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CHANGES IN EUROPEAN TAX SYSTEMS DURING ECONOMIC DOWNTURN

Keywords: *tax competition, tax structure, tax system*

Abstract: The article includes an analysis of relative changes in tax structure during the period between 2007-2008, based on data of tax revenues from 27 countries of EU and short requests for discretionary tax rates changes occurring in 2009-2010. For the quantitative analysis we used k-mean cluster analysis procedure identifying relatively homogeneous groups of European states based on selected tax structure features. Thus the basic patterns of tax systems had been distinguished for the period before the economic downturn (by convention in 2006) and then we were looking for trends in tax systems' structure. Changes in taxation, both in terms of tax burden, as well as changes in tax rates are mainly concentrated in the European peripheries, which are accompanied by heterogeneous changes in production. This arrangement supports theories of tax competition stemming from the new economic geography. Member countries of EU experiencing deep economic downturn alter their tax structure, rather by the types of tax than by economic functions of taxes. Countries are trying to raise the taxes which were previously the main basis of their tax revenues or raise those which revenues decrease the most.

ZMIANY W EUROPEJSKIM SYSTEMIE PODATKOWYM W CZASIE GOSPODARCZEGO SPOWOLNIENIA

Słowa kluczowe: konkurencja podatkowa, struktura podatkowa, system podatkowy

Abstrakt: Artykuł zawiera analizę względnych zmian w strukturze podatków w okresie 2007-2008 na podstawie danych o przychodach podatkowych 27 krajów Unii Europejskiej i krótką próbę omówienia dyskrecjonalnych zmian podatków mających miejsce w latach 2009-2010. Dla celów analizy ilościowej użyto metody grupowania wedle procedury k-średnich, co pozwoliło zidentyfikować relatywnie homogeniczne grupy krajów europejskich pod względem wybranych cech struktury podatkowej. W ten sposób rozróżniono podstawowe wzorce systemów podatkowych dla okresu przed załamaniem ekonomicznym (zasadniczo dla roku 2006), by następnie prześledzić trendy w strukturach systemów podatkowych. Zmiany w opodatkowaniu zarówno w sensie obciążenia podatkowego, jak również zmian stóp opodatkowania były głównie skoncentrowane na peryferiach Europy, a towarzyszyły im różnorodne zmiany w produkcji. To zjawisko wspiera teorię konkurencji podatkowej mającej swe źródło w nowej geografii ekonomicznej. Kraje członkowskie Unii Europejskiej dotknięte głęboką recesją dopasowują swoją strukturę podatkową raczej poprzez typy podatków niż poprzez zmianę ich ekonomicznych funkcji. Kraje starają się podnieść te podatki, które poprzednio stanowiły główne źródło ich przychodów podatkowych lub te, w przypadku których przychody spadły najbardziej.

INTRODUCTION

Global economic crisis, affecting European countries, significantly influenced the structure and level of tax burdens in the European Union, contributing to changes in the tax systems of individual countries. The most prominent changes were the result of both discretionary policies, such as changes in legislation and tax rates, as well as cyclical factors affecting the size of tax bases and tax compliance. It should be stressed that they were not only discretionary actions striving to prevent the consequences of economic slowdown but sometimes effects of decisions taken earlier independently from the business cycle phase. Examples of such actions can be, for example: introduction of flat tax in personal income tax established in Czech Republic by 2008 (Czech republic: Selected Issues 2008, p. 11),

decrease of PIT in Poland or reduction of social contribution for pensions introduced in 2007-2008, representing the implementation of previous political promises and the excise tax changes resulting from EU directives (increase of tax on tobacco and decrease of the excise tax on bio-components addicted to fuel) (Wzrośnie akcyza... 2008).

