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90-131 Łódź, Lindleya 8
www.wydawnictwo.uni.lodz.pl
e-mail: ksiegarnia@uni.lodz.pl
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JOANNA POZNAŃSKA[*], KAZIMIERZ POZNAŃSKI[**]

Comparison Of Patterns Of Convergence Among "Emerging Markets" Of Central Europe, Eastern Europe And Central Asia

Abstract

Based on analysis of economic growth indicators for 1989-2014, this article distinguishes the "emerging markets" of Central and Eastern Europe (with Russia included), from the other economies that fall in the broad 'emerging markets' category. Following the post–1989 reforms, the countries of the region share many of the same typical institutional features as other "emerging economies", but not necessarily the associated economic outcomes. What characterizes "emerging economies" is that they grow fast enough to systematically close the distance dividing them from the advanced economies, creating convergence. Departing from this pattern, Central and Eastern Europe (and Russia) have so far fallen short in terms of the growth rates, and the region as a whole has not made much progress in catching up. By more than doubling its national product Poland is the only notable exception in the region, although Slovenia may fit in the same category. At the other extreme, some of the economies actually lost two decades in terms of reducing the gaps, and some even fell further behind (e.g., Serbia, Ukraine). These findings have potentially serious implications for economic theory in general and for the presumption that globalization processes act as a unifying developmental force.

***Keywords**: globalization; convergence; Central and Eastern Europe; "Emerging Markets"; "Income Distribution", "Ownership Structure"*

[*] Professor, Seattle Pacific University

[**] Professor, University of Washington

1. Introduction

There are numerous examples of less developed economies which, once they began to converge with more developed economies, continued on the path until they closed the distance separating them from the developed economies. For instance, Japan, South Korea and China are in this category (with some residual uncertainty over China). For other economies, an initial spurt of growth reaches a low equilibrium and convergence comes to a halt. Not long ago, Brazil was considered almost as a textbook case of this category in international economics. During the first few post-war decades, the countries of the Soviet bloc began a convergence, but by mid-1980's the catching-up lost some of its momentum. At this point, the region was still averaging one-third of the productivity rates for Western Europe.

In 1989-90, with the collapse of the Soviet bloc, its former members embarked on dismantling their command economies established after the war by the Soviet Union. A market-run system, intended to imitate Western Europe, was first phased-in in Central Europe (Kornai 2006; Poznanski, Poznanska and Liu 2012) and then what is now defined as Eastern Europe (i.e., Russia, Ukraine, and Belarus) joined in as well. The economies of Central and Eastern Europe turned into "emerging markets", with typical institutional features such as: an "open" economy with low tariffs; robust domestic competition; private, and often largely, foreign banking systems; and limited unionization and flexible wages. Relatively stable prices and currencies are other features of the emerging markets that countries of the region acquired at this turning point.

These changes were undertaken with the goal of resuming the catching-up process, particularly with Western Europe as the region's role-model. Characteristics associated with "emerging markets" include not only their systemic characteristics and macroeconomic choices, but their above-the-average rates of investment and related rates of growth of their national product. The "emerging economies" also tend to be export-driven and show trade surpluses, or at least are not burdened with large trade deficits. In addition, their capital balance – i.e. the difference between inflow and outflow of capital – with respect to foreign investment is usually positive. As a rule, these factors have allowed most of the "emerging markets" by and large to reduce the distance separating them from the advanced economies.

This has not been the case with Central and Eastern Europe, often called "transition" economies. When they moved forward with their market-oriented reforms, numerous projections were made about Central Europe eliminating its distance behind Western Europe in two, or at the most three, decades. Now however, over two decades later, it is evident that the early projections have not been proven correct – with the exception of Poland and Slovenia – and no

visible closing of the economic distance has taken place. In fact, in some economies in the region the initial gap has expanded (e.g., in Ukraine and Serbia) This puts Central and Eastern European economies into a special category, where the systemic features of "emerging markets" are not associated with "economic convergence" (e.g., Poznanski 2013).

The critics of Poland's approach to transition have to recognize that at least in terms of its overall performance, measured in growth rates, Poland is a success story, with growth rates that put her on par with the Latin American emerging economies that have been able to visibly close the gaps separating them from the advanced economies. This is, however, a relative success, since among the transition economies are also two Asian economies – China and Vietnam. In pursuing liberalization, they also joined the category of "emerging markets", with China already producing two decades of the longest and fastest growth in post-war history. This has allowed China to reach rates of growth four times higher than in Poland, and another great success story, Vietnam, to reach rates nearly three times as high as Poland, and accordingly both have reached similarly higher rates of convergence levels.

2. Twenty-Five-Year Economic Growth Record

The year 1989 is chosen as the starting point to measure the relative economic performance of the "emerging economies". As has been indicated, this is the approximate year when a full-scale liberalization started in the formerly state-planned economies in Central and Eastern Europe, including Russia. It should be noted that in China market-oriented reforms greatly accelerated from 1985 onward. Historical real (i.e. corrected for inflation) GDP statistics are utilized for the calculation of growth patterns. Straight-forward indices, with the 1989 GDP level taken as 100, are calculated for selected countries in specific regions. Averages for regions are calculated by dividing the total 2014 GDP for the countries of the region by their 1989 GDP level. Using this methodology, country indices are "weighted" by the size of their economies.

Table 1 below summarizes the results for 55 "emerging economies" from five different regions, namely Asia, Latin America, Central and Eastern Europe as well as Central Asia (encompassing the remaining former Soviet republics, however with the Baltic States considered part of Central Europe). As a further point of reference for Central and Eastern Europe, growth indices for thirteen countries of Western Europe (from the "old" European Union) are included as well. This latter

addition is particularly relevant for evaluating the "catching-up" record of the Central and Eastern European economies. As previously said, Western Europe is the target by which these countries gauge their post-1989 performance.

2.1. Long-Term Comparative Economic Growth

According to Table 1 below, the fastest region during 1989-2014 was Asia, including a total of ten economies, with Taiwan, Singapore and South Korea and China among them. The GDP 2014 index for this group of emerging economies was 609, meaning that in the over 20-year period these economies grew by almost six times. This sample includes China, which registered a 2014 GDP index of 990, or above nine times growth. The second fastest economy in the region was Vietnam with a 519 index for 2014. Given the fact that China's economy accounts for about 50% of production in this region, a separate index was calculated with China excluded. For the Asian countries other than China, the 2014 GDP index was 411.

Measured against the above index for Asia as a benchmark, the post-1989 growth in Eastern Europe is merely a fraction. The 2014 GDP index for the sampled ten Central European economies was on average 221. Importantly, much of the growth came from Poland, the best performing country in the region with a 2014 index of 238. Excluding Poland, which also happens to be the single largest economy in the region, the average 2014 index for the remaining countries falls to 165. This index for these nine economies of Central Europe is roughly one-third of the above-mentioned corresponding index of 441 reported by the Asian economies other than China. Furthermore, Central Europe's index excluding Poland represents one-quarter of the 609 index for the whole of Asia, with China's economy included.

While the growth record for Central Europe is lacklustre in comparison with the Asians, who performed at the highest level among the "emerging economies", in comparison to relatively less-successful countries of Latin America the region's performance looks respectable. This is telling, since Latin American economies happen to have started their liberalization reforms about the same time as Central Europe and the countries that grew up out of the collapse of the Soviet Union in 1991, e.g. Eastern Europe and Central Asia. During 1989-2014, while showing better performance than the rest of the region, Central Europe including Poland grew as a group close to the rate reported by Latin America, with its 2014 index of 209 meaning that during this time the Latin American region doubled its production.

If the record of Latin America is taken as the lowest threshold for defining an "emerging economy" as growing fast enough to converge, then among Central European economies only Poland can be said to have performed like a typical "emerging economy" (Slovenia, with its 183 index for 2014, might possibly be another exception,). If Poland's economy is subtracted from the pool, the region grew by two-third in 1989-2014, which of course is less than the doubling of GDP reported by Latin America. In addition, among the majority that grew below the above-mentioned threshold, at least as many as three reported a GDP index for 2014 as low as one-quarter of the benchmark (i.e. 119 in Latvia; 126 in Bulgaria; 125 in Hungary).

Table 1. Emerging Markets Real GDP 2014 Indices (1989=100; 2008=100)

Region	**2014 Index (1989=100)**	**2014 Index (2008 =100)**
Asia	609	146
China	990	164
Vietnam	519	141
without China	411	144
Latin America	209	118
Argentina	256	126
Chile	336	125
Central Europe	221	106
Hungary	125	78
Poland	238	118
without Poland	165	100
South Central Europe	126	98
Serbia	79	105
Eastern Europe	112	138
Belarus	204	124
Russia	117	145
Ukraine	65	90
Central Asia	198	139
Kazakhstan	194	135
Western Europe	153	99
Austria	165	102
Germany	149	105
Turkey	242	111
Egypt	267	114
Morocco	220	113
Algeria	176	108

Source: Calculated from "Development Indicators. GDP and Growth Rates of GDP, 1989-2011", World Bank, 2012.

Importantly, not counting Albania all countries of the South Central Europe (i.e., Albania, Bosnia, Croatia, Macedonia, Montenegro and Serbia) showed a considerably slower economic growth during the 1989-2014 period than Central Europe, whether the fastest regional economy (Poland) is included in the sample or not. As an extreme for this region, Serbia reported for the 1989-2014 period a negative index of 79, this also being the extreme for all the transition economies sampled in this quantitative study. While without Poland the 2014 index for Central Europe was 165, for the South Central European region the average was only 126.

Extremely low rates have been also reported by some of the former Soviet republics that form the present Eastern Europe. Ukraine reported the negative index of 65, and for Russia the index was 107. In contrast, Kazakhstan reported an index of 194, which is above the average for Central Europe. The last member of the Eastern Europe, Belarus reported an index of 204, which was below the Central European leader Poland's 238 index. The contrast between Central Europe and the two fast-growing economies of the former Soviet Union is intriguing, since both Kazakhstan and Belarus are considered relatively conservative with respect to their market reform programs, with Belarus often claimed to be an extreme case, alongside Uzbekistan.

However, the former Soviet republics that constitute Central Asia showed a performance that is comparable to that of Central Europe. The 2014 index for the eight countries was around 198, so there is only a several point difference. Included in this group is Georgia with its 74 index, Moldova with its 69 index, and Tajikistan with its 107 index. With such poor results they all fall in the category of countries which lost over two decades of growth. However, within the group are also economies that match or even exceed the record of the best performing Central European economy, i.e. Poland. Turkmenistan reported an index as high as 345, and Uzbekistan reported 263.

Of the 27 countries constituting Central and Eastern Europe and the former Soviet republics of Central Asia, only six of them showed a benchmark index of around 200 or more and were thus able to reduce their GDP-gap vis-à-vis the advanced countries by some measurable degree. These countries are Poland and Slovenia from Central Europe; Belarus from Eastern Europe; and Azerbaijan, Turkmenistan and Uzbekistan from Central Asia. If the two formerly "state-run" Asian economies - China and Vietnam - are added, then the number of "transition economies" in the sample extends to 29 economies, with eight of them exceeding the 200 point benchmark that separates countries with visible convergence from those that liberalized without convergence.

Turning to Western Europe, the 2014 GDP index for the 15 European Union "old" members was 153. This is below the Central European 221 index as well as the region's index of 165 when counted without Poland. Of the 27 countries comprising Central and Eastern Europe, South Central Europe, and the former Soviet republics of Central Asia, only eight reported 1989-2014 growth rates higher than Western Europe as a group. Of these eight countries, three are from Central Europe, namely Poland, Slovakia and Slovenia. The remaining countries in this group include Albania from South Central Europe, Belarus from Eastern Europe plus five Central Asian countries, namely Armenia, Azerbaijan, Kazakhstan, Uzbekistan and Turkmenistan, the latter with the fastest growing economy within the whole group of 27 economies.

2.2. Responses to the 2008 financial crisis

When the 2008 crisis shook the world, it marked the worst financial crisis that hit the advanced economies in the post-war period. By 2014, the total product of Western Europe (European Union – 15) still remained below the 2008 level. Specifically, the GDP 2014 index (2008=100) was 99 for the advanced region of Europe. This was the first test for Central and Eastern Europe to see how resistant the region is to cross-border financial shocks originating in Western Europe. To the surprise of many, as a group the Central and Eastern European countries showed better economic performance in terms of growth. The respective 2014 index for Central Europe was 106, meaning it was 7 points higher than Western Europe in the six-year time span of 2008-2014.

The most resistant economies of Western Europe showed a modest increase in production and ended up with a GDP 2014 index around 102. This group would include five economies, i.e., Belgium, Austria, France, Germany and Sweden (the latter being the most successful among them, with a 108 GDP index). Among the ten economies in this group which reported declines for 2008-2014, the most severely damaged turned out to be the economies of Greece, with a 2014 growth index of 78, and Ireland with a respective index of 96. Portugal also experienced difficulties with a 94 growth index for 2014, while the respective index for Spain was also 94 and for Italy the index was 93.

Proportionally speaking, the number of Central European economies that suffered a decline from the financial shock has been lower than in Western Europe. Of the ten sampled countries of Central and Eastern Europe, two reported a visible increase in national product, namely Poland and Slovenia, with Poland having the distinct status of the best-performing European (including both West and East) economy in terms of growth. Poland's GDP

2014 growth index (with 2008=100) was 118 and that of Sweden, indicated as the fastest growing Western European member, by a large margin. Of the remaining eight Central and Eastern European economies that sharpest decline was reported by Slovenia with 91 index, Hungary with 97 and Latvia with 98 index. This is less than decline reported by the worst affected Western European economies (including Finland with 95 index in 2014).

The lesson of the 2008 crisis is that joining the European Union did not render Central Europe immune to the financial shocks. The shocks were actually imported from Western European economies, with many of them reporting the most damaging downturns ever encountered in post-war Western Europe. Further, for some Western European economies this severe decline followed years of remarkable expansion, which had been taken as proof that liberalization pays off handsomely. For example, Ireland was praised as an example that globalization worked "miracles". Its GDP index for the year 2000 (1989=100) was 217, compared to 128 index for Western Europe as a whole. But, as already mentioned, following four years of consecutive decline Ireland's GDP index for 2014 was 96, among the worst in the whole of Western Europe.

Turning now to Latin America, growth statistics show that as a region these countries proved more resistant to the 2008 financial shock, at least in the sense that none in the sample witnessed a decline of national product through 2014. The group as a whole reported an increase that averaged to a 2014 index equal to 118. This meant, however, that these economies considerably slowed down compared to the long-term average index of 209 achieved during the 1989-2014 period. Some countries showed very impressive growth rates, raising their national product during this six-year span by one-third as in Peru) or one fourth, e.g., Argentina (whose economic performance defied those critics who predicted a painful and protracted recovery from its own severe financial crisis incurred by its default on foreign debt and steep devaluation).

Central Europe fell not only behind Latin America, but also behind the "emerging economies" of Asia, which collectively enjoyed a 2014 growth index of 146 against the 2008 GDP base level, i.e. the equivalent of nearly one-half. This index is higher than that for Latin America and not matched even by the best performing member of Central Europe – Poland. If China is removed from the sample, the growth index for Asia is at 144, still higher than for any other group of "emerging economies"; still higher than for Poland alone; and also higher than that of the former Central Asian republics, which reported a very strong 2014 growth index of 138.

For further comparison, Russia reported an index of 145 and Ukraine an index of 90 for the world crisis period 2008-2014. With this data the records for the former Soviet republics can be contrasted with that of individual "emerging

economies", most notably with the "transition" economies of China and Vietnam. Not only were China and Vietnam not negatively affected by the financial crisis, they fared better than most of the Asian "emerging economies", with India leading at 179, and followed by China reporting the 164 index and Vietnam coming next at 141. Among the formerly state-run economies in Central Asia, only Uzbekistan recorded a comparable index, namely 159 and Turkmenistan ended up with the 179 index.

To broaden the geographic perspective, Table 1 provides information on the economic performance of some "emerging economies" from Middle East and North Africa, plus Nigeria. Of them, all demonstrated higher rates of growth for the 1989-2014 period than the comparable record achieved by Central and Eastern Europe, with Russia. The few selected countries of the Middle East and North Africa reported an average 2014 index against 1989 at the level of 232, which was higher than the average for Latin America and this for the economies of Central Europe achieved in the same time frame. Their index for the period of 2008-2014 was hovering around 111, meaning comparable to Latin America and much stronger than the countries in Central Europe, as well as Russia and Ukraine in Eastern Europe.

The most significant lesson is that - while the Central and Eastern European countries were more resistant to the 2008 financial shock than the advanced economies of Western Europe - they made very little progress in catching up. The differential in growth rates was not significant enough to allow Central and Eastern Europe to gain any visible ground in the "convergence game." This lacklustre performance most stands in contrasts to the performance of the two Asian economies which also dropped their state-run systems for a market-based system, namely China and Vietnam. Interestingly, the Asian parts of the former Soviet Union have also proven more resistant to the 2008 cross-border financial shocks, which for first time in the post-war years came from the advanced world.

3. Factors behind the slow convergence

The question which arises is: How is it that the "emerging markets "of Central and Eastern Europe, together with Russia and the former Soviet republics, which by and large have liberalized their systems so much, have recorded growth rates insufficient to enable convergence in a reasonably short period of time? The existing pattern is so prevalent among these "transition economies" that one would expect more or less the same factors to be responsible for the pattern discerned here. At this stage of the discussion among

economists no consensus has been achieved as to the sources of this – as identified by us – paradox of these numerous cases of liberalization without convergence.

That the region has been slow in closing the distance against the advanced economies is not in itself evidence of a failure of the "transition". Naturally convergence is not the only measure of economic success. The region of Central and Eastern Europe and Russia with the former Soviet republics is better off on many respects, with greater access to imports, more product variety, and increased quality, all of which benefits domestic consumers. Further, opportunities have opened up for people to try their entrepreneurial talent, start businesses, and innovate production. The production structure has changed dramatically, and the structure of their foreign trade is now dominated by manufactured goods that are integrated into the structure of globally-operating multinationals.

3.1. Suppressed total consumer demand

One hypothesis concerning the possible reasons for the slow convergence is that domestic demand doesn't provide a sufficient stimulus for production growth; in other words, the low rates of growth are demand-driven. This argument was raised already at the time when the region entered the post-1989 "transition recession" that shaved off over ¼ of the regional national product. According to the prevailing view, this downturn was caused by structural – supply-side – impediments, namely the presence of huge amounts of "unwanted production" which the state planners had developed in earlier years. A dissenting argument was raised, however, pointing to the demand side, namely a sharp decline in real wages combined with a drastic credit squeeze and a sharp increase in the interest charged (justified on the grounds of eradicating inflation and "strengthening" the currencies).

The demand argument has been recently revived by Podkaminer (2013) in the context of the ongoing debate on how to cope best with the post-2008 financial crisis and its aftermath. The prevailing view has been that austerity (higher unemployment and wage cuts etc.) is the remedy. But a small group of vocal Keynesian economists (e.g., Krugman in the United States, Laski in Europe) have called for "monetary easing" by allowing increased budgetary deficits and moderate price inflation. A retrospective examination of the real wage trends since 1989 seems to argue for the validity of the demand argument in explaining growth performance, both at the outset of the transition as well as in the years that followed.

The analysis reveals a continuous real wage repression, which by and large didn't allow for real wages to increase by more than one-quarter during the 1989-2012 period (Podkaminer 2013). Table 2 demonstrates that the notable exception is the Czech Republic, where after an initial decline of real wages to a 69.6 index in 1992, they recovered to reach an index of 154 in 2012, or by more than one-half. In Romania real wages reached 130 index points, and in Poland 124. Otherwise, most of the countries hovered around 110 points, or even allowed their real wages to stay at the pre-recession level, i.e., Lithuania with an index of 74 and Bulgaria with an index of 72. These low indices translate into low annual rates of growth in real wages, ranging from 1.9 % in Czech Republic and at the lower end of the positive spectrum to 1.2% in Romania, to -1.3% for Lithuania and -1.4 % for Bulgaria.

It is instructive to compare the rates of real growth in wages with the real growth of national product in particular economies. This helps to get a sense of the extent to which the population at large participates in the appropriation of the expanding "pie", meaning the national product. In the Czech Republic and Romania wages grew by more than their real domestic product. In the former case the gross domestic product index for 1989–2011 was 142, but real wages grew by 154 points. In the latter case of Romania the figures were 123 against 139; while for Poland it was reverse, with the gross domestic product growing by 221 points while the real wages index was 124.

Table 2. Average Real Wages in Eastern Europe 1989–2012 (1989=100)

	1989	**1992**	**1994**	**1996**	**1998**	**2000**	**2002**	**2005**	**2007**	**2009**	**2012**
Czech Republic	100.0	76.7	85.5	101.4	101.3	110.1	121.3	136.7	148.2	153.8	154.0
Hungary	100.0	88.2	90.9	75.8	82.4	75.7	103.6	118.9	117.5	115.7	116.4
Poland	100.0	73.3	74.4	80.7	88.2	93.3	96.3	102.1	112.0	121.0	124.5
Slovakia	100.0	73.6	73.0	81.3	89.1	82.1	87.7	93.7	100.9	105.7	104.8
Slovenia	100.0	60.6	73.5	80.3	83.9	87.6	92.9	99.2	106.0	110.8	111.0
Estonia	100.0	40.0	45.1	48.8	56.1	63.7	72.8	88.0	111.0	108.9	110.0
Lithuania	100.0	47.6	33.1	35.4	45.4	45.1	46.6	57.1	76.7	78.4	74.8
Bulgaria	100.0	68.0	48.6	38.1	38.3	41.5	41.9	46.2	52.8	64.7	72.5
Romania	100.0	74.7	62.4	76.7	61.7	62.8	67.5	94.5	118.2	135.6	130.3

Source: Adapted from Podkaminer 2013, p. 16.

Looking at another relatively fast growing economy, that of Slovenia, the gross national product increased by 190 index points, but real wages by only 111, so as with Poland the gap was very substantial, indicating the declining share of wages in the total product. In Slovakia, the respective indices were 160

for gross national product, and 104 for real wages, meaning that in the over twenty years that have passed real wages in this country have basically not increased. In the extreme case of Bulgaria, wages declined to an index value of 72, while product increased by 122 points. In Lithuania the index for product was 119 and for wages 75, indicating another case of an enormous gap. Finally, in Hungary the respective indices were 129 and 116.

The above described phenomena constitute a rather unprecedented case of the distribution of gains from economic growth, certainly in light of the Chinese transition path, where phenomenal increase in the total national product has been accompanied by almost as rapid an increase in real wages, often 10% or more on an annual basis. This is actually in line with the patterns detected in other Asian economies that experienced "economic miracles", e.g. Japan and South Korea. They all ensured a model of so-called "shared growth", guaranteeing that all major groups would equally benefit from the growing national income and productivity as its principal source.

3.2. "Labour drain" from Eastern to Western Europe

Another factor which could be of importance is that - by and large - the countries in the region experienced a low rate of labour utilization, expressed in both high rates of official and unofficial unemployment, as well as in the large-scale outflow of labour abroad. Previously free of unemployment, from 1989 onward all the transition economies witnessed rapid unemployment, quickly reaching high levels, in Poland's case as high as 15%. While Polish unemployment rates have measurably declined, it is not uncommon in these days to encounter such high levels unemployment in the region.

High rates of unemployment were typically combined with an outflow of the labour force abroad, basically to Western Europe, and the numbers are very high by any standard. For example, in Poland at least 2 million people have left to seek work abroad, mainly to England, Ireland, Germany and Spain. At the same time workers from Ukraine and Russia migrate to find employment in Poland and elsewhere in the region. This outflow is fuelled by weak labour markets in Eastern Europe as well as by the wide-spread demographic stagnation in Western Europe, particularly in Germany, its largest single economy.

During the recent 2008 financial crisis, both the rates of unemployment in the region and migration from the region have intensified, leading to in some instances to massive depopulation, mainly among the youth and skilled workers. For instance, since 2008 Lithuania's population declined by 10% and Romania's population fell

by 12%, mainly due to migration. The losses might be permanent, since migrant workers usually intend to settle and have families in Western Europe, whose leadership is very accommodating to this source of economic growth. This happens also to be a source of repressed growth in Central Europe, since the wealth created by these migrants tends to stay in the countries they move into.

The case of Poland is instructive here, with the country reporting 10.5 million persons employed in 1990, the first full year of transition. Due to initial reductions and the weak demand for labour, the number of persons employed declined permanently, settling at around 8.5 million people. This meant a reduction in the use of labour factor by 2 million people. In 2013, official statistics revealed that the unemployment rate is oscillating at around 13.5 – 14.5%, or around 2.2 million persons in absolute numbers. This was close to the level reached two decades earlier during the 1989–1992 "transition recession" that shaved off almost 20% of the gross national product. These 2.2 million represent nearly one quarter of the number of employed persons, meaning that after the transition and recession the economy has been moving forward at about one-quarter below its "potential" production growth.

3.3. Foreign ownership of banking and insurance

Another factor which might be potentially relevant is the specific structure of the financial system and related credit access. This structure is marked by high levels of foreign ownership, which have greatly helped to modernize the outdated financial system left behind from the communist times. In Central and South Central Europe banks and insurance companies are almost exclusively foreign-owned, with the majority of countries reporting around a 90% rate of foreign ownership of banking and insurance; Slovenia being an exception with foreign ownership accounting for 37% of total financial assets in 2006. Importantly, the trends show these shares might actually further increase.

As Table 3 demonstrates, ownership structure in Central Europe differs sharply from that found in the former Soviet republics or Russia itself. The level of penetration of the financial sector that is found in Eastern Europe is replicated only by Kyrgyzstan, and there are few former republics where this share is as high as 30%, e.g., Belarus, Moldova and Ukraine (Table 3) There many cases, where the foreign presence is close to insignificant, as in Uzbekistan with a 1% share, Azerbaijan with 5%, and in Russia where this share is at 13%. There is no indication that the shares of foreign ownership of banking and insurance might increase in these countries.

For comparison purposes, not counting Great Britain foreign ownership in Western Europe seldom exceeds 20 % and hovers around 10 % (and is as low as 5% in the financially powerful Germany). There are actually similar shares that are to be found in many "emerging economies" other than the "transition economies", except for China where foreign ownership of banking is subject to strict controls and limits, which results in keeping the foreign presence under 3-5 %. But in Latin America, 25-30 % foreign ownership is not unusual, with only three cases that resemble Central and Eastern Europe. These cases are El Salvador with 78 %, Mexico with 82%, and Peru where the share is as high as 95%.

Table 3. Share of banking assets held by foreign banks with majority ownership, 2006 (in %)

Eastern Europe		**Former Soviet Union**	
Albania	93	Armenia	31
Croatia	91	Azerbaijan	5
Czech Republic	96	Belarus	30
Bosnia/Herzegovina	90	Georgia	32
Bulgaria	72	Kazakhstan	24
Hungary	94	Kyrgyzstan	75
Latvia	52	Moldova	30
Lithuania	92	Russia	13
Macedonia	80	Ukraine	28
Poland	73	Uzbekistan	1
Romania	60		
Serbia	65		
Slovak Republic	93		
Slovenia	37		
Latin America		**Western Europe**	
Argentina	25	Austria	21
Bolivia	38	Denmark	19
Brazil	25	France	10
Chile	32	Germany	5
Colombia	18	Italy	9
El Salvador	78	Netherlands	10
Guatemala	8		
Mexico	82		
Peru	95		
Uruguay	44		
Venezuela	32		

Asia		Africa	
Bangladesh	0	Algeria	9
Cambodia	27	Angola	53
China	0	Cameron	63
India	5	Egypt	12
Indonesia	28	Kenya	41
Malaysia	16	Madagascar	100
Mongolia	22	Morocco	18
Pakistan	25	Mozambique	100
Philippines	1	Nigeria	5
Vietnam	0	Senegal	48
Sri Lanka	0	South Africa	0
Thailand	5	Sudan	20
		Swaziland	100
Middle East			
		Tanzania	66
Iran	0	Tunisia	22
Jordan	14	Uganda	80
Lebanon	34	Zambia	77
Turkey	4	Zimbabwe	51
Yemen	0		

Source: World Bank 2008.

Few economists have tried to estimate the correlation between the level of foreign "penetration" and the efficiency of financial sectors (se however the review article of Estrin 2009). There is no compelling research to make the argument that the impact is either positive or negative for economic growth. However, it seems reasonable to argue that the higher the foreign ownership controls, the more influence they can exert over the accessibility of means – like credit – for the formation of capital, i.e., investment. It could well be that at least until this point foreign banks in operation have – rationally – chosen a strategy to restrict investment credit as opposed to other allocations. The higher foreign ownership of banking and insurance in Central Europe might be a factor in keeping Central and Eastern European rates of income growth below their "potential" level.

3.4. Transfer out of profits and dividends

The patterns detected in the banking/insurance sectors in Central Europe reflect a more general pattern, since in other sectors (including also other service sectors such as retail sales) foreign ownership also tends to enjoy a high share. With this systemic change, the investing processes have shifted towards foreign companies, usually belonging to major multinationals that come mainly from Western Europe. Accordingly, the level of internal investment is largely dependent on the inflow of foreign investment and the "strategic choices" made by the foreign-owned companies on the role these economies play in their operations, driven by profit margins and stock valuations (Hunya 2012).

The extent to which foreign-owned corporations affect investment activities in Central and Eastern Europe is reflected in the rather unprecedented ratio of cumulative stock of foreign investment and the value of the gross national product. This ratio for the "old" 15 members of the European Union is under 25 % and is much less for typical "emerging "economies", including China and Vietnam. With a stock of 530 billion dollars in 2011, foreign investment accounted for 13% of China's gross domestic product, and for Vietnam the corresponding ratio was less than 10.0%. However, in Central and Eastern Europe the average ratio in 2012 exceeded 60%, reaching as high as 100% in Bulgaria and 84% in Estonia. In Hungary, the Czech Republic and Slovakia the ratios approach 70%, and at the lower range, Poland's ratio was 43% and Slovenia's 30%.

The strong reliance on foreign direct investment is reflected in the ratio of foreign investment to fixed capital formation, which is calculated on an annual basis. For Central and Eastern Europe the average annual ratio during 2003–2011 reached as high as 50% in Bulgaria and 33% in one of the Baltic States, Estonia. A similarly high ratio of foreign investment in total annual investment could be observed in Serbia. The lowest ratio was reported by Slovenia, a predictable result given its lowest level of foreign ownership, namely 6%. In the Czech Republic the ratio was 14 %, while Poland, Hungary and Slovakia reported a 17% ratio. Overall, the average for all these economies was 16%.

Such a heavy dependence on foreign investment provides a link through which the Central European economies are subjected to external shocks, a relationship that manifested itself during the 2008 financial crisis. It is, however, this same channel through which these countries are assisted in lifting up their economies when Western Europe recovers. After a phenomenal increase in inward investment, their stock, with Russia included, has increased from $30 billion in 2003 to $155 billion in 2008, or over five times (with Russia alone reporting an

increase from $8 billion to $70 billion). In a sharp reversal, foreign direct investment into the region collapsed to $70 billion (with as much as one-quarter of the overall decline taking place in the real estate sector) (Podkaminer 2013).

Tapping foreign direct investment has yielded many remarkable benefits to the region's development, but it has also exposed the region to an outflow of value to the host countries of foreign companies. The inflow of foreign investment must be measured against the outflow of income earned by the foreign companies from their operations in the Central and Eastern European region. The macroeconomic indicator of the resultant effects is the difference between the gross national income and gross domestic product, which tells us the annual value generated and the value "utilized" internally.

As documented, except for the initial phase when foreign companies took advantage of the privatization programs that made available a huge supply of previously state-owned assets, the region has witnessed a substantial and growing outflow of profits, rents and dividends abroad. In 2011, Czech Republic incomes collected by the foreign companies from their subsidiaries represented 7% of the gross domestic product, 5% in Estonia and 5% in Hungary. In Poland this share was also high at 4.5 %. One needs to keep in mind that these are estimates and the actual numbers could be higher. Besides, looking at the trends of the last decade these shares are on the rise in most of the economies.

The faster growth rate in the "converging economies" has been driven by acceleration of exports that allowed them to produce trade surpluses. China is again a model example, while in Central Europe trade deficits are registered almost uniformly, including in Poland, which is the fastest growing economy in the region. Also, the stiffer import competition from Western Europe limits employment opportunities. Another factor is that Eastern Europe's foreign trade is centred on Germany, which notoriously runs large surpluses with its partners. This has a repressive impact on the region's deficit-running economies across Europe. Central and Eastern Europe (with Russia and Ukraine) are all still in search of a "growth strategy" that would put them on sustainable path toward a convergence trajectory.

4. Conclusions

Overall, during the last two decades Central and Eastern European growth rates have not produced any visible convergence with Western Europe. Their rates sharply contrast with the growth performance of other "emerging markets". During the two last decades the "emerging markets" collectively grew at a rate at

least twice as high as the world average (Poznański 2011). A statistical comparison reveals that Central Europe as a region grew at 1/3 of the rates reported by the most robust "emerging markets" from other parts of the world, like China and Vietnam. Poland, and to lesser extent Slovenia, are notable exceptions with growth rates within the benchmark for convergence. However, even Poland is no match for the fastest growing "emerging markets", with China of course being the greatest success story and rapidly closing the productivity and income gap. Importantly, except for Poland, Slovenia and Slovakia, during 1989–2014 the growth rates of the other economies of Central Europe were less than in Western Europe combined. Those in South Central Europe (excluding Albania) were lower as well, with some even negative, all cases indicating a lack of convergence. Such a demand factor as wage repression might be one reason behind Central Europe's slower growth, as well as the continuous trade deficits. Restricted access to credit from largely foreign-owned banking could be another culprit. Also, the large scale emigration to seek work in Western Europe, combined with high – often double digit – rates of unemployment might contribute as well. Understanding the Polish exception is a challenge to economists studying the region, as is the case of Slovenia, which is converging on Western Europe.

