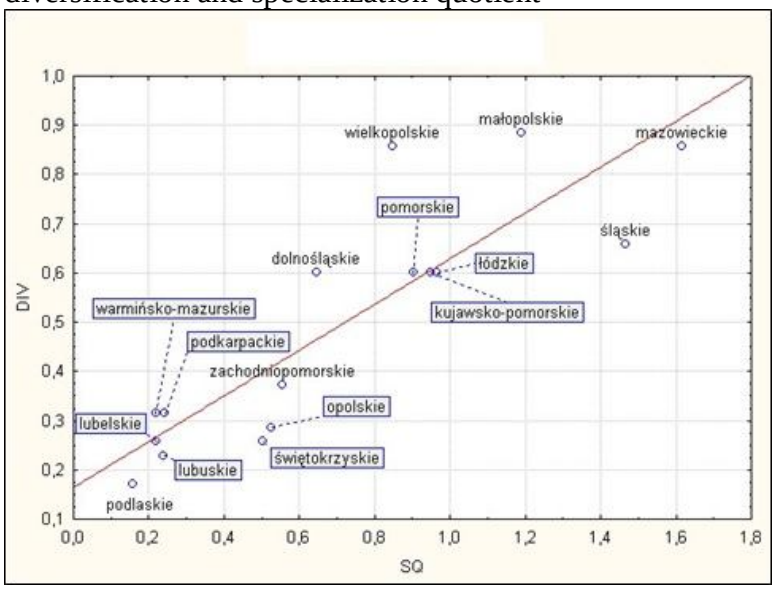
Principal Component Analysis followed on the basis of 3 aforementioned indices to account for factors driving the actual variation. In addition, PCA allowed us to construct an overall clusterization filter for Polish NUTS2 regions.
Generally speaking, clusterization indices are the highest for metropolitan regions of Poland – agglomerative forces seems to lead to concentration of different specialized and linked sectors and at the same time to general aggregation of the activity. Mazowieckie, śląskie, małopolskie, łódzkie and wielkopolskie are particularly strong. Pomorskie and kujawsko-pomorskie follow shortly. The extent of clusterization seems to be the lowest in the Eastern, generally underdeveloped regions of Poland.

Table 2: Overall clusterization index (CLUST) and the inflow of FDI into Polish NUTS2 regions

Region	Overall clusterization index	No of FDI projects over 1 mln USD	Log of foreign owned capital
dolnośląskie	1.143	181	9.350
kujawsko-pomorskie	1.597	71	7.325
lubelskie	1.628	22	6.210
lubuskie	0.189	53	6.750
łódzkie	0.179	94	7.892
małopolskie	2.296	100	7.734
mazowieckie	3.275	843	11.129
opolskie	0.687	69	7.005
podkarpackie	0.281	107	7.453
podlaskie	0.000	20	4.665
pomorskie	1.577	91	8.220
śląskie	2.868	181	8.996
świętokrzyskie	0.637	36	7.401
warmińsko-mazurskie	0.255	38	5.648
wielkopolskie	1.681	161	9.410
zachodniopomorskie	0.785	99	7.270

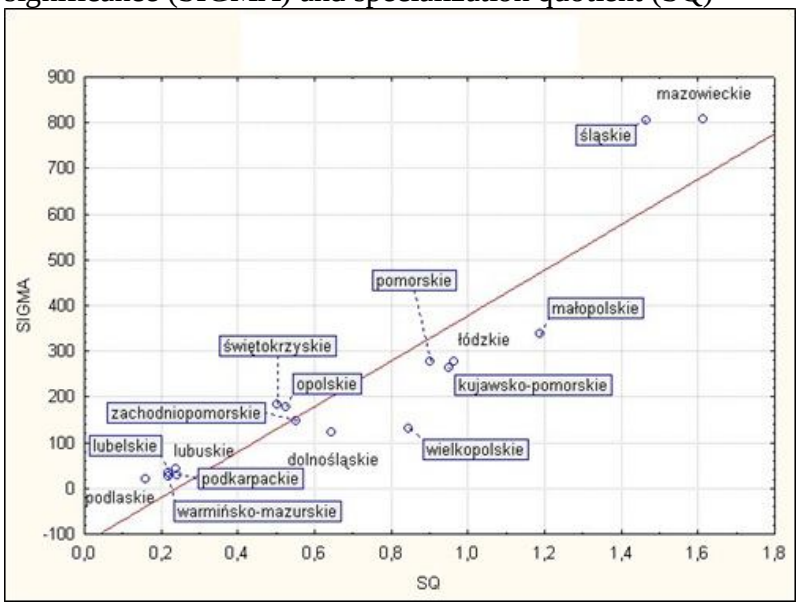
Source: Own elaboration on the basis of GUS data on total employment – REGON – Main Statistical Office of the Republic of Poland, PAIiZ (FDI inflow).

Figure 1: Clusterization indices for Polish regions – relations between cluster diversification and specialization quotient



Source: Own elaboration in STATISTICA 9.1.

Figure 2: Clusterization indices for Polish regions – relations between cluster significance (SIGMA) and specialization quotient (SQ)

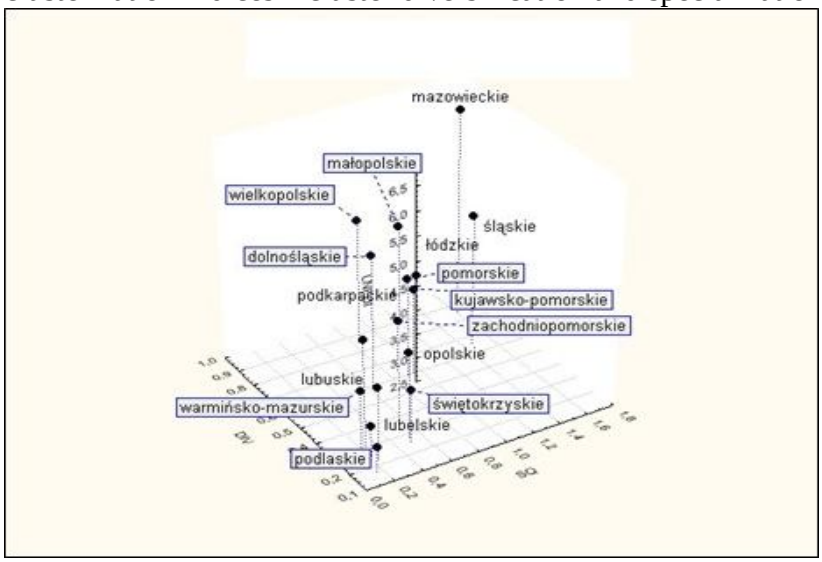


Source: Own elaboration in STATISTICA 9.1.

Signaling effects of clusters – empirical verification

The information on pattern of industrial clustering in Polish economy was compared to spatial distribution of FDI inflow into Polish regions. The detailed data set of PAIiIZ was utilized. It takes into account all FDI projects exceeding the threshold of $1 million and provides information on its area of activity and detailed location of the plant.