The article includes an analysis of relative changes in tax structure during the period of 2007-2008, based on data of tax revenues and short requests for discretionary tax rates changes occurring in 2009-2010, when it was not possible to carry out quantitative studies on the structure of tax revenue due to the lack of necessary data. For the quantitative analysis we used k-mean cluster analysis procedure identifying relatively homogeneous groups of European states based on selected tax structure features. Thus the basic patterns of tax systems had been distinguished for the period before the economic downturn (by convention in 2006) and then we were looking for trends in tax systems' structure, following the largest relative changes in the cluster distance from the cluster centers during the time between 2007-2008 or changes in clusters membership. By convention the largest distance increases covered the upper one third of investigated countries.

The study identifies the main directions of tax structure evolution and their coincidence with economic slowdown, particularly with changes of GDP and general government debt related to GDP. In particular, we are going to determine:

1. the impact of economic and financial crisis on the structure of tax revenue in European Union countries,
2. connections between tax structure recombination with the types of taxes or economic functions performed by taxes,
3. the most popular tax categories used to weaken the effects of economic slowdown in discretionary government policy,
4. the most and the least proof to decline in production structure of tax systems and tax structures preventing the accumulation of public debt.

The quantitative analysis covers cluster analysis classifying the tax systems of 27 EU countries into four groups of a similar tax structures in 2006, understood as last year before economic slowdown. The division was based on the share of individual types of taxes in GDP, according to Eurostat tax classification by the type of tax and separately for taxes in their economic functions, yielding five other clusters. Treating the output characteristics of the clusters as constant, we investigated the changes of countries membership in 2007 and 2008 and their distance from the cluster center, in order to find out countries whose tax systems varied distinctly in these two years. Additionally we calculated the average rate of decline in GDP and an aver-

age increase of the debt to GDP in each cluster, in order to hint tax structures most immune to the decline of production and to accumulation of public debt.

Unfortunately, in this way, it was not possible to examine the changes that occurred in 2009 and 2010 (due to lack of sufficient data about tax revenues), so the conclusions were supplemented with information on the discretionary changes of tax rates introduced in 2009 and 2010, to define the main patterns of tax systems reforms, especially concentrating our attention on countries most affected by the crisis. Finally, information about cluster membership was compiled with GDP and general government debt dynamics to determine whether they are related in some way. On this basis, summary and final remarks were formulated. The analysis of other discretionary tax changes were omitted, including modification of tax base and timing of tax payment because such changes are usually difficult to interpretation and often ambiguous.

Initially it was expected that the countries most affected by the crisis (experiencing the largest fall in GDP and the fastest rate of growth of public debt) should have also experienced the strongest change in the structure of the tax system. This should be particularly relevant in the classification of tax systems by economic functions of taxes, because the composition of the tax burden on labor, capital and consumption should be subject to reconstruction reducing the share of taxes on capital and consumption and increasing tax revenues from labor. This expectation is a consequence of the different sensitivity of tax bases to the changes in demand. Meanwhile, considering discretionary changes the tax burden on consumption is likely to increase, because such fitting is relatively easy to introduce from political point of view. If the latter effect had emerged in the initial stage of the crisis, it could reduce the tax burden on consumption, decrease the tax burden on capital and maintaining the level of taxation on labor unchanged. The ultimate effect of such adjustment should worsen the situation of countries receiving the significant part of tax revenue from taxes imposed on capital.

In the case of classification on tax types a relative increase of excise duties and VAT should be expected, as the these are the forms of taxes relatively prone to adjustment by the government, especially in the case of a rapid accumulation of public debt and to a lesser extent, in the case of GDP decline. The greater changes should be also reported in countries most affected by economic downturn. It seems that change in tax structure by the tax function better reflects changes in the competitive position of particular countries, while change in tax structure by the types of taxes better relates to the difficulties in tax collection. In countries threatened with insolvency

or experiencing strong GDP decline we expect changes in both categories of tax structures.