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Streszczenie

PORÓWNANIE PRZEBIEGU PROCESÓW KONWERGENCJI WE „WSCHODZACYCH GOSPODARKACH" EUROPY ŚRODKOWO -WSCHODNIEJ ORAZ AZJI ŚRODKOWEJ

W oparciu o przeprowadzoną analizę wskaźników wzrostu gospodarczego w latach 1989–2011 w artykule dokonano rozróżnienia pomiędzy „gospodarkami wschodzącymi („emerging markets") z obszaru Europy Środkowo-Wschodniej (z uwzględnieniem Rosji) a innymi gospodarkami mieszczącymi się w tej kategorii. W wyniku reform wprowadzanych od 1989 roku gospodarki tego regionu upodobniły się pod względem instytucjonalnym do innych „gospodarek wschodzących", jednakże bez oczekiwanego wpływu na tempo wzrostu gospodarczego. Cechą charakterystyczną typowych „gospodarek wschodzących" jest tempo wzrostu pozwalające na zmniejszenie dystansu dzielącego je od „gospodarek rozwiniętych". W odróżnieniu od tych „gospodarek wschodzących", które weszły na ścieżkę konwergencji, kraje Europy Środkowo-Wschodniej jak dotąd rozwijały się zbyt wolno, aby zacząć się zbliżać do poziomu dobrobytu obserwowanego w „gospodarkach rozwiniętych". Dzięki podwojeniu realnego dochodu narodowego w latach 1989–2011 Polska stała się jedynym krajem regionu, który skraca dystans rozwojowy. Drugim państwem zmniejszającym dystans rozwojowy jest Słowenia. Natomiast wiele krajów praktycznie straciło dwie dekady bądź nie redukując istniejącego dystansu rozwojowego bądź odnotowując jego dalsze zwiększenie (np. Serbia, Ukraina). Wyniki przeprowadzonej analizy mogą mieć poważne implikacje dla teorii ekonomii oraz dla zrozumienia globalizacji jako siły, która z założenia prowadzi do unifikacji poziomu dobrobytu w skali światowej.

Słowa kluczowe: *globalizacja; konwergencja; Europa Centralna i Wschodnia; gospodarki wschodzace, podział dochodu, struktura własności*

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TOMASZ GRABIA*

Interest Rate Policy Of Selected Central Banks In Central And Eastern Europe

Abstract

The aim of this article is to present and evaluate interest rate policies of three selected central banks in Central and Eastern Europe (Poland, the Czech Republic, and Hungary) from 2001 to 2013. The study consists of an introduction (Section 1) and three main parts. The introduction contains a theoretical description of the role of interest rate policy, the dilemmas connected with it, as well as an analysis of the strategies and goals of monetary policies of the National Bank of Poland (NBP), the Czech National Bank (CzNB), and the National Bank of Hungary (NBH) in the context of existing legal and institutional conditions. In turn, the first empirical part (Section 2) examines how the analysed central banks responded to changes in inflation, unemployment, and economic growth rates. The tools of the analysis are the nominal and real interest rates of those banks. The subsequent research part (Section 3) attempts to evaluate the degree of the contractionary nature of interest rate policies in specific countries in the context of the Taylor rule. The text ends with a summary (Section 4) encompassing concise conclusions drawn from the earlier analyses.

***Keywords**: monetary policy, interest rate, Taylor rule*

* Ph.D., University of Lodz, Faculty of Economics and Sociology, Chair of Microeconomics

1. Introduction

Monetary policy, the primary tool of which is interest rate policy, faces the difficult issue of having to constantly choose an optimum strategy. When setting the goals of monetary policy, several paths can be chosen. One of those can be characterized by lower inflation at the expense of slower economic growth, while the other – higher inflation but, at the same time, a more rapid rise in production. The choice between those two paths is often political and depends on preferences of the country's authorities and their appraisal of the country's socio-economic situation (Fedorowicz 2000, pp. 87-89).

In the European Union countries, the euro area establishment project contributed to an assumption that, in principal, the sole objective of central banks is to maintain the value of currency. Therefore, the EU member states were somehow forced to consider price stabilization to be the top priority of economic policy. That certainly may give rise to controversy as, in some countries, the socio-economic costs of that kind of disinflation policy are undoubtedly high. The countries that get caught in the "low inflation trap" are mainly those where inflation tolerance is higher and which could develop faster, were they not forced to meet the *a priori* imposed low inflation objective (Bednarczyk, Sobol 2011, pp. 36-41).

At this point, it is worth emphasizing that, according to the economic literature, various goals can be set for interest rate policy. Apart from combating inflation, they may include, among others: effective allocation of a country's economic resources (Borowiec 1994, pp. 274-275), increasing domestic savings, increasing effectiveness of investment, managing domestic demand, attracting additional foreign capital, increasing demand for financial assets (Walerysiak 1997, pp. 793-799), stabilization of the economy and stimulation of structural transformations (Nowak, Ryć, Żyżyński 1997, p. 443), and even stimulation of economic growth. Some of those goals are closely connected with the inflation objective (based on the principle of complementarity), whereas others (especially the last one) substitute, to some degree, price level stabilization.

It is worth noting, however, that even if the inflation goal is considered to be the sole aim, a high interest rate policy may, anyway, not always be the most appropriate inasmuch as high interest rates – due to the fact that their nominal level is usually set a little above the forecast inflation rate – have a stimulating impact on inflation expectations.

It should also be emphasized that the interest rate affects numerous other variables – both in the product and money market – and thus, when manipulating its level, effects may be brought about that are not always matched to expectations. Taking into account the pursuit of an interest rate policy as a tool to fight inflation, it is very important to precisely determine what kind of

factors contribute, to the largest degree, to its increase or at least maintenance at a relatively high level as, while high interest rates will actually curb inflation when it is pulled by demand, quite an opposite situation may occur when inflation is caused mainly by cost factors. This may be due to the fact that high interest rates often make enterprises taking out loans try to compensate for their considerable costs by raising the prices of their products (Żyżyński 1996, p. 101).

When analysing the effectiveness of interest rate policy, attention should also be paid to the differentiation between the short and long term, which is often omitted in the mass media but very important in economics. Expansionary monetary policy tends to bring about expected effects, but only in the short run. In turn, contractionary policy, associated with disinflation policy, often appears to be advantageous in the longer run. That is indicated, inter alia, by empirical research on the relationship between inflation, national income, and investment.[1] Therefore, while pursing an often unpopular inflation-combating policy, some short-term costs usually have to be borne in order to later be able to secure long-term advantages.

Such an assumption was taken, among others, by the European Central Bank (ECB) which, in contrast to, for example, the Federal Reserve System (the Fed) in the United States, does not practise defining several equally important goals. Pursuant to provisions of the Treaty Establishing the European Community (Article 105) the primary objective of the ECB is to maintain price stability. It is worth pointing out that similar principles apply to the entire European System of Central Banks. Due to the fact that Poland, the Czech Republic, and Hungary are all members of this System, the regulations in force in those countries and their sets of monetary policy instruments are also similar to those applicable within the whole system (Olszewska 2009, pp. 117-125).

The meeting of an *explicitly* established goal is to be facilitated by the considerable sovereignty of all national central banks of those countries which are members or candidate countries of the Economic and Monetary Union. Hence, central banks have been forbidden from taking any instructions from member state governments or community authorities who, in turn, have been prohibited from putting any pressure on those banks in their performance of their tasks (Szeląg 2003, p. 47). This separation between bodies carrying out monetary policies and those implementing fiscal policies is, in practice, designed to limit to a minimum the impact of the government (whose composition, and thus also economic policy, may be subject to frequent changes) on monetary policy making. That, in turn, is designed to give an appropriate importance to inflation-

[1] One of the most comprehensive analyses on this issue was conducted by R. J. Barro, who studied more than 100 countries over a period of about 30 years (from 1960 to 1990). The study indicates that a rise in the mean inflation rate by 10 percentage points reduces the rate of an increase in the real GDP by 0.24 percentage points annually (Barro 1996, pp. 157-159, 167-168).

combating policy, the adverse effects of which may lead, among others, to limiting the propensity to save and invest and decreasing the real income of the society.

Therefore, more and more countries adopt the so-called direct inflation targeting (DIT) strategy, while completely giving up indirect goals. Since 1998 this kind of strategy has been pursued by the National Bank of Poland and the Czech National Bank, and since 2001 – also by the National Bank of Hungary. Inflation targets set by central banks are currently: 2.5% in Poland (since 2004), 2% in the Czech Republic (since 2010), and 3% in Hungary (since 2007).[2]

Arguments for choosing an direct inflation targeting strategy in the conditions of increasing integration of the analysed economies with the global economy were, among others, the ability to publicly verify the direction and effectiveness of monetary policy as well as, associated with that aspect, enhancement of its reliability and flexibility. The target of having a monetary policy that is clearly set and understood by the public is among the pillars of the central bank's functional independence. Along with increasing the reliability of monetary policy, it may also contribute to overcoming inflation expectations (NBP 1998, pp. 8-9), being one of major factors affecting the rate of increase in general price levels.

At this point, however, the question arises whether the official announcement of pursuing a DIT strategy actually means that the sole goal of monetary policies of the analysed central banks is always to combat inflation. There is no doubt that it is a primary goal. Nevertheless, it seems that sometimes (especially when the inflation goal is not threatened and the economy falls into recession or crisis) central banks should also influence other macroeconomic variables, including economic growth and unemployment rates.

In the case of Poland such a conclusion can be drawn by, inter alia, analysing the discussions held by members of the Monetary Policy Council (the main decision-making body of the NBP) at its meetings.[3] For example, when a decision was made to lower interest rates by 25 base points in June 2009, the decision took into account, inter alia, "further slowdown in economic growth in Poland" and

[2] In previous years those targets were: in Poland – 6-8% in 2001, 5% in 2002, and 3% in 2003; in the Czech Republic – 3-5% in 2001-2004, 2-4% in 2005, and 3% in 2006-2009; in Hungary – 7% in 2001, 4.5% in 2002, 4% in 2005, and 3.5% in 2003-2004 and 2006 (www.cnb.cz; www.english.mnb.hu; www.nbp.pl).

[3] At that point it is worth mentioning that pursuant to the Act on the NBP the central bank may support the government's economic policy unless it restrains its primary, i.e. inflation-related, goal (*the Act of 29 August 1997 on the National Bank of Poland*, Article 3, Section 1, "Dziennik Ustaw" [Journal of Laws] of 2005, No. 1, Item 2).

"risk of global long-term low economic activity" (NBP 2009, pp. 44-45). On the other hand, in the months to follow rates were not cut any further due to, so the argument went, the improved prospects for economic activity (NBP 2009, p. 55).

It is worth emphasizing, however, that discussions on changes in interest rates made as a result of the economic situation were mainly focused on the fact that that situation impacts, first of all, on inflation, which can run above or below the target set by the central bank, rather than on the GDP and employment. Thus, it was considered that it was mainly through ensuring the relative stability of prices was it possible to contribute to maintaining high and lasting economic growth (NBP 2009, p. 55). The primary tool enabling central banks to do so within the DIT strategy are interest rates. Although central banks may use a variety of instruments, interest rates should be regarded as the most important among them and, at the same time, most understandable to the public.

2. Changes in Interest Rates by the Analysed Central Banks in the Context of Changes in GDP, Inflation, and Unemployment

Central banks tend to set the levels of several different interest rates – connected with both credit and deposit operations. Table 1 presents classification of basic interest rates of the European Central Bank and their counterparts applied by the national central banks in the Czech Republic, Poland, and Hungary.

Table 1. Basic central bank interest rates in the euro area, Czech Republic, Poland and Hungary

Area / Country	Marginal lending facility	Main refinancing operations	Deposit facility	Main refinancing operations minimum bid rate
Euro area	Certificates of deposits	Current account rate	Official discount rate	-
Czech Republic	Lombard rate	Repo – 2 weeks	Discount rate	-
Hungary	Overnight collateralised loan	Repo – 1 day	Deposit – 1 day	Reference rate – 2 weeks
Poland	Lombard rate	Open market operations ref. rate	Deposit rate	Rediscount rate

Source: Eurostat.

Levels of two of the most important interest rates (determining *marginal lending facility* and *main refinancing operations*) – both in nominal and real terms[4] – as compared with inflation, unemployment, and economic growth rates in the analysed countries from 2001 to 2013 are shown in Tables 2-4.

[4] Real rates were deflated with current inflation. This is justified by the relatively short maturity of sold assets.

Table 2 presents the respective data for Poland. Means of the analysed interest rates for the whole period[5] were (reference and lombard rates respectively): about 5.1% and 6.9%, and in real terms: about 2.5% and 4.2%. In turn, the mean inflation rate was about 2.8%, unemployment rate – about 13.4%, and economic growth rate – about 3.6%. Differentials within the discussed categories in specific years were usually quite considerable. In the case of inflation rate, the differential was 4.6 percentage points, real GDP growth rate – 5.6 percentage points, and unemployment rate – as much as 12.9 percentage points. In turn, the difference between the highest and lowest interest rate was: 9 percentage points in nominal terms and about 7.9 percentage points in real terms (reference rate), and 11.5 percentage points in nominal terms and about 10.3 percentage points in real terms (Lombard rate), respectively. Hence, those differentials were very large too.

Table 2. Selected macroeconomic indices in Poland from 2001 to 2013

Year	Interest rate[a]		Real interest rate[b]		Inflation rate[c]		Unemployment rate[d]	Real GDP growth rate
	A	B	A	B	A	B		
2001	11.50	15.50	7.63	11.50	5.3	3.6	18.3	1.2
2002	6.75	8.75	5.90	7.89	1.9	0.8	20.0	1.4
2003	5.25	6.75	3.59	5.07	0.7	1.6	19.8	3.9
2004	6.50	8.00	2.01	3.45	3.6	4.4	19.1	5.3
2005	4.50	6.00	3.67	5.16	2.2	0.8	17.9	3.6
2006	4.00	5.50	2.56	4.04	1.3	1.4	13.9	6.2
2007	5.00	6.50	0.77	2.21	2.6	4.2	9.6	6.8
2008	5.00	6.50	1.65	3.10	4.2	3.3	7.1	5.1
2009	3.50	5.00	- 0.29	1.16	4.0	3.8	8.1	1.6
2010	3.50	5.00	0.58	2.04	2.7	2.9	9.7	3.9
2011	4.50	6.00	0.00	1.44	3.9	4.5	9.7	4.3
2012	4.25	5.75	2.01	3.47	3.7	2.2	10.1	2.0
2013	2.50	4,00	1.89	3.38	0.8	0.6	10.3	1.6

[a] A – Open market operations reference rate; B – Lombard rate.

[b] Rounded off to two decimal places. Calculated according to the formula: real rate = (1 + nominal rate / 1 + HICP inflation rate December to December in a given year) – 1. A – Open market operations reference rate; B – Lombard rate.

[c] Measured with the Harmonized Index of Consumer Prices (HICP). A – annual average, B – December to December.

[d] Harmonized unemployment rate measured as the share of the unemployed in the civilian labour force – annual average.

Source: Own work based on: http://epp.eurostat.ec.europa.eu; sdw.ecb.europa.eu; www.nbp.pl.

[5] The provided mean values do not actually concern the whole period but only the final months in all the years.

In the Czech Republic (see Table 3), the mean nominal interest rates for the whole period were 1.9% (Repo rate) and 2.8% (Lombard rate). That meant their very low real levels – (-0.3)% for the former and 0.55% for the latter. Rate differentials were also much smaller than in Poland – 4.7 and 5.5 percentage points in nominal terms and about 4.95 and 5.75 percentage points (for the two different rates) in real terms. The mean economic growth rate, which was running at about 2.6% (with a considerable differential of 11.5 percentage points), was lower than in Poland. However, the rise in prices and lack of jobs were a slighter problem as the mean inflation rate was about 2.3% (with a 6.4 percentage point differential) and the unemployment rate – about 7% (with a slight differential of 3.9 percentage points).

Table 3. Selected macroeconomic indices in the Czech Republic from 2001 to 2013

Year	Interest rate[a]		Real interest rate[b]		Inflation rate[c]		Unemployment rate[d]	Real GDP growth rate
	A	B	A	B	A	B		
2001	4.75	5.75	0.82	1.78	4.5	3.9	8.1	3.1
2002	2.75	3.75	2.65	3.65	1.4	0.1	7.3	2.1
2003	2.00	3.00	1.09	2.08	-0.1	0.9	7.8	3.8
2004	2.50	3.50	0.00	0.98	2.6	2.5	8.3	4.7
2005	2.00	3.00	0.10	1.08	1.6	1.9	7.9	6.8
2006	2.50	3.50	0.99	1.97	2.1	1.5	7.1	7.0
2007	3.50	4.50	-1.90	-0.95	3.0	5.5	5.3	5.7
2008	2.25	3.25	-1.02	-0.05	6.3	3.3	4.4	3.1
2009	1.00	2.00	0.50	1.49	0.6	0.5	6.7	-4.5
2010	0.75	1.75	-1.52	-0.54	1.2	2.3	7.3	2.5
2011	0.75	1.75	-1.99	-1.02	2.1	2.8	6.7	1.9
2012	0,05	0,25	-2.29	-2.10	3.5	2.4	7.0	-1.0
2013	0,05	0,25	-1.43	-1.23	1.4	1.5	7.0	-0.9

[a] A – Repo rate – 2 weeks, B –Lombard rate.

[b] Rounded off to two decimal places. Calculated according to the formula: real rate = (1 + nominal rate / 1 + HICP inflation rate December to December in a given year) – 1. A – Repo rate – 2 weeks, B – Lombard rate.

[c] Measured with the Harmonized Index of Consumer Prices (HICP). A – annual average, B – December to December.

[d] Harmonized unemployment rate measured as the share of the unemployed in civilian labour force – annual average.

Source: Own work based on: http://epp.eurostat.ec.europa.eu; sdw.ecb.europa.eu; www.cnb.cz.

A considerably lower stability characterized the third analysed country – Hungary (see Table 4). It had the decidedly highest mean inflation rate (about 5.2% with a 7.4 percentage point differential). Its economic growth rate was also the lowest, at about 1.6% on average annually (with a differential of as much as 11.6 percentage points). On the other hand, it had a mean unemployment rate for

the whole period at about 8.2%; hence, the rate was lower than Poland's. Its trend, however, was definitely opposite as, apart from 2003, 2011 and 2013, the unemployment rate was constantly rising in Hungary, which made it higher than in Poland in the final six years (apart from 2013).

Table 4. Selected macroeconomic indices in Hungary from 2001 to 2013

Year	Interest rate[a]		Real interest rate[b]		Inflation rate[c]		Unemployment rate[d]	Real GDP growth rate
	A	B	A	B	A	B		
2001	9.75	11.25	2.76	4.17	9.1	6.8	5.6	3.7
2002	8.50	9.50	3.43	4.39	5.2	4.9	5.6	4.5
2003	12.50	13.50	6.53	7.48	4.7	5.6	5.8	3.9
2004	9.50	10.50	3.79	4.74	6.8	5.5	6.1	4.8
2005	6.00	7.00	2.61	3.58	3.5	3.3	7.2	4.0
2006	8.00	9.00	1.31	2.25	4.0	6.6	7.5	3.9
2007	7.50	8.50	0.09	1.02	7.9	7.4	7.4	0.1
2008	10.00	10.50	6.38	6.87	6.0	3.4	7.8	0.9
2009	6.25	7.25	0.81	1.76	4.0	5.4	10.0	-6.8
2010	5.75	6.75	1.10	2.06	4.7	4.6	11.2	1.3
2011	7.00	8.00	2.79	3.75	3.9	4.1	10.9	1.6
2012	5.75	6.75	0.62	1.57	5.7	5.1	10.9	-1.7
2013	3.00	4.00	2.39	3.38	1.7	0.6	10.2	1.1

[a] A – Repo rate – 1 day, B – Overnight collateralised loan rate.

[b] Rounded off to two decimal places. Calculated according to the formula: real rate = (1 + nominal rate / 1 + inflation rate December to December in a given year) – 1. A – Repo rate – 1 day, B – Overnight collateralised loan rate.

[c] Measured with the Harmonized Index of Consumer Prices (HICP). A – annual average, B – December to December.

[d] Harmonized unemployment rate measured as the share of the unemployed in civilian labour force – annual average.

Source: Own work based on: http://epp.eurostat.ec.europa.eu; sdw.ecb.europa.eu; english.mnb.hu.

Despite the (usually) relatively slight increase in GDP and climbing unemployment, the interest rate change analysis indicates, however, that the National Bank of Hungary did not intensely use that tool to improve the economic situation, as mean nominal interest rates from 2001 to 2013 were respectively: 7.65% (Repo rate) and 8.65% (collateralised loan rate), considerably exceeding similar rates set at the other analysed central banks. Significant reductions in relatively high interest rates occurred principally only in 2005 (probably as a response to the decline in inflation to the lowest level in the whole period) and from 2009 to 2010 (along with the global trend of lowering

rates as a reaction to the crisis). In real terms, due to the higher inflation, those rates were, however, at a level close to that observed in Poland (Repo rate – about 2.7%; "overnight" rate for collateralised loan – 3.6%).

3. Deviations in the Interest Rates of Analysed Central Banks from Hypothetical Rates According to the Taylor Rule

Interest rate policy may be discretionary or based on a rule. The most popular form of the latter is the Taylor rule, created in 1993. Its original algebraic form was as follows:

$$r = p + 0.5\,y + 0.5\,(p - 2) + 2 \qquad (1)$$

where:
r – central bank interest rate,[6] p – inflation rate in the last four quarters; y – percentage deviation of the real GDP from the potential GDP determined by the formula:

$$y = 100\,(Y - Y_p)\,/\,Y_p \qquad (2)$$

where:
Y – real GDP; Y_p – potential real GDP.

The author of the rule – Taylor – based it on certain assumptions. The most important of those was that the central bank ought to assume a target inflation level (inflation goal) and try to maintain it. Moreover, monetary policy should respond to changes in two basic values – real gross domestic product and inflation, which directly arises from the formula.

If the real GDP equals the potential GDP (understood as many years' mean) and inflation equals a goal set at 2% (thus, y and $p - 2$ in the formula (1) equal zero), the central bank interest rate should remain close to 4%, which implies the mean real interest rate of 2% (which is reflected by the last component on the right side of the equation) (Taylor 1993, p. 202). That rate, on the other hand, should be increased or reduced when the GDP deviates from its potential level and/or inflation deviates from the goal. If, for example, the real GDP rises by one per cent above the potential GDP, the interest rate should be raised – taking into account the current inflation rate – by 0.5 percentage point. If, additionally, inflation exceeds the goal by 1 percentage point, the interest rate should, due to that fact, be lifted by another 0.5 percentage point. Therefore, the optimum level of interest rate according to the Taylor rule ought to be 5% in the above discussed example.

[6] In the original formula it was the rate of federal funds as the proposal originally concerned the US.

Of course, values of coefficients for deviations may be set a little differently than in the original formula. For instance, in analyses concerning Europe, where, principally, the sole legally sanctioned objective of monetary policy is to combat inflation, a deviation of the latter is, as a rule, given more importance than the GDP gap (Giammarioli, Valla 2003, p. 12; Fernandez, Gonzalez 2004, p. 23-25). In such a case, the monetary policy rule could take the following form:

$$r = p + 0.5\,y + 1.5\,(p - 2) + 2 \tag{3}$$

Thus, the only difference would be the value of the coefficient assumed for the deviation of the actual inflation rate from the goal.

Table 5. Real vs. potential interest rate (according to the Taylor rule) in Poland from 2001 to 2013

Year	Interest rate calculated based on the Taylor rule[a]		Deviation of the open market operations reference rate from the rate calculated based on the Taylor rule[ab]		Lombard rate deviation from the rate calculated based on the Taylor rule[ab]	
	A	B	A	B	A	B
2001	5.25	3.55	+6.25	+7.95	+10.25	+11.95
2002	1.25	-1.85	+5.50	+8.60	+7.50	+10.60
2003	1.70	-0.60	+3.55	+5.85	+5.05	+7.35
2004	7.00	8.10	-0.50	-1.60	+1.00	-0.10
2005	4.05	3.75	+0.45	+0.75	+1.95	+2.25
2006	4.00	2.80	0.00	+1.20	+1.50	+2.70
2007	6.25	6.35	-1.25	-1.35	+0.25	+0.15
2008	7.80	9.50	-2.80	-4.50	-1.30	-3.00
2009	5.75	7.25	-2.25	-3.75	-0.75	-2.25
2010	4.95	5.15	-1.45	-1.65	+0.05	-0.15
2011	6.95	8.35	-2.45	-3.85	-0.95	-2.35
2012	5.50	6.70	-1.25	-2.45	+0.25	-0.95
2013	0.95	-0.75	+1.55	+3.25	+3.05	+4.75

[a] In version A, calculated assuming the coefficient for inflation deviation from the target at 0.5; in version B – at 1.5.

[b] In percentage points. The "+" sign means an upward deviation; the "–" sign means a downward deviation.

Source: Own work based on formulas 1 and 3 and Table 2.

Tables 5-7 compare real interest rates at the analysed central banks with hypothetical rates computed according to the Taylor rule. The latter were calculated in two versions. In the first version, it was assumed that the coefficient for inflation deviation from the goal is 0.5 and in the other (which, as already mentioned, may be more appropriate for Europe) – 1.5. The mean annual HICP inflation rate was considered the inflation measure for the last four quarters.

Table 6. Real vs. potential interest rate (according to the Taylor rule) in the Czech Republic from 2001 to 2013

Year	Interest rate calculated based on the Taylor rule[a]		Deviation of the Repo rate – 2 weeks from the rate calculated based on the Taylor rule[ab]		Lombard rate deviation from the rate calculated based on the Taylor rule[ab]	
	A	B	A	B	A	B
2001	7.25	7.75	-2.50	-3.00	-1.50	-2.00
2002	1.60	-1.00	+1.15	+3.75	+2.15	+4.75
2003	1.05	-3.05	+0.95	+5.05	+1.95	+6.05
2004	6.00	4.60	-3.50	-2.10	-2.50	-1.10
2005	7.10	5.70	-5.10	-3.70	-4.10	-2.70
2006	8.05	7.15	-5.55	-4.65	-4.55	-3.65
2007	8.10	8.10	-4.60	-4.60	-3.60	-3.60
2008	10.45	13.75	-8.20	-11.5	-7.20	-10.50
2009	-5.70	-8.10	+6.70	+9.10	+7.70	+10.10
2010	2.70	1.90	-1.95	-1.15	-0.95	-0.15
2011	3.45	3.55	-2.70	-2.80	-1.70	-1.80
2012	2.65	4.15	-2.60	-4.10	-2.40	-3.90
2013	-0.40	-1.00	+0.45	+1.05	+0.65	+1.25

[a] In version A, calculated assuming the coefficient for inflation deviation from the target at 0.5; in version B – at 1.5.

[b] In percentage points. The "+" sign means an upward deviation; the "-" sign means a downward deviation.

Source: Own work based on formulas 1 and 3 and Table 3.

Furthermore, instead of a percentage deviation of the real GDP from the potential GDP, deviation of the actual growth rate of the real GDP from the mean rate for the whole 13 years' period was taken into account. As already mentioned, the mean rates for the analysed countries were (in round figures): in Poland – 3.6%, in the Czech Republic – 2.6%, and in Hungary – 1.6%. Also, actual inflation targets were assumed, slightly different from those in the formula presented in the previous point. Thus, instead of p – 2, for Poland, the third component of the discussed formula contained the following expressions:

p – 7 (for 2001), *p – 5* (for 2002), *p – 3* (for 2003), and *p – 2.5* (for 2004-2013).

For the Czech Republic, the following expressions were used in calculations:

p – 4 (for 2001-2004), *p – 3* (for 2005-2009), and *p – 2* (for 2010-2013).

In turn, for Hungary, those were:

p – 7 (for 2001), *p – 4.5* (for 2002), *p – 3.5* (for 2003-2004 and 2006), *p – 4* (for 2005), and *p – 3* (for 2007-2013).

Those differences arise from different inflation goals assumed by the analysed central banks in the specific years (see Section 1).

Table 7. Real vs. potential interest rate (according to the Taylor rule) in Hungary from 2001 to 2013

Year	Interest rate calculated based on the Taylor rule[a]		Deviation of the Repo rate – 1 day from the rate calculated based on the Taylor rule[ab]		Deviation of the "overnight" rate for collaterised loan from the rate calculated based on the Taylor rule[ab]	
	A	B	A	B	A	B
2001	13.20	15.30	-3.45	-5.55	-1.95	-4.05
2002	9.00	9.70	-0.50	-1.20	+0.50	-0.20
2003	8.45	9.65	+4.05	+2.85	+5.05	+3.85
2004	12.05	15.35	-2.55	-5.85	-1.55	-4.85
2005	6.45	5.95	-0.45	+0.05	+0.55	+1.05
2006	7.40	7.90	+0.60	+0.10	+1.60	+1.10
2007	11.60	16.50	-4.10	-9.00	-3.10	-8.00
2008	9.15	12.15	+0.85	-2.15	+1.35	-1.65
2009	2.30	3.30	+3.95	+2.95	+4.95	+3.95
2010	7.40	9.10	-1.65	-3.35	-0.65	-2.35
2011	6.35	7.25	+0.65	-0.25	+1.65	+0.75
2012	7.40	10.10	-1.65	-4.35	-0.65	-3.35
2013	2.80	1.50	+0.20	+1.50	+1.20	+2.50

a In version A, calculated assuming the coefficient for inflation deviation from the target at 0.5; in version B – at 1.5.

b In percentage points. The "+" sign means an upward deviation; the "-" sign means a downward deviation.

Source: Own work based on formulas 1 and 3 and Table 4.

The presented analysis of deviations of the studied countries' specific interest rates from rates determined based on the Taylor rule allows us to conclude that a relatively mild monetary policy, for most of the analysed period, can be observed only in the case of the CzNB as, apart from 2002, 2003, 2009 and 2013, actual interest rates in the Czech Republic were lower than the hypothetical ones according to the Taylor rule. A particularly large difference between them occurred in 2008.

It is also worth mentioning that both the real Repo rate for 2-week operations and the real Lombard rate became even negative from 2007 to 2013 (apart from 2009). Hence, that may indicate an actually excessively expansionary nature of the CzNB policy in those subperiods. It should be emphasized, however, that essentially the bank did not make abrupt changes in interest rates. The sole exception from the rule was its reaction to the crisis from 2009 to 2010, resulting in the nominal Repo rate at as little as 0.05% at the end of the studied period.

A different attitude and more contractionary monetary policies were observed in Poland and Hungary. In Poland, however, that applied mainly to the initial years of the studied period. Comparison between actual NBP interest rates and rates calculated according to the Taylor rule indicates that the former ran at a significantly higher level in the 2001-2003 period. It is also worth recalling that, at that time (2002-2003), the inflation rate deviated downward below the lower margin of the goal, economic growth rate was relatively the lowest, and unemployment rate was the highest throughout the studied period. Therefore, it can be said that at the beginning of the studied period interest rates in Poland, although regularly lowered, should have been cut faster and the monetary policy was too contractionary.

In the subsequent several-year subperiod of 2004-2006 NBP interest rates were decidedly closer to the hypothetical rates according to the Taylor rule. That may indicate a significantly more neutral nature of the monetary policy pursued at that time.

Yet another conclusion can be drawn about that policy in Poland in the final seven years of the studied period. It seems that at that time, thanks to its neutral attitude to interest rate policy, the National Bank of Poland managed to avoid mistakes made, for example, by the US Federal Reserve System as, in response to the economic crisis, interest rates in Poland were reasonably lowered, to run at a level higher than in the Czech Republic as well as in the euro area. In that context it should, however, be pointed out that Poland was affected by the economic crisis to the smallest degree, relatively speaking. Moreover, more drastic cuts in rates in Poland were significantly limited by a strong depreciation in the Polish zloty in 2009 (Pronobis 2009, p. 112).

That aspect aside, it ought to be emphasized that the actual NBP reference rate in the 2007-2012 period, and at the end of that period in particular, might have been even higher if compared with that computed based on the Taylor rule. Thus, it completely contradicts some opinions of politicians stating that the level of interest rates was too high in that subperiod, hampering economic growth. It should be more justified to say that the central bank succeeded in maintaining a "healthy" balance between short- and long-term objectives at that time. Admittedly, we often experienced "overshooting" the inflation target – both upwards and downwards. As a rule, however, it was not significant and inflation quickly returned to its set range.

