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The Comparison of Net Budgetary Position Development and GDP Development for Selected Net Recipients of the European Union

Abstrakt:
Problematika rozpočtu Evropské unie je velmi důležitá pro každý členský stát, obzvlášť v současné době s ohledem na doznívající hospodářskou krizi a převládající krizi eurozóny. Tento příspěvek analyzuje vývoje čisté pozice pro vybrané členské státy EU, ale také přináší komparaci vývoje čisté pozice a vývoje HDP vybraných států. Úroveň HDP by měla být považována za jeden z nejdůležitějších indikátorů pro výpočet příspěvků každého členského státu, ovšem s ohledem na celou řadu výjimek a velmi komplikovaný mechanismus výpočtu může být jeho vliv poměrně nízký. Cílem příspěvku je ověřit hypotézu, že existuje korelace mezi vývojem čisté pozice na obyvatele a vývojem HDP na obyvatele pro vybrané čisté příjemce EU. Pro ověření této hypotézy je použitý výběrový korelační koeficient.

Klíčová slova:
Čistá pozice, Evropská unie, příjmy, rozpočet, výběrový korelační koeficient, výdaje

This article deals with the issues of European Union budget, specifically with analysis of net position development, and with comparison of this development with GDP development for selected EU countries. The structure of expenditures has been changed during past several years. This change is related to an aim of European Union for Financial Framework 2007–2013. This aim is to create in European Union knowledge and innovation based economy and become a competitor to the leading economies, most of all United States of America. Therefore in these days there is a significant increase in the expenditures for structural and regional policy, while there is a relative decrease in the expenditures for agricultural policy (Stejskal, Kovárník 2009).

Czech Republic, which has been member of European Union since 2004, is a net recipient for a whole period. This means, that the amounts provided for European budget by the Czech Republic are less than the amounts received from European budget. These amounts, provided into Czech national budget from European budget, could be significant and important for the development of Czech Republic, as well as for the other net recipients. This analysis is one of the aims of this article.

However, this article analyses not only development of net position, but also compares the net position development with the GDP development. This indicator is both one of the most important indicators for evaluation of economic situation of particular state, but also important indicator for calculation of contributions for each member states from the budget of EU. However, because of many exceptions and very complicated mechanism of calculation of these contributions (such as British rebate), its influence could be low. Therefore, the other aim of this paper is to verify the hypothesis that there is some correlation between the development of net position per capita and the development of GDP per capita for selected net recipients of EU.

On one hand, it is well known that the contribution based on the gross national income (which could be calculated from gross domestic product) is only one of the payments of each member state, there are also other contributions. On the other hand, the payments based on the GNI are the most important contributions of every member state. Moreover, the GNI based contribution is calculated according to the current development of each member state. Therefore, it is more important if the GNI development of one state is either quicker or slower than in the other states. Such analysis could be done, but the author of this article decided to focus only on above mentioned issue of the correlation between the development of net position per capita and the development of GDP per capita.

The methodology used for this article is especially the analysis of generally available data about GDP and net position for selected countries, while the selected statistical methods (especially selective correlation coefficient) are used for verification of hypothesis.

1. The Size of the Net Position

As mentioned above, there are countries in the European Union, which are in the position of net contributor, and the other countries, which are in the position of net recipient. Net contributors are providing more amounts into the common European budget than they receive back. The situation of net recipients is completely reversed; their contributions into the common European budget are less than the amounts received from this budget (Kovárník 2011).

Before the analysis is done, it is necessary to note that in some financial reports published by European Commission there is possible to find net position for each member state, while in the others financial reports there are not such amounts. Therefore the author of this article decided to calculate net position for each member state himself as a difference between expenditures and revenues for each member state, although these amounts could be a little bit different than the published ones because of the rounding. The other important note is about

available data. Financial reports are usually published during September, therefore during the creation of this paper there are available data for the calculation of net position only for the year 2012. Regarding the GDP, it is possible to find the level of GDP for each member state in PPS, nevertheless, the net position is in the Euro per inhabitant, therefore the author decided to use also GDP in Euro.