In this paper we use Eurostat data included in “Taxation trends in the European Union: Data for EU member States, Iceland and Norway” (Edition June 2010). Available data is classified according to the three classifications: by the type of tax (direct, indirect, social contributions), by economic function (taxes on labor, capital and consumption) and by the level of government collecting taxes (central or local government). As a reminder: Eurostat divides all taxes according to the three classifications: by the type of tax (direct, indirect, social contributions) by economic function (taxes on labor, capital and consumption) and by the level of government collecting taxes (central or local government). The latter division is not considered in this study. Data on discretionary changes of tax rates are also provided from mentioned publication and they apply only to years 2009-2010, the period for which no quantitative data on tax revenue are available.

The article is structured as follow. First we present tendencies in tax burden changes which appeared after 2006 in EU countries. These are, for example: composition of tax revenues in two classifications, changes in composition of taxes according to their economic functions and evolution of tax revenues structure during economic slowdown. In second part, dynamics of GDP and general government debt is combined with tax classifications derived in previous part of the study in order to find potential interdependencies and conclusions. The consideration complements general description of discretionary tax rates changes occurred in last two years: 2009-2010. The final part concludes the most important findings of the research.

CHANGES OF TAX SYSTEMS IN EU MEMBER COUNTRIES DURING PERIOD 2006-2008

During the examined period the financial crisis left its mark on both the share of taxes in GDP and the structure of taxation (Taxation trends... 2010). Tax burden on capital in GDP declined by 0.4% points and in the same time taxes levied on consumption were reduced by 0.3% points. Considering the tax structure in 2006-2008 taxation on consumption decreased in total tax revenues from 34.2% to 33.1%, taxation on labor increased from 45.6% to 46.7% and the share of taxes on capital remains constant and equals to 20.4%. For the main types of taxes, the VAT share dropped from 22% to 21.4%, the share of excise duties from 8.7% to 8.4%, the share of personal income tax rose from 20.4% to 21.1%, CIT from 9% to 9,2% and

social security contributions from 29.8% to 30.2%. These changes indicate a strong impact of economic downturn on consumption and relatively small on employment and business gains, at least at the beginning of the crisis. It is probably related to the incomplete adjustment of tax revenue to the deterioration of economic situation and relatively good income situation of government's budgets in many EU countries in 2008.

To trace the changes in more detail, it is necessary to distinguish similar tax structures. Therefore, the two classifications of Eurostat were used. According with the first one (by economic functions) taxes can be levied on: consumption, labor and capital, while according to the second one (by the type of tax) we can indicate: VAT, excise duties, other taxes on products (including taxes on imports), other taxes on production (for example: taxes on assets, real estate taxes, etc.), PIT, CIT, other direct taxes and social security contributions (SSC). Of course, only the: VAT, excise duties, PIT, CIT and social security contributions have a significant share in tax revenues. Despite this, all tax types listed above were used in classification procedure. The detailed composition of tax types is described more precisely in "Taxation trends ..." (Edition 2009).

Cluster analysis helped to divide all EU countries according to their relative similarity into five groups, by taxes performing economic functions and into four groups, by types of taxes. It seems that the excessive diversification of the tax systems would render perception of the broad tax changes and creating a few groups would not allow a comparison of tax changes with GDP and public debt dynamics. In both cases, unusual cases (outliers) were identified. In the classification by economic function the outlier was Bulgaria with a very high proportion (over 50%) of taxes on consumption, whereas in the division by types of taxes Denmark turned out to have most unusual structure of tax rates, with very low revenue from social security contributions, substituted by personal income tax. The table 1 shows the membership of countries to the clusters and characteristic of each clusters centers.

It is clearly visible that in countries which joined EU after 2004, the share of consumption taxes is most prominent, whereas in old member countries the role is played by taxes on labour. It should be added, that very similar to each other, especially in terms of taxes on consumption, are clusters 2 and 3, and respectively 4 and 5, but all these clusters differ significantly when it comes to the taxation of labor. It is also worth noting that the relatively high share of taxation on capital in countries which are international financial centers, such as the United Kingdom or Luxembourg and in the south-Europe, such countries like: Italy, Spain, Cyprus, Malta and Greece and Poland and Slovakia in our part of Europe. It seems plausible

that low share of labor taxation in the new member states is implied by: relatively low wages, a large shadow economy and important outflow of workers to western European countries offering higher salaries to employees.