Among the studied central banks, the highest nominal interest rates, apart from 2001, definitely occurred in Hungary. What's more, comparison of actual interest rates with those calculated based on the Taylor rule indicates that the former were frequently too high and thus, the NBH policy was excessively contractionary. In the case of the Repo rate for 1-day operations, that occurred in 2003, 2006, 2008 (according to the A version), 2009, 2011 (according to the A version) and 2013. If, however, the "overnight" rate is considered, that took place also in 2002 (according to the A version) and 2005.

Therefore, it may not be ruled out that the NBH interest rate policy contributed, to some extent, to a relatively low, as compared to the other countries, GDP growth. Some justification for that quite contractionary monetary policy was, however, firstly the decidedly highest inflation rate in Hungary among the studied countries, which fell below the assumed target only in 2005 and 2013. It is worth emphasizing that even during the crisis, which was accompanied by falling global demand, the inflation rate in Hungary fluctuated around 5%. Secondly, the contractionary monetary policy was often a response to an extremely expansionary budgetary policy[7]. Hence, to some extent, the high interest rates might have been justified as they prevented an even higher inflation. On the other hand, such a mix of macroeconomic policy causes a strong crowding out effect through a rise in all kinds of interest rates as, along with increased central bank rates, an excessive deficit makes it necessary to offer high interest on treasury bonds.

4. Conclusions

The monetary policy of every central bank is carried out in specific economic conditions. Those conditions are sometimes difficult to completely identify and understand. However, when evaluating monetary policies followed by the analysed central banks, attention should be drawn to the fact that the applicable legislation clearly specifies that their activity is to bring about beneficial economic effects in the long run. That is to be achieved by preventing an excessive rise in prices, which is currently the sole final goal of each of those banks.

The conducted analysis reveals that the studied central banks pursued that very objective to the largest extent. Thus, interest rates were changed, first and

[7] During the years 2001–2010 the public finance sector deficit in Hungary was never particularly close to meeting the Maastricht reference value of 3%. A very high level of that deficit was recorded especially from 2002 to 2006 when it ranged from 6.4% (2004) to 9.3% (2006) (http://epp.eurostat.ec.europa.eu).

foremost, in response to inflation rate changes. Taking into consideration the whole studied period, the analysed central banks seem to have avoided mistakes consisting in the excessively expansionary nature of their policies made, for instance, in the United States. One can, admittedly, wonder whether the monetary policy in the Czech Republic should not have sometimes been a little more contractionary (e.g. from 2007 to 2008). On the other hand, an opposite objection, of the excessively contractionary nature of policies, seems to be substantiated in the case of Hungary and, at the beginning of the studied period, Poland. Nevertheless, mistakes made in those countries were still smaller than in the US.

It is already possible to state with a high degree of probability that the extremely expansionary policy of the US Federal Reserve System (Fed) was co-responsible for the global 2008–2009 economic crisis. Such an opinion is actually also expressed by the author of the Taylor rule, who claims that one of the most important factors behind the crisis was the excessively expansionary interest rate policy in the US from 2002 to 2006 (especially in the 2003-2004 subperiod) as at that time the rates were set at a level considerably lower than that arising from the rule he proposed (Taylor 2007, p. 5).

The analysis conducted in this study indicates, admittedly, that the Taylor rule was not commonly applied by all of the three analysed central banks. In consequence, interest rates set by them sometimes significantly differed from the hypothetical levels determined based on the discussed rule (either exceeded or were lower than the hypothetical rates). Nevertheless, it is worth emphasizing yet again that the discretionary interest rate policies of the analysed central banks did not appear to be as erroneous as those in the US, maintaining an appropriate level of macroeconomic rationality.

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Streszczenie

POLITYKA STOPY PROCENTOWEJ WYBRANYCH BANKÓW CENTRALNYCH W EUROPIE ŚRODKOWO-WSCHODNIEJ

Celem artykułu jest przedstawienie i ocena polityki stopy procentowej trzech wybranych banków centralnych Europy Środkowo-Wschodniej (Polski, Czech i Węgier) w latach 2001–2011. Opracowanie składa się z wprowadzenia i dwóch części zasadniczych i podsumowania. We wprowadzeniu (p. 1) zawarto teoretyczny opis roli polityki stopy procentowej, dylematów z nią związanych, a także analizę strategii i celów polityki monetarnej Narodowego Banku Polskiego (NBP), Narodowego Banku Czeskiego (NBCz) oraz Narodowego Banku Węgier (NBW) w kontekście obowiązujących uwarunkowań prawno-instytucjonalnych. Z kolei w pierwszej części empirycznej (p. 2) sprawdzono, w jaki sposób analizowane banki centralne reagowały na zmiany stóp inflacji, bezrobocia i wzrostu gospodarczego. Jako instrumenty analizy przyjęto nominalne i realne stopy procentowe tych banków. W następnej części badawczej (p. 3) podjęto próbę oceny stopnia restrykcyjności polityki stopy procentowej w poszczególnych krajach w kontekście reguły Taylora. Całość zamknięto podsumowaniem (p. 4), zawierającym wnioski z przeprowadzonych wcześniej analiz.

***Słowa kluczowe**: polityka pieniężna, stopa procentowa, reguła Taylora*

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MARLENA PIEKUT*

The Rich North-west, The Poor Middle-east – Consumption In EU Households

Abstract

The aim of paper is to analyze household consumption in EU countries in the 21st century. The two hypotheses posited have been confirmed. The start of the 21st century saw an increase in consumer spending in EU households and reduction in the disparities between households of different countries. At the end of the first decade there was a stabilization in consumer spending. The differences in consumption between households can be considered as a) the effect of freedom of choice, and b) a consequence of specific restrictions that do not allow for an appropriate level of funds to meet household needs. Households with the most favourable situation are located in the United Kingdom and Austria. The most unfavourable situation can be observed in the households of Estonia, Latvia, Poland, Romania and Bulgaria.

Keywords: *households, EU, consumer expenditures, disproportions*

1. Introduction

A major aim of the European Union is to reduce differences in the level of development of the various regions and the backwardness of the outermost regions, including rural areas. As a result of the Treaty of Maastricht in 1992, instruments and policies were established with the common goal of reducing the asymmetry in the EU regions.

* Ph.D., Warsaw University of Technology, College of Economics and Social Sciences

The subject of convergence became popular in new EU Member States upon their accession to the EU. Since then countries from Central and Eastern Europe have been beneficiaries of the cohesion policy - a regional policy of the EU aimed at increasing the level of economic, social, and territorial (spatial) cohesion. While the economic aspect is a very thoroughly researched area of convergence studies, the social aspects are less often covered in the specialist literature.

The aim of paper is to analyze the level and structure of household consumption in EU countries and also to identify changes in consumer spending in 21st century.

Accordingly, research problems posed for the following analysis are:

- To indication the level of consumer spending and its structure in EU households in 21st century.
- To indicate the variability of consumer spending in the period 1995–2011 in EU households.
- To divide EU countries into groups based on similar levels of consumer spending and similarities in their structure.

The following hypotheses were formulated:

Hypothesis 1: The start of the 21st century saw an increase in consumer spending in EU households and a reduction in the disparities between the households of different countries. At the end of the first decade, due to the economic crisis, there has been a stabilization in consumer spending in the EU.

Hypothesis 2: The differences in consumption between households can be considered as a) the effect of freedom of choice; and b) a consequence of specific restrictions that do not allow for an appropriate level of funds to meet the household needs.

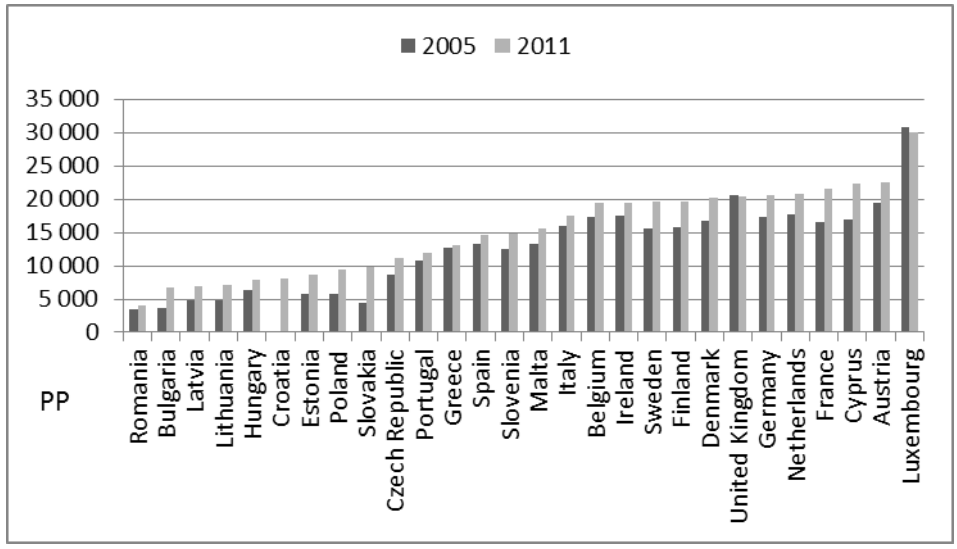
This paper is organized as follows. This introduction, which includes the purposes and hypotheses of the report, is followed by a literature review in Section 2. Section 3 describes and explains the research methodology. Section 4 presents empirical results obtained by the panel data analysis approach. It includes a sub-section focusing on analysis of the wear indicator of AIC per capita; a second sub-section classify EU countries according to their AIC; and a third sub-section dealing with the structure of expenses of households in selected countries. Section 5 provides results and discussion, and the final Section 6 contains conclusions.

2. Literature review

The level of affluence of a population and households is dependent on many factors, among which income is particularly important (Piekut 2009). It is a major determinant of the level of needs, both in terms of quantity and qualitatively (Gutkowska et. al., 2012).

There are significant differences in average household income between the various EU Member States. The highest household incomes are in households located in Luxembourg, followed by Austria, Cyprus and France. The lowest incomes were recorded in Romania, Bulgaria, Latvia and Lithuania (see Figure 1).

Figure 1: Mean equivalent net income in households in EU countries in 2005 and 2011, in PPS[1]



Comment: due to the lack of 2005 data relating to income, the data for 2005 for Romania was taken from 2007 and for Bulgaria from 2006.

Source: own work on the basis of *Eurostat Database*, 2013.

[1] The PPS (purchasing power standard) is - according to Eurostat (Eurostat – OECD 2005) - a substitute currency unit. Hypothetically, one PPS can buy the same number of goods and services in each country. On the other hand, differences in prices across borders mean that different amounts of national currency units are necessary for the same goods and services depending on the country. PPS is derived by splitting any economic aggregate of a country in national currency by its respective purchasing power parities. Eurostat uses PPS as the technical term for the common currency in which national account aggregates are articulated when adjusted for price level differences using PPPs. Therefore, PPPs can be interpreted as the exchange ratio of the PPS against the euro.

Household income is regarded as the maximum amount that a household can spend on consumption (purchase of goods and services) within a certain period, without the need to fund these expenditures from savings, liquidation of tangible or financial assets, or borrowing. The size of household incomes determines the size and dimensions of expenditure on consumption. Thus each increase or decrease in income (expressed in real terms) also leads to an increase or decrease in consumption (Janoś-Kresło 2006).

Income distribution is one of the most significant problems in modern society. Normally, it is considered that a severe polarisation in terms of income per capita can have a great negative impact on the universal process of economic development (Albu 2012).

Bogović (2002) indicates that private consumption acts as an accelerator of economic growth and development. Consumption is also seen as a specific "locomotive" of economic growth (Bywalec 2007). Increasing the value of consumer spending has multiplier effects in both total production and the economy. In particular, an increase in consumer spending increases the demand for goods and services and thus increases their production. However, this impact is not limited to the production of one sector but all other sectors of the economy, on the basis of output-input. Thus, an increase in personal consumption directly affects the development of one part of the economy, and indirectly the whole economy.

The economic crisis in 2008-2010 had its source in the irrational behavior of household members. Many members of households did not recognize their financial capabilities when they took out loans, and as a result many households became insolvent. The scale of the phenomenon was so great and widespread that it lead to the global economic and financial crisis (Bywalec 2012).

3. Research methodology

This analysis included statistical data from the statistical offices of Germany, Poland and Eurostat. The object of interest was EU countries.

To illustrate the similarities and differences in consumer spending in selected countries we used Ward's analysis and the k-means method.

Ward's cluster analysis method is a hierarchical clustering method which does not require the number of clusters previous. At the beginning of the procedure, it is assumed that each entity (object) is the focus of a separate step, then connects to a group of objects most similar to each other until one cluster forms containing all observations.

Ward's cluster analysis method is considered to be effective because it ensures the homogeneity of the objects inside the cluster and simultaneously the heterogeneity between clusters (Ward 1963). The classification of countries has incorporated the adjusted per capita consumption of individuals.

The k-means method of clustering is different from hierarchical clustering and the Ward method, which are applied when there is no prior knowledge of how many clusters there may be or what they are characterized by. K-means (MacQueen 1967) consists of unsupervised learning algorithms. The main idea is to define k centroids, one for each cluster. K-means clustering aims to partition n observations into k clusters, in which each observation belongs to the cluster with the nearest mean, serving as a prototype of the cluster.

Frequently, both the hierarchical and the k-means methods are used successively. The former (Ward's method) is used to get some sense of the possible number of clusters and the techniques then merge as seen from the dendrogram. Then the clustering is re-run with only a chosen optimum number in which to place all the cases (k-means clustering). Deciding upon the optimum number of clusters is largely subjective, although looking at a dendrogram may help. Clusters are interpreted solely in terms of the variables included in them. Clusters should also contain at least four elements. If we drop to only three or two elements, they cease to be meaningful (Burns and Burns 2008).

The choice of the correct classification was based on the Tabular Accuracy Index (TAI). Calculated by the formula (1) "Evans (1977)":

$$TAI = 1 - \frac{\sum_{j=1}^{k} \sum_{i=1}^{n_j} |x_{j_i} - \overline{x_j}|}{\sum_{i=1}^{n} |x_i - \overline{x}|} \tag{1}$$

where:

x_i- the sum of the values in the set,

n - the size of the set,

$\overline{x}$ - the arithmetic mean of the whole set,

k- the number of classes,

x_{ji}- values belonging to the j-th class,

n_j- number of j-th class,

$\overline{x_j}$ - the arithmetic mean of the values found for the j-th class.

The TAI ratio has a value in the range <0,1>. The better the class division reflects the nature of the data, the higher will be the value.

For the classification connected with actual individual consumption expenditure levels, thirteen variables, connected with the AIC expenditure level per capita over the period 2000-2012, have been applied. The TAI value was calculated using the coefficient of variation, as studied similarity countries due to the variability of the AIC.

For the second classification, connected with the structure of expenditure in households, twelve variables, being categories of household expenditure in 2011, have been applied. The TAI was calculated on the basis of the share of expenditure on basic goods, i.e. the share of expenditures on food and fees associated with the maintenance of living premises.

To illustrate the dynamics, the average rate of change was used. This benchmark determines the growth or decrease in the examined phenomenon over a stated time, in relation to the magnitude of this occurrence in the reference period. First, chain indices were calculated (2); and next average values for the given period were established (3) using the given indices.

$$i = y_n / y_{n-1} \tag{2}$$

i – the chain index

y_n – the analysed period, the present year for which the index is being defined

y_{n-1} – the base period, the year before the present year.

$$\overline{i_G} = \sqrt[n-1]{i_{n/n-1} \cdot i_{n-1/n-2} \cdot \ldots \cdot i_{2/1}} = \sqrt[n-1]{i_{n/1}} - 1 \tag{3}$$

i_G – the average rate of change for the analysed period.

The research period encompassed the years 2000-2012.

The statistical analysis was recalculated with Statistica 10 and Excel.

4. Empirical results

4.1. Consumption in households

The first decade of 21st century began with improving economic conditions and increasing economic growth. The Gross World Product in 2001-2003 increased by nearly 10%. Economic acceleration was also seen in the next triennium before the economic crisis. Consumer expenditures of households increased in all EU countries.

A good index for illustrating the level of consumption between countries is actual individual consumption per capita (AIC). While GDP per capita is principally an indicator of the level of economic activity, AIC per capita is an alternative indicator better adapted to represent the material welfare and situation of households. Goods and services actually consumed by individuals, irrespective of whether these goods and services are purchased and paid for by households, by government or non-profit institutions, consist of actual individual consumption. In international volume comparisons, AIC is often seen as the preferable measure, since it is not affected by the fact that the organization of certain significant services consumed by households, like education and health services, vary greatly across countries (Eurostat – OECD 2005).

In general, levels of AIC per capita are more homogeneous than GDP, but still there are substantial differences across the EU countries. In 2012, twelve countries are clustered above the average of the EU-28. Luxembourg has the highest level of AIC per capita in the EU, 90% above the average of the EU-27.

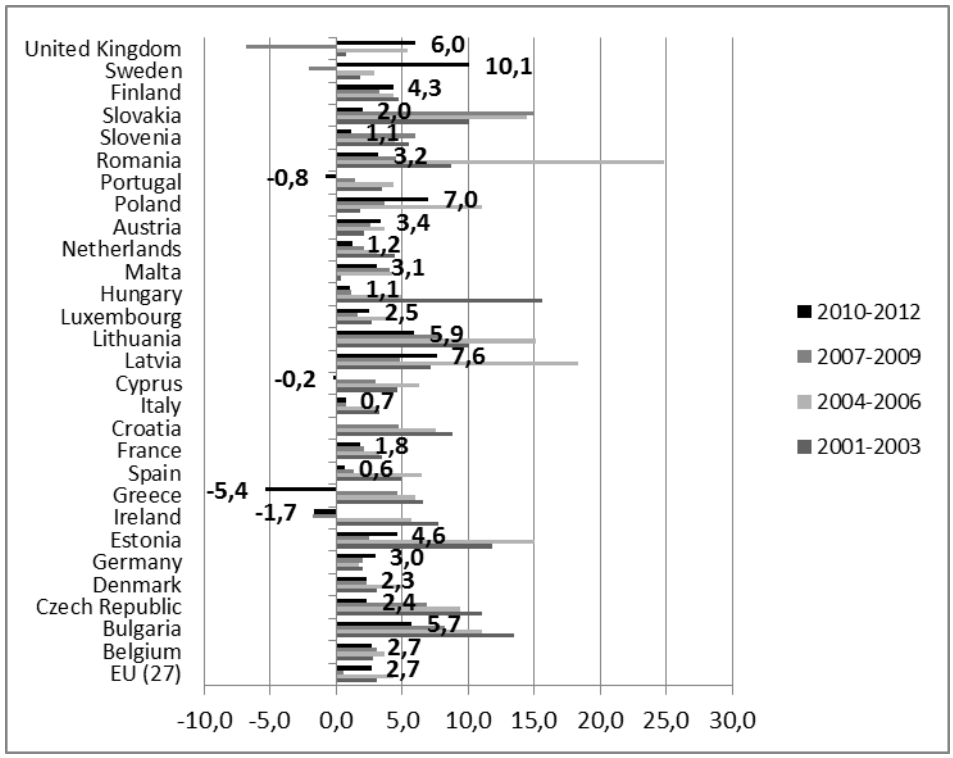
The EU Member State with the second highest AIC per capita is Denmark, at 67% above the average of the EU-28, and then Sweden (59% above), Finland (43% above), the United Kingdom and Austria (each with 32% above) (see Figure 2 below).

In 2001-2003 the highest average growth rate of AIC was recorded in Hungary, Bulgaria, Estonia and the Czech Republic, with yearly increases from 11.0% to 15.6%. In the same period, a relative stabilization of AIC was noted in Malta, the United Kingdom, Sweden and Poland. In the next three years the highest increases in AIC were observed in Romania (24.8%) and Latvia (18.3%). More than 11-percent growth was also noted in Lithuania, Estonia, Slovakia, Bulgaria and Poland. Relative stability was observed in Germany. The first symptoms of the crisis in households manifested themselves by declines in consumer spending. This situation appeared in 2008 in the United Kingdom and Sweden (Piekut 2013). The crisis provoked decreases in AIC in the United Kingdom (a decrease from year to year of 6.8%), Sweden (2.1%) and Ireland (1.7%) in the years 2007-2009. Stabilization or a slight increase in the AIC was noted in other countries. The largest increase in the AIC was observed in Slovakia (14.9%), in other countries it was 8.3%. In the period 2010-2012 a declining growth rate was recorded Greece (a decrease in AIC from year to year of 5.4%), Ireland (1.7%), Portugal (0.8%) and Cyprus (0.2%). In other countries, a slowdown in the previous growth of AIC was observed. The largest increases were recorded in Sweden (10.1%).

In summary, during the 13-year period the greatest rate of change in the AIC was observed in Slovakia and Romania, with increases from year to year in the AIC of 10%. The following numbers (in terms of the size of the AIC) were

recorded in the post-communist countries (Lithuania, Bulgaria, Latvia, Estonia, the Czech Republic, Poland and Hungary): the average AIC from year to year during the period 2000-2012 increased by more than 5.5% to almost 10.0%.

Figure 2. The rate of change of AIC adjusted per capita in period 2001-2012 in the EU, in %



Source: authors' own calculations based on the Eurostat Database, 2013.

4.2. Classification of countries with respect to actual individual consumption

Clustering was used for the analysis of household expenditures and structure of expenditures in households in the EU countries. Ward clustering and the k-means methods were used. The respective analyses yielded slightly different results (Table 1).

Table 1. Cluster countries with respect to the AIC by using the method of Ward and k-means

Cluster	Ward method	k-means method
I	Sweden, United Kingdom, Ireland, Finland, Germany, the Netherlands, France, Austria, Belgium	*Luxembourg, Denmark*, Sweden, the United Kingdom, Ireland, Finland, Germany, the Netherlands, France, Austria, Belgium
II	*Luxembourg, Denmark*	**Portugal, Slovenia, Malta**, Croatia
III	Hungary, Croatia, Slovakia, Poland, Lithuania, Latvia, Estonia, Czech Republic, Romania, Bulgaria	Hungary, Slovakia, Poland, Lithuania, Latvia, Estonia, the Czech Republik, Romania, Bulgaria
IV	**Portugal, Slovenia, Malta,** Cyprus, Spain, Greece, Italy, EU (28 countries)	Cyprus, Spain, Greece, Italy, EU (28 countries)

Source: authors' own calculations based on the *Eurostat Database*, 2013.

The level of actual individual consumption in individual countries is diversified, although a tendency toward reduction of the differences can be observed. The c*oefficient* of *variation for* AIC between the countries being analyzed was 52.1% in 2012, whereas it had been 58.5% in 2005 and 65.4% in 2000. (It is known that if the c*oefficient* of *variation for any cluster is higher than* 50%, the data set is considered as having great variability.)

The cluster analysis *(using Ward's method)* in respect of the level of AIC resulted in the formation four groups of countries. The number of clusters was determined based on the graph of node distance in relation to the node steps, as well as the length of the arms of the dendrogram. In the dendrogram of the clustering result, the longer branches of clusters (where the distances between cluster are bigger) are cut off to obtain the optimal number of clusters. This was followed by the cluster analysis method adopting the k-means, subdivided into four concentrations.

The Tabular Accuracy Index (TAI) for the Ward method was 0.75 and for the k-means method was 0.80. For further analysis the division of countries using the k-means method was adopted.

The first cluster (using the k-means method) is the largest and contains 11 countries, i.e., Luxembourg, Denmark, Sweden, United Kingdom, Ireland, Finland, Germany, the Netherlands, France, Austria and Belgium. These countries had the greatest AIC per capita: from 21,200 euros in Ireland to 34,800 euros in Luxembourg in 2012. In the Ward's clustering method, Luxembourg and Denmark were a separate cluster. From 2000 to 2012 the AIC was the greatest in the mentioned countries. During the first twelve years after 2000, the AIC in cluster I increased from almost 16% in the United Kingdom to over 63% in Finland.

The second cluster (using the k-means method) was comprised of four countries, i.e. Croatia, Malta, Portugal and Slovenia. The AIC per capita in these countries were relatively high and in 2012 ranged from 11,600 euros in Malta to 12,200 euros in Slovenia. In the cluster analysis using the Ward's method, Croatia was included in cluster III. Euclidean value indicated that the nearest neighbour to Croatia was Hungary, and then Estonia and Poland. Between 2000 and 2012, the growth rate of the AIC varied across the countries in this cluster, increasing by 28% in Portugal and even by 65% in Slovenia.

The 3rd cluster (using the k-means method) contained the following countries: Bulgaria, the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania and Slovakia. In all of these countries the AIC was situated below the average for the UE-28. The highest AIC was recorded in the Czech Republic, Slovakia and Lithuania (from 8200 to 8900 euros per capita), and the lowest in Bulgaria and Romania (3900 and 4400 euros per capita respectively). The rate of AIC growth between 2012 and 2000 increased from approximately two times in Hungary and Poland to three times in Slovakia, Romania, Lithuania and Bulgaria.

The 4th cluster includes Cyprus, Greece, Italy and Spain. The AIC in the 4th cluster was greater than the 2nd and 3rd clusters, but less than the 1st. The AIC in these countries oscillated near the average for the EU-28 (18,300 euros per capita in 2012). In 2012 the AIC ranged from 13,900 euros per capita in Greece to 18,800 euros per capita in Italy. In this group of countries the AIC increased by various factors: from 26% in Italy to 48% in Spain.

4.3. The classification of countries regarding their structure of household expenditures

An important part of consumption analysis is the *structure of household expenditures*. Ernest Engel, Saxon's statistic researcher of household budgets in the 21st century, pointed out certain regularities in consumption. He noticed that along with the increase of incomes overall spending and consumption also grows. We also found the growth rate of expenditure on food is weaker than non-food items, meaning that in affluent households the share of food in total household expenditure is lower, while services related to education and recreation grow in importance in the structure of expenses.

The structures of household expenditures *were much more diverse.* The highest c*oefficient* of *variation was observed for education (51.8%), hotel* and restaurant services (44.6%) *and alcoholic beverages and tobacco (42.5%)* i*n 2011.* The greatest diversification was seen in health care - *the* c*oefficients* of

variation reached over 30.5% in the mentioned period. The c*oefficients* of *variation for food and non-alcoholic beverages were* 22.8%. The smallest disparity was observed for the costs of housing, transportation, recreation and culture.

The cluster analysis *(using the Ward`s method)* in respect of the structure of households expenditures resulted in the formation of five groups of countries. Cluster analysis was also performed using the k-means method and yielded a slightly different result than the Ward method (see Table 2).

The Tabular Accuracy Index (TAI) for the Ward method was 0.56 and for the k-means method 0.40. For further analysis we adopted the division of countries ensuing from the Ward method.

Table 2. Clusters of countries arising from the structure of household expenditures using the Ward method and the k-means method

Cluster	Ward method	k-means method
I	Portugal, Malta, Cyprus, Spain, *Ireland*	Portugal, Malta, Cyprus, Spain
II	Slovenian, **Hungary,** Italy, Greece, **Latvia, Estonia**	Slovenian, Italy, Greece, *Ireland*, Austria**,** EU (27 COUNTRIES)
III	Slovakia, Poland, the Czech Republic	Slovakia, Poland, the Czech Republic
IV	***the United Kingdom, Luxembourg*****,** Austria	**Hungary, Latvia, Estonia**
V	the Netherlands, Germany, Belgium, France, Sweden, Finland, Denmark, EU (27 COUNTRIES)	***the United Kingdom, Luxembourg,*** the Netherlands, Germany, Belgium, France, Sweden, Finland, Denmark

Source**:** authors' own calculations based on the *Eurostat Database*, 2013.

The first cluster comprises five countries: Portugal, Malta, Cyprus, Spain and Ireland. The share of expenditures on food in the total household expenditures ranged from more than 10% in Ireland to nearly 17% in Portugal. The share of expenditures on housing were smaller and ranged between 12% (Malta) and 21% (Ireland). The share of expenditures on hotels and restaurant services were the greatest, from above 11% in Malta to 18% in Spain (see Table 3).

The 2nd cluster covers Estonia, Greece, Italy, Latvia, Hungary and Slovenia. The shares of expenditures on food ranged from almost 14% in Italy to about 20% in Estonia and Latvia. The share of expenditures on basic needs (food, soft drinks and housing) observed in Latvia – nearly 45% of total expenditures – was the largest compared to other countries in clusters.

The 3rd cluster covers the Czech Republic, Poland and Slovakia. The share of expenditures on food in total household expenditures for these countries oscillated from about 15% in the Czech Republic to 19% in Poland. This share is high compared to other clusters (in particular in comparison to clusters I, IV and V).

Expenditures on basic goods absorbed 41-43%. The share of expenditures on alcoholic beverages and tobacco products was the highest and ranged from 5% in Slovakia to more than 9% in the Czech Republic.

The 4th cluster also includes three countries, i.e. Luxembourg, Austria and the United Kingdom. In these countries the share of expenditures on food in total household expenditures was the lowest, at about 9-10%. Expenditures on basic goods absorbed 31-33% of total household expenditures and was the lowest of the clusters.

The 5th cluster has the greatest number of countries, i.e., Belgium, Denmark, Germany, France, the Netherlands, Finland, Sweden and EU (27 countries). The share of expenditures on food ranged from above 11% in Denmark to almost 14% in France. In Denmark housing costs accounted for a third of total expenditures. This was the highest share among the EU countries. In households in other countries in the cluster, housing fees ranged between 24% and 27%. In these countries expenditures on alcoholic beverages and tobacco products accounted for small shares of total household expenditures, from 3% in Germany and the Netherlands to 5% in Finland.

Comparing the structure of expenditure in European households with previous years leads to the following conclusions (Piekut 2013): the share of expenditure on food and non-alcoholic beverages was declining and the share of expenditure on secondary goods (recreation and culture, catering and hotel services) in households was increasing.

Table 3. The structure of household expenditure in EU countries in 2011

Specification	Food and non-alcoholic beverages	Alcoholic beverages and tobacco	Clothing and footwear	Housing, water, electricity, gas and other fuels	Furnishings, household equipment maintenance	Heath	Transport	Communications	Recreation and culture	Education	Hotels and restaurants	Miscellaneous goods and services
I cluster												
Ireland	10.4	5.8	4.4	21.5	4.6	5.0	13.3	3.0	7.4	2.2	13.1	9.3
Cyprus	12.6	4.4	6.0	18.6	5.0	5.0	11.5	3.4	7.9	2.7	15.3	7.8
Spain	13.8	2.9	5.3	20.4	4.8	3.5	11.5	2.8	8.1	1.4	17.7	7.9
Malta	15.2	3.0	4.3	12.0	6.8	4.4	13.1	3.4	10.3	1.3	16.0	10.1
Portugal	16.8	3.1	6.0	15.3	5.8	5.9	12.6	3.1	7.2	1.3	11.2	11.6
II cluster												
Italy	14.2	2.8	7.4	22.4	7.2	2.9	12.8	2.4	7.3	1.0	10.2	9.6
Slovenian	14.8	5.4	5.5	19.4	6.1	3.7	15.1	3.2	8.7	1.2	6.9	10.0
Greece	16.2	4.4	3.7	23.8	4.0	6.4	11.8	2.9	5.6	2.4	11.7	7.0
Hungary	17.1	7.4	2.8	21.9	4.3	4.3	13.0	3.7	7.5	1.4	6.7	9.9
Estonia	19.8	9.1	6.3	20.0	4.0	2.6	13.2	3.3	6.4	0.6	7.5	7.1
Latvia	19.9	7.4	4.9	24.8	3.5	3.8	13.6	3.3	7.3	1.8	4.8	5.0

III cluster												
Czech Republic	14.7	9.2	3.1	26.5	5.3	2.5	9.3	3.0	9.4	0.6	7.7	8.6
Slovakia	17.4	5.0	4.0	25.5	6.1	4.0	7.3	3.7	9.5	1.5	5.5	10.6
Poland	18.9	6.5	4.2	24.3	4.5	4.4	10.0	2.9	7.7	1.2	2.8	12.6
IV cluster												
Luxembourg	8.5	8.4	4.6	23.9	6.4	2.0	19.1	1.7	6.9	0.8	7.0	10.5
the United Kingdom	9.1	3.7	6.0	23.9	5.0	1.8	14.2	2.2	10.7	1.5	10.0	11.8
Austria	9.9	3.4	5.7	21.5	6.5	3.5	13.4	2.1	10.4	0.7	12.1	10.7
V cluster												
Denmark	11.4	3.5	4.6	29.1	5.0	2.8	12.3	1.7	10.9	0.8	5.2	12.6
Germany	11.5	3.2	4.9	24.4	6.2	4.8	14.0	2.6	8.9	1.0	5.9	12.6
the Netherlands	11.8	3.1	5.4	23.8	6.0	2.7	12.5	4.1	10.0	0.6	5.1	14.8
Sweden	12.2	3.6	4.8	26.9	5.0	3.2	13.3	3.3	11.1	0.3	5.6	10.7
Finland	12.2	4.9	4.9	26.9	5.3	4.7	11.2	2.2	11.3	0.4	6.4	9.5
Belgium	13.4	3.5	5.0	23.9	5.7	5.6	12.4	2.1	9.0	0.5	6.1	12.8
France	13.5	3.2	4.3	25.1	5.8	3.9	14.4	2.6	8.4	0.8	7.1	11.1
EU (27 countries)	12.9	3.6	5.3	23.6	5.7	3.7	13.2	2.7	8.8	1.1	8.6	10.9
C*oefficient* of *variation*	22.8	42.5	20.6	16.4	17.4	30.5	16.9	21.9	18.2	51.8	44.6	21.3

Comment: this analysis did not include Bulgaria, Romania, Lithuania and Croatia due to the lack of data.