Figure 3: Signaling effect of clusters - Inflow of FDI into Polish regions (lnFDI) versus clusterization indices – cluster diversification and specialization quotient

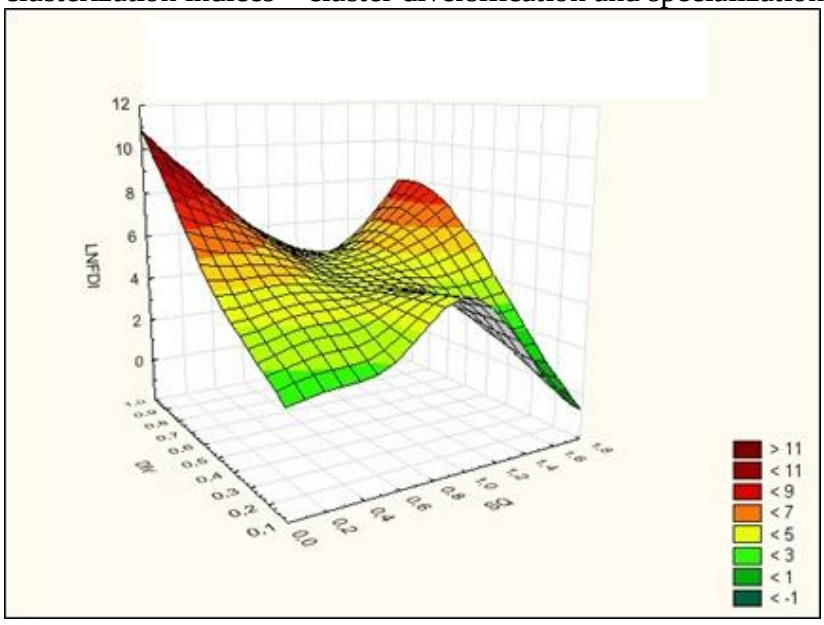


Source: Own elaboration in STATISTICA 9.*1.*

The data were transformed and aggregated within a project of the Institute for Development (Brodzicki et al., 2010). It is worth noting that FDI is more spatially

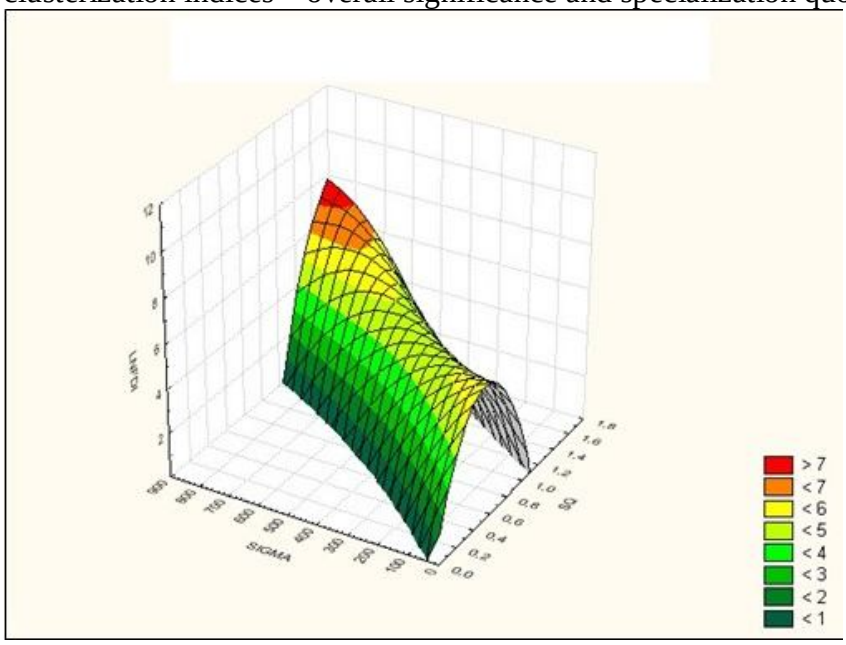
concentrated (FDI agglomeration effect) then overall manufacturing industry employment (production – location) and overall population (urbanization, metropolitan areas). The data contains information on all major investment projects carried out up to 2010.

Figure 4: Signaling effect of clusters - Inflow of FDI into Polish regions (lnFDI) versus clusterization indices – cluster diversification and specialization quotient



Source: Own elaboration in STATISTICA 9.1.

Figure 5: Signaling effect of clusters - Inflow of FDI into Polish regions (lnFDI) versus clusterization indices – overall significance and specialization quotient



Source: Own elaboration in STATISTICA 9.1.

On the basis of review of theoretical literature we expected the existence of a positive and statistically significant impact of extent of industrial clustering within a given

region on the FDI inflow into the region. The following figures indicate that there is a clear link between the extent of clusterization and the inflow of FDI in Poland. The direction of causality can be however questioned (it might be bidirectional).
A simple introductory econometric analysis proved the initial results. We constructed a simple empirical model with log of no of FDI projects (ln FDI, models 1-4) and stock of foreign capital in regions (ln FSTOCK, models) as depended variables.

Table 3: OLS estimates of the impact of industrial clustering on the ln FDI

	Dependent variable: ln FDI			
	(1)	(2)	(3)	(4)
lnPOP	0.261	0.242	0.292	0.288
	(12.64)***	(9.00)***	(18.25)***	(14.11)***
SQ	1.296			
	(3.86)***			
DIV		2.357		
		(3.53)***		
SIGMA			0.002	
			(3.32)****	
CLUST				0.459
				(2.56)**
Adj R2	0.9845	0.9831	0.9822	0.9792
F-test	509.79	466.07	441.19	360.33
No of obs.	16	16	16	16

Note: Results are simple OLS estimates. t-statistics in brackets, *significant at 10%; **significant at 5%; ***significant at 1%.
Source: own elaboration

Table 4: OLS estimates of the impact of industrial clustering on the ln FCAP

	Dependent variable: ln FCAP			
	(5)	(6)	(7)	(8)
lnPOP	0.451	0.415	0.507	0.491
	(13.23)***	(9.60)***	(18.35)***	(15.19)***
SQ	2.232			
	(9.02)***			
DIV		4.197		
		(3.92)***		
SIGMA			0.004	
			(3.14)***	
CLUST				0.871
				(3.07)***
Adj R2	0.9858	0.9854	0.9821	0.9817
F-test	577.02	542.02	439.22	430.64
No of obs.	16	16	16	16

Note: Results are simple OLS estimates. t-statistics in brackets, *significant at 10%; **significant at 5%; ***significant at 1%.
Source: own elaboration

A simple cross-sectional analysis with the use of OLS followed. The impact of overall industrial clustering as measured by industrial clusterization indices – SQ, DIV and SIGMA as well as the overall clusterization index CLUST has a positive and statistically significant effect at 5 per cent level on the number of FDI project (lnFDI) and value of foreign capital owned capital (lnFCAP) in Polish NUTS2 regions controlling for regions size as given by lnPOP (natural log of population size of a given region)
Our results should be treated with caution as they are not very robust to inclusion of other explanatory variables. Further more elaborated analysis on expanded data set – preferably large panel data would be required. The impact of potential spatial autocorrelation should preferably be taken into account.

Conclusions

Accession of new Member States and the associated expansion of the internal market led to increased relocation of economic activity within the EU and especially between its central and peripheral regions. Economic integration mainly through economies of scale also affects the degree of spatial concentration of economic activity especially in sectors characterized by the presence of strong internal and external economies of scale. Relocation of economic activity within the EU has a direct and indirect impact on the development of industrial clusters in its territory (overall clusterization) of its economy. The observed trends fit well with the previously identified trends for EU-15 (Midelfart-Knarvik et al. 2002).
The delocation of manufacturing as well as to a some extent industrial sectors increased the overall level of clustering of economic activity in Polish voivodeships. Existence of clusters creates a signaling effect luring further cluster-specific investors. Different aspects of clusterization as well as an overall clusterization index have a positive and statistically significant impact on the inflow of FDI into Polish NUTS2 regions as proxied by no of FDI projects and cumulated regional foreign capital stock. The result is not very robust and should only be treated as a preliminary. The endogeneity of the relation can be only properly tested with the use of spatial panels of data with significantly long temporal dimension (location adjusts over long period of time).

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ANALYSIS OF THE MAJOR PRECONDITIONS OF COAL-HYBRID POWER PLANTS CONSTRUCTION AS A PERSPECTIVE DIRECTION OF HIGH EFFICIENCY HEAT-POWER ENGINEERING DEVELOPMENT

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Abstract

In this paper we are investigating the question of technical and economic efficiency of coal-hybrid power plants construction. We are considering a combined-cycle gas turbine plant, in which combustion heat of the coal is used to provide the necessary initial temperature in the gas cycle and before the steam turbine while the hydrogen fuel is used for intermediate steam superheating. This technical solution allows to increase significantly power and heat generation efficiency but also raises the issue of the most effective way of producing hydrogen. As the research results revealed, there are large scale production and row material bases available in Russia, therefore the question deserves further investigations.

Keywords: energy efficiency, combined-cycle gas turbine plant, coal, hydrogen, methane steam reforming, coal seams degassing.