Table 1. Groups of countries according to the results of classification by economic functions in 2006 and basic features of cluster centers

Countries	Taxes on consumptions	Taxes on labor	Taxes on capital
BG ¹	56,5%	31,7%	14,4%
EE, LV, LT, HU, PT, RO, SI	39,0%	47,6%	13,5%
IE, EL, CY, MT, PL, SK	38,5%	35,5%	26,1%
BE, CZ, DK, DE, FR, NL, AT, FI, SE	28,3%	53,3%	18,5%
ES, IT, LU, UK	27,3%	43,3%	29,8%

Source: Own calculations in SPSS 16.0 on data from Taxation trends in European Union (Edition 2010).

Measuring Euclidean distance of tax structures in 2008 to the set of cluster centers from 2006 one can distinguished the countries with particularly strong tax structure changes, which was arbitrarily taken at the level of one third of countries with the largest amend in distance, compared to the distance calculated in 2006. This specified group of countries was supplemented by one country that between 2006 and 2008 has swapped its affiliation to the cluster, namely Portugal (PT). Strong changes in tax structure can also be seen in the case of: IE, ES, CY, MT, HU, BG and SK. In most cases, we can observe a decline in the consumption tax (except Ireland) and growth in taxes on labor (except CY, MT and BG). Tax burden on capital increased especially in CY, MT, BG and PT. Tax burden on capital increased especially in CY, MT, PT and BG. Such a change may indicate a difference in economic slowdown prevalence, which first reached the states located in the center of the continent and the major economies, causing a decline in tax revenue from capital and to a lesser extent, yet (in 2008) affecting states from south and east of the Europe.

Tax structure by types of taxes is more complex and to simplify its presentation, beside the membership of each country to the clusters, the cluster centers characteristic is specified and includes only the most important types of taxes, such as: VAT, Excise duties (ED), PIT, CIT, social security

¹ All countries are described using two-letter abbreviations, accurately explained in table 3.

contributions (SSC) and all others taxes. Eventual results of classification are shown the Table 2.

As one can see, apart from the unusual share of social security contributions, Denmark is very similar to other countries from second cluster, especially if we compare aggregate shares of PIT and SSC. Also the latter cluster, with the exception to the participation of these two sources of tax revenue, is not very different from the rest of the third group. The individual group membership similarity increases the probability of individual countries to jump to the other clusters during economic downturn, so we expect more frequent swaps between clusters than in previous classification. Against this background, the very clear difference of tax structure refers to the countries that recently joined European Union from southern Europe (except Malta) and the Baltic states (except Lithuania), where a much larger role is played by indirect taxation and the importance of revenue generated from PIT is strictly limited.

Table 2. Groups of countries according to the results of classification by type of tax in 2006 and basic features of cluster centers.

Countries	VAT	ED	PIT	CIT	SCC	Other taxes
BG, EE, CY, LV, RO	30,3%	11,9%	13,7%	9,1%	28,7%	6,3%
DK	20,8%	6,8%	50,1%	8,8%	2,1%	11,4%
CZ, DE, EL, ES, FR, HU, NL, AT, PL, PT, SI, SK	20,4%	8,1%	16,5%	8,1%	36,6%	10,3%
BE, IE, IT, LT, LU, MT, FI, SE, UK	19,7%	7,9%	26,2%	10,2%	24,5%	11,6%

Source: Own calculations in SPSS 16.0 on data from Taxation trends in European Union (Edition 2010).