Source: own work based on data Volkswirtschaftliche…2012.

5. Results and discussion

It can be concluded that the countries of Northern and Eastern Europe had higher AIC per capita and smaller shares of expenditures on food. Households with the most favorable situation are in the United Kingdom, Austria and Luxembourg. Germany, the Netherlands, Belgium, France, Sweden, Denmark and Finland, which also have a high level of AIC and relatively low the share of expenditures on food.

In countries where households do not have large budgets, the insufficient level of consumer spending also reflected a poorer structure of consumption, with most of the spending for basic needs (food and housing costs). In these countries, it is important to make greater use of the existing production capacity, the development of new industries and changes in the structure of production so as to achieve an appropriate level of demand in the domestic market **(**Bogović 2002).

Household spending increased in the 21st century, and the difference in spending between the different European countries decreased. During the crisis, there has been a decrease in the stabilization of household expenditures. Gerstberger, Yaneva (2013) indicate that the effects of the financial and economic crisis have varied significantly. The Baltic economies and Greece were the most severely affected, with loss of actual individual consumption (in volume terms). While actual individual consumption started to recover in the Baltic countries in 2011, the contraction accentuated in Greece as a result of the deepening recession and debt crisis. In Romania, Hungary, Bulgaria, Ireland and Poland actual individual consumption also fell, while it expanded in Luxembourg and Sweden.

Glick, Lansing (2010) show that the efforts of households in many countries to cut down their elevated debt loads via increased savings could lead to sluggish recoveries in consumer spending. Higher rates of saving and correspondingly lower rates of domestic consumption growth would mean that a larger part of GDP growth would have to come from business investment, net exports, or government spending. Debt reduction might also be made via various forms of default, such as real estate short sales, foreclosures, and bankruptcies. But such de-leveraging includes significant costs for consumers, who may have tax liabilities on forgiven debt, legal fees, and lower credit ratings.

The AIC growth rate in the countries of Central and Eastern Europe was higher than in the countries of Western and Northern Europe in the early 21st century. However, the crisis has slowed down the growth of AIC. Although each year the differences between EU countries' level of consumption are reduced, there are still significant disparities between the household expenditures of different countries. The new EU members, which joined the Union during the

years 2004-2012, increased their consumer spending levels faster than the others. The highest growth factor in the 2000 to 2012 period was observed in Romania, Slovakia, Bulgaria and Lithuania (above 10.0). Significant growth factors could also be observed also in Latvia, the Czech Republic and Estonia. In Malta and Slovenia household expenditures increased at a slower pace – the growth factor did not exceed 4.3 for these countries.

In recent years, many households of the East European countries have been exposed to market rules and the consequences of their countries' socio-economic transformations their accession to the EU. This has transposed their character and their manner of performance on the market and, accordingly, created changes in area of consumption.

The countries of Central and Eastern Europe had relatively smaller AICs and greater shares of expenditures on food, i.e. households from Estonia, Latvia, Poland, Hungary and Slovakia had relatively lower levels of AIC and a higher share of food in their total household expenditures. Countries where households income or wealth are higher are characterized by lower shares of food expenditures to income (Eurosystem 2013). The above analysis shows the differences in the structure of household expenditures between countries. However, it should also be noted that there are differences depending on the type of household within the country itself. In Poland available income per capita in 2011 for the poorest households (1^{st} quintile group) was 399.33 zł, while for the wealthiest households (5^{th} quintile group) the amount was 3308.57 zl. Available income categorized by family/biological type of household was from 719.09 in marriages with three or more dependent children to 1743.40 zł in marriages without children (Household…2012). Dabrowska's Research (2006) shows that in Polish high income households (income amounting to more than 5000 zł per person), there were relatively small differences in consumption patterns compared to the countries of the "old EU".

The bottom line is that food consumption in households is more evenly assigned than income and net wealth. The fact that spending on food is relatively evenly distributed reflects the fact that households engage in consumption smoothing, so they try to support consumption expenditures even when income or wealth is subject to adverse shocks (crisis). Other documents (Cermakova 2001, Piekut 2008) show that spending on food increases with household size (understandably). Consumption is positively equated with income and wealth. As wealth and earnings are also positively correlated with education, it follows that consumption is higher for more educated people. Food consumption increases in the lower age brackets, peaks for middle-aged households, and subsequently declines. This trend partly reflects modifications in household composition over time (Eurosystem 2013).

It also indicates that the shares of the main consumption items have only gradually changed over the past decade. However, there are some medium-term trends, such as a rising share of expenditure on electricity, gas and other fuels, housing costs, water supply and other dwelling services and health, and falling shares for furnishings, clothing, recreation and communications. Some effect of the financial and economic crisis is discernible in the drop in the shares of miscellaneous goods and services, which include financial and insurance services and transport. On the other hand, the shares for food and non-alcoholic beverages, health, actual and imputed housing costs and water supply seem to have increased, which would be consistent with the fact that expenditures on basic needs tends to be more resilient than other consumption items in an economic recession (Gerstberger, Yaneva 2013).

Studies conducted in Poland (Zalega 2013) indicate that a reduction in consumer spending as a result of the economic crisis in households was achieved by reducing food purchases, changing purchasing patterns and consumption, and greater use of home-grown items, with the help of family and assistance provided by various community organizations.

In the recent years there have been a lot of developments in consumption. In Lithuania, Latvia, Poland and the Ukraine the attractiveness of catering establishments has increased the share of consumer expenditures on them. This phenomenon is dictated by the social need to be with other people, strengthening interpersonal relationships and the need for recreation (Dąbrowska 2011).

The Human Development Index (HDI) is a composite statistic of life expectancy, education, and income indices used to rank countries into four tiers of human development. The HDI combines three dimensions: a long and healthy life (life expectancy at birth), education index (mean years of schooling and expected years of schooling), and a decent standard of living (GNI per capita). The index shows that, over the last decade, all countries accelerated their achievements in the education, health, and income dimensions as measured by the HDI - to the extent that no country for which data was available had a lower HDI value in 2012 than in 2000. As more rapid progress was recorded in those countries with lower HDI indexes during this period, there was notable convergence in HDI values globally, although progress was uneven within and between regions. First place among the EU countries belonged to the Netherlands (fourth place in the HDI ranking), followed by Germany, Ireland, Sweden. Among the countries of Central and Eastern Europe, Slovenia appeared first on the list (21st place). Among the countries of Central and Eastern Europe first on the list emerged Slovenia (21st place), followed by the Czech Republic (28th place), Estonia (33rd place), Slovakia (35th), Hungary (37th) and Poland (39th) (Human… 2013).

6. Conclusions

The two hypotheses have been tested, and the set of H1 has been confirmed. *The start of the 21st century saw an increase in consumer spending in EU households and reduction in disparities between households of different countries. At the end of the first decade, due to the economic crisis, there has been a stabilization in consumer spending in the EU.*

The level and structure of consumption expenditure shows that there is no uniform model of consumption in the EU. There are significant differences both in the levels of expenditure and their structures. During the economic crisis, there has been a stabilization in consumer spending and deepening disparities between households of different countries.

The set of H2 has also been confirmed. *The differences in consumption between households are a) those that can be considered as the effect of freedom of choice; and b) those that are a consequence of specific restrictions that do not allow for an appropriate level of income to meet needs*.

Households in higher income countries have seen increased consumer spending at their preferred structure. This may indicate a large number of households are satisfying the needs of their members. It seems that these families' consumption is the result of freedom of choice and not a consequence of restrictions. However, in households with lower incomes, it can be seen that basic needs (food, housing payments) absorb a significant part of their budget in terms of the structure of their consumption. One can therefore conclude that in these households consumption patterns are a consequence of restrictions.

The analysis also indicates the polarization of consumption in the EU. On the one hand, there are the Nordic countries and Western Europe (high consumer spending, a low share of spending on basic goods) on the other hand, the countries of Central and Eastern Europe. Although many EU funds have been directed to countries at a disadvantage, one can still see disparities between the East and West. In his study, Albu (2012a; 2012b) showed an important convergence process in the EU, regardless of the negative impact of the actual crisis. However, the differences in terms of convergence emerge at the level of groups of countries. It follows that in the EU-10 (recently-joined EU members) a strong convergence is evident, while in the EU-15 ('old' EU members) a major trend of divergence can be observed.

With respect to the test method, we used the two-dimensional distribution of statistical methods in all EU countries with respect to their household expenses.

The use of different statistical methods could divide the groups, that are not covered by the end and are able to draw conclusion. First, one should be cautious about the results using methods belonging to the cluster analysis.

Statistical methods are useful in the study, but should be supported by experts' knowledge in the field. The methods used made it possible to quickly analyze the data and draw some interesting conclusions. Second, it is appropriate to use more than one statistical method in order to make full use of the information contained in the data and allow for a more comprehensive analysis.

It is necessary to continue to monitor the level and structure of expenditures in households. As indicated, consumption acts as a growth accelerator. Higher consumer spending means a faster development of the country. In particular, the idea is to increase consumer spending in the households of Central and Eastern Europe in order to accelerate the development of these countries.

An analysis of household expenditures makes it possible to prepare for future demands and changes thereto. Households in countries with lower levels of consumption will seek to achieve the level of those countries with expenditures on consumption. This analysis should also be of interest to the private sector, since households are the basic consumer unit.

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Streszczenie

BOGATY PÓŁNOCNY ZACHÓD, BIEDNY ŚRODKOWY WSCHÓD – KONSUMPCJA W GOSPODARSTWACH DOMOWYCH UE

Celem artykułu była analiza konsumpcji w gospodarstwach domowych z UE w XXI w. Początek XXI w. przyniósł wzrost wydatków na konsumpcję w gospodarstwach domowych oraz redukcję dysproporcji między gospodarstwami domowymi z różnych krajów UE. Koniec pierwszej dekady XXI w. przyniósł stabilizację w wydatkach na konsumpcję. Gospodarstwa domowe z najkorzystniejszą sytuacją materialną odnotowano w Wielkiej Brytanii i Austrii. Najmniej korzystna sytuacja gospodarstw domowych uwidoczniła się Estonii, Łotwie, Polsce, Rumunii i Bułgarii.

***Słowa kluczowe**: gospodarstwo domowe, UE, wydatki konsumpcyjne, nierówności*

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TOMASZ KIJEK*

Modelling Of Eco-innovation Diffusion: The EU Eco-label

Abstract

The aim of this article is to carry out a theoretical and empirical analysis of the process of eco-label diffusion. Eco-labels allow consumers to identify products and services that have a reduced environmental impact during their life cycle. Thus, they are aimed at diminishing the information gap between sellers and buyers. The results of the estimation using the Bass model indicate that the diffusion of the EU eco-label has been most dynamic in countries such as Hungary, Poland, Denmark, Germany and France. In turn, the scope of diffusion (absolute saturation level) reached the highest value for companies in France and Italy. In addition, the results of the study confirm the stimulating impact of the scope of eco-label diffusion on consumer awareness of environmental issues. This finding points to the need for environmental education among consumers, which could in turn encourage firms to undertake pro-environmental actions.

***Keywords**: eco-label, eco-innovation, innovation diffusion, Bass model*

1. Introduction

The OECD (1991, p. 12) defined 'environmental labelling as "the voluntary granting of labels by a private or public body in order to inform consumers and thereby promote consumer products which are determined to be environmentally more friendly than other functionally and competitively similar products." Thus, eco-labelling, either as an information instrument or an environmental instrument,

* Ph.D., University of Life Sciences in Lublin, Department of Economics and Agribusiness

is aimed at increasing demand for environmentally preferable goods, which leads to a reduction of the environmental impacts of local economies. Eco-labels, regarded as a type of eco-innovation marketing, are complementary to eco-innovative products, since they offer information on products' quality and performance with respect to their environmental impacts during their life-cycles. The main objective of eco-labelling is to reduce information asymmetry, i.e. the inability of customers to judge the environmental impacts of the products before purchase, and hence encourage them to substitute "conventional" products with eco-labelled ones, which are more resource- and energy-efficient (Kenzo et al. 2002, pp. 227-248). Taking into account that most of a product's environmental characteristics are credence attributes, no signal/information is credible without third-party intervention. If consumers cannot be certain of the claim, the labelled products are to be crowded out by unlabelled ones.

According to the International Organisation of Standardisation (ISO), three voluntary eco-labels can be distinguished, namely ISO Types I-III (ISO 1999, ISO 2000, ISO 2007). Type I, considered in this study, refers to a criteria-based certification program that awards a license authorizing the use of environmental labels on products. These labels provide qualitative environmental information. Type II describes environmental claims made by manufacturers, importers and distributors without independent third-party certification. Type III provides quantified environmental data using predetermined parameters. Another classification of environmental labelling programs into five different categories on the basis of three distinctions is provided by the USEPA (1993, p. 11). This classification distinguishes between programs which promote positive attributes of products or the disclosure of neutral or negative information. Moreover, it differentiates between programs on the basis of whether they are mandatory or voluntary, or considers a single attribute or a range of environmental attributes.

Despite the direct and indirect environmental benefits of eco-labelling, research on the adoption process of eco-labels remains anecdotal. Within the field of environmental economics, the diffusion of eco-labelling programs has received much less attention compared to the diffusion of environmental technologies (Popp et al. 2010, pp. 899-910). There are a few papers that deal with the adoption of eco-labelling schemes by countries (Horne 2009, pp. 175–182), but firm level analyses are limited. This paper attempts to address this gap in the literature by providing an empirical analysis of the process of eco-labels' diffusion in EU firms. Moreover, the variations in the scope of diffusion in particular countries is explained.

The remainder of this paper is organized as follows: Section 2 provides a concise review of the nature of innovation diffusion and its drivers. Sections 3 and 4 present and discuss the methodology and the results of research. Section 5 presents conclusions.

2. Theoretical aspects of eco-innovation diffusion

Within the field of economics of innovation, technological change is comprised of three stages, which are called a Schumpeterian trilogy, i.e: a) invention - the generation of new ideas), b) innovation - the development of those ideas through to the market, and c) diffusion - the spread of innovation across its potential users (Stoneman, Diederen 1994, p. 918). The concept of innovation diffusion is described and defined in various ways in the literature. Rogers (2003, p. 5) defines diffusion as the process by which an innovation is communicated through certain channels over time among the members of a social system. Consequently, he distinguishes between innovation diffusion and innovation adoption; in that the former occurs within a society, whereas the latter pertains to an individual (i.e. a firm or a person). Another frequently cited definition is that of Katz et al. (1963, p. 240), who defines diffusion as the acceptance over time of some specific item - an idea or practice by individuals, groups or other adopting units. The process of spreading innovation may be vertical or horizontal. The former pertains to the flow of information in the research and implementation processes, and the latter means that the transfer of innovation may be spatial or situational (Kijek, Kijek 2010, p. 55).

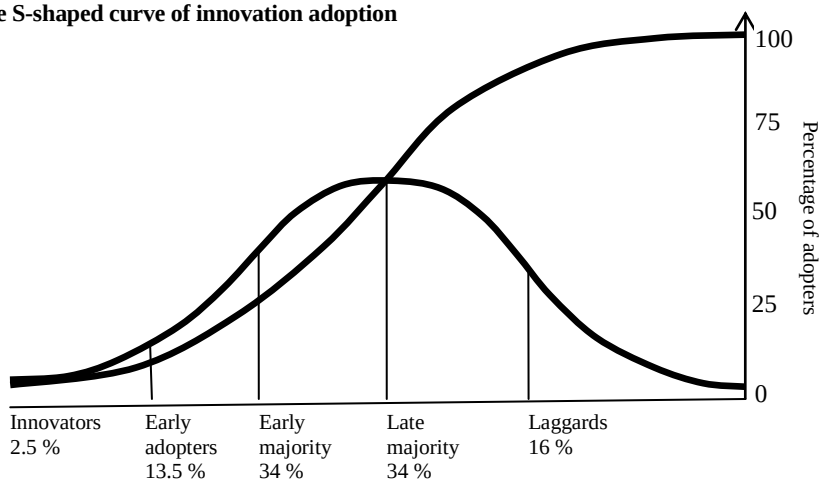
The diffusion of innovation is a gradual and dynamic process. This process generates the well-known S-shaped diffusion curve: innovations spread slowly in the initial period, next there is a recovery phase and then comes the phase of saturations. In one of the early diffusion studies (Ryan and Gross 1943, p.) the rate of adoption of hybrid seed by Iowa farmers followed the S-shaped normal curve when plotted on a cumulative basis. Ryan and Gross's study was expanded upon by Griliches (1957, pp. 501-522), who investigated the diffusion of hybrid seed in other agricultural regions of the United States. His research and other empirical works (Stoneman, Battisti 2010, pp.740-741) show some regularities in diffusion process:

- diffusion often follows the S-shaped path when plotted against time;
- diffusion paths differ across innovations and markets;
- adopters have different characteristics.

According to Figure 1, the adopters of innovation can be divided into five categories, namely: innovators (the area lying to the left of the mean time of adoption minus two standard deviations); early adopters (the area between the mean minus one standard deviation and the mean minus two standard deviations); the early majority (the area between the mean date of adoption and the mean minus one standard deviation); the late majority (the area between the mean and one standard deviation to the right of the mean); and laggards – the last 16 percent to adopt (Rogers 2003, pp. 280-281). Such a division is the result

of the interaction of two factors. The first concerns the heterogeneity of social agents in relation to the tendency to risk and social/economic characteristics. The second results from the different rates of acquiring knowledge (learning) of individual units.

Figure 1. The S-shaped curve of innovation adoption



Source: Rogers (2003, p. 281).

Roger's diffusion theory can be applied to different types of innovations, including eco-innovations. The OECD (2009, p. 13) defines eco-innovation as a new or substantially improved product (manufacture or service), process, organization or marketing method, which reduces negative influences on the environment, i.e. environmental risk, pollution and harms, and/or optimizes the use of resources. It is quite obvious that the beneficial environmental impact of eco-innovations is socially desirable, but the double externality problem reduces the private incentives for firms to invest in environmental innovations. Apart from this characteristic of eco-innovation, Rennings (2000, pp. 319-332) identifies two more peculiarities, i.e.: the regulatory push/pull effect and the increasing importance of social and institutional factors for eco-innovations.

What is important is that the former makes eco-innovations more dependent on regulation compared to other innovations, while the latter stresses the role of networking with other firms and institutions for eco-innovation (Cainelli et al. 2011, p. 328-368).

Due to the above-mentioned peculiarities of eco-innovations they are assumed to have a slow rate of adoption, creating a more gradual slope of the S-curve, for example in 2006 solar power - commercially available for over 60 years - accounted for less than 0.1% of electricity generation in the US (Zhang

et al. 2011, p. 152). According to Karakaya et al. (2014, p. 398) the importance of understanding diffusion of eco-innovations has been growing both in practice and theory. They give a concise review of recent studies on diffusion of eco-innovations using bibliographical evidence, and conclude that only the study of Ottman et al. (2006, pp. 24-36) focuses on the credibility of product claims and its impact on diffusion process. As mentioned previously, contrary to eco-innovative products and processes, marketing eco-innovations such as eco-labeling relies on non-technological mechanisms and concerns the firm's orientation towards customers by leveraging environmental issues. Piotrowski and Kratz (1999, pp. 431-432) identify some problems with eco-labelling which affect its adoption. First of all, the life-cycle assessment process and the determination of criteria are especially controversial due to the lack of a commonly-accepted methodology for carrying them out. Moreover, the constant tightening of eco-labelling standards may have the unintentional effect of excluding the majority of producers. Last but not least, there is the problem with the life cycle analyses costs. In order to improve the usefulness of environmental claims, the OECD (2011, p. 98) suggests following actions:

- developing environmental claims standards and codes;
- specifying relevant information to be included or required on labels;
- taking enforcement actions to counter false environmental claims.

According to the Hall's concept, several factors affect the rate of innovation diffusion, i.e. the benefits and costs perceived by adopters, the market and social environment, as well as problems regarding uncertainty and information (Hall 2004, pp. 12-20). The last factor results in the occurrence of the 'prisoners' dilemma' faced by firms considering investing in eco-labels where consumer preferences are unknown, i.e. no one wants to be the first to engage in such an investment. On the other hand epidemic models assume that one adoption generates further adoptions and thus a reduction in uncertainty is self-perpetuating (Mansfield 1971, p. 88).

In the case of eco-labels, a firm's cost-benefit analysis is based on the evaluation of two dimensions. The first relates to the extent to which an eco-label would increase the production and administrative costs (e.g. application fee, audit inspection, product testing etc.). The second refers to the extent to which consumers are willing to use the environmental information in their purchase decision-making process and ultimately pay more for an eco-labelled product. For example, a review of studies on premium and market valuation of environmental attributes, including organic food labelling, provided by Krarup and Russel (2004, p. 98), reveals that very few consumers are ready to pay more than 5-10% above the price of a standard product. So, the eco-labelling incentive will be undertaken if the net private pay off from such investment is positive. When the net benefit of

eco-labelling is difficult to estimate, the fact that a large number of a firm's competitors have introduced eco-labelling may prompt the firm to introduce it as well. It is important to note that the sensitivity of consumers to environmental issues and their propensity to pay more for eco-labelled products are the result of their environmental education. It becomes clear that a low level of the consumer sensitivity to the environment reduces the scale of eco-labels' diffusion.

Apart from these market-based factors, environmental policy may affect the propensity to eco-label in direct and indirect ways. Eco-labels' diffusion may be fostered by public support, i.e. grants, subsidies and loans. On the other hand, regulations in the form of minimum product standards or requirements may also stimulate firms to apply for eco-labels, but this impact is indirect. As suggested by empirical analyses, environmental regulations have a direct positive impact on environmentally-innovative products (Wysokińska 2013, p.207), which are regarded as being complementary to eco-label certification (Mehamli 2013, pp. 51-63).

3. Materials and methods

The data on eco-labelling in European countries was obtained from the Eurostat dataset. The data included the number of Eco-label/EU Flower licenses in 12 countries during the years of 2000-2009. The EU Eco-label is a voluntary scheme, which means that producers, importers and retailers can apply for the label for all their non-food and non-medical products and services. The Community Eco-label was awarded for the first time in 1996 to products and services with reduced environmental impacts. It is administered by the European Commission and receives the support of all EU Member States and the European Free Trade Association (EFTA).

In order to model the diffusion of eco-labels in the EU countries, we used the Bass model, which can be expressed by following equation (Bass 1969, pp. 215-227):

$$\frac{\mathbf{dN(t)}}{\mathbf{dt}} = \left[\mathbf{p} + \frac{\mathbf{q}}{\mathbf{m}}\mathbf{N(t)}\right][\mathbf{m} - \mathbf{N(t)}] \tag{1}$$

where:

$N(t)$ – the cumulative number of adopters at time t,

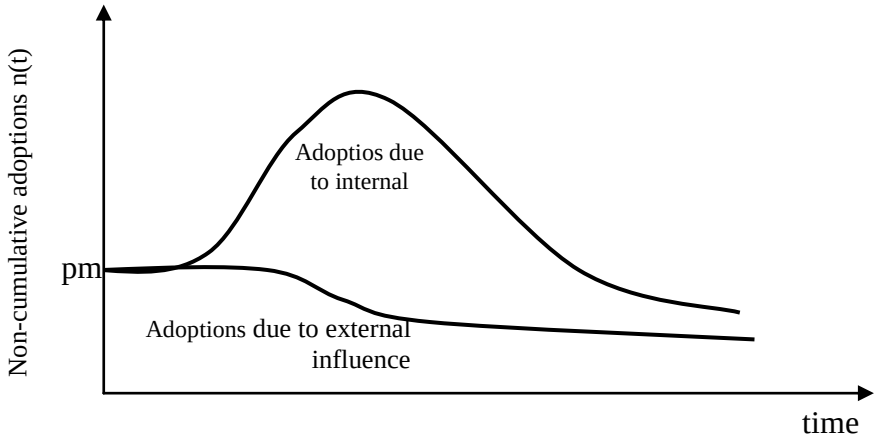
m – the ceiling,

p – the coefficient of innovation,

q – the coefficient of imitation.

The constant *p* in the equation is defined as a coefficient of innovation or external influence emanating from outside of a social system (Kijek and Kijek 2010, pp. 53-68). Under such a premise, it can be assumed that *p* depends directly on the information about innovation, formulated by market agents, government agencies etc., and aimed at potential users of innovation. In turn, the constant *q*, defined as a coefficient of imitation, reflects the interactions of prior adopters with potential adopters. So the speed of diffusion is a function of the *p* coefficient and the *q* coefficient (F*i*gure 2).

Figure 2. Adoptions due to internal and external influences in the Bass model



Source: Mahajan et. al. (1990, p. 4).

Assuming $F(t) = \frac{N(t)}{m}$, where *F*(*t*) is the fraction of potential adopters who adopt the technology by time *t*, the Bass model can be restated as:

$$\frac{dF(t)}{dt} = [p + qF(t)][1 - F(t)] \tag{2}$$

With the assumption that the ceiling of potential adopters *m* is a constant, equation (1) is a first-order differential equation with three parameters *p*, *q*, *m*. Integrating the differential equation yields the curve of innovation diffusion, i.e. the cumulated adopters distribution *N*(*t*):

$$N(t) = \frac{m - \frac{p(m-N_0)}{p+\frac{q}{m}N_0} e^{-(p+q)t}}{1 + \frac{\frac{q}{m}(m-N_0)}{p+\frac{q}{m}N_0} e^{-(p+q)t}} \tag{3}$$

where $N_0 = N(t=0)$.

For the diffusion of innovation curve (3), the point of inflection i.e. $[dN(t)/dt]_{max}$ occurs when:

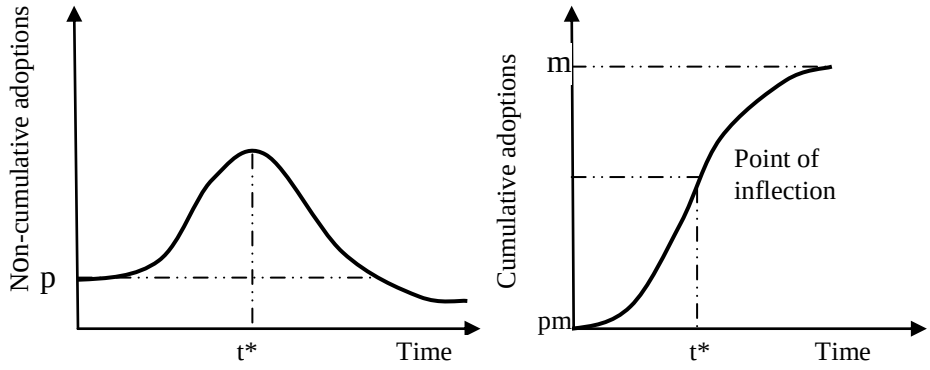
$$\mathbf{N(t^*) = m\left(\frac{1}{2} - \frac{p}{2q}\right)} \tag{4}$$

$$\mathbf{t^* = -\frac{1}{p+q}\log\left(\frac{p}{q}\right)} \tag{5}$$

$$\mathbf{n(t^*) = \frac{dN(t^*)}{dt} = m\left(\frac{q}{4} + \frac{p}{2} + \frac{p^2}{4q}\right)} \tag{6}$$

The analytical structure of the Bass model is presented in Figure 3. As depicted, the adoption process is symmetric with respect to time around the peak time t*, which is the point of inflection of the S-shaped cumulative adoption curve, up to 2t*.

Figure 3. Analytical Structure of the Bass Model



Source: Mahajan et al. (1990, p. 4).

In a special case where the coefficient of innovation *p* is zero, the Bass model simplifies to the following equation:

$$\mathbf{\frac{dN(t)}{dt} = \frac{q}{m}N(t)[m - N(t)]} \tag{8}$$

This model contains two parameters, *q* and *m*, and is referred to as the logistic model. Integrating the equation (8) yields the cumulated adopters distribution $N(t)$:

$$\mathbf{N(t) = \frac{m}{1 + \frac{(m-N_0)}{N_0}e^{-qt}}} \tag{9}$$

where $N_0 = N(t=0)$.

The nonlinear least squares (NLS) estimation procedure was used to estimate the parameters of the Bass model (Srinivasan, Mason 1986, pp. 169-178). Using equation (3), the model for the number of adopters X_i in the time interval (t_{i-1}, t_i) can be expressed as:

$$\mathbf{X_i} = \mathbf{N(t_i)} - \mathbf{N(t_{i-1})} + \boldsymbol{\varepsilon_i} \tag{10}$$

or

$$\mathbf{X_i} = \frac{\mathbf{m}-\frac{\mathbf{p(m-N_0)}}{\mathbf{p+\frac{q}{m}N_0}}\mathbf{e}^{-(p+q)t_i}}{\mathbf{1}+\frac{\mathbf{q}}{\mathbf{m}}\frac{\mathbf{(m-N_0)}}{\mathbf{p+\frac{q}{m}N_0}}\mathbf{e}^{-(p+q)t_i}} - \frac{\mathbf{m}-\frac{\mathbf{p(m-N_0)}}{\mathbf{p+\frac{q}{m}N_0}}\mathbf{e}^{-(p+q)t_{i-1}}}{\mathbf{1}+\frac{\mathbf{q}}{\mathbf{m}}\frac{\mathbf{(m-N_0)}}{\mathbf{p+\frac{q}{m}N_0}}\mathbf{e}^{-(p+q)t_{i-1}}} + \boldsymbol{\varepsilon_i} \tag{11}$$

where ε_i is an additive error term. Based on equation (11), the parameters *p*, *q* and *m* and their asymptotic standard errors can be directly estimated.

Once the model parameters had been computed, the next step was to investigate the drivers of the diffusion process. Due to the lack of data on eco-label characteristics, i.e. the expected profitability of eco-labelling, the size of investment required to apply for it etc., we focused solely on the drivers of the *m* parameter such as: personal importance of environmental protection, financial subsidies on eco-innovations, and environmental regulations. The data was derived from Eurobarometer No. 295 "Attitudes of European citizens towards the environment"[1] and Eurobarometer No. 315 "Attitudes of European entrepreneurs towards eco-innovation. Analytical report".[2] We used a multiple linear regression to find the determinants of the scope of the eco-label diffusion.

4. Results and discussion

After estimation of the parameters of the Bass model it turned out that the parameter *p* was either insignificant or took negative values in most cases. So we decided to apply the reduced form of the Bass model, which include only the parameters *q* and *m*. This approach seems to be appropriate, since the *q* coefficient plays a dominant role in the Bass model and, by its construction, it ought to be a subject to testing (Stoneman 2002, p. 149). Table 1 summarizes the results of parameter estimations of the reduced Bass model, their significance, and the adjusted coefficients of determination. The Table includes only statistically significant parameters and hence omits countries for which the Bass model appeared not to be correct.

[1] ec.europa.eu/public_opinion/archives/ebs/ebs_365_pres_en.pdf

[2] ec.europa.eu/public_opinion/flash/fl_315_en.pdf

Table 1. Parameter estimations of the reduced Bass model

Parameters / Country	q	m	Adj. R^2
UE	0.373***	2306**	0.990
Austria	0.456**	81*	0.935
Denmark	0.737***	57***	0.903
Finland	0.316***	24*	0.957
France	0.690***	315***	0.948
Germany	0.717***	79***	0.992
Greece	0.145*	248*	0.959
Hungary	0.927***	8***	0.962
Italy	0.580***	451***	0.974
Poland	0.885***	14***	0.992
Sweden	0.184***	66*	0.977
United Kingdom	0.432***	109**	0.998

*Statistical significance at level 0.1, **Statistical significance at level 0.05, ***Statistical significance at level 0.01

Source: own compilation.

According to the results of the Bass model's parameter estimations, the diffusion process of eco-labels was the most dynamic either in scope, i.e. the *m* parameter, or in speed, i.e. the *q* parameter, in the firms from France and Italy. The high rate of eco-labels diffusion among French firms may be explained by the existence of large multi-national firms which drive the growth of eco-innovations. Moreover, France is one of the leading European countries in terms of total numbers of eco-patents.[3] It can be expected that patentability increases firms' capabilities of fulfilling the eco-label requirements. In turn, Italian firms face high internal demand for eco-innovative products and services, since there is an increasing interest on the part of Italian consumers for sustainability and ecological production.[4]

A high rate of diffusion was also observed in the firms from Denmark, Germany, Hungary and Poland. However, in the case of the firms from Hungary and Poland, the scope of diffusion had a limited extent. In general, development of eco-innovations in Poland and Hungary was significantly hindered by a number of barriers. The most important one concerned the lack of sufficient capital to invent and implement eco-innovative solutions.[5] In interpreting the results of the research it should be noted that the study focuses on the "EU Flower" licenses, whereas there

[3] www.eco-innovation.eu/France

[4] www.eco-innovation.eu/Italy

[5] www.eco-innovation.eu/Poland; www.eco-innovation.eu/Hungary

are many national environmental labelling schemes in the EU countries. For instance the first and oldest environment-related label – the Blue Angel – was initiated by the German government. The variety of eco-labelling schemes causes a proliferation of eco-innovation activities. In such circumstances, the analysis of the diffusion of a particular scheme does not give a full insight into the adoption of eco-labels at a country level.