JEL classification: *L64, L71, L72, L95, O13, P48, Q49, Q53.*

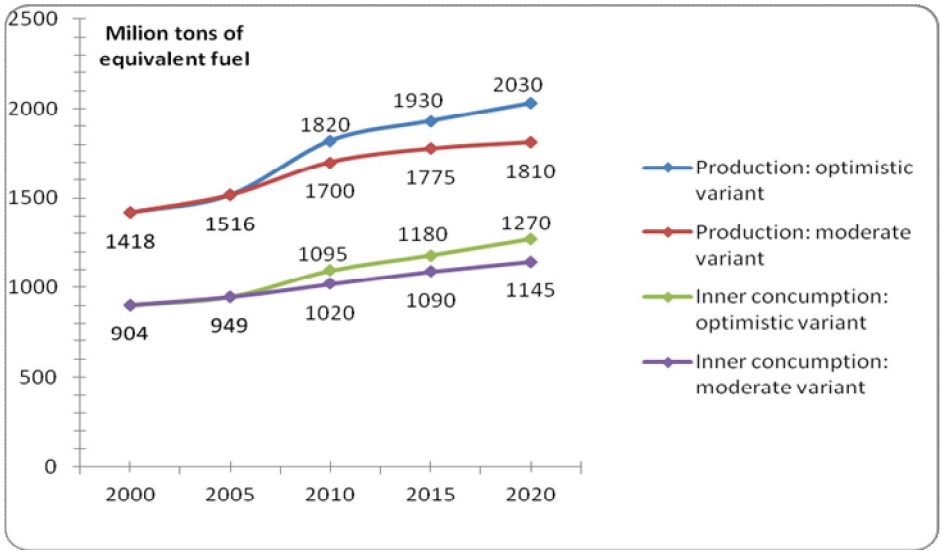
Introduction

This paper is organized as follows. First, the review of literature on the subject of the research, justifying the need for thermal power plants improvement will be provided. Second, the technical solution for this improvement will be suggested and estimated from both technical and economic points of view. Third, the way of obtaining the extra resources, required for the solution will be discussed in detail. Finally, we draw the conclusions that outline the necessity of the further development of the subject.

Overview of the research literature

Efficiency of fuel consumption is not only an energetic and economic objective, but also a socio-political condition for achieving major goal of country development course in prospect. In his book A. N. Artjushin says, that low energetic efficiency of Russian economics (in comparison with economically developed countries) leads to high energy-supply expenses, interruptions of energy-supply of private and public economic sectors, impedes energy security providing.
Ineffective fuel and power utilization in Russian economics is due to imperfection of actual legal, economical and price mechanisms, faintly stimulating energy resources manufacturers and consumers to reduce fuel and power costs. Implementation of the energy saving strategy can have a positive impact on the country's economic development, including improvement of production, transport and public utility technologies, deceleration of inflation processes, increasing marketability of Russian commodity producers, raise of the country's export potential and, at last, Gross Domestic Product growth and living standards improvement.
In their book O. L. Danilov and other authors say, that during the last decades there has been stable economic growth, accompanied by energy resources consumption raise (figure 1). Russia is ranked third in the world (after the USA and China) in quantity of energy resources consumed.

Figure 1: Production and consumption of primary energy resources for the period 2000-2020.



Source: O. L. Danilov, A. B. Gorjajev, I. V. Jakovlev I dr. M. (2010) *Energosberejenije v teploenergjetice i teplotehnologijah,* Izdatjelskij dom MEI.

Given this, according to the Energy Strategy of Russia till 2030, fuel and energy consumption structure will be undergoing significant changes in the near future (see Table 1).

Table 1: Forecast of energy resources consumption structure phased changing.

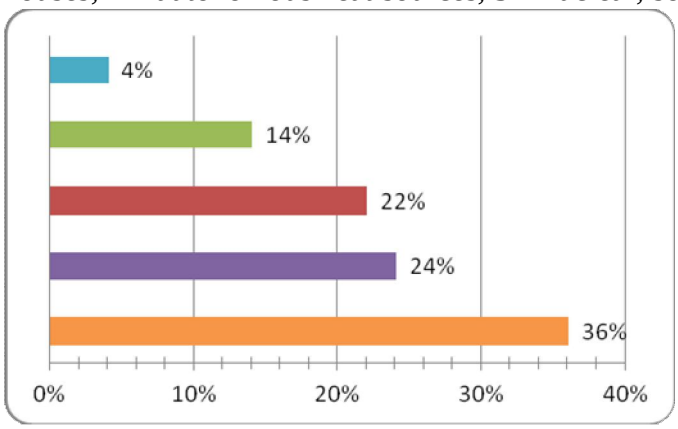
Energy resources, %	Years			
	2011	2014	2022	2030
Natural gas	53,4	52,2-52,5	48,7-50,2	42,2-45,0
Oil and oil products	19	19,9-20,1	20,5-21,2	20,4-21,6
Coal	16	16,9-17,0	17,4-17,8	18,4-19,0
Nonfuel energy resources	11,6	10,6-10,7	11,9-12,3	16,2-17,2

Source: O. L. Danilov, A. B. Gorjajev, I. V. Jakovlev I dr. M. (2010) *Energosberejenije v teploenergjetice i teplotehnologijah,* Izdatjelskij dom MEI.

As can be seen from the above mentioned data, the hydrocarbons percentage will decrease, while nonfuel energy resources consumption (hydro energetics, renewable energy sources) will raise from 11 to 16-17%. The percentage of natural gas consumption in energetics and industry will gradually decline to 42-45%. Providing gas supplies for power plants under construction and industrial enterprises at the same time with export obligations execution will become one of the key problems of Russian energetics.

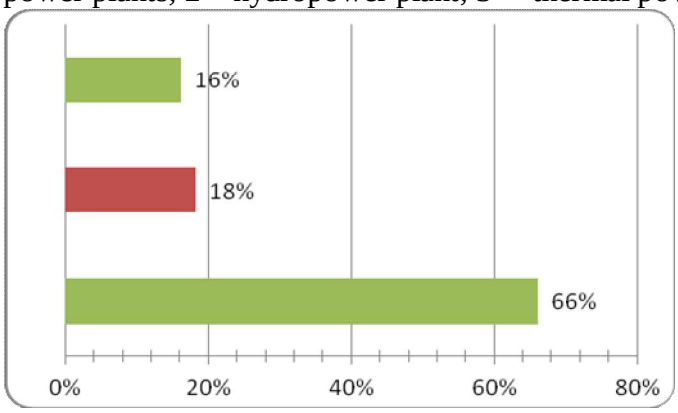
Growth of the gas prices will stimulate coal energetics progress. It will require development of the new fuel preparation, processing and combustion technologies. At present moment Russia lags behind developed countries in the field of coal technologies. Actual structure of energy production is illustrated in fig. 2-3.

Figure 2: Heat generation by different sources in Russia: 1 -- heat electropower stations; 2 – large boiler houses (thermal power over 100 Gcal/hr); 3 – small boiler houses; 4 – autonomous heat sources; 5 – nuclear, solar, geothermal energy.



Source: O. L. Danilov, A. B. Gorjajev, I. V. Jakovlev I dr. M. (2010) *Energosberejenije v teploenergjetice i teplotehnologijah,* Izdatjelskij dom MEI.

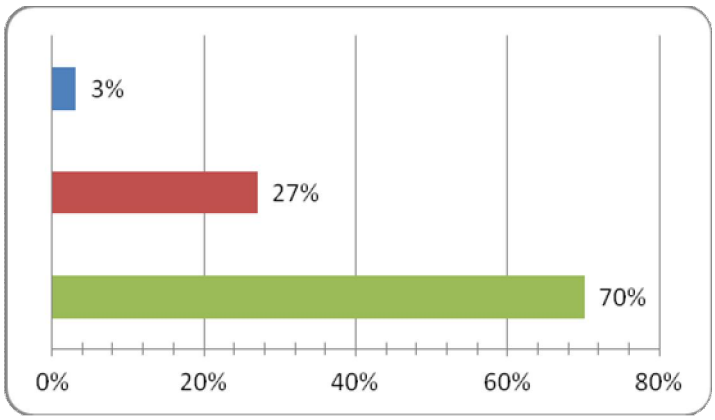
Figure 3: Electric power generation by different types of power plants: 1 – nuclear power plants; 2 – hydropower plant; 3 – thermal power plant.