As before, treating the cluster centers as constant we selected one third of countries with the greatest changes of tax structure composition and supplemented this group by countries that changed their affiliation to the cluster subdivision. Therefore, to the countries with relatively strong reconstruction of tax structure we can count: BG, RO, IE, CY, FI and UK. We can notice subsequent changes of cluster membership: the LT and MT went to the first group due to the decrease of revenues from PIT, EE transferred to the third group, as a result of the growing importance of the SSC and the LV moved to the fourth cluster after the drop of VAT share in total taxes and growth of PIT and CIT. First of all, changes in classification affected

Baltic states, however, without clarified direction. This fact contests the assumption of a determined tax structures evolution at least at the beginning of economic slowdown.

At the same time, summing up the two classifications we can see that changes in the tax systems prevailed in countries located on the periphery of the European Union, to a lesser extent, causing changes in the heart of Europe. Such dichotomy can be generated by a greater sensitivity of the peripheral areas to the shape of tax system or by stronger tax competition at Europe's economic center, preserving stability of tax systems. It is worth noticing, that this is consistent with the suggestions of the authors of the new economic geography (Baldwin, Krugman 2004) on tax competition (Wilson, Wildasin 2004). According to this hypothesis the capital tax competition requires the use of low taxation of capital in the periphery area of integration, in order to offset the geographical advantage of countries located near the center of economic union. In the dynamic context it could indicate a stronger change of the tax structure in the peripheral countries, which confirms the observations made for years 2007-2008.

RELATIONS BETWEEN TAX STRUCTURE RECONSTRUCTION, GDP DECREASES AND GROWTH OF GENERAL GOVERNMENT DEBT

Changes in GDP related to the economic downturn include the years 2008-2009; during this period one can assume the tax structure probably had impact on GDP and public debt dynamics. Therefore, the classification made for 2006 has been accepted as potentially having impact on the economies of EU countries during the crisis. Given the short time series we collated data about average economic growth and changes in debt with similar tax structure represented by clusters. On the one hand it allowed us to draw conclusions on the basic tax characteristics of countries relatively good coping with the slowdown and on the second hand with countries performing the worst. The smaller was the decline in GDP growth and increase of the general government debt to GDP the better was perceived the cluster.

It should be noted that the decline in GDP in 2008-2009 was very heterogeneous, both in terms of scale and geographical diversity, highly affecting such dissimilar states like, for example Ireland or Estonia. Analogically, impact of economic slowdown on the accumulation of public debt was mixed. Table 3 presents main figures illustrating dynamics of GDP and public debt in 2008-2009.

Table 3. Dynamics of GDP and dynamics of public debt to GDP in 2008-2009

Country	% change of debt to GDP			% change of GDP		
	2006	2007	2008	2006	2007	2008
Belgium (BE)	-3,9	5,6	6,9	2,9	1,0	-2,8
Bulgaria (BG)	-4,5	-4,1	0,7	6,2	6,0	-5,0
Czech Republic (CZ)	-0,4	1,0	5,4	6,1	2,5	-4,1
Denmark (DK)	-4,7	6,8	7,4	1,7	-0,9	-4,9
Germany (DE)	-2,6	1,0	7,2	2,7	1,0	-4,7
Estonia (EE)	-0,7	0,8	2,6	7,2	-3,6	-14,1
Ireland (IE)	0,1	18,9	20,1	6,0	-3,0	-7,1
Greece (EL)	-2,1	3,5	15,9	4,5	2,0	-2,0
Spain (ES)	-3,4	3,5	13,5	3,6	0,9	-3,6
France (FR)	0,1	3,7	10,1	2,4	0,2	-2,6
Italia (IT)	-3,0	2,6	9,7	1,5	-1,3	-5,0
Cyprus (CY)	-6,3	-9,9	7,8	5,1	3,6	-1,7
Latvia (LV)	-1,7	10,5	16,6	10,0	-4,2	-18,0
Lithuania (LT)	-1,1	-1,3	13,7	9,8	2,8	-14,8
Luxembourg (LU)	0,2	7,0	0,8	6,5	0,0	-4,1
Hungary (HU)	0,3	7,0	5,4	1,0	0,6	-6,3
Malta (MT)	-1,8	1,8	5,4	3,8	1,7	-1,5
Netherland (NL)	-1,9	12,7	2,7	3,9	1,9	-3,9
Austria (AT)	-2,7	3,1	3,9	3,7	2,2	-3,9
Poland (PL)	-2,7	2,2	3,8	6,8	5,0	1,7
Portugal (PT)	-1,1	2,7	10,5	2,4	0,0	-2,6
Romania (RO)	0,2	0,7	10,4	6,3	7,3	-7,1
Slovenia (SI)	-3,3	-0,8	13,3	6,8	3,5	-7,8
Slovakia (SK)	-1,2	-1,6	8,0	10,6	6,2	-4,7
Finland (FI)	-4,5	-1,0	9,8	5,3	0,9	-8,0
Sweden (SE)	-4,9	-2,5	4,0	3,3	-0,4	-5,1
United Kingdom (UK)	1,2	7,3	16,1	2,7	-0,1	-4,9