Table 2. Determinants of the scope of eco-labels diffusion process

Variable	Definition
Customer attitudes - x_1	the percentage of people assessing environmental protection as very important
Financial subsidies- x_2	the share of firms indicating insufficient access to existing subsidies as a very serious barrier for eco-innovation
Environmental regulations- x_3	the share of firms judging existing regulations and structures as main barriers for incentives to eco-innovate

Source: own compilation.

To find the determinants of the scope of the eco-labels' diffusion, we regressed a vector of likely explanatory variables, i.e. exogenous factors, on the *m* parameter. Due to a formal rigour we made a strong assumption that these exogenous factors remain constant during the diffusion process. Table 2 gives a brief description of determinants of the scope of eco-labels' diffusion process.

Table 3 contains the results of the estimation of the multiple linear regression model and the results of its verification. In order to include only significant exogenous variables in the model, the backward stepwise regression method was used.

Table 3. Parameters' estimates and measures of model goodness-of-fit

Independent variables	Coefficient
Const.	x
X_1	2.008***
X_2	x
X_3	x
Adj. R^2	0.524
F (p value)	10.853 (0.008)

Note: x – eliminated variable, *Statistical significance at level 0.1, **Statistical significance at level 0.05, ***Statistical significance at level 0.01, F – test of model utility.

Source: own compilation.

The results of the research show that only the customers' attitudes towards environmental issues had a positive and significant impact on the scope of the eco-labels' diffusion process. This means that customer awareness is a prerequisite condition for the emergence and growth of eco-labelled products/services markets.

As such, environmental education becomes of great importance, since it allows customers to consider eco-labels within their decision-making procedures and ultimately leads to a change in purchasing behaviour. This evidence that customers' environmental education can alter the diffusion process of eco-labels is likely to be welcomed by policymakers, because educational policy may be easier to implement than other forms of regulations. Contrary to the theory-based expectations, financial subsidies and environmental regulations turned out not to affect the scope of diffusion of eco-labelled products/services. This may be explained by the fact that these factors may directly affect eco-innovative products/processes, which in turn stimulate the firms to eco-labels.

5. Conclusions

Eco-labels can be regarded as a tool aimed at coping with the problem of asymmetric information. They allow customers to make a distinction between the environmentally 'good' products/services against 'bad' products/services. If consumer behaviour is at least to some extent influenced by environmental issues, then participation by firms in eco-labelling schemes may be seen as a rationale for providing for an increase in sales and market shares. At the same time, a number of problems arise from the adoptions of eco-labels, e.g. a possible lack of transparency in the life-cycle assessment process and high potential costs of complying with standards.

The diffusion of eco-labels is a dynamic process which can be described by the Bass model, grounded in the mathematical theory of the spread of infections during epidemics and the theory of information. The Bass model allows for the estimation of the rate of growth of eco-labels users and for forcasting their numbers in the future. The estimations of the reduced Bass model parameters show that the eco-labels' diffusion process was the most dynamic in countries such as Hungary, Poland, Denmark, Germany and France. However, in the case of the ultimate level of penetration (saturation) two countries, i.e. France and Italy, experienced the highest ceiling of potential adopters.

Moreover, the evidence suggests that the customers' attitudes towards environmental issues emerge as the main determinant of the scope of the eco-labels diffusion across the EU countries. This finding is consistent with the OECD's (2010, pp. 119-120) work, which found that there are benefits to promoting consumer education on the meaning and proper interpretation of claims and in heightening consumer awareness of the environmental consequences of their purchases.

This paper is not exempt from some limitations. The main drawback pertains to the fact that the Bass model assumes a constant ceiling of potential adopters. Another shortcoming of the study concerns the lack of analysis of potential drivers of the speed of the eco-labels' diffusion process. In order to overcome these limitations future research should incorporate the dynamic model with the exponential form for potential adopters and focus on a broader set of determinants of the eco-labels' adoption rate.

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Streszczenie

MODELOWANIE DYFUZJI EKO-INNOWACJI NA PRZYKŁADZIE WSPÓLNOTOWEGO OZNAKOWANIA EKOLOGICZNEGO

Celem artykułu jest teoretyczna i empiryczna analiza procesu dyfuzji oznakowań ekologicznych. Oznakowania ekologiczne umożliwiają konsumentom identyfikację produktów lub usług o niskiej uciążliwości dla środowiska w całym cyklu ich życia. Podstawowym celem stosowania oznakowań ekologicznych jest redukcja luki informacyjnej pomiędzy sprzedawcami a nabywcami. Wyniki estymacji parametrów modelu Bassa wskazują, że dyfuzja oznakowania ekologicznego „UE Eco-label" była najbardziej dynamiczna w takich krajach, jak: Węgry, Polska, Dania, Niemcy i Francja. Z kolei, zakres dyfuzji (absolutny poziom nasycenia) osiągnął najwyższą wartość dla przedsiębiorstw z Francji i Włoch. Ponadto, wyniki badania potwierdziły stymulujący wpływ znaczenia kwestii środowiskowych dla konsumentów na zakres dyfuzji oznakowań ekologicznych wśród przedsiębiorstw. Powyższa prawidłowość wskazuje na konieczność prowadzenia edukacji ekologicznej wśród konsumentów, co może przekładać się na skłonność producentów do podejmowania działań pro-środowiskowych.

***Słowa kluczowe**: oznakowanie ekologiczne, eko-innowacja, dyfuzja innowacji, model Bassa*

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MARIANNA GRETA[*], KRZYSZTOF LEWANDOWSKI[**]

The Impact Of The Global Financial And Economic Crisis On The Convergence Process In OECD Countries

Abstract

This paper analyzes the issue of convergence in OECD countries and tries to assess the effect of financial crisis on the process of convergence. In other words it will consider whether the global financial crisis pulled the economies of the organization together or pushed them apart. It tries to show whether the present crisis has had a similar effect on the convergence process as the Great Depression had 80 years ago. It will analyze the most important macroeconomic data from the period 2007–2012 and use a simple econometric model to establish the relationships and, in conclusion, compare the similarities and differences between these two economic events.

***Keywords**: economic crisis, economic growth, OECD, convergence*

1. Introduction

The issue of real convergence of countries and regions has become a popular subject of analyses and an integral part of the theory of economic development. We still observe a growing gap worldwide between the highly developed countries

[*] Ph.D., Professor at the University of Lodz, Faculty of Economics and Sociology, Department of World Economy and European Integration

[**] Ph.D., University of Lodz, Faculty of Economics and Sociology, Department of World Economy and European Integration

and the poor agricultural economies in terms of production, income, and level of technology. Does this mean that a similar phenomenon can also be observed in countries with a similar level of development?

This article seeks to clarify this issue by determining how the economic crisis has affected the course of this phenomenon in the OECD countries. The first section explains the various definitions and types of convergence, and the following one analyses this phenomenon in a historical perspective. The third section is an attempt to determine the factors which positively influence the process of convergence. The consequent section is a description of the impact of financial and economic crisis on the economies of the OECD countries. The fifth section shows the effects of the crisis in the European Union, which in terms of numbers represents the largest group of OECD countries. The sixth and final section presents the results of empirical studies conducted using an econometric model depicting the process of convergence among OECD countries in the Years 2003–2012.

2. Definition and types of convergence

The concept of convergence inherently relates to economic growth. The traditional theories on convergence are derived from the neoclassical economic growth model proposed by Robert Solow (Solow 1956, pp. 65-94) that proposed the fundamental nature of savings and population increases as the factors promoting the growth of capital stocks in a particular economy and determining the steady – state level of growth in pro-capita wealth in the short run. Nevertheless, the model in question is not able to explain the phenomenon of persistent growth that one finds in the majority of modern economies. Thus, it was necessary to introduce the role of technological change into the model as an exogenous variable capable of justifying long-term economic growth. In addition, the traditional analysis of the concept of convergence assumes a decline in the returns to scale, thereby proposing that the more backward areas will grow at higher rates than those of more advanced economies.

The new definitions and methodological approaches to convergence derive from newer models of endogenous technological progress, pioneered by Romer (1990), Barro (1991) and Barro and Sala-i-Martin (1991, 1992).

Robert Barro and Javier Sala-i-Martin are the authors of the well known concepts of sigma and beta convergence (Barro , Sala-i-Martin 1991). According to them, sigma convergence occurs when there is a reduction in the dispersion of per-capita incomes over time. Applying standard deviation as a measure of dispersion, there is sigma convergence when $\sigma_{t+T} < \sigma_t$, where σ_t is the standard deviation of the logarithm of GDP of the i-th economy at time t ($\log (y_{i,t})$ and T is the period of time considered.

The analysis of sigma convergence does not allow for identifying the causes of the convergence, in that one is not able to establish if the result is due to the higher economic growth produced by less developed regions, decrease in the unemployment and/or increase in the activity rates in the less developed areas or by lower levels of growth, increases in unemployment rates or decrease in activity rates in the more developed areas (Leonardi 2007, p.95).

Beta convergence refers to an analysis of cross-sectional data, relative to an aggregate of regional economies that highlights the negative correlation between the rate of growth in per-capita income and the relative initial value. In other words, we have beta convergence when the less developed economies are growing faster than the developed ones. The economic literature also introduced the concept of "conditional" beta convergence, which is derived from the presence of differences in structural characteristics between the units analyzed, with the result that the level of per capita income does not tend to be equal in all economies considered.

Angel de la Fuente proposed a model for empirical analysis of convergence that essentially reflects the one proposed by Barro and Sala-i-Martin and is defined by the equation (de la Fuente 1997, p.36):

$$\Delta y_{i,t} = x_i - \beta y_{i,y} + \varepsilon_{i,t}$$

where y is the relative income level, $\Delta y_{i,t}$ is the approximation of the rate of growth, β is the convergence coefficient, x_i – a vector of fundamentals, and ε the term of stochastic disturbance. The "conditional" beta convergence is present when β appears between 0 and 1, while "absolute" beta convergence implies an identical x_i for the entire sample.

Looking at convergence from a historical perspective, one can observe the phenomenon only to a limited extent. The economic growth in the twentieth century shows a striking divergence instead of convergence. World trade, migration, and flows of capital should all work to take resources and consumption goods from where they are cheap to where they are expensive. As they travel with increasing speed and increasing volume as transportation and communication costs fall, these commodity and factor-of-production flows should erode the differences in productivity and living standards between continents and between national economies (Dowrick, De Long 2003, p.5).

Economists found that convergence was restricted only to the narrow range of North Atlantic countries (Pollard 1981). Outside the charmed circle there was structural change and economic integration, but not convergence. William Baumol and Edward Wolff proposed the term "convergence club", which they defined as that set of economies where the forces of technology transfer, increased international

trade and investment, and the spread of education were powerful enough to drive productivity levels and industrial structures to (or at least toward) those of the industrial core (Baumol, Wolff 1988, p.1155–59).

3. Convergence in the historical perspective

Long before the OECD organization was created, the most industrialized countries of the world showed signs of convergence. Before the First World War the convergence club included the West and North European countries: Germany, France, Belgium, the Netherlands, Switzerland, Spain, Italy (without the southern part), Austria, Denmark, Norway, Sweden, Finland, Great Britain and Ireland, as well as the European settlement countries – the United States, Canada, Australia, New Zealand plus Argentina, Chile and Uruguay (see Pollard 1981, Lewis 1978).

This spread of convergence was connected with the globalization. International trade, migration, and international investments profoundly affected economic, social and political structures throughout the world. The invention of the steamship and the telegraph made the transoceanic shipment of staple commodities economically feasible for the first time in human history. Although investments were also made into other parts of the world (China, India, Malaysia), they failed to trigger there any acceleration in productivity growth or convergence to the world`s economic core. The convergence was of limited size, not touching continental Asia and barely touching Africa and Latin America (Lewis 1978).

In the interwar period it is difficult to discern the trends due to war damage and the Great Depression in the greater part of most industrialized countries. It may be said that convergence stopped between 1914 and 1950 also due deglobalisation and the implosion into autarchy (Williamson 1995, p.1). However, rapid growth was noted in Japan, in some Latin American countries (Venezuela, Brazil and Peru), and surprisingly in the Soviet Union. The Stalin era was a disaster for human life, social welfare and economic efficiency, but was a powerful motor of industrialization.

The second half of the 20th century brought about essential changes in the convergence process. In Latin America, countries like Venezuela, Peru, Argentina, Chile and Uruguay showed signs of divergence. Since the mid 1970s the same occurred in the Soviet Union and other socialist countries. Then came the collapse of economic activity in the 1990s that followed the end of communism. Most economists argue that in these two cases the economic failure was of a political nature (Landes 2008, pp. 371, 554, DeLong, Eichengreen 1993, pp.189-230).

Since the 1950s the West European countries have undergone a progressive process of economic integration, involving both real and financial markets. This process has not been linear and monotonous, with the main stages marked by the creation of the customs union, the ratification of the Maastricht Treaty, and the start of the Economic and Monetary Union (EMU) in January 1999. The economic and monetary integration, coupled with the cohesion policy, contributed to convergence among member states. The pace of β-convergence was 2.1 – 2.3% among these countries over the period 1960 – 2003 (Halmai, Vásáry 2010, p.233) and increased to 3.4% between 2004 and 2008 (European Commission 2009).

At the same time the East Asian economies: Japan, South Korea, Taiwan, Singapore, Thailand and Malaysia entered the path of quick economic growth. Since the 1980s the two most populated countries in the world - China and India – have been considerably improving their economic performance and today belong to the fastest growing economies in the world. Following the collapse of socialism in the Central and East European countries and the reforms that these countries accomplished, a great part of them (Poland, Hungary, Slovakia, Slovenia, Czech Republic and Baltic states) joined the OECD and European Union and successfully reduced their income gap with respect to their richer neighbours from Western Europe.

4. Factors stimulating the convergence

According to the Heckscher – Ohlin paradigm, countries export commodities which intensively use the factors with which they are well endowed, while they import commodities which intensively use the factors in which they are poorly endowed. The falling transport costs tend to equalize prices of the traded commodities, encouraging more trade. Countries export more goods which exploit their favourable factor endowment. The demand for the abundant and cheap factor booms while that for the scarce and expensive factor falls. Thus, commodity price convergence tends to produce factor price convergence: wages should rise in poor countries relative to the rich.

Commodity price convergence played a significant role in fostering real wage convergence up to 1895. It explains more than a third of the decline in the Anglo-American real wage gap in the period 1870 – 1895 (O`Rourke, Williamson, Hatton 1994).

Another significant factor explaining the convergence between countries is a mass migration. It can change the situation on labour markets and may have a significant impact on wages. Foreign immigration will only lower wages in

a local labour market if it increases total labour supply. If instead there is completely offsetting native emigration, then a rise in the immigrant share is consistent with no change in the size of the local labour force, and no immigrant-induced wage effect compared with other local labour markets in which natives relocate.

European emigration had a significant impact on labour markets at home: the departure of the migrants improved the economic conditions of the remaining residents faster than would have been true without emigration – raising real wages, lowering unemployment and eroding poverty. By entering the labour market abroad, the mass migration also reduced the pace of real wage growth in receiving countries. Thus, mass migration tended to create economic convergence among the participating countries – the living standards in the poor emigrating countries tended to catch up with living standards in the rich countries which received immigrants.

The biggest impact was on those countries which experienced the largest migrations: by 1910, Irish wages would have been lower by 36%, Italian by 33% and Swedish by 12%. At the same time American wages would have been higher by 15%, Australian by 28% and Canadian by 31%. Without Irish emigration (mostly to the U.S.) and US immigration (many of whom were Irish), the American – Irish wage gap would have risen by 101 percentage points, while in fact it fell by 48; without Italian emigration (a large share of whom went to the USA) and US immigration (many of whom were Italian), the American – Italian wage gap would have risen by 149 percentage points, while in fact it fell by 102 (Williamson 1995, p.16).

Another very important factor is education. Carlo Cipolla argued that the "more literate countries were the first to import the Industrial Revolution" and presented plenty of evidence to back up his view (Cipolla 1969, p.87). His view was supported by Sandberg, who showed that the 1850 educational ranking was highly correlated with the 1970 data ranking per capita incomes, and that up to 1913 "the poor, high literacy countries … grew the fastest ... while the low literacy countries … (grew) slower". (Sandberg 1982, p.689).

The contribution of education to real wage growth is even more important today. Poor countries well endowed with an educated population caught up faster than those poorly endowed, presumably because their social capabilities were better established. That is, they were better able to exploit the open economy and globalization effects. Furthermore, when conditioned by education, the rate of real wage convergence rises significantly (Williamson 1995, p.20).

5. The financial and economic crisis and its consequences

The international economy has been affected during the last six years by the most severe financial and economic crisis since the Great Depression. It began with

the bursting of the U.S. housing market bubble and a rise in foreclosures, then ballooned into a global crisis. In October 2008 credit flows froze, lender confidence dropped, and one after another the economies of countries around the world dipped into recession. The crisis exposed fundamental weaknesses in financial systems worldwide, and despite the coordinated easing of monetary policy by governments, trillions of dollars in intervention by central banks and governments, and large fiscal stimulus packages, the crisis seems far from over (Nanto 2009, p.6).

The financial crisis which began in the industrialized countries quickly spread to emerging markets and developing economies. Investors pulled capital from countries, even those with small levels of perceived risks, which caused the values of stocks and domestic currencies to plunge. The global crisis now seems to be playing out on two levels. The first is among the industrialized nations, where most of the losses from subprime mortgage debt, inadequate backing and credit default swaps have occurred. The second level of the crisis is among emerging markets, which were resistant to the crisis but were affected by the actions in global markets. Most industrialized countries were able formulate their own rescue package by borrowing domestically and in international capital markets, but many emerging markets have insufficient sources of capital and have turned to the international institutions for help – the World Bank, International Monetary Fund and the European Union.

In analyzing the consequences of the global financial and economic crisis on the most developed countries we come to our basic question – what impact has the present crisis had on the convergence process among the OECD countries? The experiences from the Great Depression 1929 – 1932 had a negative impact on convergence. This was due to the retreat from globalization as well as the policies of those countries favouring autarchy.

The present world economy differs essentially from that of the interwar period. The integration processes, capital flows and mass migration fuelled the growth of globalization and made the economies far more interdependent. In fact, in 2008 all OECD countries suffered a drop in their GDP growth rate and this trend was continued in 2009 (with exception of Australia and New Zealand). The next year brought about a slow recovery, but in some countries (Greece, Iceland, Ireland) the negative trend continued. It is noteworthy that the biggest problems are faced by countries with the excessive budget deficits (Greece, Spain, Italy). Also some new member states (e.g. Estonia, Hungary, Slovenia) are highly sensitive to the shock impacts due to their relatively small size, high levels of openness, and greater need for external financing.

Another difference that can be observed in the course of these two great crises is that in the case of the interwar crisis the economies of the developed countries relatively quickly entered a path of rapid growth, and now this phenomenon cannot be observed. After a decline in production in the years 2008

– 2009, the OECD countries reported a positive growth the following year, but in most countries the years 2011 and 2012 brought about a decline in the rate of growth, and even a new wave of recession. This occurred as a result of the transformation of the financial and economic crisis into the debt crisis.

Table 1. GDP annual growth rates in OECD countries (output approach)

Country	2007	2008	2009	2010	2011	2012
Australia	3.7	1.7	2.0	2.2	3.6	2.6
Austria	3.7	1.4	-3.8	1.8	2.8	0.9
Belgium	2.9	1.0	-2.8	2.3	1.8	-0.1
Canada	2.2	0.7	-2.8	3.2	2.5*	1.7*
Chile	5.2	3.3	-1.0	5.8	5.9	5.6
Czech Republic	5.7	3.1	-4.5	2.5	1.8	-1.0
Denmark	1.6	-0.8	-5.7	1.4	1.1	-0.4
Estonia	7.5	-4.2	-14.1	2.6	9.6	3.9
Finland	5.3	0.3	-8.5	3.4	2.7	-0.8
France	2.3	-0.1	-3.1	1.7	2.0	0
Germany	3.3	1.1	-5.1	4.0	3.3	0.7
Greece	3.5	-0.2	-3.1	-4.9	-7.1	-6.4
Hungary	0.1	0.9	-6.8	1.1	1.6	-1.7
Iceland	6.0	1.4	-6.9	-3.5	2.7*	1.4*
Ireland	5.6	-3.5	-7.6	-1.0	2.2*	0.2*
Israel	5.5	4.0	1.2	4.6	4.2	3.2*
Italy	1.7	-1.2	-5.5	1.7	0.5	-2.5
Japan	2.2	-1.0	-5.5	4.7	-0.6	2.0*
Korea	5.1	2.3	0.3	6.3	3.7	2.0
Luxembourg	6.6	-0.7	-5.6	3.1	1.9	-0.2
Mexico	3.4	1.2	-6.0	5.3	3.9	3.8*
Netherlands	3.9	1.8	-3.7	1.5	0.9	-1.2
New Zealand	2.9	-1.1	0.8	2.5	2.2*	3.2*
Norway	2.7	0.1	-1.6	0.5	1.3	2.9
Poland	6.8	5.1	1.6	3.9	4.5	1.9
Portugal	2.4	0.0	-2.9	1.9	-1.3	-3.2
Slovak Republic	10.5	5.8	-4.9	4.4	3.0	1.8
Slovenia	7.0	3.4	-7.9	1.3	0.7	-2.5
Spain	3.5	0.9	-3.8	-0.2	0.1	-1.6
Sweden	3.3	-0.6	-5.0	6.6	2.9	0.9
Switzerland	3.8	2.2	-1.9	3.0	1.8	1.0
Turkey	4.7	0.7	-4.8	9.2	8.8	2.2
United Kingdom	3.4	-0.8	-5.2	1.7	1.1	0.3
United States	1.8*	-0.3*	-2.8*	2.5*	1.8	2.8
OECD Total	2.7	0.3	-3.5	3.0	2.0*	1.5*

*expenditure approach

Source: Author`s own calculations based on data from: http://stats.oecd.org/index.aspx?queryid=26646#

Another important outcome of the financial crisis is the substantial rise in government debt. For most of the OECD countries an ageing society, an expanding social welfare state, and stagnant population growth – compounded by huge increases in government debt – make the situation with respect to public finances very severe.

Table 2. Central Government Debt of the OECD countries (in relation to GDP)

Country	2004	2006	2008	2010	2012
Australia	22.6	21.6	18.3	29.3	40.5
Austria	65.1	62.0	64.1	72.2	78.5
Belgium	88.4	83.2	82.7	86.2	89.4
Canada	46.8	43.1	43.0	51.4	53.5
Chile	10.7	5.3	5.2	9.2	
Czech Republic	19.3	22.7	24.4	33.6	40.8
Denmark	43.6	32.0	30.8	41.2	47.2
Estonia	5.5	5.5	5.6	8.9	10.4
Finland	46.3	39.7	32.0	47.0	51.0
France	69.1	66.5	71.0	86.5	100.9
Germany	41.7	42.1	41.7	53.7	55.2
Greece	121.8	123.0	116.8	126.9	163.6
Hungary	65.6	69.4	72.8	81.7	84.7
Iceland	48.6	43.2	79.3	105.7	112.6
Ireland	31.6	28.2	46.8	83.7	120.5
Israel	96.6	82.7	75.3	74.7	
Italy	106.7	105.1	103.4	115.8	126.2
Japan	156.8	145.2	153.1	174.8	196.0
Korea	23.7	30.1	29.0	31.9	
Luxembourg	4.0	4.4	12.3	17.5	20.0
Mexico	20.7	20.6	24.4	27.5	
Netherlands	49.2	43.2	52.1	57.7	67.9
New Zealand	44.3	43.5	36.8	50.3	69.0
Norway	39.0	49.0	44.3	35.8	20.9
Poland	43.6	45.1	44.7	49.7	
Portugal	66.0	67.1	75.9	91.4	122.8
Slovak Republic	43.9	32.2	29.7	45.5	53.5
Slovenia	27.1	25.8	21.2	36.0	
Spain	40.7	33.4	33.5	47.1	65.9
Sweden	50.0	44.3	39.7	36.7	35.3
Switzerland	36.3	33.7	26.2	23.8	
Turkey	56.6	45.5	40.0	42.9	45.1
United Kingdom	42.0	43.8	54.3	81.2	97.2
United States	56.4	55.3	64.0	85.6	94.3

Source: Authors own calculations based on the World Bank data: http://data.worldbank.org/indicator/GC.DOD.TOTL.GD.ZS and OECD data: http://stats.oecd.org/Index.aspx?DataSetCode=GOV_DEBT.

The relatively poorer East European countries also experienced an essential rise in government debt, although the pace was differentiated. The Czech Republic, Slovak Republic and Slovenia and Hungary all noted a more than 20 percentage points rise in their debt/GDP ratio, while Poland experienced less than a 5 percentage point increase in the period 2006–2010.

The table does not show the total external debt, including both public and private debt. Reinhart and Rogoff argue that total external debt is an important indicator because the boundaries between public and private debt can become blurred in a crisis. External private debt (particularly but not exclusively that of banks) is one of the forms of "hidden debt" that emerge out of the woodwork in a crisis. Just as bank balance sheets before the 2007–09 financial crisis did not reflect the true economic risk that these institutions faced, so too official measures of public debt are typically a significant understatement of a state's vulnerability (Reinhart, Rogoff 2013).

The International Monetary Fund confirms that private debt is even worse for growth than government debt (Liu, Rosenberg 2013, p.4). It is comprised of corporate and household debts. In the years following the 2008 global financial crisis, the private non-financial debt-to-GDP levels have increased in all the OECD countries. This trend can be seen as both a cause and an effect of the great recession: loose credit conditions and the associated rapid accumulation of private sector debt increased a country's vulnerability to sudden stops of capital inflows and contributed to the severity of the crisis (Bakker, Gulde 2010).

The increase in the private sector's indebtedness was highest in those countries that experienced the strongest boom-bust credit cycle, such as Iceland (reaching 956% of the GDP in 2010), Ireland (350%) and Estonia. For the EU as a whole, debt ratios - particularly those of households - have started to catch up to the high levels in the US and Japan (respectively 280% and 205% of GDP in 2010 (Liu, Rosenberg 2013, p. 4).

6. Crisis in the European Union OECD countries and convergence

The economic, financial and fiscal crisis that started in Europe around 2008 has taken its toll on the convergence of GDP per capita levels in the European Union. As many as 21 of the 34 OECD countries belong to the European Union, so their results will largely affect the economic performance of the entire group. From the point of view of economic policy, similar levels of economic development and harmonization of economic cycles are necessary for the smooth functioning of the European economy. This is of particular importance

for the Euro Area. A similarity of these economies helps in making political decisions, reduces the need to transfer funds, and makes the common monetary policy more suitable to the needs of the Euro Area Member States. Convergence can be supported through market-oriented reforms both at the EU level and at national level. This would of course improve the functioning of commodity, financial, services, and labour markets across the region.

In Europe the financial crisis transformed into a sovereign debt crisis in several countries. This kind of crisis exposed structural weaknesses in some European economies, such as unsustainable levels of public or private debt or declining competitiveness. These concerns intensified in early 2010 and thereafter led European nations to implement a series of financial support measures, such as the European Financial Stability Facility (EFSF) and European Stability Mechanism (ESM).

On 5 January 2011, the European Union created the European Financial Stabilisation Mechanism (EFSM), an emergency funding programme reliant upon funds raised on the financial markets and guaranteed by the European Commission using the budget of the European Union as collateral. The members of the Euro area and eight non-euro area countries also concluded the Treaty on Stability, Coordination and Governance in the Economic and Monetary Union, which entered into force on January 2013. This treaty aims to further strengthen fiscal discipline by enshrining strict fiscal rules and balanced budget provisions into national legislation.

After the enlargement to the East, the European Union has become more heterogeneous and polarized in terms of knowledge-generation, innovation performance, and the development of technological capabilities. Former Eastern Bloc countries are still no match for the 'old' EU countries in terms of innovation, but on the other hand filling this gap can become a basis for them to catch up with the more developed countries (Archibugi, Filipetti 2011, p.1-30).

The new member states are also more vulnerable to external shocks: these are the countries which have significantly reduced their investments in direct response to the crisis, later this trend weakened, but strengthened again in 2012. The average level of GDP per capita of these countries in relation to the EU-15 increased from 41% in 2000 to 60% in 2012 (Ville 2013).

The differences in the impact of the crisis between the individual Central and East European countries were substantial. These countries were in different cyclical positions when the financial crisis began. Some of them - e.g. Hungary and Estonia - grew rapidly, which led to a positive output gap and fostered the emergence of internal and external imbalances. The CEE countries were also severely affected by heightened risk aversion on the part of international investors , which led to sharp a drop in cross-border capital flows (ECB 2010, p.88)

During the crisis a number of actions were taken in order to make full use of EU funds by simplifying procedures and facilitating access to the funds. In some member states the role of the structural funds was extremely important. The funds were often an important source of public investment at a time when the central budget spending had been reduced and the volume of investment loans had declined (Healy, Bristow 2013). It is through the use of structural funds (and a favourable exchange rate) that Poland did not experience a decline in GDP, and the effects of the crisis in other cohesive countries were much smaller. For the poorer EU countries the structural funds turned out to be a kind of a shock-absorber which reduced the effects of the crisis.

Research conducted by Helmai and Vásáry demonstrated that financial and economic crisis had affected individual EU countries to varying degrees. According to simulations, the potential growth rate of the so-called 'convergence countries' is due to return to a path of growth slower than in the developed countries, and in some cases may show a divergence. This can occur especially in certain Mediterranean countries, as well as in 'vulnerable' new member states. These trends may have a significant impact on the cohesion policy implemented at the level of the community (Halmai, Vásáry 2012, p.297–322).

Among the countries that were most affected by the economic and financial crisis were both the poorer countries of the old Union and the group of new member states. This may have a negative impact on the process of convergence in the European Union. The possibility that some countries (Greece, Portugal and Spain) will take a protracted time to return to the path of development is bad news for the entire EU.

7. The results of the empirical study

An econometric model was constructed based on the unconditional beta convergence in order to investigate the convergence processes occurring in OECD countries in the years 2003–2012. A panel estimation with fixed-effects was applied in the model, using 306 observations. The first study used data for 34 OECD countries from a period of nine years. The data included the level of Gross Domestic Product per head in constant process.

In the second estimation, observations were divided into two sub-samples, the first involved the years 2003–2007, i.e., the period before the onset of the financial crisis; and the second the period 2007–2012, covering a sharp decline in economic conditions and the period thereafter.

The following parameter values were obtained for the entire period:

$$\Delta \ln GDP_{i,t} = 0.281 - 0.0263 \ln GDP_{i,t-1}$$

$$(5.79) \quad (-5.53),$$

with a coefficient of determination of $R^2 = 0.1$.

The results for the entire sample and sub-samples are presented in the following table:

Table 3. The parameter values obtained for the full sample and sub-samples

	Full sample (2003-2012)	**(2003-2007)**	**(2008-2012)**
Constant	0.281 (5.79)	0.293 (7.56)	0.226 (3.40)
ln GDP $_{i,t-1}$	-0.0263 (-5.53)	0.0256 (-6.72)	-0.0217 (-3.35)
R^2	0.1	0.3	0.1

Source: Authors own calculations based on data from: www.oecd-ilibrary.org

The results show that in the period under study the OECD countries recorded a statistically significant unconditional convergence amounting to 2.63%. The analysis of sub-samples found a decrease in the rate of convergence from about 2.6% in the period before the crisis to 2.25 after the emergence of the crisis.

The study suggests that the global financial crisis has not led to inhibition of the process of real convergence among OECD countries, but noticeably decreased the rate of this process.

8. Conclusions

The analysis shows that despite the fact that the world economy as a whole is still characterized by a divergence, an opposite phenomenon can be seen among the most developed countries in the world. The cconomic and financial crisis which emerged in 2007 weakened the process of convergence, but not enough to repeat the history of the Great Depression in the years 1929-1932.

Therefore, one may ask what factors helped maintain the convergence process and what distinguishes the present crisis from that of 80 years ago? In this respect it may be said it was the role of globalization and international integration, thanks to which the OECD countries have not resumed the policy of autarchy, as was the case in the past. In addition the role of the state and international institutions is today much larger. Protective measures prevented a greater decline in global demand. However, this was done at the expense of a very large increase in public debt.

Since the Common Market was created in Europe, the isolation of its economies is virtually impossible. Also, the EU cohesion policy played a major role and allowed relatively poorer countries to make a smoother transition through the crisis (Poland, Slovakia), and possibly slowed down the decline in GDP in some countries. Noteworthy in this respect are the good economic results recorded in this period by the relatively poorer non-European countries (Chile, Turkey).

The Central and East European counties were hit by the financial and economic crisis to a different degree. All of them suffered from the considerable decline in GDP growth and collapse in exports. These countries, with the exception of the Czech Republic and Poland, noted sharp drops in domestic demand, which was driven by a steep decline in private consumption.

The weakening of the convergence process should be in part attributed to the economic performance of those relatively poor European countries which fell into the debt crisis (Greece, Spain and Portugal), owing to which their economies have been developing relatively worse than the other OECD countries since 2008.