Source: O. L. Danilov, A. B. Gorjajev, I. V. Jakovlev I dr. M. (2010) *Energosberejenije v teploenergjetice i teplotehnologijah,* Izdatjelskij dom MEI.

Fossil fuel consumption has the following structure (figure 4).

Figure 4: Utilization of different types of fossil fuel for electric power production by thermal power plants in Russia: 1 – natural gas; 2 – coal; 3 – boiler oil.



Source: O. L. Danilov, A. B. Gorjajev, I. V. Jakovlev I dr. M. (2010) *Energosberejenije v teploenergjetice i teplotehnologijah,* Izdatjelskij dom MEI.

As can be seen from the above mentioned data, to improve fossil fuel utilization efficiency for electric power generation we should first of all concentrate on thermal power plants. Leading position in this sector take steam-gas plants or combined-cycle gas turbine plants (CCGTP). In their paper, N. D. Rogaljev and other authors say, that, basically, efficiency improvement of such plants is achieved by increasing parameters of the heat carrier before the turbine. For example, it is possible to improve the coefficient of performance value up to 55-60% by raising initial heat carrier temperature before the turbine up to 1500 °C.

At the same time, initial steam temperature for the majority of steam-turbine plants is usually from 540 to 560 ^{0}C and in some rare cases it can reach 600 ^{0}C. As a result, the total coefficient of performance of steam-turbine plant does not exceed 45%.

A simple combination of two independent cycles with different temperature levels of heat carriers in steam-gas plants is a serious imperfection of this thermodynamically progressive solution. The deficit is caused by the fact that the operation life of high-temperature gas turbine is significantly lower in comparison with the one of steam turbine. Today the durability of steam turbines reaches 200 thousand hours, but according to the data, provided by *"Siemens"*, the guaranteed durability of gas turbines at the initial temperature of 1350 ^{0}C does not exceed 30 thousand hours. Moreover, there is a substantial probability of unscheduled halts of high-temperature gas turbines.
As a result, despite the high thermal coefficient of performance of combined-cycle gas turbine plants, their real effectiveness will be significantly lower while their operating costs will be much higher in comparison with steam power plants. Thereby, it is considered to be incorrect to plan the development of energetics being based only on steam-gas plants.

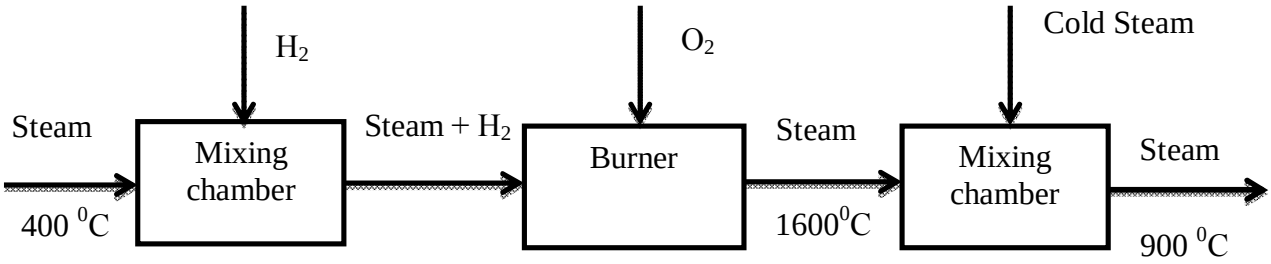
High capacity hybrid power plants CHPP

One of the possible ways of increasing the efficiency of fossil fuel utilization for power generation is construction of high capacity hybrid power plants CHPP (coal-hybrid power plants). In these plants fossil fuel (in this case it is coal, the future of energetics, according to the forecasts) is the primary source of thermal energy, providing the necessary initial steam temperature and the hydrogen fuel combustion heat is used for intermediate steam superheating.
The major advantages of using hydrogen fuel are:

- hydrogen is a pollution-free energy source. The only reaction products of combusting hydrogen in pure oxygen are thermal energy and water;
- high calorific value (the low heat value of hydrogen is 142 MJ/kg, that is 4 times more, than the coal's one and 2,5 times more than the one of natural gas).

The basic specific feature of using hydrogen for intermediate superheating is the process of H_2 combustion in steam environment directly. There are no technological complications, for combustion chambers, required for this process, are similar to the ones of the gas turbine engines. One of the possible solutions is illustrate by fig. 5. Superheated vapor (400 ^{0}C) and hydrogen are supplied to the mixing camber, located at the inlet. Then the mixture and the oxygen, required for the combustion process, are supplied to the burner. The result of the process is superheated vapor (1600 ^{0}C), that is in further mixed with the "cold" steam supplied to the combustion chamber body. The steam temperature after the combustion chamber is defined by the hydrogen consumption and the amount of "cold" steam supplied.
Thus, only the turbine room needs reconstruction – a new high-temperature turbine, connected to generator of higher capacity is to be installed.
The high-temperature steam turbine design diagrams show that dividing both high-pressure section and high-temperature intermediate-pressure section in a separate cylinder allows to avoid significant changes in construction of low-temperature intermediate-pressure section and low-pressure section.

Figure 5: Hydrogen combustion chamber.



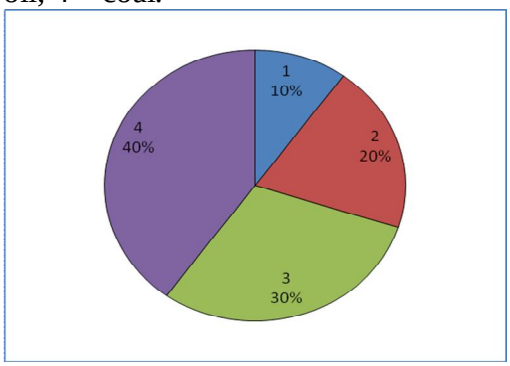
Source: N. D. Rogaljev, A. E. Zarjakin, A. G. Zubkova, O. S. Pronina, M. (2007) *Sozdanie energetichjeskogo oborudovanija bolshoj moshchnosti s ispolzovaniem vodoroda (otsenki i prelagajemye reshenija)*. Izdatjelskij dom MEI.

Aerodynamical calculations and experimental design of the new two-tier low-pressure cylinder's flow part revealed, that the fundamentally new solution considered allows to increase in 1,5 times the limiting steam passage to condenser and, thereby, increase in 1,5 times the limiting steam turbine outputs without elongation of the last turbine stage blades or significantly decrease the specific quantity of metal of existing turbines.
Thus, from technological point of view combining two kinds of fuel allows to create fundamentally new power plants with improved technical and economic metrics, being based on actual power machine building potential. From economic point of view, fuel combining leads to decreasing of energy producing prime costs at the expense of energy efficiency enhancement.

Hydrogen producing technologies

Good potential of hybrid fuel utilization technologies raises the question of the most effective hydrogen producing method. For using hydrogen as a fuel in high capacity coal power units, its large scale production is required. In this case, high purity of hydrogen is not required. Hydrogen can be obtained from every primary energy source, including nearly all the kinds of fossil fuels (figure 6).

Figure 6: The structure of hydrogen production: 1 – electrolysis; 2 – natural gas; 3 – oil; 4 – coal.