Source: Data from Eurostat <<http://epp.eurostat.ec.europa.eu/tgm/table.do?tab=table&init=1&plugin=1&language=en&pcode=tsieb020>> (access 15 August 2010); <<http://epp.eurostat.ec.europa.eu/tgm/table.do?tab=table&init=1&plugin=1&language=en&pcode=tsieb090>> (access 15 August 2010).

In 2008-2009, the decline of production most severely affected: Baltic states, Ireland and Finland, which experienced more than 7% compound

reduction of GDP over two years. On the other hand positive growth during this period registered: PL, CY, BG, SK and MT. However, it should be mentioned that much of the growth occurred in the first year 2008, suggesting that it was at least a result of delayed prevalence of the economic slowdown in these countries (for instance in the case of BG and SK). The highest growth ratios of debt to GDP were realized by IE (39% points), LV (27.1% points) and UK (23.4% points). High (two-digit growth rate) increase of debt share was also recorded in: BE, DK, EL, ES, FR, IT, LT, HU, NL, PT, RO and SI. We can guess this occurrence involves recapitalization of banks and stimulation of economic growth by expansive fiscal policy. Meanwhile, the decrease of public debt happened in: BG (-3.4% points) and CY (-2.1% points) and a small increase in SE (1.5% points) and EE (3.4% points). In the latter case it could be related to fulfilling convergence criteria necessary for euro adoption from 2011 on.

Comparing changes in GDP and public debt with classification of tax systems we can observe differentiation of dynamics between clusters (See Table 4).

Table 4. Dynamics of GDP and debt in clusters build on economic functions of taxes in 2008-2009

Countries	Average GDP changes in clusters	Average public debt growth in clusters
BG	-5,0%	0,7% points
EE, LV, LT, HU, PT, RO, SI	-10,1%	10,4% points
IE, EL, CY, MT, PL, SK	-2,6%	10,2% points
BE, CZ, DK, DE, FR, NL, AT, FI, SE	-4,4%	6,4% points
ES, IT, LU, UK	-4,4%	10,0% points

Source: Own calculations on data from Taxation trends in European Union (Edition 2010) and Eurostat data about GDP and general government debt statistics (See source below Table 3).

As we can see, during the economic downturn the lowest decrease of GDP features countries with relatively **low tax burden on labor, comparable tax burden on consumption and average taxes on capital (third cluster)** despite this the worst countries can be characterized by **high tax burden on labor and very low burden on capital (second cluster)**. In other words, to avoid great depression we should prefer differentiated and tax structure equally levied on: consumption, labor and capital. This suggestion, however, need not necessarily indicates a causal relationship. For

example heavy recession in Baltic states is probably driven by sharp reduction of loan accessibility, as casual effect of international banking insolvency problem. Earlier development of Baltic states was very fast and some authors emphasized as one of economic success sources just friendly and simply tax system (Krajewska 2004).