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Streszczenie

WPŁYW KRYZYSU GOSPODARCZEGO I FINANSOWEGO NA PROCES KONWERGENCJI W KRAJACH OECD

Niniejszy artykuł poświęcony jest zjawisku konwergencji i próbuje oszacować wpływ kryzysu finansowego i gospodarczego na proces konwergencji realnej wśród krajów OECD. Głównym celem artykułu jest wykazanie, czy w wyniku globalnego kryzysu finansowego i gospodarczego gospodarki ugrupowania zbliżyły się do siebie pod względem osiąganego PKB per capita, czy też wystąpiło zjawisko zupełnie przeciwne. Autorzy próbują ponadto ustalić, czy obecny kryzys miał podobny wpływ na procesy konwergencji jak Wielki Kryzys z lat 1929–1932. Artykuł obejmuje dwie części. W pierwszej, o charakterze teoretycznym, przedstawiono międzynarodowy dorobek w dziedzinie konwergencji oraz czynników, które na nią oddziałują, a także przedstawiono procesy konwergencji w perspektywie historycznej. W części drugiej, o charakterze empirycznym przedstawiono wyniki badań uzyskanych przy wykorzystaniu modelu ekonometrycznego. Model ten przedstawia analizę beta-konwergencji wśród 36 państw OECD przed i po okresie wystąpienia kryzysu i obejmuje swoim zasięgiem lata 2003–2012. W zakończeniu przeprowadzono porównanie oddziaływania na konwergencję obecnego kryzysu gospodarczego, z tym, który miał miejsce osiemdziesiąt lat temu.

Słowa kluczowe: *kryzys gospodarczy, wzrost gospodarczy, OECD, konwergencja*

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AGNIESZKA RZEŃCA*

Biodiversity As An Ecological Safety Condition. The European Dimension

Abstract

Contemporary research concerning the benefits (services) of the ecosystems (environment) confirm the rank and significance of the natural environment and its resources for shaping humanity's well-being. Particularly highlighted is the need to protection of live natural resources to preserve biodiversity, which is essential for retaining the basic ecological processes and providing the sustainability of usage of these resources. Consequently, protection of biodiversity is not only an environmental issue, but also an economic and social issue involving the well-being and quality of life of society. Thus, biological diversity is an essential condition for providing ecological safety, retaining the continuity of natural processes, and conditions the quality of life and economic potential.

The main purpose of the paper is to indicate the theoretical bases of biodiversity protection from the perspective of the natural and economic sciences, and to describe the diversity of biodiversity protection levels in the EU states. A specific aim is to indicate the forms and instruments of nature conservation involved in biodiversity protection, and to carry out an overview of established nature conservation programmes in selected EU countries. In order to accomplish such a complex aim, this article presents an overview of literature found in the natural, economic and legal sciences and popular magazines presenting scientific research within the field of biodiversity. Then a comparative analysis is presented based on the statistical data coming from various international statistics resources (OECD, EUROSTAT, EEA).

Keywords: *biodiversity, biodiversity protection, forms of nature protection, Natura 2000, ecological safety conditions*

* Ph.D., University of Lodz, Faculty of Economics and Sociology, Department of Regional Economics and Environment

1. Introduction

The organic and non-organic natural environment is rich in elements of practical value with multiple functions of crucial meaning for human existence. It is a capital that serves to meet both biological and esthetical human needs and conditions their manufacturing activity and well-being (Śleszyński 2000, p.13). Every form of human activity happens in the natural environment, but this environment changes and transforms and human activities disturb the processes happening within the natural environment itself and leads to structural transformations, the consequences of which human beings have not been aware of over many thousands of years (Olaczek 1988). Together with the accelerated civilizational development of the "third wave", the idea of a "return to nature" has resurfaced. *Thorough development*– taking into account the diversity and richness of cultures created by peoples, a new outlook on nature from the view of the continuity of processes happening within itself, and the restoration and durability of natural systems - has become more and more meaningful (Toffler 1997, pp. 441–468). Contemporary research concerning the benefits (services) of ecosystems (environment) confirm the rank and meaning of the natural environment and its resources in the creation humanity's well-being (Costanza 1997). Of particular importance is the protection of live natural resources in order to retain that biodiversity which is essential to maintain the basic ecological processes and provide for the sustainability of use of these resources.

The quality of the natural environment, and above all biological diversity, will play an ever-increasing role not only in retaining natural capital but also in building up the resistance and adaptability of ecological systems. On the other hand, the dynamics of economic and social processes and the intensity and diversity of human activity increases the demand for places (areas) of rest and regeneration of psychophysical strengths. In particular, the inhabitants of industrial regions and industrial or highly urbanized areas look for peace and silence in places outside their life and work environments.

Ecological safety, which yields biological diversity, can be compared to financial markets. A diversified portfolio of species resources, similarly to securities, may protect against the fluctuations in environment (or a market), which causes a decrease in individual categories of the resources.

This stabilizing effect of "a bio-diversified portfolio of resources" may play a significant role inasmuch as the changes in the environment are happening quicker and quicker owing to global warming and other effects of human activity (Kalinowska 2008, p. 17).

The main aim of the article is to indicate the theoretical bases of biodiversity conservation from the view of the natural and economic sciences, and identification of the diversity of biodiversity conservation levels in the European Union countries. A particular aim is to indicate forms of environmental protection which act as an instrument of biodiversity protection, and present an overview of the established nature conservation forms in selected EU countries. In order to accomplish such a complex aim, this article presents an overview of literature found in the natural, economic and legal sciences and popular magazines presenting scientific research within the field of biodiversity. A comparative analysis is presented based on the statistical data from multiple international statistical resources (OECD, EUROSTAT, EEA).

2. Biodiversity protection – origin, core and purposes

Biological diversity is a term referring to the diversity of organisms on every level – from the genetic varieties belonging to the same species through to species diversity and finally ecosystem diversity. The diversity of living organisms, their morphological, physiological and behavioural characteristics, is the result of evolution processes lasting for millions of years.

Ehrlich P. and Wilson E.O. postulate that the potential number of species on Earth is between 90-100 million (Ehrlich, Wilson 1991, pp. 758-762). There is no precise data on the potential number of species, however, scientific circles speak unanimously with one voice about the necessity of biodiversity protection. The Living Planet Index[1] shows that the biospherical conditions are decreasing dramatically. From 1970 till 2003 the index decreased for 31% for terrestrial species, 27% for sea species, and of 28% for freshwater species.

The biggest losses are recorded in the tropics. The main sources of negligence in the scope of biodiversity protection result from the untrammelled fulfilment of basic economic needs, civilizational expansion, and political decisions. The loss of biodiversity does not trigger instant results, does not influence the level of meeting needs associated with lifestyle, and the benefits of biodiversity are not recognized by the recipients (Kalinowska 2008, pp. 17–18).

[1] Living Planet Index, rate of a living planet worked out in cooperation with WWF and United Nations Environmental Programme – UNEP, which estimates biodiversity on the basis of trends in over 3600 populations of 1300 vertebrate species in the world. Among them, data of 695 land species, 344 freshwater species and 274 sea species has been analyzed. http://www.wwf.pl/informacje/publikacje/inne/lpr2006final.pdf

Current opinions, especially those of naturalists, have been supported in recent years by economists. Due to the research devoted to ecosystem services, a financial dimension has been assigned to biodiversity, which explicitly proves the necessity for undertaking protective activities. A priority is the protection of living natural resources on every level of organization, which is essential for maintaining the basic ecological processes and providing the sustainability of resource usage. This means preserving the natural capital, both with respect to quantity and quality, which is necessary to guarantee the maintenance of self-reproduction mechanisms (*World Conservation Strategy* 1980).

Biodiversity conservation aims at "preserving the whole natural richness and providing the sustainability and possibility of development of every level of its organization (intraspecific, interspecific, overspecific)" (*Krajowa strategia ochrony…*, 2003, p. 18). Particular emphasis is put on biodiversity conservation of habitats and wild flora and fauna, which are determined by genetic and species diversity and also anthropogenic conditions.

All conservation categories designed to serve biodiversity protection include: scientific protection, partial protection and landscape protection, and have to consist of:

1. recognition and monitoring of the biological diversity conditions and existing potential threats;
2. removing and limiting current and potential threats to biological diversity;
3. retaining and enriching the existing elements and restoring the vanishing elements of biological diversity,
4. integration of those activities necessary for the sake of biological diversity with those activities important for the protection of economic sectors and public administration and society (including non-governmental organizations) (*Krajowa strategia ochrony…* 2003, p. 18).

The international dimension of biodiversity was recognized at the Rio Summit and later the Johannesburg Summit, where it was indicated that the global economy is 40% based on biological products and processes.

One of the purposes of the sixth environment action programme of the European Community 'Environment 2010: Our future, Our choice' is environmental protection and biological diversity, which is to be implemented on every area at different levels of territorial organizations and should concern both used and developed lands as well as significantly degraded lands, and mostly species and habitats which are rare or endangered. Former international activities aimed at and crucial for biodiversity protection, i.e. the Bonn Convention, Ramsar Convention, CITES, National Heritage of UNESCO, accomplished it only in a narrow scope. For this reason the European Strategy 2020, which treats the resource-economic problem comprehensively, including the biological resources and their derivatives (landscape),currently has key meaning and crucial importance.

3. Biological diversity and its economic dimension

Together with the civilisational development of the "third wave", the concept of comprehensive development - with diversity and cultural richness created by the peoples and a new outlook on nature - becomes more important from the view of the continuity of processes happening within themselves, and the renewal and stability of natural systems (Toffler 1997). According to current economic thought, natural resources are economic goods and retaining natural capital is an essential condition for stable and sustainable development (Jankowska-Kłapkowska 1993). Natural environmental resources are treated as capital assets from the economic perspective, where nature capital co-exists with anthropogenic capital and it is both its original source and complement.

The role and meaning of biological diversity for the economic system is confirmed by the research concerning "ecosystem services". This is a new methodological approach which presents ecosystem processes and products as material and non-material benefits for human beings. The research conducted by Constanze R. allowed to differentiate 17 functions of ecosystems and assign to each of them material and non-material benefits, and then estimated the global monetary value of the ecosystem benefits at over 33 trillion USD (*The Millennium Ecosystems Assessment*… 2005). Thus, economic matters currently decide about the level and type of biodiversity protection; from the perspective of economics, devastation of nature is identified with capital decrease, which leads to reducing its value and income inflow.

Data concerning biodiversity losses and its pace is alarming. It is estimated that the pace of species extinction is caused by human activity and is a thousand times faster than the "natural" pace typical for the Earth's entire history. During the last two decades, for instance, 35% of mangrove forests have disappeared. Some countries lost even up to 80% of mangroves, as a result of their transformation for the sake of aquaculture their excessive exploitation, and storms.[2]

Currently, biological resources (flora and fauna) cannot be treated *a priori* as renewable resources, although they were treated as such for hundreds of years. Those resources that undergo a continuous anthropogenic impact become a non-renewable source (Sweeney 1993, p. 22). Even acknowledging, however, biological resources as renewable, it has to be highlighted that their potential is not stable, it can or increase or decrease depending on the scale of use and the rules governing its use (Woś 1995, p. 131). Renewable resources also "react" to environmental

[2] For more, see: *The Millenium Ecosystems Assessment*, Global Assessment Report 1: Current State and Trends Assessment. Island Press, Washington DC.; *The Millenium Ecosystems Assessment*, Living Beyond Our Means: Natural Assets and Human Well-being. Island Press, Washington DC.

changes (pollution, water shortage, climate change), and both the conditions for regeneration are changing as well as their quantity and condition. Managing these resources should be based on the principle of so-called 'sustainable yield', which is about retaining the quantity of resources on the same level, and using only their growth. This is connected with the sustainability criterion of ensuring the continuity of existence, ability for restoration, and high quality of a renewable resource (Pearce 1986, p. 3). Efficient management is supposed to retain the dynamic sustainability of ecosystems, where the resource usage rate cannot be higher than the self-renewable or regeneration rate.

The strong anthropogenic impact is enhanced by the fact that biological resources (biological diversity) are a type of public goods,and nobody is in the legal ownership of them. Public goods, in contrast to private goods, are exposed to an excessive common usage and usually uncontrolled access. Harding explicitly indicated that resources i.e. landscape, air, water, biological diversity etc., which from their nature are common (public) goods and are present in a closed system (a limited world), are condemned in advance to destruction, and he defined their co-usage as "the tragedy of common goods" (Harding 1992, pp. 91-105). He drew attention to the fact that common and unlimited access to public environmental goods threatens them with excessive and irrational usage, and in consequence degradation and irreversible loss. The consequence of human wasteful economy is currently raised as an issue of "environmental poverty", understood as a shortage of basic environmental resources or their poor quality.

According to H. Daly, market mechanisms do not possess the ability to estimate a socially desired scale of resource usage and effective allocation of limited resources. In case of public goods, the market does not reveal the preferences in terms of supply and demand, and not all external effects (production and consumption) undergo internalization. Mechanisms that regulate and correct the scale and intensity of anthropogenic impact and set the rules of the usage of natural resources should be motivational and preventive comprehensive instruments. A crucial question is biodiversity protection in conditions of sudden and very often uncontrolled spatial processes that lead to permanent changes in the natural environment (e.g. agricultural land usage structure change, suburbanization, transport infrastructure developments), where market bonds are not able to optimally regulate environmental management (Fiedor 2002).

4. Environmental protection forms as an instrument of biological diversity preservation

The multi-functionality of the natural environment and the possibilities for competitive usage of natural resources, and their loss of the characteristics of free goods means that legal-administrative regulations are essential to retain the sustainability of their existence.

In order to protect the most valuable species and their habitats and diversified ecosystems and landscape, they are put under legal forms of environmental protection. Environmental protection forms are to preserve the spatial integration of valuable lands that undergo anthropogenic impact. Metropolitan areas need a cohesive network of protected areas in order to retain the sustainability, resistance and stability of their already weakened environmental system.

The established forms reflect current trends in environmental protection, beginning with conservation, strict protection, to active and landscape protection, requiring environmental users to act in such a way as to retain, renew and build environmental capital. Another reason for protection in current conditions is to retain aesthetic values and avoid degradation of valuable fragments of natural or cultural landscape. Implementation of environmental protection forms is also an expression of the maturity of a country's or region's citizens, and becomes part of accomplishment of the human development concept, which is understood as a "process of a multiplication of human choices" with respect to the time and scale of usage of available capital, in this case environmental capital. It is also a choice of particular development policy, the basis and priority of which is to preserve environmental capital.

It also constitutes a particular ecological investment. In this context, it may be assumed that protected areas have an economic value, which consists of the following benefits:

1. habitat-forming (the so-called "economic neighbourhood benefit") – stabilizing and improving the potential of the areas (lands) that are within the scope of the protected facility;
2. bio-innovative - including all the benefits from retaining and multiplying the gene fund and biocoenotic fund as current sources of potential lands (genotype, more efficient ecosystems);
3. "attracting" - resulting from the benefits coming from different economic branches which may use the nature potential to stimulate development;
4. financial, where nature is a value, a wealth in itself (Krzymowska-Kostrowicka 1988, p.47).

The basic criterion for developing environmental protection forms are: represented natural values and the level of their naturalness; meaning for the ecological system of a region (area) or country; way and level of usage and land development; scale and volume of anthropogenic impact. National states individually make decisions as to the scope and activities of protection and nomenclature of the established forms, however, it is characteristic that the idea and purposes of protection are almost identical. National parks and natural reserves, both in Europe and in the world, despite their diversity are the most transparent form of protection, one that highlights remarkable transnational individual characteristics, unique natural values, and their importance and need of protection (Table 1).

Table 1. Comparison of environmental protection forms in EU states with respect to their subject and scope of the protection

Poland	France	Czech Republic	Germany
National park			
Park narodowy	Parcnational	Národni park	National park
Nature reserve			
Rezerwatprzyrody	Réserves naturel	Národnipřirodnirezervace	Naturschutzgebiet
Protectedlandscapearea (park)			
Park krajobrazowy	Parc naturel régional	Chráněnákrajinnáoblast	Landschaftsschutzgebiet
Nature monument			
Pomnikprzyrody	-	Přirodnipamiátka	Naturdenkmal

Source: own work based on the literature mentioned above, red.Burchard-Dziubińska M., Drzazga D., Rzeńca A., Wydawnictwo Uniwersytetu Łódzkiego, Łódź 2014.

Polish natural landscape parks refer, by their idea of nature and cultural landscape protection, to the much earlier-established Natural Regional Parks in France. In the case of France, the initiators and promoters of their formation are local governments. They are also responsible for managing the park. Establishing this form of environmental protection not only serves for the protection of nature and cultural land values, but is also a tool that helps to combine economic and ecologic requirements in rural environments.Characteristic in managing this form of environmental protection is co-management (citizen management), activity integration in the scope of environmental development and protection, combining nature conservation with regional development and integration of local communities and minimizing conflicts (Burchard-Dziubińska, Drzazga, Rzeńca 2014).

In the case of Germany, equivalents of Polish landscape parks and protected landscape areas have been established. Nevertheless, these forms are definitely more `rigorous (with a more strict regime) than in Poland.On the other hand, in the Czech Republic, equivalents of the Polish nature reserve are „Národnipřirodnirezervace", and „Přirodnipamiątka", and also „Přirodnirezervace", which has a similar form.

For the sake of systematization, but also for carrying out comparative analysis of the environmental protection forms established in the world, the International Union for Conservation of Nature (IUCN) worked out a set of eight categories of protected areas, six of which were accepted by the UN as official categories of protected lands in 1992. The bases for classification assumed were: existing natural values, condition of their preservation, ways of management and usage.

In order to preserve endangered natural habitats and plant and animal species on a European scale, a European ecological network Natura 2000 was founded. The purpose of the network is to preserve biological diversity though protection of the most valuable and rare elements of nature, and also the most typical, still common natural systems characteristic for bio-geographical regions (e.g. alpine, Atlantic, continental). The programmeNatura 2000 meets the demand for creating an integrated network of biologically active areas, both natural as well as semi-natural, on the basis of four basic principles, aimed at retaining the:

1. continuity of ecosystems in time;
2. continuity of ecosystems in space;
3. diversity of ecological niches;
4. compatibility between biotic environment and its abiotic conditions (Andrzejewski 1983, Andrzejewski 1985).

Although the Natura 2000 network is non-spatial, it will be a crucial element in the coherent spatial system established on a European level, because it suits the idea of a spatial Pan-European Ecological Network (PEEN), which is an instrument for implementing decisions of the Pan-European Biological and Landscape Diversity Conservation Strategy. PEEN construction is based mainly on the existing forms of legal protection and it is supposed to preserve not only biological diversity but also landscape diversity in Europe. The bases of the network are going to be: interchanging areas (cortical), wildlife corridors and their buffer zones, and areas that undergo re-naturalization, which improve the network's coherence and in the future may become cortical areas or wildlife corridors (van Opstal 1999).

5. Biological diversity in the European Union countries – a comparative analysis

Species diversity is estimated within a very broad range. The potential number of species on Earth varies between 3m to 100m (May 2010, pp. 41-42). The "Catalogue of life"[3] records 1.5m species. The estimated percentage of undiscovered plants amounts to approximately 13%–18% (Joppa, Roberts, Primm 2010, p. 554-559). Biological diversity and its degree of identification is difficult because natural processes are very dynamic and they are not readily put into statistics or even generalizations. An additional obstacle is the question of the "peelability" percentage of species and further research and professional personnel (including not only scientists but also enthusiasts). These conditions, however, should not be used as an excuse to not collect, use, process and make new data available.

Table 2. A set of chosen key indicators of biological diversity of the EU, serving for the assessment of progress in the area of biological diversity loss prevention

Problematic areas	Indicators
Status and trends of the components of biological diversity	• Trends in the abundance and distribution of selected species • Change in status of threatened and/or protected species • Trends in the extent of selected biomes, ecosystems and habitats • Trends in the genetic diversity of domesticated animals, cultivated plants, and fish species of major socio-economic importance • Coverage of protected areas
Threats to biodiversity	• Nitrogen deposition • Trends in invasive alien species (numbers and costs of invasive alien species) • Impact of climate change on biodiversity
Ecosystem integrity and ecosystem goods and services	• Marine Trophic Index • Connectivity/fragmentation of ecosystems • Water quality in aquatic ecosystems
Sustainable use	• Area of forest, agricultural, fishery and aquaculture ecosystems under sustainable management • Ecological Footprint of European countries
Status of access and benefits- sharing	• Percentage of European patent applications for inventions based on genetic resources
Status of resource transfers	• Funding to biodiversity
Public opinion	• Public awareness and participation

Source: *Streamlining European biodiversity indicators 2020: Building a future on lessons learnt from the SEBI 2010 process*, EEA Technical report No 11/2011, p.14, http://www.eea. europa.eu/ publications/streamlining-european-biodiversity-indicators-2020,access: 10.07.2014.

[3] http://www.catalogueoflife.org/col/info/totals, access09.08.2014.

The process for developing a catalogue of biodiversity indicators: The Streamlining European Biodiversity Indicators (SEBI) on a European level was started in 2005 and aimed at providing knowledge about the issue of biological diversity loss. Currently, this process is continued and a set of indicators is supposed to help in making decisions at various levels of organization (regional, national and international)[4]. The set of indicators (26 indicators) worked out by the European Union serves to identify representative species, monitoring their quantity, scope and condition, and potential changes and threats to the species and habitats. Indicators concerning various levels of natural organization are proposed in seven thematic blocks covering genetic, population, biocoenotic, ecosystem and landscape. This set outlines the scope for carrying out comparative analysis and may be modified at any time in accordance with the purpose and scope of research and data availability (Table 2).

In this paper, for comparative analysis characterizing the biodiversity of EU countries, indicators concerning established forms of nature conservation, forests' condition, and endangered species were chosen. A flagship project of the European Union aimed at biodiversity protection is indicating and establishing areas of Natura 2000 in national states in both those areas not protected to date as well as those which are already protected. The basis for appointing the areas of Natura 2000 constitute two directives, on "habitats"[5] and "birds".[6] On the basis of the birds' directive there special bird protection areas (Special Protection Areas – SPA) are indicated, and on the basis of the habitat directive special habitat protection areas (Special Areas of Conservation – SAC) are designated, both on land and marine territories. The main purpose was the biodiversity protection of the Community's countries through preservation of the most valuable natural habitats and diversity of plant and animal species and bird populations that are present in a natural state and represent various European bio-geographical regions. The protection concerns both areas as well as species. The Natura 2000 programme provides opportunities for intensification of activities for the sake of natural European heritage preservation, on the basis of a uniform law imposing an obligation to prevent deterioration in the condition and quality of habitats and species, as well as provide proactive protection.

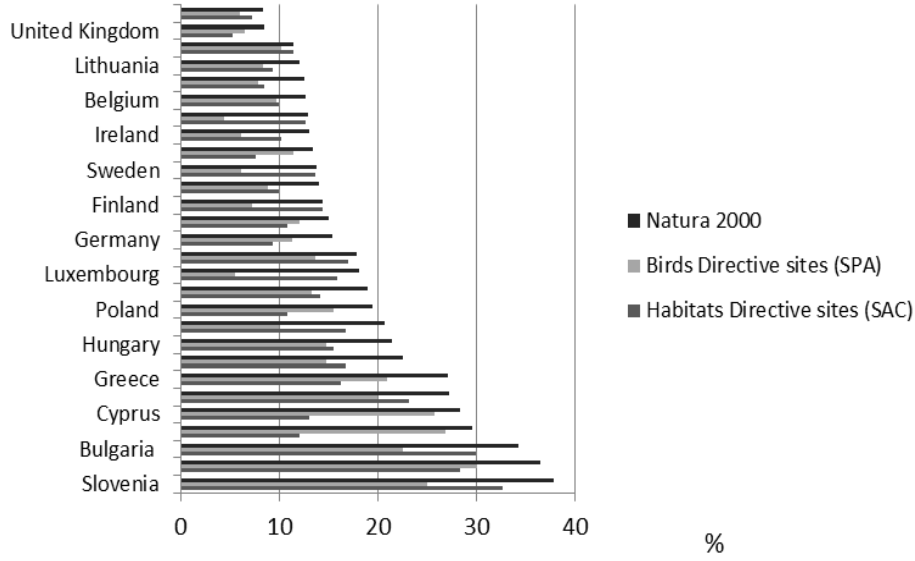
[4] http://biodiversity.europa.eu/topics/sebi-indicators, access 24.08.2014

[5] Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora, O.J. L206, 22.07.92, http://eur-lex.europa.eu/legal content/EN/TXT/ PDF/?uriCELEX:32009L0147 &from=EN, accessed on: 01.07.2014

[6] Council Directive 2009/147/EC of 30 November 2009 on the conservation of wild birds (codified version),http://eur-lex.europa.eu/legalcontent/EN/TXT/PDF/?uri=CELEX:32009L0147& from=EN , accessed on: 01.07.2014.

Natura 2000 areas constitute 18.36% of the EU-28 territory, with SACs[7] designated on 14.01% of the EU area, and Special Protection Areas (SPAs) taking up 12.51%[8] (Figure 1). The respective shares of areas covered by Natura 2000 is diversified in individual EU states, which results on the one hand from the natural conditions and level of nature preservation, and on the other from activities undertaken in the scope of implementation of the directive. Among the leading countries with a significant percentage of Natura 2000 areas are countries with the lowest seniority in the EU, which have to catch up with the others in terms of designating areas, which is not easy to do in conditions of a intense investment pressures.

Figure 1. Share of Natura 2000 areas and share of Natura 2000 areas designated on the basis of habitat directive (SAC) and birds' directive (SPA) (% of the total surface)



Source: own work based on European Environment Agency data.http://www.eea.europa.eu/data-and-maps/daviz/natura-2000-barometer#tab-dashboard-03, accessed on 05.08.2014.

Among the EU countries one can indicate those with the highest biodiversity level, which is determined by a highest share of areas covered by both the birds and habitats directive. These include: Slovenia, Croatia, Bulgaria, Spain, Greece, Estonia

[7] Interpretation Manual of European Union Habitats EUR 28, April 2013, European Commission DG ENVIRONMENT Nature ENV B.3, http://ec.europa.eu/environment/nature/legislation/habitatsdirective/docs/ Int_Manual_EU28.pdf, access 03.08.2014.

[8] European Environment Agency http://www.eea.europa.eu/data-and-maps/daviz/natura-2000-barometer#tab-dashboard-03, accessed on 02.07.2014.

(Figure 1). Poland belongs to the states with a share of Natura 2000 areas similar to the European average share, however it should be kept in mind that the process of appointing these areas is still ongoing. Currently, in Poland the share of areas covered by the birds directive dominates, which is a consequence of Poland's diversified physical-geographical conditions (natural rivers, forest complexes etc.) and high share of extensively used agricultural areas.

Poland belongs to the countries with a high share of protected areas, which proves that preservation anda high value of nature are derived from the centuries-old conservation tradition of nature protection (28.1% according to IUCN classification). In Poland there are 23 national parks, which take up 1% of Poland's total surface. All of them meet the requirements of the Assembly of International Union for Conservation of Nature and Natural Resources (IUCN) for national parks, and fifteen of them are included in the II category of protected areas. Six of the youngest parks (Biebrzański, Bory Tucholskie, Gór Stołowych, Narwiański, Magurski and Ujścia Warty) have not been classified yet by the IUCN, and two parks are included in the V category.

European Union states are characterized by a high diversification in their surfaces of protected areas and a high share of protected areas of one of the lowest categories, which proves the relatively low level of natural wildlife conservation and high anthropogenic impact (Table 3).

Table 3. Protected areas in selected EU states according to IUCN classification

State	% share of the most important protected areas in the country'stotal surface	Share of protected areas according to the International Union for Conservation of Nature (IUCN) category in protected areas total (%)					
		I	II	III	IV	V	VI
Czech Republic	15.8	0.9	6	0.2	6	87	-
France	11.8	-	4	-	6	90	-
Germany	55.7	-	5	-	6	89	-
Greece	2.8	-	45	2	19	5	-
Hungary	8.9	-	27	-	3	69	-
Italy	12.5	-	4	8	-	6	16
Poland	**28.1**	**-**	**2**	**-**	**2**	**27**	**-**
Slovakia	25.2	8	20	0.3	0.6	1	-
Spain	7.7	0.1	5	-	36	47	-

Source: own work based on OECD Environmental Data. Compendium 2008, http://www.oecd.org/env/41069197.pdf, access 21.08.2014.

A different kind of protection from that described above is species protection, which encompasses a set of undertakings and activities as a part of nature conservation aimed at preserving wild plants and fungus, and animals together with their habitats. It concerns mainly the following species: endemic, relict, occurring in the borderlands of their ranges, prone to threats and extinction, and enumerated in international conventions and agreements. The essence of species protection is to provide protection for particular species and the legal prohibition of their devastation, acquisition or trade (both in living state as well as in dried state).

In the modern world, the main danger that threatens wild plants and animals are quality changes in the environment and demolition of their living space by the cities, roads, canals and the like. This is why the species protection is supported by the other established nature conservation forms (nature reserves, Natura 2000 areas and other). A separate issue of species protection is made up of crop plants or humanitarian animal protection, and plants and animals protection against genetic interference.

The species' extinction rate in Poland, assessed according to the IUCN classification, it is not large in comparison to other EU states (Table 4). However, due to the occurrence of a great number of rare species of flora and fauna (e.g. vacuole, bear, bison, tatra chamois, and many plants that are rare on the European scale) within the country's areas, Poland has a particular responsibility for the protection of natural heritage, particularly when there is a bad condition (e.g. the snake Esculap) or a suddenly deterioration (e.g. vacuole) (*Environment conditions in Poland…*2011, p. 30).

Table 4. Flora and fauna threats according to species (% of species total)

State	Mammals	Birds	Freshwaterfish	Amphibians	Reptiles	Vascularplants
Czech Republic	18.7	52.4	41.5	51.9	61.5	41.7
France	8.2	13.3	11.8	16.3	16.3	bd
Germany	33.4	35.6	30.1	36.4	61.5	27.4
Greece	25.2	14.1	31.8	26.1	13.6	4.4
Hungary	37.8	14.5	43.2	27.8	33.3	4.1
Italy	40.7	18.4	35.1	41.0	35.0	2.8
Poland	**12.4**	**7.6**	**28.6**	**bd**	**27.3**	**11**
Slovakia	21.7	14.0	18.1	44.4	38.5	30.3
Spain	13.3	26.9	51.4	30.6	25.7	13.7

Source: own work based on OECD StatExtracts, http://stats.oecd.org/, accessed on 21.08.2014.

Protective forests are a particular category of forests, because they act as non-productive, which has a significant impact on biological processes and the health and safety of a human being. Their importance is connected with the protection of lands, water, climate (microclimate), infrastructure and areas inhabited by human beings and endangered by the results of possible disasters, such as floods. These forests have also recreation, spa and climatic functions. In the EU-28 they constitute 20.5% of the total forest area. Among the EU countries, one can clearly indicate those states which have considerable shares of protective forests (Italy, Romania, Poland) and those in which these forests constitute a small percent. This situation is a consequence of the established forest policy, and hence specific forest management, which apart from the economic aspects on different levels takes into consideration ecological and social aspects (Table 5).

Table 5. Features distinguishing Poland among the European states with respect to biodiversity

Features	Poland	EU states
Forest area with a protective function (2010)*	29.6 %	Italy 87.4%; Romania 47 %; Czech Republic 19.9%; Hungary 9.6%; France 6%.
Tree crown defoliation, defoliation class 2–4 (2012)**	23.4%	Czech Republic 50.3%; France 41.1%; Slovakia 37.9 %; Germany 24.6%.
Population trends of Farmland bird (This indicator is an aggregated index of population trend estimates of a selected group of breeding bird species dependent on agricultural land for nesting or feeding. (2008)***	99.3%	Hungary 105.3%; Czech Republic 97.3%; France 96.2%; Spain 84.2%; Germany 75.7%.
Number of aquatic and wetland facilities (2008)****	13 facilities	Germany 33, Hungary 28, France 21, Slovakia 14, Czech Republic 10

*Protective functions of forests Eurostat's Database, http://appsso.eurostat.ec.europa.eu/nui/submitViewTableAction.do?dvsc=3, accessed on 03.08.2014.

**Forest Condition in Europe 2013, Technical Report of ICP Forests, http://www.ti.bund.de/fileadmin/dam_uploads/vTI/Publikationen/Thuenen_Working_Paper/Thuenen_Working_Paper_19_Gesamt.pdf, accessed on 05.07.2014.

***Common farmland bird index, Eurostat's Database http://appsso.eurostat.ec.europa.eu/nui/ show.do?dataset=env_bio2&lang=en.,accessed on 05.07.2014.

**** OECD Environmental Data. Compendium 2008, http://www.oecd.org/env/41069197.pdf, access 05.07.2014.

Source: own work.

Forest conditions have a significant impact on biodiversity. In Europe in 2012, 22.8% of treestand was made up of trees with defoliation which was medium and strong and dead trees.[9] A slightly higher share of these classes was observable for the European Union area – 25.4%. However, the ratio between the classes is unfavourable(nearly 50% of the forests were classified asClassI), and the fact of their low share of dead trees (3%) is favourable.[10]

The condition of forests in the European Union is very diversified (see Table 7). One can observe both positive and negative trends. The situation in the Czech Republic, Germany and Poland improved in comparison to 2011; one can observe a decrease in the defoliation index accordingly of -2.4 percentage points, -3.4 percentage points and -0.6 percentage point. Negative trends are observed in Bulgaria, where the deforestation index increased in classes 2-4 by 10.7 percentage points, Spain (5.7 percentage points, and Italy 4.4 percentage points). The ensuing situation is impacted by both natural conditions (genetic composition of forests, condition of habitats, climatic and hydrological conditions) and also strongly by the anthropogenic impact (industry, automotive industry etc.).