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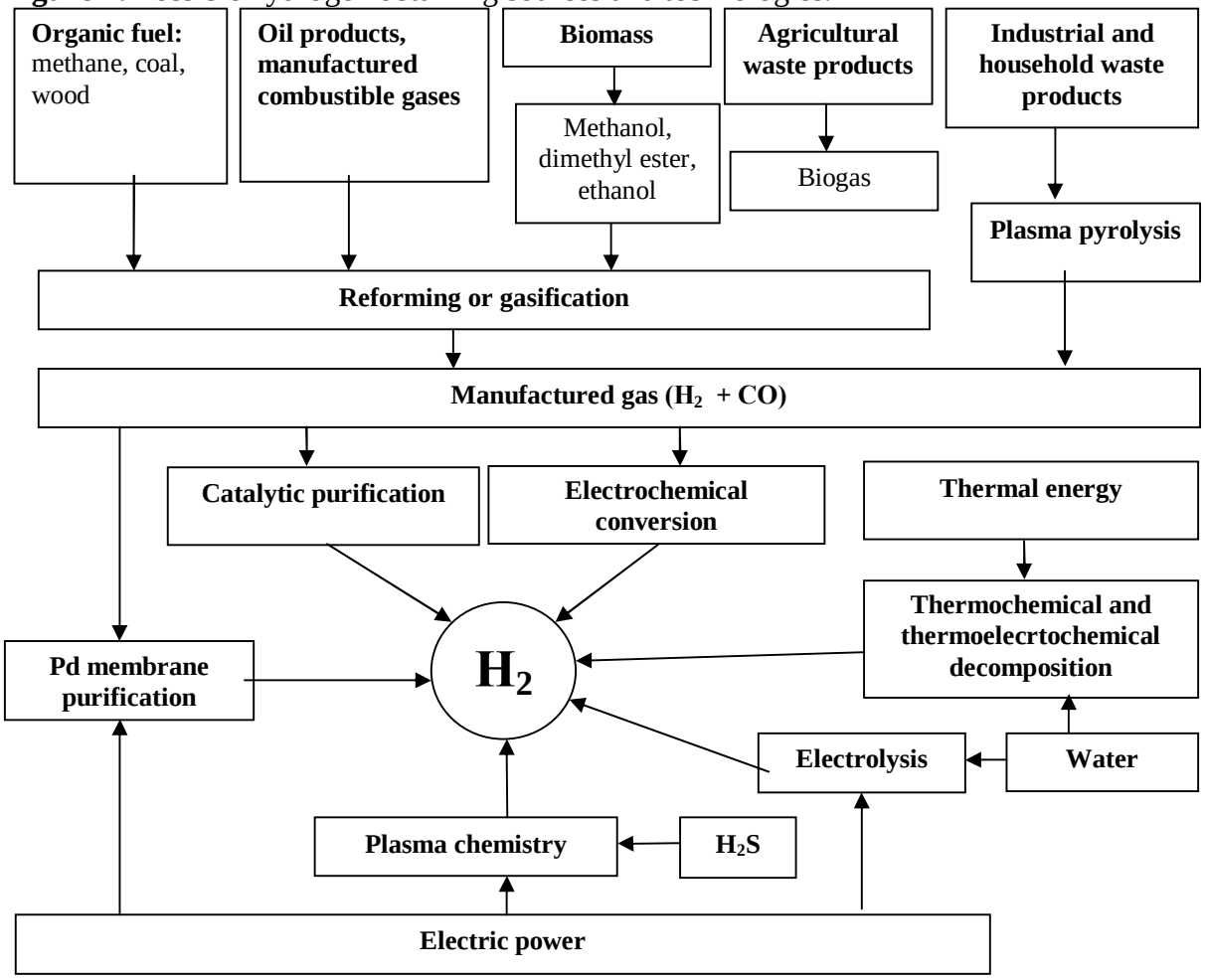
At present, a great variety of hydrogen producing technologies is used in different fields. They allow obtaining of H_2 in various amounts and purity degrees (figure 7).
The most widespread technologies are:

- steam methane reforming;
- coal gasification and oil residual gasification;
- water electrolysis.

Figure 7: Possible hydrogen obtaining sources and technologies.



Source: own research.

Analysis of technical and economic peculiarities of hydrogen production technologies revealed, that the dominating technology is hydrocarbon gases steam reforming with further carbon oxide conversion and H_2 purification. The end product is gaseous or liquefied hydrogen.
The point of autothermal reforming (ATR) is that the mixture of steam, natural gas and oxygen is supplied to the reaction volume at a pressure of 0,15 – 0,2 MPa. Proportions of the mixture are such, that one part of methane combusts in oxygen while another one reacts with steam, producing hydrogen and carbon oxides.

$$12\ CH_4 + 5\ H_2O\ (steam) + 5\ O_2 \rightarrow 29\ H_2 + 9\ CO + 3\ CO_2 + 85{,}3\ kJ. \quad (1)$$

Natural gas partial combustion provides high temperature that is necessary for the reaction.
Natural gas reforming process can actually be improved by reducing investments and using larger installations. The basic prospective technologies, used for this purposes, are:

- the new-generation ATR (reduction of steam/carbon ratio from 0,6 to 0,3 without the reactor's metal destruction);
- heat exchange reforming (combined process, in which the heat, produced in ATR is used for steam reforming);
- ceramic membrane reforming (non-porous membranes provide ion transfer of oxygen from air to the reaction zone).

All the alternative hydrogen production technologies, both industrial and experimental-industrial, turn out to be more expensive (table 2).

Table 2: Comparative appraisement of hydrogen producing technologies.

Method	Effectiveness of technology	Possibility of industrial	Ecological characteristics	Additional investments (except hydrogen production units)
Methane steam reforming	High	Production units are available (productivity 100 tn/hr)	Moderate	Gas transport
Oil products reforming	Moderate	Production units are available (productivity 1tn/hr)	Moderate	Oil products transport
Heavy crude oxidation	Moderate	Production units are available (productivity 1tn/hr)	Moderate	Oil products transport
Electrolysis	Low	Production units are available (productivity 0,5 tn/hr)	High	Absent
Coal gasification, manufactured gas reforming	Moderate	Production units are available (productivity 0,55 tn/hr)	Moderate	Coal transport

Source: own research.

Producing hydrogen by natural gas reforming has a significant weakness – its implementation is connected with large investments in gas transport system if the coal power unit is situated far from the existing distribution network. The least problem with the row-material base providing has the way of producing hydrogen by coal gasification, but at present there are no high performance industrial installations.
From both technological and economic points of view it is advisable to use manufactured gas and methane as hydrogen production row material. The gases are supposed to be obtained by coal seams degassing.
Methane resources of the Russian coal fields are quiet significant – they are estimated from 200 to 300 billion m^3. But not all of them are economically feasible to extract. Methane bound to coal seams can be considered as fossil. Up to 13 billion m^3 in Kuznetskiy coal field and 2 billion m^3 in Pechorskiy coal field are considered to be the kind of methane resources, in view of the current degree of the coal-bearing territories development and the present state of coal extracting techniques and technologies. But this amount of gas is sufficient for the coal seams methane to be considered as a serious base for its large scale extraction.

Main conclusions

Based on the foregoing analysis, it appears, that utilizing hydrogen fuel for exterior intermediate steam superheating in the steam cycle of steam-gas plant allows to increase heat energy production efficiency. At the same time, there are no technical difficulties with both combustion of hydrogen in oxygen environment and the necessary steam turbine modernization. There are highly developed production and resource bases. Moreover, in the case of hydrogen, extra fuel consumption does not damage environment, for its combustion products are ecologically harmless. Hence, coal hybrid power plants construction is an objective of current interest, that deserves further technical and economic researches.

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THE RELEVANCE OF POWER GENERATING CAPACITIES BASED ON THE COMBINED CYCLE POWER PLANTS OF HIGH POWER

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Abstract

The purpose of this article was to substantiate the relevance and perspectivity of construction and operation of thermal power plants working on the combined cycle in Russia. This paper provides an overview of the current state of the technology. Its capabilities were disclosed and a global trend to use combined cycle was revealed. Special attention was paid to Russia's abilities to self-construction of such generating capacity. The authors examined the documents adopted by the Ministry of Energy of Russia, according to which the development of the CCGT is a top government priority modernization of the energy sector of the country. The article describes the structure of the current consumption of energy resources and gives the prediction of its changes until 2030. On the basis of the data it was concluded that there is an additional need for CCGT in Russia. General advantages of combined cycle power plants in comparison with classical schemes of power generation in terms of technical and economic efficiency were disclosed. The paper reflects the problems of investment attractiveness of CCGT construction projects in Russia. The cause of weak interest of investors to such projects was identified.