Debt relations are even more blurred. For example very small change of public debt is attributed to Bulgaria but it is only a single country, so this observation may be atypical. Probably the huge increase of debt during period of research was determined rather by expenditure site of budget (e.g. public support for the banks) than by revenues site, due to the limited transmission of financial crisis to the real economy responsible for tax fluctuations.

Table 5. Dynamics of GDP and debt in clusters build on types of taxes in 2008-2009

Countries	Average GDP changes in clusters	Average public debt growth in clusters
BG, EE, CY, LV, RO	-9,2%	7,6% points
DK	-4,9%	7,4% points
CZ, DE, EL, ES, FR, HU, NL, AT, PL, PT, SI, SK	-3,8%	8,1% points
BE, IE, IT, LT, LU, MT, FI, SE, UK	-5,9%	9,6% points

Source: Own calculations on data from Taxation trends in European Union (Edition 2010) and Eurostat data about GDP and general government debt statistics (See source below Table 3).

The next table shows dynamics of GDP and public debt in clusters build on types of taxes in 2008-2009, according to data of GDP we should have **relatively more income from social security contributions and personal income and less from VAT**, while the worst model of tax system **assumes large share of VAT and excise duties, with low proportion of personal income and social security contributions**. Again it's difficult to pinpoint significant tax advantages of country clusters with respect to the debt growth. On this basis, one can reject the assumption of close relation between tax structure ex ante and the debt formation during economic slowdown. It does not preclude, however, that debt will impact the reconstruction of the tax structure or discretionary changes in taxation ex post.

DISCRETIONAL CHANGES OCCURRED IN 2009-2010 AND THEIR IMPACT ON GDP AND PUBLIC DEBT FORMATION

As it was announced earlier, the analysis of tax systems change should be complemented by a description of discretionary changes of tax rates undertaken in 2009-2010, at the very advanced stage of economic slowdown. To capture the major trends, we decided to show only the changes in the statutory rates tax, omitting modifications in the tax base and the distribution of tax payments over time, despite such items of tax are very important because of the amount of collected revenue. From this perspective, changes in interest shall be regarded as indicators of tax policy correction made at political level by national government.

In order to facilitate the analysis, information on tax rates changes are presented in Table 6. Obviously, in this case, it was not possible to follow the changes in tax structure according to economic functions of taxes, because data were tax specific.

Personal income taxation reduction was quite common even in 2009. The tax cuts probably have to maintain low levels of unemployment but from the beginning of 2010 a new trend appeared which aim was to raise the burden of personal income. In the same time the several countries adopted policy of lowering CIT rates. Reduced budget revenues sought to compensate with the raise of excise duties and VAT. Still relatively few changes had been made in countries from central Europe as evidenced the fact that among countries that do not change rates of taxation or made minor changes prevail countries lying in the center of the European Union, such as: BE, NL, LU, DE, IT, AT, MT, PL and SE.

Only three countries did not change any tax rates in 2009-2010: BE, MT and NL and another three made changes only in one type of tax: PL, IT, AT. Particularly interesting in this context are changes in the countries threatened with insolvency or strongly affected by economic downturn. The largest tax adaptation (mainly tax increase) occurred in: HU, LV, EE, LT, EL, FI and IE. The rules how to deal with the crisis were different: for example, the Baltic states primarily increased VAT and excise duties, IE and EL excise duties and personal income taxes, while FI and EE beside the excise duties raised social security contributions. Despite the adverse economic situation governments tried to reduce the burden on personal income. Although in 2010 some countries have been forced to increase the tax rate of personal income, like for instance FR and LV. HU decreases PIT and social security contribution, compensating lower tax revenues with VAT and excise duties increase. HU decreases PIT and social security con-

tribution, compensating the lower tax revenues, with the VAT and excise duties increases.