Important indexes in confirming biodiversity are those concerning common, water, and wetland birds. The systematic research undertaken in this area allows for constant monitoring of the population size and indicating the effects of transformations. Since 2000, the index for the number of common farmland bird populations (FBI – Farmland Bird Index)has been calculated.[11] It is an aggregated index of the population number of a selected group of common breeding birds characteristic for the farmland, which enables obtainment of the picture of trends in changes of farmland bird grouping, and at the same time reflects the multi-scale changes in the agricultural landscape. This index for the 27 countries of the European Union in 2008 reached the level of 93.3% and undergoes constant

[9] Bioindicative methods are used for assessment of the degree of forest damage; the main criterion of loss (defoliation) and decolourization of assimilation apparatus of tree crowns. The criteria meet the methodology adopted within the international UN programme (UNEP/EKG) for examination of the influence of air pollution on forests. 0 - no damage class 1 - Alert class 2 - Small and medium damage class 3 - Serious damage class 4 – Deadwood; Estimates of defoliation and decolourisation are grouped by species, whereas all species in total by classes: class 0 – from 0 to 10%, class 1 – from 11 to 25%, class 2 – from 26 to 60%, class 3 – above 60%, class 4 – deadwood.

[10] Forest Condition in Europe 2013, Technical Report of ICP Forests, http://www.ti.bund.de/fileadmin/dam_uploads/vTI/Publikationen/Thuenen_Working_Paper/Thuenen_Working_Paper_19_Gesamt.pdf, access 05.07.2014.

[11] The indicator is elaborated through compilation of information on indices of populations of 23 bird species. Data on species are aggregated on the national and international levels, thus providing information on changes within the whole of Europe and in particular within the EU. They are presented by the Statistical Office of the European Union (Eurostat).The value of index in 2000 has been set as 1.00 (or, equivalently 100%).

fluctuation. A much higher value of the common farmland birds population index is characteristic for the newer member countries e.g. Hungary, Poland, Czech Republic, which proves a well-preserved agricultural landscape and a still extensive form of agriculture (Table 5.) The development of a large-area intensive agriculture and monoculture farms may lead to the impoverishment of farmland biological diversity, because intensification of agricultural production is accompanied by an increased use of chemicals. Investment pressure, in particular of multidimensional facilities but also of urbanization and suburbanization, significantly - both directly and indirectly - negatively influences biodiversity on agricultural areas, including water and wetland bird habitats. In Poland, there were appointed only 13 aquatic and wetland areas[12] of transnational importance. However, the natural potential of these areas is not to be underestimated because of the occurring diversity and number of rare species, not only with respect to Europe but to the whole world.

6. Conclusions

The challenge for contemporary nature conservation, and not only in the European Union, is the protection of living natural resources in order to preserve biodiversity and retain basic ecological processes which provide for sustainable usage of these resources. The significance of biodiversity is very often underestimated and is lost in the pursuit of other forms of usage of the Earth which ensure the direct and instant benefits. Despite many initiatives undertaken for the sake of biodiversity protection, the condition of the majority of species and natural habitats which are endangered on the European scale is defined as unsatisfactory, with almost ¼ of all wild species in Europe endangered. A lot of factors of anthropogenic origin have an impact, both directly and indirectly, on the impoverishment of flora and fauna and its degree of diversity.

The Eastern Bloc countries that have the shortest length of membership in the European Union have a long tradition of nature conservation and can offer significant and unique natural values. They are covered by national nature conservation forms, and above all they constitute a basis for the designation of Natura 2000 areas. The countries that have the highest share of Natura 2000 areas, that is above the EU average, include the newest Member States (Slovakia, Slovenia, Poland, Hungary, Bulgaria, Romania, Estonia). Regardless of the situation, in the face of local investment pressure and global issues (such as climate change and circulation of the hydrological cycle) nature and its diversity

[12] Convention about aquatic and wetland areas of international importance, especially as a habitat for waterfowl; compiled in Ramsar on 2 February 1971, called the Ramsar Convention.

in all EU countries faces a threat. Therefore, there is a real need for comprehensive actions across the EU in accordance with the provisions of the New Strategy of the EU biodiversity protection.

A New Strategy of biological diversity protection in the EU until 2020 was accepted by the European Commission in 2011 and constitutes a framework for a long-term policy (until 2050), and also designates some current activities (until 2020), as its aims, indicating the following:

- Full implementation of the birds and habitats directive.
- Preservation and restoration of ecosystems and their services.
- Increase of the contribution of agriculture and forestry in retaining and reinforcing biological diversity.
- Providing for the sustainable use of fish resources.
- Eliminating invasive foreign species.
- Support for the sake of the world biological diversity loss prevention.[13]

At the present time issues of biodiversity protection should be considered in a much broader perspective than ever before, because they are not only a matter of "protection" but an issue of a long-term socio-economic strategy. These expectations are met by the Europe Strategy 2020, which talks about resource-efficient resource management. EU policy in the area of biodiversity protection, however, will not substitute national solutions in this field. Because of the large differences in the level of biological diversity between the EU states, national solutions are necessary in the areas of agricultural policy, forest policy and economic policy, stimulating an active protection of nature's potential.

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Streszczenie

RÓŻNORODNOŚĆ BIOLOGICZNA JAKO WARUNEK BEZPIECZEŃSTWA EKOLOGICZNEGO. WYMIAR EUROPEJSKI

Współczesne badania nad świadczeniami (usługami) ekosystemów (środowiska) potwierdzają rangę i znaczenie środowiska przyrodniczego i jego zasobów dla kształtowania dobrobytu człowieka. Szczególnie mocno akcentują ochronę żywych zasobów przyrody dla zachowania bioróżnorodności, która jest niezbędna dla utrzymania podstawowych procesów ekologicznych oraz zapewnienie trwałości użytkowania tychże zasobów. W efekcie ochrona bioróżnorodności to nie tylko problem przyrodniczy, ale również problem ekonomiczny i społeczny, dobrobytu i jakości życia. Zatem różnorodność biologiczna jest niezbędnym warunkiem zapewnienia bezpieczeństwa ekologicznego zachowania ciągłości procesów przyrodniczych, warunków i jakości życia oraz potencjału gospodarczego.

Głównym celem artykułu jest wskazanie teoretycznych podstaw ochrony bioróżnorodności z perspektywy nauk przyrodniczych i ekonomicznych oraz identyfikacja zróżnicowań poziomu ochrony bioróżnorodności w krajach Unii Europejskiej. Celem szczegółowym jest wskazanie form ochrony przyrody jako instrumentu ochrony bioróżnorodności oraz dokonanie przeglądu ustanawianych form ochrony przyrody w wybranych krajach UE. Dla realizacji tak założonego celu dokonano przeglądu literatury z zakresu nauk przyrodniczych, ekonomicznych i prawnych oraz aktualnych czasopism z zakresu nauk przyrodniczych prezentujących badania naukowe w obszarze bioróżnorodności. Analiza porównawcza została przygotowana w oparciu o dane statystyczne pochodzących z różnorodnych zasobów statystyki międzynarodowej (OECD, EUROSTAT, EEA).

***Słowa kluczowe**: bioróżnorodność, ochrona bioróżnorodności, formy ochrony przyrody, Natura 2000, stan bezpieczeństwa ekologicznego*

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SAMIR AMINE*

Reflections On Employment Protection Legislation: An International Comparison

Abstract

In Europe, as in the rest of industrialized countries, reforms of the labour market have generally concerned employment protection legislation (EPL). One of the main missions of this legislation is to insure security for workers, particularly in case of redundancy. The object of this article is to compare the strictness and the degree of rigidity of EPL in two different economies, namely, Canada and France. This choice is justified by the fact that the labour market policies in both countries do not have the same orientation and are based on different ideological references.

Keywords: *Employment Protection, France, Canada, Security, Unemployment*

1. Introduction

In Europe, as in the rest of industrialized countries, the reforms of the labour market have generally concerned employment protection legislation (EPL). One of the main missions of this legislation is to insure the security of workers, particularly in case of redundancy (Cazes and Tonin 2010). Nevertheless, the notion of security covers other dimensions, such as the possibility of reinstating easily and quickly finding a new job and security of income for those who participate in the labour market (Coxkx and Van Der Linden 2010).

* Professor, University of Quebec (Outaouais), Department of Industrial and Labor Relations, Canada and Fellow in CIRANO

Several theoretical studies have attempted to analyze the effects of employment protection policies, including firing costs on firms' performance. In this sense, Nickell (1978), Bentolila and Bertola (1990) and Bertola (1990) show that high dismissal compensation costs for firms reduces both the creation and elimination of jobs (Blanchard and Wolfers 2000, Mortensen and Pissarides 1999).

In addition, in most Western countries we see the emergence and development of atypical forms of employment, associated with the need for professional security compatible with the constraints on flexibility required by companies. In this context, the concept of *flexisecurity* has become one of the political strategies to adjust employment regulations in response to the transformations of the labour market structure (Bevort and *al*. 2006).

Unlike other public policies, this approach focuses on the protection of individuals rather than job protection. According to the European Commission, *flexisecurity* should answer the question of "how to maintain and improve competitiveness while strengthening the existing social model." This concept was introduced for the first time in a publication of the Danish Ministry of Labour in 1999, in which the "golden triangle" was described as an approach that combines the flexibility of the labour market (low firing costs), generous unemployment compensation, and active employment policies (executive education system). However, in the context of the economic crisis which accentuated the unemployment rate, the Danish government, which seeks to control its public spending, has established a set of reforms to favour the dynamics of the labour market. Among these reforms, the government introduced amendments to the unemployment insurance system by reducing the duration of unemployment benefits from four to two years. This questioning of *flexisecurity* is part of a process of developing a new concept, called *mobication*. According Meilland (2010), the concept of *mobication* is a contraction of the words *mobility* and *education*. This new approach is based on the development of human capital in order to increase mobility in the labour market by directing labour to those industries in short supply of it.

In the same framework, Romih and Festić (2008) discussed the relevance of reforms such as *flexisecurity* in the economies of Central and Eastern Europe. They emphasized that it is necessary to review the relevance of individual forms of labour market flexibility and security while taking into account the competitiveness of the economy and social security of workers. Moreover, they explained that the successful implementation of *flexisecurity* requires consideration of several parameters, such as ethics, local values and social traditions. In this perspective, they point out that the adoption of certain*lexisecurity* reforms in economies where legislation is weak could lead to negative effects on social security for workers and inefficient public spending increases (Kluwe and al. 1999).

Boeri and Garibaldi (2005) show that in the case of Poland, for example, the transition difficulties between the public and private sectors explain the low employment rate of unemployed persons. In response, Poland and Slovenia each offered a program of public works in order to create opportunities for full-time employment for the unemployed. It should be noted that the low professional and spatial mobility of workers in Poland can partly be explained by the increase in the number of unemployed (Boeri and Garibaldi 2005).

In a general way, EPL represents all the regulatory measures which govern the termination of employment, severance pay, periods of advance notice and other procedural obligations (Cazes and Tonin 2010). In this perspective, Botero and *al*. (2004), being interested in the determinants of the employment regulations, show that the latter are not of an economic, but legal nature. The legal system includes, according to these authors, three branches: labour law, the law of the collective relations, and the law of social security.

In this sense, the World Bank, in terms of labour law, maintains three basic indicators. They concern the flexibility of recruitment, the flexibility of redundancy, and the conditions of employment. Besides, the OECD had developed indicators of the degree of job protection. These indicators measure the procedures and the costs related to redundancies of workers, and the procedures for hiring workers under fixed-term or temporary contracts. In the compilation of its data, the OECD takes into account the existing legislation, the collective (bargaining) agreements, and the jurisprudence of member countries.

The object of this article is to compare the EPL in two different economies, namely, Canada and France. This choice is justified by the fact that the characteristics concerning and public policies underlying the labour markets of both countries are different. Indeed, the 'common law' countries (the United States, Canada, Australia, New Zealand, the United Kingdom) appear as having weak regulation of employment with respect to the other countries of Western Europe (Netherlands, Germany, Italy, France, Greece, Spain, Portugal) (Kirat 2006).

Tonin (2009) presented a study of employment protection legislation indicators for a wide group of Central and East European countries during recent years. Using the OECD methodology (OECD 1999), they took into account labour legislation and information from collective agreements. However, because of the difficulties in collecting and processing data for all countries, only the regulations contained in Labour Codes and other relevant laws were included in their study (for Poland the chosen law was that of 31 December 2004). They showed that in the countries studied informal practices (such as employment without a contract) were widespread and skewed the appreciation

strictness of regulations on employment protection. As a result they explained that the inclusion of these informal practices in the indicators of EPL is a very difficult task owing to the lack of detailed information.

In another study on labour markets in the economies of Central and Eastern Europe, Nesporova Cazes (2003) emphasized the importance of adopting an update of EPL strictness in this region.

According to Boulhol (2014), Poland is close to the OECD average in terms of EPL stringency for permanent contracts. In this context the author shows that regulation related to the definition of unfair dismissal is also one of the least constraining among OECD countries (OECD 2013). Furthermore, he explains that the Polish labour market is heavily segmented; the share of temporary employment in total dependent employment is above 25% (Baranowska and al. 2011).

Taking this into account, Blanchard and Tirole (2003) examined the empirical relationship between employment protection and unemployment in the context of an international comparison. They showed that differences in employment protection between the United States (lower) and Portugal (higher) are not reflected in significant differences in unemployment rates in the two countries. Instead, over the past thirty years, their unemployment rates have been very similar. However, according to them, the duration of unemployment in Portugal was on average three times higher than in the United States (Blanchard and Portugal, 2001).

We know that measuring employment protection is a difficult task, not only because of the variety of institutions, but in addition the indicator methodologies differ between countries, thus making comparisons difficult (Bertola and *al*. 2000). Therefore, especially given that Canada and France are both members of the OECD, the comparative analysis of the strictness of legislation between the two countries will be based on the indices and indicators defined by the OECD.

2. Analysis and indicators for comparative purposes

The OECD uses measurements to calculate its indication of employment protection which make reference to the employment protection conferred by the law and the regulations, taking into account the procedures of application. In general, the indicators used by the OECD refer to legislative and contractual elements.

It is important to note that the work of Lazear (1990) was at the origin of several empirical studies on the effects of employment protection on the performance of the labour market (Elmeskov and *al* 1998, Di Tella and MacCulloch 2005, Scarpetta 1996). In this perspective, and having as its main

objective the development of a synthetic index of EPL, the OECD is much inspired by the work of Grubb and Wells (1993) (OECD, 1993, 1994, 1999). It considers that the measures developed by the OECD remain the most relevant and represent a great improvement over other analyzes based largely on firing costs (Addison and Teixeira 2003).

In our case, we arranged the raw data concerning Canada and France into four components, and converted the components examined into cardinal values on a scale from 0 to 6, with 6 indicating the strictest legislation. The four components we used are those established by the OECD (2013). They are: the protection of the permanent workers against individual and collective dismissals (EPRC); the protection of the permanent workers against the individual dismissals (EPR); the additional rules applicable to collective dismissals (EPC); and the legislation concerning temporary contracts (EPT).

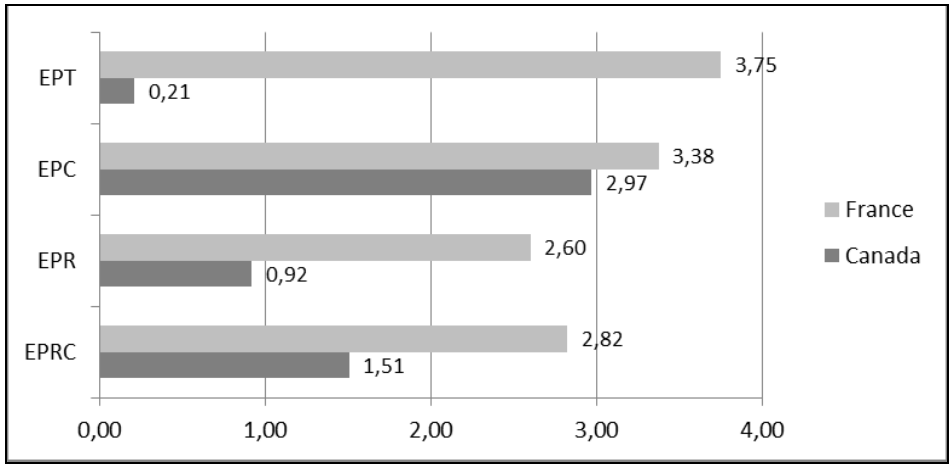
The results of this data compilation are shown in Figure 1. It thus appears that laws and regulations related to EPL are more severe and rigid in the French economy compared to its Canadian equivalent. This is true for both permanent contracts as well temporary jobs. However, the difference is more significant when it comes to the comparison of temporary jobs (EPT). Indeed, this difference illustrates the rigid and conservative nature of French public policy, which emphasises the protection of workers and the fight against social exclusion at the expense of the flexibility required by companies to adjust their payroll to the vagaries of the economy. We later show that this severity has negative effects on the persistence of unemployment and on labour market participation.

While the OECD associates EPL with the internalization effect of the social costs of dismissal by companies themselves in order to increase economic efficiency, other authors, in contrast, consider EPL to be a device for alternative taxation to employment regulation (Blanchard and Tirole, 2003, Cahuc and Kramarz, 2003, Cahuc and Jolivet, 2003).

Casez and Tonin (2010) argue that the primary function of EPL is to ensure that workers have greater security, both in their current jobs and in the event of dismissal (Bevort and *al*., 2006).

Many authors recognize that it is easier to quantitatively measure aspects such as the number of months' notice which must be met given before an individual or collective dismissal, while other aspects are more difficult to measure accurately, such as access to court procedures by dismissed employees, or the judicial interpretation of the legitimate reasons for terminating employment (Bertola and *al*. 2000).

Figure 1. Indicators of Employment Protection, 2013



Source: Database of the OECD employment protection, 2013.

Moreover, Blanchard and Tirole (2004) emphasize the principle of corporate responsibility on the social costs of layoffs. They argue that a "good system of employment protection" is one that financially empowers companies. Based on this financial responsibility, the decision whether to dismiss or not should be left to companies.

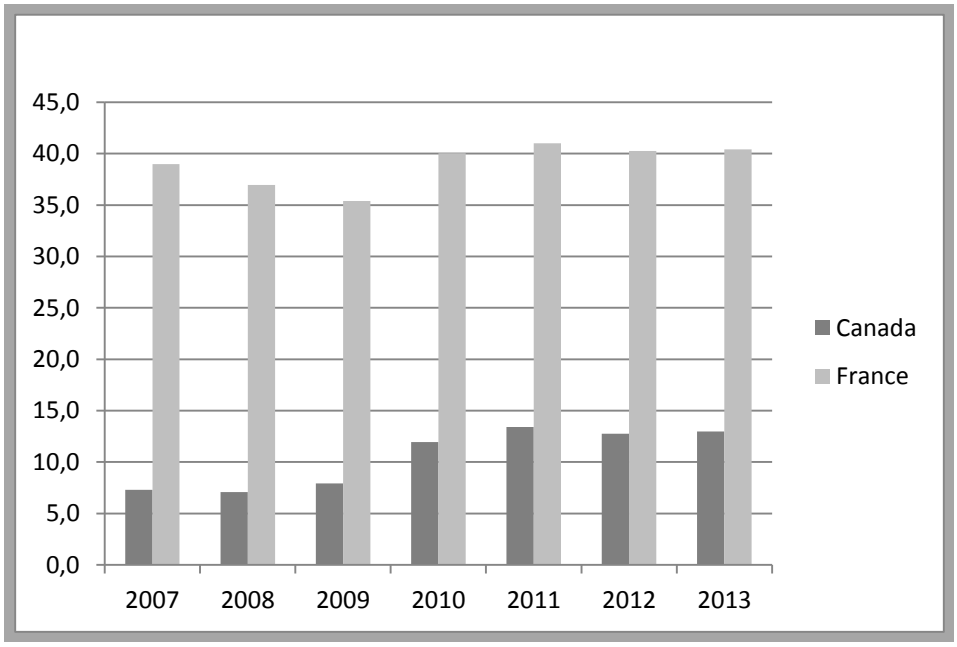
3. Employment Protection and Labour Market Performance

In addition, most theories of the labour market suggest that employment protection, in the form of legal and administrative constraints, should result in a lower rate of layoffs, reduced labour market flows, and longer durations of unemployment. According to the OECD, the empirical evidence on international data is largely consistent with these theoretical conclusions. On the basis of the indices of employment protection constructed, there is a strong negative correlation between employment protection and flow to and from employment and unemployment. Average times of high unemployment are often observed in those countries where employment protection is high (OECD 2004).

In order to check this observation in the context of our comparison between France and Canada, we linked the level of employment protection and the harmonized unemployment rate. It is clear that it remains higher in France than in Canada (in 2013 10% against 7%). Certainly, the gap in unemployment

rates is partly explained by the difference in severity of the two countries' EPL. However, in order to better validate such a conclusion, we are interested in long-term unemployment (Figure 2).

Figure 2. Number of long-term unemployed (12 months and more) as a percentage of total unemployed 2007-2013



Source: database OECD 2013 workforce.

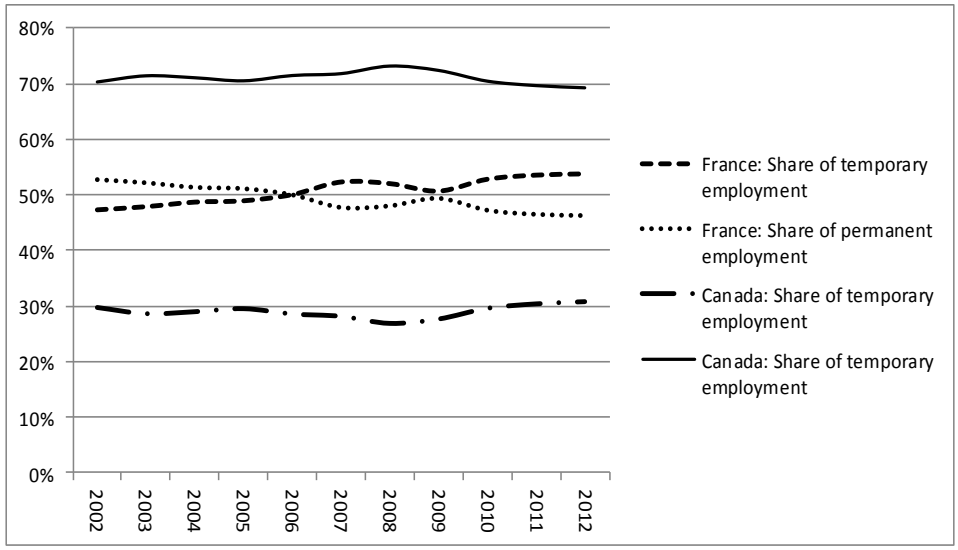
In accordance with our intuition, we found that the number of long-term unemployed (12 months or more) is much higher in France. The latter has provoked, in recent years, long-term unemployment and a large drop in labour market participation. Although the unemployment benefit system remains more generous in France than in Canada, the current economic recession has made it impossible to maintain such a policy orientation. In this context, the French government has initiated a series of reforms to make its legislation less rigid and to give more flexibility to companies.

In addition, to better understand the differences between the two countries in their responses to the rise in temporary jobs, we analyzed the proportion of permanent and temporary jobs, compared to total employment, in both economies.

Several empirical studies have analyzed the effects of the severity of EPL on the performance of the labour market, and in particular on the level of employment and total unemployment (Autor and *al*. 2004, 2006, Kugler and

Saint-Paul 2004). However, these effects should be qualified by demographic groups to which EPL reforms apply. In this line, Behaghel and *al*. (2008), studied the effects of a less protective EPL reform on workers over 50 years of age in France. They showed that, after the reform, the unemployment rate for workers over 50 declined compared to their counterparts less than 50 years of age (Acemoglu and Angrist, 2001, Fernandez-Kranz and Rodríguez-Planas, 2011). Other studies using time series data by industry have tried to analyze the correlation between EPL (including redundancy costs) and employment flows. In this sense, Bassanini and Garnero (2013) analyzed several sectors in a comparative approach of OECD countries. They show that the rate of transition from one job to another remains low in industries where EPL is restrictive (Haltiwanger and *al*. 2013).

Figure 3. Evolution of the share of permanent and temporary jobs as a percentage of total employment 2002-2012



Source: OECD Database: data expressed as a percentage of total employment.

As shown in Figure 3, it appears that the share of permanent employment is higher in Canada than in France, while the finding is reversed when it comes to temporary employment. This result is not surprising and is entirely consistent with the characteristics of the two economies. Indeed, given that Canadian laws and regulations in terms of labour law are relatively flexible, companies can create permanent jobs more easily, as the costs of dismissal are less restrictive compared to other countries. In contrast, the rigid nature of the French labour market encourages companies to use temporary employment (fixed-term contracts) to meet their demand for labour and to circumvent the law with respect to permanent employment.

4. Final Remarks

In this article we have tried to highlight some features of employment protection legislation (EPL) using a comparative approach between two different economies. We have shown that, according to OECD data, laws and regulations related to the labour market are more stringent in France than in Canada. This finding may partly explain the considerable gap between the two countries in the levels of long-term unemployment (France being much higher). Long term unemployment is one of the phenomena which is used to undermine the rigidity that characterizes the French labour market and justify the process of reforms to make France's EPL more flexible. Despite these differences observed between a known rigid country such as France and one considered flexible such as Canada, many experts and organizations focus on international convergence in terms of public policies in the labour market (Amine 2014). This homogenization trend is largely justified by the consequences of the economic crisis, especially on fiscal responsibility for national budgets.

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Streszczenie

REFLEKSJE NA TEMAT USTAWODAWSTWA W ZAKRESIE OCHRONY ZATRUDNIENIA: PORÓWNANIE MIĘDZYNARODOWE

W Europie, podobnie jak w pozostałych krajach uprzemysłowionych, reformy rynku pracy dotyczą na ogół ustawodawstwa w zakresie ochrony zatrudnienia (EPL). Jednym z głównych zadań tego ustawodawstwa jest zapewnienie bezpieczeństwa pracowników, w szczególności w przypadku zwolnienia z pracy. Celem niniejszego artykułu jest porównanie surowości i stopnia sztywności EPL dwóch różnych gospodarek, a mianowicie, Kanady i Francji. Wybór tych dwóch państw wynikał z faktu, że polityka rynku pracy w obu państwach jest odmiennie zorientowana i opiera się na różnych podstawach ideologicznych.

***Słowa kluczowe**: ochrona zatrudnienia, Francja, Kanada, bezpieczeństwo, bezrobocie*

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HALINA WANIAK-MICHALAK*, EWELINA ZARZYCKA**

Financial And Non-financial Factors Motivating Individual Donors To Support Public Benefit Organizations

Abstract

This study is aimed at determining how the financial data of public benefit organizations (PBOs) affects donations received by them and if the donors use financial and non-financial information in order to donate. In order to achieve our aim we used different methods of research: quantitative research (econometric model and survey) and qualitative research (laboratory test). The research allowed us to draw the conclusion that Polish donors make very limited use of PBOs' financial statements in the donation process and that non-financial information plays greater role for donors in making decisions to give charitable donations. The most important information is the organization's goals and descriptions of its projects. At the same time, many donors stated that they donated under the influence of people they knew. This article fits into the scope of world research on PBOs and uses the concept of civil society.

***Keywords**: Public Benefit Organisations, Performance measurement, donors*

1. Introduction

The focus of most accounting studies undertaken in recent years has focused on the quality of business profits and the dependence of firm's economic results on selected variables. The studies usually concern large firms –

* Ph.D., University of Lodz , Faculty of Management, Department of Accounting

** Ph.D., University of Lodz, Faculty of Management, Department of Accounting

whose data is more readily available - or small and medium firms whose importance for national economies has been acknowledged in many reports prepared by European institutions, research organizations, and scientists all over the world. More recently, the scope of the studies has been extended to include public sector entities and their reporting. Charitable organizations fall outside these categories and, unlike them, have not attracted broad-scale studies on their performance and the volume of their activity. However, their real importance for the economy (represented by the volume of funds they control) calls for monitoring their operations and for developing indicators to measure their performance. Public benefit organisations (PBOs) have mostly non-financial purposes and serve the general public or individuals. Their activities are frequently funded from large sums of money offered by individual donors.

Poland is a country with specific history with respect to charitable organizations. During the inter-war period (between the First and Second World Wars) there were approximately three thousand Foundations and ten thousand Associations operating in Poland (Wawrzyński 1997, p.18). After WWII almost all of them disappeared, because private charitable organizations were viewed and treated as uncontrolled social movements and dangerous for the socialist system (Archewska 2007; 2009). Most of present charitable organizations in Poland were established in the 1990s. Therefore the history and experience of current Polish PBOs is much shorter than in other countries such as Great Britain or United States. At the same time however, the accounting and reporting requirements for Polish PBO's are comparable to other countries.

Moreover the social environment in which charitable organisations operate in Poland is also specific. The social activity of Polish citizens nowadays remains very low due to the socialist legacy. Civil society practically does not exist in Poland, and 80% of Polish citizens admit that within the last year they were not socially engaged in any voluntary activity or work for the common good or for people in need (Kinowska 2012, p. 4). The forty years of a communist regime resulted in a lack of social trust towards government and its agencies, as well as in demanding approach towards the state and other citizens.

The reluctance of Polish citizens toward policy and government adversely affects their attitude towards public benefit organisations collaborating with local authorities and financed by grants and subsidies. This situation can lead to a dysfunctional dependence. Thus it is particularly important nowadays in Poland to provide transparent mechanisms of financing the "third sector" as well as diversification of its sources of finance. However, at the same time Polish inhabitants were encouraged, by the Act of Public Benefit Activity and Volunteering (2004) to take part of the responsibility for the social policy of the government. They can donate 1% of their personal income tax, i.e. public

money, to their chosen philanthropic organization. This mechanism of 1% was established to guarantee a more effective way of distribution of public money for charitable purposes. The government decided that citizens know better what is most needed and important for their community and for society as a whole. However, the question is if they can really make meaningful choices among PBOs and if they use any criteria for their assessment of such organizations.

A financial analysis of PBOs shows that their incomes differ considerably. This leads to the thesis that donors use specific criteria to choose the charity they wish to fund. Some criteria can be derived from the PBOs' financial statements, while other criteria are non-financial. The latter category includes, for instance, the reputation of the charity or of its leaders or advocates, and donors' own life experiences or habits.

This research aims to determine what information can increase the creditability of PBOs and what factors encourage donors to donate money after so many years of diminishing the meaning of charities in the eyes of society. The research will cover financial factors, particularly the effect of information contained in PBOs' financial statements and Websites on the decisions of individual donors. The econometric equations and analyses applied in the course of our research is aimed at determining whether donors offering donations use and analyse the financial information in making their decisions. The collected statistical data will also help to determine if there are other factors that motivate donors, including non-financial ones. The equation estimates will be supplemented with information derived from a survey of individual donors and a laboratory experiment designed to strengthen the conclusions.

2. The role of financial statements in evaluating PBOs' performance

Considering that public benefit organizations do not have investors, they must use grants and donations to fulfil their charitable objectives. However, they cannot guarantee that they will deliver what they promise. They can only declare that they have the intention, commitment, and determination to help their target group of beneficiaries. Because PBOs frequently raise huge sums of money from individual donors, the nature and usefulness of their financial statements for evaluating their performance and as documents reflecting their true financial standing sparked animated discussions at the turn of the 20th and 21st centuries. Notwithstanding the different scientific perspectives, almost all accounting specialists (see Noraini et al. 2009) agree that the PBOs' financial statements are

needed both by government institutions for monitoring and control purposes, and by wide groups of stakeholders to make their decisions having the necessary insight into their operations.

A donor can learn, from a PBO's financial statement, about the amounts and ways of distribution of its resources serving its charitable objectives, evaluate management quality and development prospects, and assess whether the organization has enough resources to go on. He or she can also see its liabilities, where the funding comes from, and whether it is effectively spent. Therefore, the financial statements disclosed by PBOs may help donors choose which PBO they wish to support and gain certainty that it is efficient and working towards its goals.

Polish charities must act in compliance with the amended Public Benefit Organization and Volunteerism Act of 22 January 2010. While introducing sanctions against PBOs for failure to file and publish activity and financial statements on due dates, the act missed the opportunity to impose relevant qualitative standards, thus contributing to the heterogeneity of the statements. Particular organizations publish different ranges of financial information and even the same organization may inconsistently present the structure and amount of information. Other qualitative standards applying to financial statements, such as those provided within the conceptual framework developed and approved by the IASC in 1989, e.g. comprehensibility and usefulness, are not met either. Some financial statements are incomplete, for instance the additional information section shows only how assets and liabilities were valued; while others are limited to the balance and a profit and loss account in a version used by business organizations (Waniak–Michalak 2010).

3. An overview of empirical studies on factors motivating donors to support a public-benefit organization

Factors that motivate donors to support PBOs are studied particularly often by researchers in the US and Western Europe. One of the first UK studies, involving a group of 130 respondents, found that PBOs' stakeholders appreciate both financial and non-financial performance (Hyndman 1991, pp. 69-82).