Keywords: energetics, costs, GTU, CCGT, efficiency, generation, heat, power

JEL classification: *L95, O33, Q41*

Introduction

Energetics is the most important part of the economy of any country. It's one of the factors determining the growth of the GDP of the state. Amounts of electricity and thermal energy must either grow faster or at the same rate as the output of goods and services increases. Such a situation stems from the specifics of the energy industry. At the moment, the development of technology doesn't allow to store energy and therefore build up reserves of power. Reserves of electric power can be provided through construction and commissioning of new generation facilities. In fact increase

of generating capacity creates space for overall growth of the economy. As generation of electricity determines its consumption, and consumption itself is variable over time and varies depending on time of day and the ambient temperature, some part of capacities can be considered to be the part of the power reserve. They are connected to the system at the time of increasing the load, and thus supply both large industrial customers, such as steel plants, and consumers in the housing sector with power energy.

Problems with Combined Cycle Gas Turbines (CCGT) in Russia

In Russia, the issue of renovation and construction of power plants is the most acute. Most of the power units, produced in the USSR are already both morally and physically outdated. Average age of power plants in Russia is 30 years. Equipment worn out greatly reduces its effectiveness and, moreover, makes its operating unsafe. The efficiency of Russian power plants is about 36%. More than one tenth of the electricity is produced on the plants, the efficiency of which is equal to 25% (typical efficiency of the 30-ies of the last century). Meanwhile, this indicator is not lower than 45% in developed countries. The years of perestroika are responsible for such a serious state of national energy sector. General decline in production of those years led to a natural decommissioning of generating capacities. Electricity generation decreased by 275 billion kWh (25%) from 1992 to 1998. Lack of orders to plants for power units manufacturing and technical tasks to research and development institutions has led to the degradation of the production base and technology obsolescence. Current situation of Russian energy sector is still difficult. In some areas of power facilities production Russia lags far behind foreign competitors. This gap is most pronounced in the production of gas turbines. At the moment Russia is able to produce three types of gas turbines: turbines of 110 and 160 MW are already in mass or small-scale production (GTU-160, which are produced under Siemens license) and 65 MW gas turbine, existing in one piece and not even entered into trial operation. There is even nothing to submit in the segment of high-power gas turbines (240-300 MW) of our country . Here we lose to the world gas turbine market leading companies. Siemens, Alstom, Mitsubishi, General Electric are among them. It can be stated that Russia should grow rapidly and catch up. Otherwise it will not catch up 15-20 years lag. The 4th generation of gas turbines has come to the world market, but we learned to produce only the first. National gas turbine efficiency does not exceed 36%, while the latest development of General Electric (GE) - GTP of 100 MW has reached 46% working on a simple cycle. Compared to Western models, not even the most advanced domestic production does have competitive advantages. To date, companies that used to produce their own gas turbines are engaged in licensed production of foreign products. For example, the decision to produce modern Siemens gas turbines with unit capacity up to 290 MW was made at Leningrad Metal Plant. Measures are taken to technological upgrading of turbine production with the development of specialized production facilities at the Leningrad Metal Plant and Turbine Blades Plant in St. Petersburg, bringing the volume of output to 3 GW of gas turbines a year.

In JSC "NPO" Saturn "(Rybinsk) the process of putting into production of a 110 MW gas turbine developed by NPO" Mashproekt "(Nikolaev, Ukraine) started. On the basis of this engine combined cycle power unit with capacity of 325 and 170 MW can be built. The first unit operates at Ivanovo Power Plant in Komsomolsk.

According to all of the above the government needs to take immediate action to change the situation. And this action exists. One of the measures is the creation of a technological platform "Clean thermal energy of high efficiency." In Russia, the concept of a technological platform came 5 years ago, which is not too late in comparison with Europe, where technology platforms appeared 10 years ago. Technology platform is a coordinating mechanism which aimes to consolidate the work of the various stakeholders (industrial, scientific and financial) on a common goal - the creation of concrete technology. These organizational solutions are extremely relevant for our country. The fact is that technology platforms solve a very important problem - bridging the gap between companies, business, and science and technology sector. Thus, technology platforms are perspective objects of the innovation infrastructure, allowing the integration of science and business to concentrate resources on priority areas of scientific and technological development of the country. In Russia, research institutions and the business hasn't learned how to work in cooperation yet and a series of platforms could be the first meaningful step of the government in right direction.
One of the tasks of a particular platform is the implementation of the Energy priority directions of scientific and technical progress in the energy and engineering, defined in the Energy Strategy of Russia for the period up to 2030. Under this strategy, the main problems of electric power are the following:

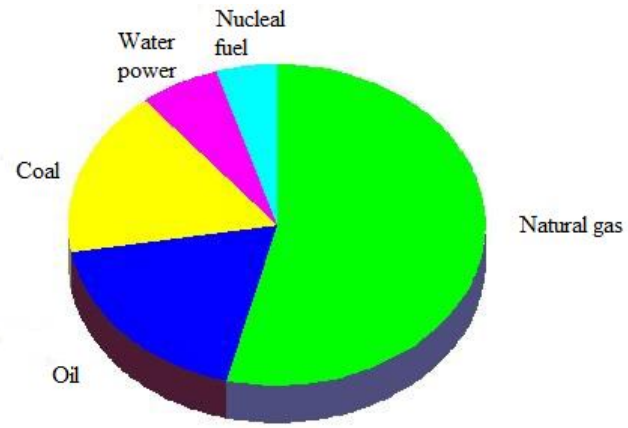
- deficit of generation and transmission capacities in certain regions of the country;
- non-optimal structure of generating capacity due to the lack of semi-peak and peak power maneuvering;
- reduced reliability of power supply due to high wear and tear of fixed assets and the lack of necessary investment for their large-scale and timely updates;
- long-term technological gap the creation and development of modern steam, clean coal and electric technologies;

One of the measures to overcome these problems in the energy strategy is the creation of new generation capacity working on steam cycle using gas , with 53-55% efficiency, and gas turbines, combined with heat recovery boiler. Development of technologies in this area is reflected in energy technology platform. There are plans to create technologies allowing to build a combined-cycle plant with up to 60% efficiency and prospective technologies using fuel cells to ensure efficiency of 70%. It is evident that the technology platform envisages the creation of "breakthrough technologies" in the direction of using gas as fuel to generate electricity.

The current structure of the consumption of fuel and energy resources (FER) in Russia

Such attention to the CCGT in our country is justified. At the moment gas share in Russian fuel and energy resources consumption structure is 53.8%. It is used mainly for the production of heat and electricity. In Moscow, 97% of the energy output is produced by burning natural gas. Figure 1 shows the structure of consumption of energy resources at the moment.

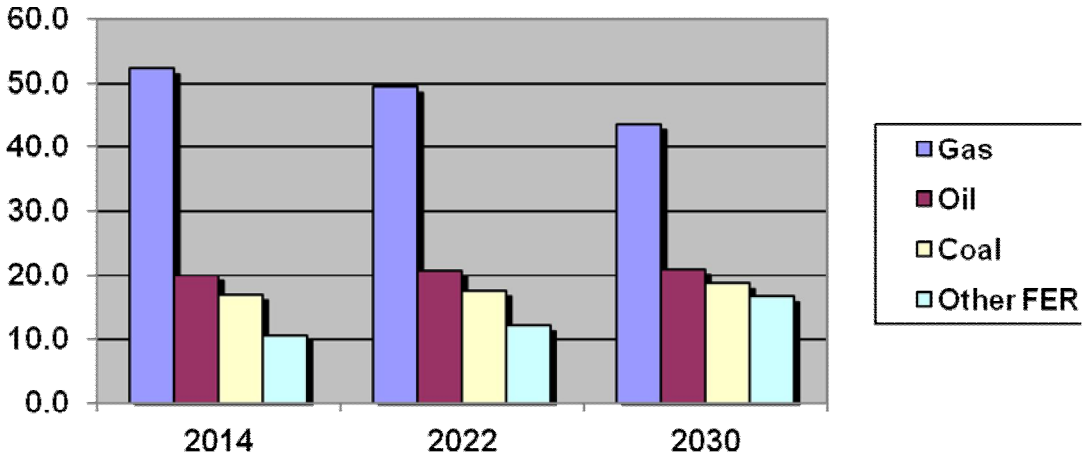
Figure 1: Structure of FER consumption in Russia



Source: The Energy Strategy of Russia until 2030, Ministry of Energy of the Russian Federation.