Table 6. Changes of nominal tax rates in 2009-2010

Country	2009					2010				
	CIT	PIT	SSC	VAT	Excise Duties	CIT	PIT	SSC	VAT	Excise Duties
BE										
BG			-					-		+
CZ	-		-			-			+	
DK							-			+
DE		-					-			
EE			+	+	+					+
IE		+			+				-	+
EL		+			+	-	+		+	+
ES					+				+	
FR		-					+			
IT					-					
CY			+							
LV		-		+	+		+			+
LT	+	-		+	+/-	-				
LU	-									
HU		-	-	+	+	+/-	-	+/-		+
MT										
NL										
AT		-								
PL										+/-
PT					+		+			
RO		-	+		+					
SI	-				+	-	+			
SK			+/-							-
FI		-		-			-	+	+	+
SE	-		-					-		
UK				-			+			

+ means increase of tax rate; – means decrease of tax rate; +/- means changes of tax rates in different directions.

Source: Data from Taxation trends in European Union (Edition 2010).

Overall, it appears that countries are trying to compensate for the decline in tax revenue raising tax rates on these taxes, which experienced a drop in the share of tax revenue. It means that governments are trying to return to the structure of tax systems before the recession. Another explanation may be focus on taxes, which are the most powerful sources of tax revenue. According to the latter hypothesis, countries in which some type of tax plays an important role as source of tax revenues, will raise rates just this type of tax because this is simply the most efficient. This also confirms that the existing tax systems generally are considered as appropriate for the countries and governments have no will to their reconstruction and they prefer to resolve significant problems in tax collection by proportional increases of tax rates (or other features of taxes) reconstructing the tax composition prevailing before the beginning of economic slowdown.

CONCLUSIONS

Referring to the hypotheses presented in the introduction, it should be noted that the hypothesis on the impact of economic slowdown on tax systems, depending on the amount of decline in GDP did not find direct confirmation. Changes in taxation, both in terms of tax burden, as well as changes in tax rates are mainly concentrated on the European peripheries, which are accompanied by heterogeneous changes in production. This arrangement supports theories of tax competition stemming from the new economic geography, pointing out the greater sensitivity of tax systems located in countries on the periphery area of economic union.

Member countries of EU experiencing deep economic downturn (except IE) alter their tax structures, rather by the types of tax than by economic functions of taxes. This conclusion may support the hypothesis of maintaining the stable tax burden on consumption, labor and capital in order to restore the tax structure existing before crisis, as evidenced by the diverse reactions to changes in tax rates very consistent with previously observed tax structure in each country. In other words, countries are trying to raise those taxes that were previously the main basis of their tax revenues or those whose revenues decrease the most. Therefore a raise in consumption taxes was quite common in 2009-2010, as a consequence of the decline in revenue generated by them in the years 2007-2008. This phenomenon in some ways resembles a tax system homeostasis, persisting as a stable form of tax systems despite of the impact of the environment. Discussion, however, is whether such actions conducive to economic growth or lead to formulation of an optimal tax system just after the crisis. Perhaps the current

tax structure for some reason seems to be optimal for the tax authorities, probably due to factors unrelated to the economic slowdown.

With regard to discretionary adjustments in 2009-2010 countries prefer to raise excise duties and VAT and are willing to cut CIT. Additionally the old EU member states often increase the taxes on personal income (especially in 2010) and FI and EE raise also social security contributions. So we cannot say that the tax adjustments affects only taxes on consumption but certainly consumption taxes are a very important group of taxes with increasing rates. More changes are taken in countries severely threatened by insolvency, demanding a complete reconstruction of their tax systems. This remodeling is rather an effect of the fiscal position of the countries ex-post, than a reaction anticipating future events like consequences of crisis (action ex ante).

In the relationship between changes of tax systems from one hand, the decrease of the GDP and the growth of public debt, on the other hand, only changes in GDP appear to be associated with the structure of taxation. Precisely, resilient to the crisis proved to be countries with the most homogeneous distribution of the tax burden between consumption, labor and capital, including Poland. Stabilizing impact was also relying on PIT and social security contributions, instead of VAT and excise duties, which turn out to be unstable in the case of consumption collapse, which took place in some countries, for example in Baltic states.

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