Khumawala and Gordon (1997) carried out an experiment in which students, treated as prospective donors, were asked to rank financial information by its impact on the decision to donate.

A range of studies have confirmed that donors are more willing to offer funds if they know the organization and have been informed about its mission, objectives, and major financial data (Gordon et al., 1999). Parsons (2007) also has

concluded that some donors, having been given financial information in advance, would be more willing to make a donation than those who have not received such information.

Many studies seek to determine the relationships between business variables presented in PBOs' financial statements and the actual amounts of donations they receive. Parsons (2003) has suggested that the key factors motivating donors to give money to a public-benefit organization are organizational efficiency and sustainability. Parsons defines PBO's efficiency as the share of resources it allocates to its charitable objectives. Technically, the indicator shows the average proportion of donations spent directly on the intended beneficiaries. Hyndman (1991) and Khumawala and Gordon (1997) agree that donors are very interested in the ratio between charitable spending and the organization's total expenditure, and that they more willing to support these organizations where the ratio the highest. In order to measure PBOs' efficiency, studies use variables obtained from their financial statements, such as the already-quoted ratio between an organization's charitable spending and total expenditure (Posnett & Sandle 1989; Callen 1994; Tinkelman 1998), the ratio between total expenditure and the spending on charitable programmes and research activities, and a PBO's administrative costs as a proportion of its total expenditure (Frumkin & Kim 2001, Tinkelman & Mankaney 2007).

The sustainability of a public-benefit organization is defined by Parsons (2003) as its ability to continue on even if faced by a shortage of funds. This quality builds on the 'on-going concern' principle commonly used by accountants in the business sector. Parsons and Trusell's study (2008) has confirmed that sustainability is a determinant in the amount of donations an organization can raise, because donors prefer viable organizations, even if they have temporary cash problems (e.g. during an economic crisis). The sustainability measures that are the most frequently found in the literature are an organization's net assets as a proportion of its total income (Trussel & Greenlee 2004), an income concentration indicator calculated as a ratio between donations and subsidies raised by the organization and all its income (Parsons &Trussel 2008), and an indicator similar to the gross margin indicator used by enterprises.

Greenlee and Trussel (2000) used financial indicators calculated on the basis of a PBO's financial statements to develop a model predicting its vulnerability. According to the authors, the model can serve stakeholders estimating the performance of a Foundation, particularly those who are considering whether or not to support it financially.

A study performed by Khumawala, Parsons and Gordon in 2003 led them to the conclusion that donors preparing financial statements for their own organizations (e.g. enterprises) were more inclined to offer funds to a public benefit organization characterized by a lower ratio of total expenditure to funding raised.

Another factor that prospective donors look at is a PBO's reputation. However, this category of organization is very difficult to evaluate with respect to the quality of their "final product". Studies assume therefore that the quality and prestige of a PBO can be measured by its age (Trussel & Parsons 2007), the value of assets held (Tinkelman 1998), or the amount of subsidies and grants it can raise (Tinkelman 1998).

Andreoni and Payne (2003) have demonstrated though that public benefit organizations raising more grants tend to lose interest in pursuing other sources of funding, and as a consequently 'other donors' account for a smaller proportion of their incomes.

A 2010 study on Polish PBOs which used the *Charity Navigator* indicators to evaluate their performance found a correspondence between the evaluation outcomes and the amounts of donations raised by the organizations (Waniak-Michalak 2010). However, other researchers found that the ratings of the *Charity Navigator* were not useful for donors (Szper& Prakash, 2011). They concluded that the changes in ratings were not associated with the primary revenues of the charities. The interviews with charities' managers in the state of Washington revealed that the managers do not value the ratings at all. They believe that other factors influence donor support for non-profits, like familiarity, word-of-mouth or the visibility of the non-profit in the community (Szper & Prakash 2011)

In the studies on factors motivating donors to support a public-benefit organization, the paper of R. Bekkers and P. Wiepking (2011) is especially noteworthy. It contains a broad overview of the academic literature on charitable donations, based on over 500 articles. The authors identify eight mechanisms driving charitable donations, i.e. awareness of needs, solicitation, costs and benefits, altruism, reputation, psychological benefits, values and efficacy. In an earlier article Bekkers and Wiepking (2011a) also found evidence on the relationship of donating to religion, education, age and socialization of donors. Moreover, other researchers state that the motives for charitable donation depend on the situation and on whether the organization is "the main" charity, the "second choice", or even the accidentally chosen charity (Bennet 2012). Ireland (1969) stated that "[a]ll individuals serve their own interests" even if they have philanthropic motives and take philanthropic actions. There are usually personal reasons underpinning a donor`s behavior.

However, the above–mentioned researches do not give answers with respect to *how* individuals choose a particular charity. We are aware of the fact that the motives for charitable giving influence the final choice of which charity to choose. The research presented in this paper is looking for the factors which push individuals in Poland to support a particular organization, and at the same time for the factors influencing the financial results of the PBOs, in the light of history of Poland (and Polish PBOs) in the twentieth century.

4. Methodology

In our study we used two types of research: quantitative and qualitative. The purpose of the quantitative research presented below is to establish what financial indicators had an effect on the revenue of PBOs and what other motives existed for making donations. In this process an econometric model as well as survey are used.

An econometric model is used to assess how information presented in PBOs' financial statements determines the choices of individual donors. The analysis is guided by the following question: "Do donors use PBOs' financial information and analyse it in deciding whether to donate?". The statistical data collected for the research should also allow for drawing conclusions about the possible existence of other factors influencing donors. In the model, the financial motivators are represented by variables derived from PBOs' financial statements.

The study covers the years 2006–2010 and the sample consists of 84 public benefit organizations based in Poland. We chose those organizations that received at least 50% of entire 1% contributions from taxpayers' income tax for the year 2009, because we started the research in 2010, adding new data and explanatory variables in the following years to learn more about the motivations of donors supporting public benefit organizations. We assumed that the organizations are those that obtain a significant value from donations. Moreover, the financial statements of PBOs that received small amounts of donations and grants are of poor quality and do not contain all the necessary information.

The equations presented in the paper have been estimated using the 2010 data, because the 2006–2009 results have already been discussed in earlier articles. It is worth noting, however, that the recent findings and those obtained previously are consistent. The current sample of PBOs represents only a fraction of their total population in Poland, and some of them raise donations and grants of very high value (e.g. 10M Euro). The equations have been estimated using the Eviews software package. We used the OLS method in building our model. The research hypotheses serve to identify the determinants of donors' decisions. Each of them has been provided with explanatory variables representing the respective determinant. All explanatory variables in the model are lagged, because donors evaluate organizations and choose the one they want to support based on the previous year's information. An important element of each equation is the regression coefficient, which indicates how much the explanatory variable will change following a change in the respective independent variable. The direction of the relationship between particular variables indicated by the sign of the appropriate regression coefficient is also significant.

The survey is aimed at verifying and completing the results received from the estimation of equations and to determine what other financial and non-financial variables donors consider important in choosing a charity to support. In this case, a random drawing procedure was prevented because the personal data protection act limits access to donors' personal data. Therefore, the findings of this survey cannot be generalized to the entire population of donors, but they can serve as signposts showing the direction for future research. The survey was conducted with 250 persons: university students and employees.

The results obtained from quantitative research inspired us to follow it up with qualitative research. Thus, a laboratory experiment was run with 32 participants.

5. Results of the quantitative research

The first research hypothesis (Hypothesis 1) is based on the study conducted by Trussel and Parsons (2007), who analysed a number of financial variables in terms of their impact on the amounts of grants received by over 4,000 public benefit organizations in the USA. Their study also summarizes all earlier attempts to quantify the effect of PBOs' financial statements on donors by considering the amounts of donations from four perspectives: PBOs' organizational efficiency, sustainability, reputation, and information disclosed to donors. Our hypothesis is formulated as:

Hypothesis 1: The value of financial donations received by public benefit organizations from individual donors depends on the disclosure of specific information in their financial statements.

This hypothesis was tested by performing multiple estimations of an equation where the explained variable is the amount of financial donations received by PBOs from individual donors in a year (FINDON_Y).The explanatory variables were selected from the aforementioned Trussel and Parsons' study (2007) representing four factors determining the amounts of donations: organizational efficiency, sustainability, reputation and disclosed information.

Organizational efficiency is measured using the following explanatory variables:

- charitable spending as a proportion of PBOs' total expenditure (variable PROG); the regression coefficient is expected to have a positive sign, because donors like public benefit organizations characterised by a greater share of charitable spending in their total expenditures;
- PBOs' administrative costs as a proportion of total expenditure (variable ADMIN);the regression coefficient is expected to have a negative sign, because donors reluctantly contribute to organizations with a large share of administrative costs in total expenditure.

- sustainability is explained through the following variable:
- a gross margin rate (variable MARGIN); the regression coefficient is expected to have a positive sign, because donors believe that PBOs where the rate is high perform better and are more sustainable.

The reputation of the sampled PBOs is assessed based on the following variables:

- the gross value of assets (variable ASSETS); the regression coefficient is expected to have a positive sign, because this measure of organization's potential shows its ability to accomplish its objectives as well as its operational capabilities,
- the amount of subsidies and grants obtained by PBOs (variable GRANTS); the regression coefficient is expected to have a positive sign, because many individual donors are of the opinion that financial support offered by government agencies and institutions confirms that the recipient is trustworthy.
- Donors' knowledge is measured with the following variable:
- amounts spent by PBOs on advertising and promotion to attract more donations and gifts (variable FUND); the regression coefficient is expected to have a positive sign, because advertisements create a positive image of organizations and attract new donors.

All explanatory variables in the model are lagged, because donors typically evaluate organizations and choose the one they want to support based on their previous year's statements.

To test Hypothesis 1, the following equation is estimated:

Equation 1: FINDON_Y = C(1) + C(2)*ASSETS + C(3)*GRANTS + C(4)*MARGIN + C(5)*PROG + C(6)*FUND + C(7)*ADMIN,

where:

The explained variable:

FINDON_Y - the amount of financial donations (in PLN) that a PBO received from individual donors in the previous year.

Explanatory variables:

ADMIN – PBOs' administrative costs as a share of their total expenditures,
PROG – charitable spending as a proportion of total expenditure,
MARGIN – the gross margin rate,
FUND –PBOs' advertising and promotional spending,
GRANTS –the amount of subsidies and grants received by PBOs,
ASSETS – the value of PBOs' assets.

Equation 1 estimates obtained using the above variables for the years 2006–2010 are statistically unsatisfactory, because the analysis of t-Student statistics shows that the regression coefficients are statistically insignificant for all variables

but ASSETS and GRANTS. This means that PBOs' sustainability, efficiency and the disclosed financial information have little effect on donors' choice of a particular PBO. Financial indicators in PBOs' statements that correspond to these three aspects cannot be considered as a factor having influence on how much PBOs will be able to raise in donations. This is in contrast to the results of Trussel and Parsons' study (2007), due to the fact that Poland is a country with specific history of charitable organizations. Individuals in Poland may be convinced that the information published by the PBOs is prepared for authorities, not donors, and thus they may consider it not important. However this may be consistent with the theory of civil society. The Polish individual donors may choose the organizations that are visible in the community and whose actions are appreciated, not necessarily those with satisfactory financial statements.

Although the estimates of MARGIN, FUND, PROG, and ADMIN are not satisfactory because the variables have low significance, the estimation of the equations suggests that the amount of grants (GRANTS) received in the previous year and the value of PBOs' assets (ASSETS) do have an effect on the total amount of financial donations. According to Tinkelman (1998) and Trussel and Parsons (2007), these two variables represent a PBO's reputation. We assumed therefore that the reputation of PBOs can be defined as the quality and prestige of the organization measured by its age (the older the organization the higher the degree of trust in it, resulting from the assumption that it is a PBO with greater experience – however this was not valid in the cases of Polish PBOs which are relatively young), the value of assets held (the bigger organization the higher the degree of trust in it), and the amount of subsidies and grants it can raise. Therefore, Hypothesis 2 is formulated as follows:

Hypothesis 2: The reputation of a PBO motivates individuals to support it financially.

$$\text{Equation2: FINDON\_Y} = C(1) + C(2)*\text{ASSETS} + C(3)*\text{GRANTS},$$

where:

The explained variable:

FINDON_Y – the amount of financial donations (in PLN) that a PBO received from individual donors in the year.

The explanatory variables:

GRANTS –the amount of subsidies and grants (in PLN) that a PBO received in the previous year;

ASSETS – assets (in PLN).

The estimates of equation 2 are presented in Table1 below.

Table 1. The results of estimation of equation 2

Dependent Variable: FINDON_Y			
Sample: 1			
Included observations: 64			
Year 2010			
Variable	Coefficient	t-Statistic	Prob.
C(1)	-1012981.	-1.020113	0.3118
ASSETS	0.640527	11.73543	0.0000
GRANTS	-0.375821	-2.927023	0.0048
R-squared	0.697035		
F-statistic	69.02139		
Prob (F-statistic)	0.000000		

Source: E-views estimates.

According to the t-Student statistics (t-stat), the estimates of GRANTS and ASSETS are statistically significant, (see the probability measures in the t-Statistic column in the Table). However, the regression coefficients are consistent with the assumptions only for ASSETS. The estimation of equation 2 shows that an increase in a PBO's assets (ASSETS) makes individual donors more willing to support it with donations. According to the estimation results, PBOs with a smaller resource of subsidies and grants (GRANTS) draw more financial donations from individual donors. This finding reveals a discrepancy between the regression coefficients and the assumptions. It is, however, consistent with the results obtained by Andreoni and Payne who studied US-based non-profit organizations (2003). They observed that an increased value of grants tended to reduce the amount of funding raised from other sources. Moreover, this situation can be also caused by already-mentioned reluctance and distrust of Polish citizens toward public benefit organisations collaborating with local authorities and financed by grants and subsidies. PBOs seeking funding such as subsidies and grants, are regarded as unreliable by Polish individual donors. This is again in contrast to the results of Trussel and Parsons' study (2007), where grants and subsidies were treated as reputation variable, based on the argument that financial support offered by government agencies and institutions confirms to individual donors that the recipient is trustworthy.

According to the outcomes of equation 2 testing Hypothesis 2, the equation offers a relatively high level of explanation – the determination coefficient (R-squared) for 2010 is 0.69. Likewise, the Fisher-Snedecor statistics

(F-statistic of 69.02 in 2010) indicates that at a significance level of 0.001 (Prob (F-statistic)=0.001) the null hypothesis should be replaced with an alternative hypothesis according to which the total impact of all explanatory variables in the equations on the endogenous variable is statistically significant.

Overall, the equation estimates confirm only part of Hypothesis 2. The important factor that makes a public benefit organization attractive for individual donors is an increasing value of a PBO's assets. It is worth mentioning that PBOs with modest resources in terms of subsidies and grants raise larger amounts of individual donations, because these organizations are deemed more trustworthy by them.

The results of the quantitative research (estimation of equations) carried out on the basis of Parsons' and Trussels' findings encouraged us to draw the preliminary conclusion that motives of Polish donors for supporting PBOs differ from motives of donors from other countries. The Polish history of the twentieth century has influenced the attitude of individuals in Poland toward public statements and private equity. For many years the responsibility for social welfare has been taken on by the State. For this reason the mechanism of donating for Polish citizens may be different.

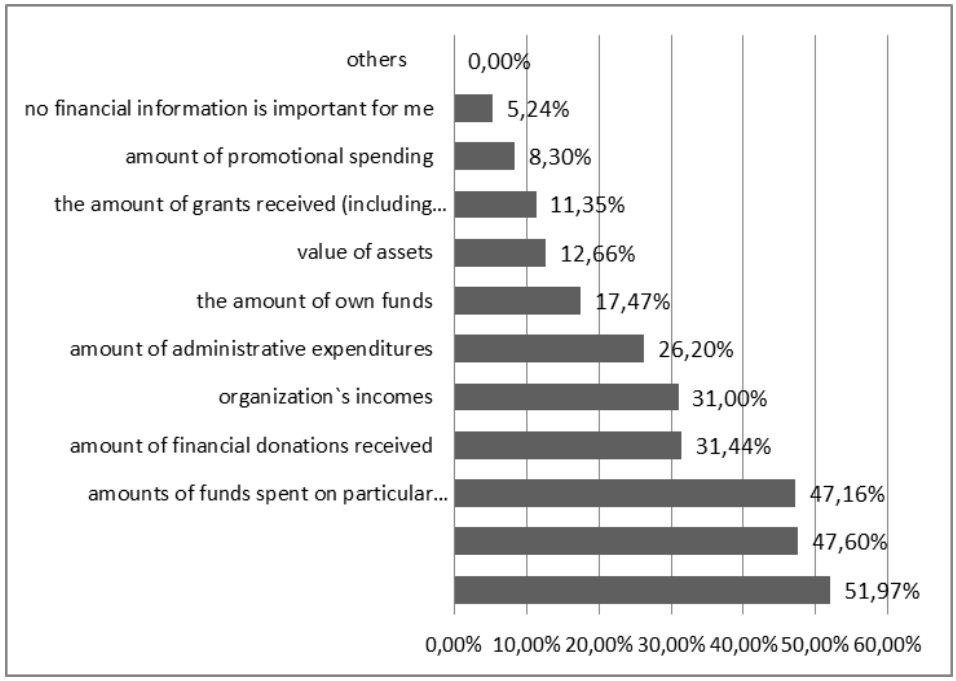
As a result of the above presented findings, we decided to carry out a questionnaire survey. We mailed and handed out 250 questionnaires to selected respondents. Owing to the non-random sampling approach and our commitment to collecting all the questionnaires, all of them were filled out and returned. Among these, 229 were found to be eligible for analysis (21 were rejected because the respondents were not employed and the rule adopted for the survey disqualified individuals without their own incomes). Although the answers cannot be treated as representative of the whole population of donors, they do provide a basis for formulating more research hypotheses and for planning new activities.

Compared with only 26.2% of the surveyed donors who stated that they used PBOs' financial information to find out which one they wanted to support, as many as 68.56% declared that they were interested in some of the financial information the organizations disclosed, however they did not use the financial data in their decision-making process. Only 5.24% of donors were not interested in financial results at all.

As regards financial information, the organization's spending on its charitable mission (51.97% of responses) and the descriptions of tasks completed in previous periods (in value terms) (47.60%) were rated the highest (see Chart 1). The balance sheet data, i.e. the amounts spent on promotion and the amount of grants received were found by the individual donors to be the least significant (8.30% and 11.35% respectively of all responses), with promotional spending being ranked the lowest. While these results are at variance with those

obtained from the statistical analysis, it must be kept in mind that the only thing they show is that donors appreciate this type of information, and not that the level of assets determines PBO's opportunities for raising additional funding, i.e. its potential (Chart 1).

Chart 1. What financial information individual donors considered important

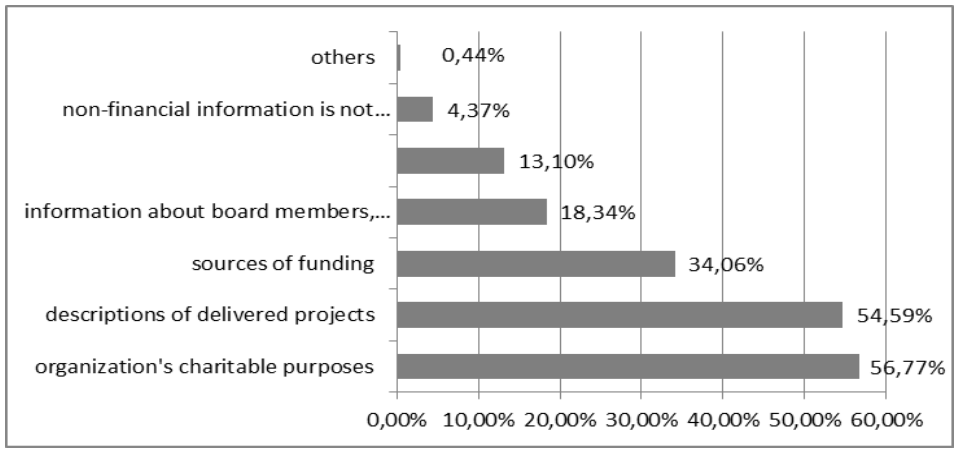


*the respondents could give more than one answer.

Source: developed by the authors.

As far as non-financial information is concerned, the respondents were the most sensitive to the organization's charitable purposes as defined in its governing document (56.77% of responses) and the descriptions of past delivered projects (54.59%). Some respondents (4.37%) were of the opinion that all non-financial information was not important to them, and a small group, 0.44%, could not specify their expectations (see Chart 2).

Chart 2. What non-financial information individual donors considered important

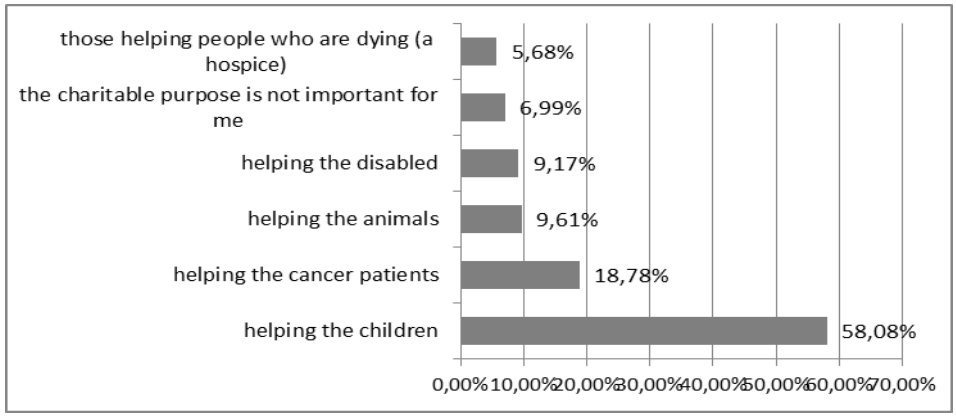


*the respondents could give more than one answer.

Source: developed by the authors.

When asked to assess the importance of the PBO's mission, the respondents usually pointed to those helping children (58.08%) (see Chart 3). Other purposes that the donors found worthy of their support were the care of cancer patients, animals, and the disabled. However, 6.99% of them found the PBO's mission not to be important at all. Respondents could choose answers from the list (based on the previous research, including Bekkers, 2008, Vriens et al., 1998), but they also could indicate other purposes not listed in the questionnaire.

Chart 3. What charitable purposes individual donors prefer



*the respondents could give more than one answer.

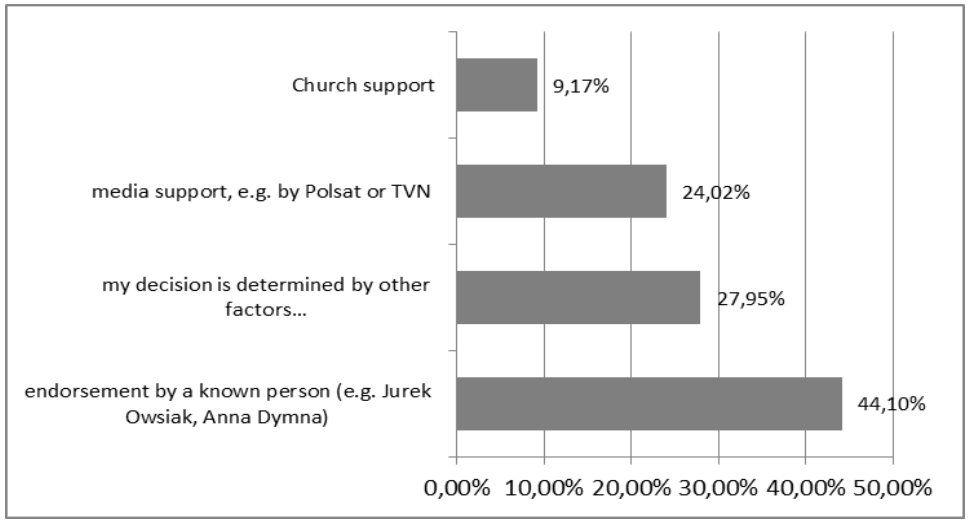
Source: developed by the authors.

The last thing the respondents were asked was to state other, less significant factors taken into account by individual donors in making donations (see Chart 4). The respondents could choose answers prepared by the authors as well as indicate other reasons not mentioned in the survey. A significant number of respondents (44.10%) pointed to the endorsement of an organization by public figures, and 27.95% of respondents listed factors outside the range proposed by us. In the latter group, the influence of a known person – a PBO employee, a volunteer, or the family of a foundation's or associations' beneficiary (7.86% of respondents) was mentioned the most frequently. Other noteworthy factors were:

- acting on an impulse, emotions (4.37%),
- PBO's local focus (3.06%)

Some other motivations for donating to a PBO included its visibility, credibility and efficiency (the respondents did not specify how they understood these terms, though), as well as the purpose of activity. Eleven persons could not state their motivations for donating. These results coincide with those obtained by Szper and Prakash (2011), who found that routine events or things, such as a word of encouragement from people one knows or the organization being present in a community's life could have the strongest effect on the decisions of individual donors.

Chart 4. What other information individual donors considered important



*the respondents could give more than one answer.

Source: developed by the authors.

The respondents of our questionnaire survey could be divided into three groups:

- Donors using sources of financial data and valuing financial information (26.2%);
- Donors not using the financial data but interested in financial results (68.56%);
- Donors not interested in financial results (5.24%).

6. Results of qualitative research

The high share of respondents interested in financial information (i.e. considering the information important for their decision) encouraged us to carry out qualitative research: a laboratory experiment. The aim of the laboratory experiment was to answer the question: what is the path of the decision making of individual donors in fact and why does the financial information not influence their decision despite of the fact that they consider it important?

We chose 32 participants for the laboratory experiment. They were chosen randomly among participants of a postgraduate courses at a leading University in Poland.

We planned four steps:

- Step 1 – making an individual decision. The participants had to choose one organization from a list supplied to them together with a short description of the organizations' goals. Then they had to explain shortly why they chose that particular charity.
- Step 2 – decision-making in groups. We divided the participants into groups of four persons. The participants could change their decision under the influence of others. Then they had to briefly explain why they made the decision they did.
- Step 3 – reading the statements of charities. The participants were given both the financial and activity statements. They could change their decision after reading and analyzing the financial information and explain why they did so.
- Step 4 – comparison of the organizations. Participants got the comparison in a Table containing the most important financial data and ratios of the given public benefit organizations. They could change their decision and they had to explain their decision.

After all steps were completed, we opened up the discussion and asked the participants to answer the following additional questions:

1. Is the financial information presented in a clear way?
2. Do they trust the financial information presented on the Websites of the PBOs or in their financial statements?

3. Which charity do they support in real life and why?
4. Did the exercise encourage them to use the financial data of PBOs in future in order to decide whether to donate and to whom?

After the analysis of responses of the participants we could draw following conclusions:

- 46% of participants (15 persons) never changed their mind after all the four steps;
- 34% of participants (11 persons) changed their mind after reading the financial statements;
- 21% of participants (7 persons) changed the mind under influence of others;
- No one changed the mind after getting the comparison of the results of the PBOs, however some declared that the comparison strengthened their choice.

We received following answers to the discussion questions:

1. The participants stated that the statements were difficult to interpret. The statements were either too long or too short – and the content was different in every organization. However, the value of salaries and number of volunteers was important to them in making the decision. Unfortunately, Polish donors did not know where to look for the statements. They said that they would use the statements in the future if they had time to do so. The key drivers of decision making were the name of the organization and the brand of the entity.
2. They said that they believed neighbors or the media more than the public statements of the organizations. The participants were skeptical about the information presented in the statements. They never checked to see if the organization had used the money effectively. As they put it: "Nothing depends on us, so why we should take care of this problem?" We argue that the attitude of the participants to the content of the statements results from the history of Poland and its years under communism.
3. Some people decided on impulse (3 participants); some people chose an organization because they knew its name or what it did (15 participants). The rest (14 participants) chose the organization taking into consideration the mission and goals of the charity. Moreover, most of them (30) said, that they do not pay attention to the choice of PBO when deciding which charity to designate as recipient of 1% of their personal individual tax. They do so because "it doesn't cost us anything." For this reason they choose the organization randomly or because they have heard about it.
4. All of our participants declared their willingness to use the financial statements of PBOs in future. They found the experiment to be a very interesting experience.

Below we present a few selected answers of the participants:

"…*I chose the charity because I was a witness to the help rendered by the organization. It helped a very sick child. (...) However, after reading the financial statement I noticed that it pays high salaries, that's why I changed my decision."*

"At first I chose charity X because it was a charity with a long history. However, as a member of the group I changed my mind. The key driver of my decision was the fact that one of my colleagues knew a beneficiary of the charity. The content of the financial and activity statements did not change my decision."

"I chose organization Y because it was well known. The statements did not change my decision. I think that it is reliable"

"I chose the organization that helps children with cancer. I think there is nothing worse than sick children. My colleagues thought the same. After reading the statements I did not change my mind. The charity pays no salaries! (...) I saw few mistakes in the statements, but I do not think they were on purpose…"

"I chose organization Z because its activity is close to my heart(…). After reading the statements I did not change my decision. I liked the fact that it does not pay the salaries and has many volunteers. This is the most important for me."

The analysis of the respondents' answers from the questionnaire survey and laboratory experiment not only supplemented the conclusions drawn from the estimated equations, but also confirmed some of them. We determined that building the civil society in Poland may be more difficult than in other countries because of the lack of tradition for Polish citizens to take responsibility for the good of society. However, non-financial information is the most important for individual donors, especially information from beneficiaries, media or people whom the donors trust. Based on the survey's findings, we have formulated new research questions for the next stage of our research, after the necessary data is collected. We want to investigate if the PBO's incomes depend on the scale of its activity as expressed through the number of its beneficiaries, staff and volunteers. Moreover we want to discover if a PBO's donations from individual donors depend on the visibility of the PBO on the Internet.

7. Conclusions

This research was aimed at identifying the factors influencing individual donors to choose a public benefit organization to support financially. The equation estimates and the findings provided by the questionnaire survey show that Polish donors still make very limited use of PBOs' financial statements in

this process. This is mainly due to their low opinion of the usefulness of the financial information, as they either lack the necessary information to assess it or are provided with an overwhelming amount of data. We found the the reporting of activities and financial reporting by the PBOs are determined by strong institutional influences affecting their utilization.

The research also found that only some non-financial variables are important for individual donors. The key pieces of non-financial information the surveyed individuals needed to make a donation were the organization's goals and descriptions of its projects. At the same time, quite many participants stated that they had donated under the influence of people they knew. Some respondents could not explain what had made them support a specific organization, or else answered that the decision was spontaneous. However, one of our most important findings is that Polish PBOs operate in a specific environment: while donors are conscious of the fact that the financial data is crucial, nevertheless they do not believe the public statements. For this reason Polish PBOs must search for other tools to communicate with donors and encourage them to donate.

It is interesting to note that individual donors in Poland tend to adhere to the established patterns of donation. As a result a PBO receiving donations in the past will very likely obtain them in the future as well.

Our findings show that Polish individual donors are extremely reluctant to take on the responsibility for community development and building the civil society. The communist regime diminished social trust towards the government and organizations cooperating with the authorities. Thus Polish donors more believe their neighbours and beneficiaries than the public statements. Moreover, for many years all the tasks of the social welfare have been financed by the State. Thus it will take many years to change the conviction of Polish citizens that the government should take care of the poor and others in need.

As the awareness of Polish donors increases every year, it can be expected that they will give more and more importance to financial data and other information published by public benefit organizations. A growing number of donors will be interested in knowing if their contributions are used efficiently, and in PBOs' sustainability and the fulfilment of their missions. Owing to these expected trends we plan to carry out more research on the factors considered by donors planning to make donations, and on the reasons why they choose a particular charity. The first stage will involve the updating of the quantitative research sample with the most recent statistical data and the introduction of new variables to the model. At the same time, more questionnaire surveys will be carried out.

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Streszczenie

FINANSOWE I NIEFINANSOWE CZYNNIKI MOTYWUJĄCE DARCZYŃCÓW DO WSPARCIA ORGANIZACJI POŻYTKU PUBLICZNEGO

Organizacje pożytku publicznego (OPP) realizują cele głównie niefinansowe, społecznie użyteczne, służące dobru jednostki lub dobru publicznemu. Wyniki finansowe OPP w Polsce pokazują znaczącą nierówność osiąganych przychodów, co oznacza, że darczyńcy stosują określone kryteria w podejmowaniu decyzji, której organizacji dobroczynnej udzielić wsparcia finansowego.

Celem badania jest określenie czynników o charakterze finansowym i niefinansowym wpływających na wybór przez darczyńców indywidualnych określonej organizacji nonprofit, którą wesprą finansowo. Metodą badawczą stosowaną dla realizacji postawionych celów jest model ekonometryczny, ankieta oraz eksperyment laboratoryjny.

Przeprowadzone badania potwierdziły, że indywidualni darczyńcy w Polsce w niewielkim stopniu wykorzystują sprawozdania OPP. Przyczyną takiego stanu jest m.in. zbyt duża zawartość informacji w sprawozdaniach i/lub niewiedza darczyńców o miejscu publikacji tych sprawozdań. Z drugiej jednak strony duża część uczestników badania wykazała zainteresowanie danymi finansowymi i wynikami niefinansowymi OPP w celu podjęcia decyzji.

Słowa kluczowe: *organizacje pożytku publicznego, pomiar dokonań, darczyńcy*

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