According to the Energy Strategy the share of natural gas in the thermal power plants will reduce due to the construction of new nuclear power plants in the central part of Russia and hydroelectric power plants in the east part. But even being reduced the share of natural gas in the general structure will be significant. Figure 2 shows the forecast change in the structure of energy resources consumption.

Figure 2: Forecast changes in the structure of FER consumption in Russia



Source: The Energy Strategy of Russia until 2030, Ministry of Energy of the Russian Federation (2012).

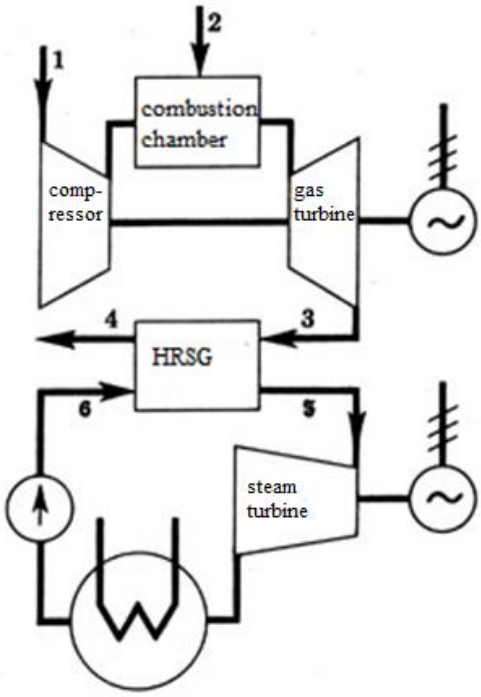
Limited gas resources emphasize the importance of solving the problem of natural gas energy-efficient use. According to the specialists of "BP" Russia has enough gas reserves for 72 years with the condition of conservation at the level of consumption of 2010. It should be noted that natural gas and other fossil fuels are becoming more difficult to reach and move from the land to the sea. This greatly complicates energy resources transportation, and thus directly affects the cost of 1 kWh of electricity and

thermal energy 1Gkal. As a result, this will increase the cost of living in the country without associated increase in income of the population.
How can Russia preserve its natural resources? To do this, it is necessary either not to reduce the consumption of gas, or at least leave it unchanged. For growing economy, it is difficult to fulfill the task. How to balance the increasing demand of fuel and do not increase its production? This contradiction should solve CCGT mentioned earlier.
Despite the fact that the efficiency of CCGT was proved in the 50's of last century in the Soviet Union in the future they did not spread. The development of combined cycle power plants was hampered by several factors. The low price of natural gas and other hydrocarbon fuels in general, was one of the main causes of neglecting combined-cycle technology. Availability of hydrocarbons made the development of combined cycle technologies irrelevant, in contrast to the West, where the price of fossil fuels was high. Therefore, such plants have been actively developed in the west. The peak of this technology in the West was in the last 20-30 years. To date, the United States produces annually about 50 million kilowatts of generating capacity, working on steam cycle. If we talk about the world in general, at least 70% of all new thermal power plants are based on the CCGT.

The principle of CCGT and its advantages

To understand the economic benefits of the combined cycle it is necessary to understand its principle of operation. Its simple scheme is shown in Fig. 3. CCGT is a combination of 2 cycles: Brayton gas cycle and Rankine steam cycle. In the first cycle air compression occurs. Air enters the compressor for the direct pressure pumping, then the combustion chamber, where the gas is burned, and then the combustion products enter the gas turbine, where they perform mechanical work. Compressor and electrical generator, which produces electricity, are on the same shaft as the turbine. The peculiarity of this cycle is the high temperature of gases over the turbine. It can be 700-800°C. In modern gas turbines, this indicator is about 400-450 °C. In classical GTU such gases are emitted into the atmosphere and not used. However, large energy saving potential is hidden in these thermal wastes. CCGT is designed to implement it. In the thermal circuit shown in Figure 3 gases after they have worked in the GTU are sent to the recovery boiler which is a heat exchanger. Heating coolant is gases from the gas turbine, and heated coolant is water. Eventually, water should turn into superheated steam, and then do the work in the turbine using waste gases heat to produce electricity. So, in contrast to the classical GTU waste gases heat is used in the steam cycle to generate electricity. It is the main advantage of this type of plants. It reduces the cost of electricity generation. Compared with classical thermal power plants working on the steam cycle this indicator is lower for 50 grams of fuel for CCGT. Fuel costs make up a large part of the cost of energy produced by thermal power plants. Increase in efficiency of generation saves fuel in the first place. In modern CCGT value of efficiency can be up to 62-64%. This makes them very attractive to the energy industry of the Russian Federation. CCGT also has many other advantages which should be mentioned.

Figure 3: CCGT circuit diagram



Source: Olhovskiy, G. (1985), *Energy gas turbines*, Moscow, Russia: Energoatomizdat, 304 p.

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CCGT gives significantly lower emissions of nitrogen oxides (N0x is the most dangerous of all emissions, therefore it may carry acid rain and general environmental degradation).

CCGT maneuvers the level of load easily. Only autonomous GTU is matched with its maneuverability. Potentially high maneuverability ensured by the presence of GTU in CCGT scheme. Its load can change in several minutes. It is also possible to disable the STU cycle to reduce electricity production in particular periods. Combination of the possibility of constructing large power units and the presence of deep regulation of power output makes CCGT indispensable in the future architecture of Russian energy

economy.
Comparing STU and CCGT with the same capacity, CCGT water treatment costs will be lower for 2/3. The reason is that capacity of CCGT steam-power part is 1/3 of the total capacity, and GTU practically does not require cooling water.
CCGT has a moderate cost of the power unit, due to the smaller size of construction, , simple steam turbine and the water supply system, the lack of sophisticated power boiler, expensive chimney and regenerative feedwater heating system.

The economic advantage of CCGT

No more than 10 power plants working on the steam cycle are in operation or under construction at the present time in Russia. Some of them are given in Table 1.

Table 1: CCGT in Russia

№	Name	Capacity, MW	Power unit	Net electrical efficiency	Capital investment $ / kW	Stage of implementation
1	North-West HPP, unit № 1	900	CCGT-450T	50,5%		operates
2	Ivanovo SDPP, unit № 1	650	CCGT-325	51%	396	operates
3	Sochi TPP	160	CCGT-39	51%		operates
4	Ufa TPP-5	440	CCGT -220 c	51-53%	633	under construction
5	Kaliningrad HPP-2	900	CCGT -450	48,78%	438,6	operates
6	Tyumen TPP-1	231	CCGT - 190/220		515	operates

Source: Own research

It turns out that the cost of installed capacity unit at CCGT-TPP is about 1000 € / kW. It is significantly lower than the same index of thermal power plants operating on the steam cycle using natural gas. They have this indicator at the level of 1000-1500 € / kW and for thermal power plants operating on coal the indicator is 2000-2500 € / kW.
But to date, only several CCGT operate in Russia. Such amount of CCGT-TPP is too small for the size of the Russian Federation. In the total amount of thermal power plants CCGT increased efficiency values do not affect the average efficiency of thermal power plants in the country. It remains very low, at the level of 36%. To improve the situation it is necessary to build and put into operation a lot more power plants of this type, as well as to reconstruct old power plants with their transfer to more advanced principles of work. It will also help to satisfy the growing demands of the country for electricity. According to the Energy Strategy of Russia for the period up to 2030, the production of electric power in Russia in 2020 should amount to 1215-1365 billion kWh. At the same time the share of generation of the thermal power stations should reach 791-882 billion kWh. It becomes obvious that the replacement of the existing thermal power plants to the power plants operating on the steam-gas cycle, will greatly benefit the national economy. Energy intensity indicator, which is expressed in

kilowatts of energy consumed to produce $ 1,000 of GDP, will decrease. Nowadays this indicator is 0,76. It is significantly higher than average world level - 0.31. In Canada, which is in similar climatic conditions with Russia, this indicator is also lower - 0.41. Implementation of new power plants will reduce electricity prices for ordinary citizens, and for industrial customers. Lower costs for electricity will make domestic products more competitive. In the future it will allow to recoup the cost of building of new power plants.