The biggest net contributors, recalculated per capita, are the Netherlands, Sweden, Denmark, Germany, etc. All of net contributors, except Cyprus, could be considered as developed countries. The biggest net recipients, recalculated per capita, are Luxembourg, Estonia, Lithuania, Portugal, Latvia, Greek, Hungary, etc. Except Luxembourg, all of net recipients could be considered as developing countries. This situation for the period 2006–2012 is described in the Table 1.

Tab. 1: Net Position of EU Member States per Capita, 2006–2012

State / Year	2006	2007	2008	2009	2010	2011	2012
Belgium	139.3	123.0	143.8	89.6	125.6	170.0	155.5
Denmark	-127.1	-141.0	-135.4	-210.6	-153.7	-175.4	-225.2
Germany	-100.3	-112.2	-134.2	-107.4	-146.1	-134.5	-129.2
Greek	448.5	483.3	550.5	266.7	304.2	409.7	402.9
Spain	69.9	65.9	46.7	9.7	67.3	55.3	76.0
France	-49.6	-48.4	-67.0	-100.1	-100.1	-99.3	-128.7
Ireland	230.0	130.9	107.3	-34.9	150.3	65.8	169.7
Italy	-43.8	-45.6	-80.9	-100.4	-96.7	-107.1	-91.9
Luxembourg	2004.7	2000.2	2354.2	2344.2	2575.6	2452.7	2388.9
The Netherlands	-241.1	-267.8	-267.7	-90.0	-209.2	-228.4	-236.5
Austria	-45.8	-74.7	-50.0	-59.7	-96.2	-96.7	-128.7
Portugal	213.2	230.4	249.6	196.3	237.9	282.0	476.5
Finland	-53.1	-39.0	-73.2	-113.5	-73.4	-123.2	-125.5
Sweden	-123.8	-137.3	-190.8	-43.4	-169.6	-167.4	-230.7

Great Britain	-67.4	-98.5	-45.7	-62.5	-126.8	-116.1	-146.7
Czech Republic	28.7	53.6	100.3	150.1	182.5	128.4	279.4
Estonia	126.3	149.2	154.5	416.3	496.6	258.2	597.7
Cyprus	111.7	-55.5	-62.8	-33.9	-8.1	-1.4	-35.6
Latvia	108.2	209.1	174.2	219.4	297.4	351.2	465.5
Lithuania	166.8	228.9	239.8	439.6	400.4	442.5	495.4
Hungary	105.2	154.9	105.1	265.4	269.1	440.0	326.2
Malta	262.8	79.0	66.3	17.4	123.6	165.2	173.9
Poland	75.0	130.6	109.3	160.4	213.9	281.9	306.9
Slovenia	63.2	15.3	23.7	92.5	180.3	217.5	259.5
Slovakia	54.6	104.4	119.6	88.7	231.8	202.4	285.7
Bulgaria	46.8	39.3	79.7	77.7	115.0	96.6	185.8
Romania	32.1	23.8	67.3	74.9	54.7	66.9	93.1

Source: Own calculations based on European Commission (2007, 2010, 2012, 2013).

In the Table 1 is possible to analyze the development of net position among EU member states. It is quite obvious, that the biggest recipient, recalculated per capita, is Luxembourg. Moreover, the difference between Luxembourg and the second country, Estonia (in 2012), is enormous. However, the development is quite stable in some countries (Belgium, Denmark, Germany, etc.), while on the other hand, it is quite fluctuating in other countries. For example Cyprus was net recipient in 2006, then relatively big net contributor in 2007, while its contributions have been decreasing since 2008. The positions of Hungary or Belgium have been decreasing in comparison with previous year, while the positions of Czech Republic or Latvia have been increasing.

Following analysis will focus only on the position of net recipients. The shares of net position per capita on GDP per capita for net recipients for the period 2006–2012 are in the Table 2.