CCGT has a much smaller construction cycle. CCGT, especially single-shaft can be put into operation in stages. This simplifies the problem of investment. CCGT-TPP can be constructed in just 9-12 months. Speaking about the full development cycle of a new power plant, in addition to the construction itself, it also includes a feasibility study, forecasting the future value of the equipment, design of the facility, its construction with the installation of all required units, start-up and then commissioning. High power CCGT can be put into operation in the fourth year after the start of the design, coal-fired power - in the fifth year, NPP units - in the sixth. Before deciding to invest in the construction of a high power CCGT the consumption of electricity in the region and the dynamics of the demand for electricity is primarily analyzed. Specificity of power is that generating capacities should grow simultaneously with consumption of their products - electricity. If it appears that built capacities are excessive, it can lead to freezing of the project even at the final station as it happened with the Ufa TPP when the projected increase in energy consumption has not happened because of apartment buildings construction crisis. Eventually being almost constructed, but not put into operation station was unprofitable and further investment in it was pointless. So during the preparation of the project it is necessary to determine with a high degree of reliability not only where and how much generating capacity will be demanded, but also to predict the station loading for electricity for decades to come. However, the conditions of free competition, based on market principles, any other investor can build a competitive station, therefore displacing the previously constructed from thermal power plants trading schedule.

Conclusions

The uncertainty of the cost of new power equipment is a cause of low investment attractiveness of projects for the construction of CCGT. In addition, the question arises: how much of cost recovery for the construction of power plants falls on the future electricity supply tariff considering the desired payback period? Or conversely: what will be the payback period of the power plant with fixed tariffs for electricity? These questions are easily answered, when the station is already built and there are estimates for all supplied equipment and services rendered. Costing on the fact is not a difficult task. But the need for determining the cost of construction occurs much earlier, at the stage of the decision to build the object. Single method for calculating the cost of power equipment would help in defining the necessary parameters of the investment project. In particular, the method of estimating the cost of high power CCGT as the most promising scenario of thermal energy in Russia in the nearest future. At the moment in Russia, such technique does not exist. Forecasting of value is based on common methods for calculating the cost of construction projects, which do not take into account the specifics of the energy industry. Creating a methodology that would allow at the initial stages of power plant construction to determine its value and cost structure, will

encourage investors to invest in the construction of new TPP-CCGT. It will allow to determine the need for financial resources more accurately, to plan the implementation phases more effectively and will decrease the risk of loosing the financial sustainability of the project.
Relevance of the methodology for assessing the value of CCGT is caused by processes running on the state level. Long overdue restructuring of energy requires significant resources. Attracting investors to run multiple projects must be based on a public and private partnership. Independent investment in CCGT related to the solution of many of the institutional problems arising from the peculiarities of energy systems, fuel and energy balances, the need of correct forecast of load and the presence of state-controlled generating companies and infrastructure organizations of industrial associations. These tasks should be considered in the perspective methodology for assessing the cost of new power equipment.

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Source: Čábelková and Orkhan (2012)

The results of statistical analysis (regressions, correlations) should be summarized as the following:

Table 2: Results of the regression analysis

	Inflows	**Std. errors**	**Outflows**	**Std. errors**
Variable 1	-.277***	.177	.784***	.155
Variable 2	7.763***	2.180	-2.543**	1.472
Constant	-77.39**	64.399	-4.145*	2.964
R-squared	0.378		0.305	
Adjusted R-squared	0.370		0.296	
No. of observations	150			

Note: * significant at 10%; ** significant at 5%; *** significant at 1%
Source: Own results

The results of estimating more complicated models can be presented in the following way:

Table 3: Results of the multinominal logistic regression

	Group 1 vs. Group 4	**Group 2 vs. Group 4**	**Group 3 vs. Group 4**
Category 1			
Variable 1	1.125	.982	.906**
	(.318)	(.035)	(.043)
Category 2			
Variable 2	8.059	1.9138	1.9239
	(18.119)	(1.2674)	(1.6957)
Category 3			
Variable 4	1.026	1.9055	.1.557
	(3.811)	(2.9398)	(2.972)
Variable 5	1.151	41.024***	19.597**
	(8.881)	(37.304)	(26.475)
Variable 6	2.354	12.7514***	40.340***
	(7.576)	(12.291)	(47.621)
Pseudo R^2		0.49	
Pseudo LL		-74.033	
Wald		141.06	
Number of observations		1141	

Note: * Significant on the 10% level;** Significant on the 5% level; *** Significant on the 1% level; RRR and standard errors in parentheses

Source: Sanderson and Strielkowski (2012)

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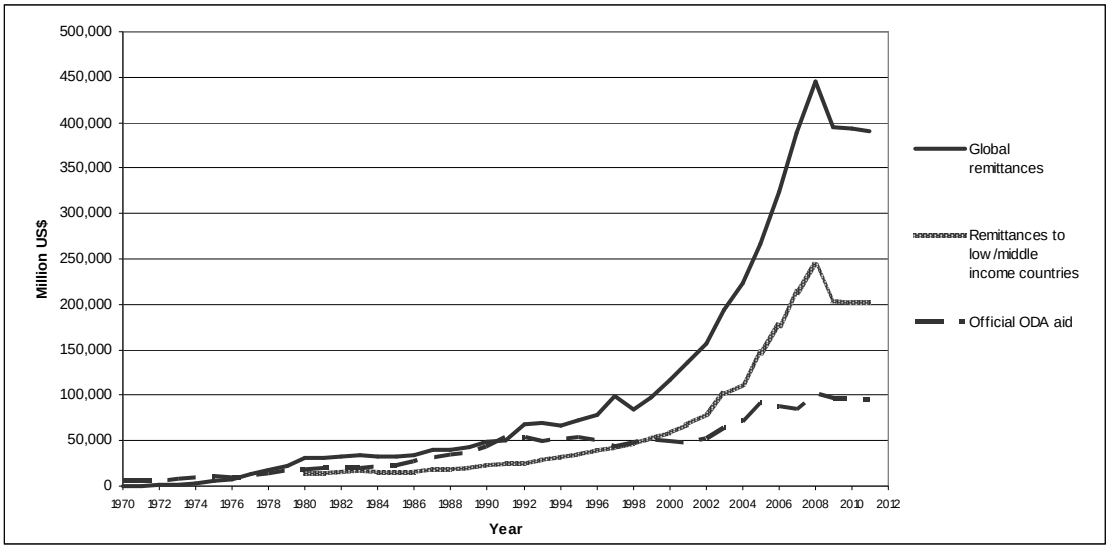
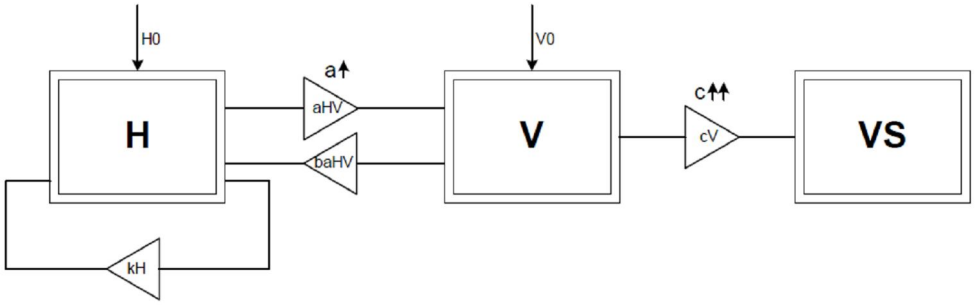


Source: Own calculations based on World Bank (2012).

Diagram 1: Intertemporal interactions between species over time



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- Bauer, A., Haltom, N., Peterman, W. (2004), *Examining Contributions to Core Consumer Inflation Measures*, Federal Bank of Atlanta, Working Paper 27, 36 p.

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- Rosstat (Federal'naya Sluzhba Gosudarstvennoy Statistiki) (2010), *Statisticheskoye obozreniye (Statistical Survey)*, Moscow, Russia: Rosstat, 215 p.

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