Tab. 2: The Share of Net Position per Capita on the GDP per Capita for Net Recipients, 2006–2012

State / Year	2006	2007	2008	2009	2010	2011	2012
Belgium	0.46	0.39	0.44	0.28	0.38	0.51	0.46
Greek	2.40	2.43	2.65	1.30	1.55	2.21	2.34
Spain	0.31	0.28	0.20	0.04	0.30	0.24	0.34
Ireland	0.55	0.30	0.27	N	0.43	0.19	0.48
Luxembourg	2.80	2.56	3.08	3.28	3.33	3.05	2.96
Portugal	1.40	1.44	1.54	1.23	1.46	1.75	3.05
Czech Republic	0.25	0.42	0.68	1.10	1.28	0.87	1.91
Estonia	1.26	1.24	1.28	4.00	4.64	2.13	4.60
Latvia	1.50	2.18	1.66	2.55	3.46	3.58	4.27
Lithuania	2.25	2.57	2.37	5.23	4.50	4.34	4.50
Hungary	1.18	1.56	1.00	2.92	2.80	4.44	3.33
Malta	2.05	0.58	0.45	0.12	0.80	1.03	1.07
Poland	1.06	1.59	1.15	1.98	2.33	2.94	3.10
Slovenia	0.41	0.09	0.13	0.53	1.04	1.24	1.51
Slovakia	0.66	1.02	1.01	0.76	1.92	1.58	2.16
Bulgaria	1.38	0.98	1.73	1.69	2.40	1.86	3.44
Romania	0.71	0.41	1.04	1.36	0.94	1.10	1.50

Source: Own calculations based on European Commission (2007, 2010, 2012); Eurostat (2013).

In the Table 2 it is possible to analyse that the share of net position on GDP is quite significant for some countries; specifically in the year 2012 there was share over 4% in Estonia, Lithuania, and Latvia, over 3% in Bulgaria, Hungary, Poland, and Portugal, and over 2% in Luxembourg, Greek and Slovakia. Therefore it could be assumed, that the development of net position per capita has

an influence on the development of GDP per capita for some net recipients. The verification of this hypothesis is one of the aims of this article.

For the analysis there have been chosen countries, where the share in the year 2012 was higher than 1%. There is 14 countries above the criterion – Greek, Luxembourg, Portugal, Czech Republic, Estonia, Latvia, Lithuania, Hungary, Malta, Poland, Slovenia, Slovakia, Bulgaria, and Romania.

2. The Comparison of Net Position and GDP Development

As mentioned above, for better analysis is necessary to recalculate both the net position and the GDP per capita. Due to this recalculation it is possible to compare the value of GDP and net position in analysed countries regardless of the number of inhabitants.

The comparison of development of GDP per capita and net position per capita for selected countries is described on the Figure 1. Selected countries are those with the share of net position per capita on GDP per capita higher than 4%, which means Estonia, Lithuania, and Latvia. Czech Republic has been selected for the comparison too, due to the fact that it is the homeland of the author. For a better comparison, there is GDP per capita in hundreds of Euro and net position in Euro in this figure.

It is also necessary to add that both in the following Figure 1 and in the next calculations have been used data since 2000. These data are possible to find in the Financial report of European Commission (2007), and it is possible to make better calculations because of such analysed period. However, in above mentioned Tables 1 and 2 are data only since 2006, because the longer tables with all analysed data will probably lost their information value and these shorter tables are sufficient for the description of net position development.

According to the Figure 1 and to the other data it is possible to analyse that in all countries there was a decrease in GDP between years 2008 and 2009 because of the economic crisis. This decrease was both small (Greek, Portugal, Malta etc.) or quite significant (Estonia, Latvia, Lithuania etc.).

On the other hand, the development of net position per capita was not affected by this crisis. In some countries, there was a decrease between the years 2008 and 2009 (Bulgaria, Slovakia etc.), in other countries there was an increase (Slovenia, Poland, Hungary etc.).

Therefore it is possible to make a partial conclusion based on the Figure 1 and other data, that there is no relationship in the development of GDP per capita and net position per capita. However, this conclusion is based only on the visual analysis of above mentioned figure and other data. Following chapter is focusing on statistical verification of this relationship.

Fig. 1: The Comparison of Net Position per Capita Development and GDP per Capita Development for Selected Countries, 2000–2012
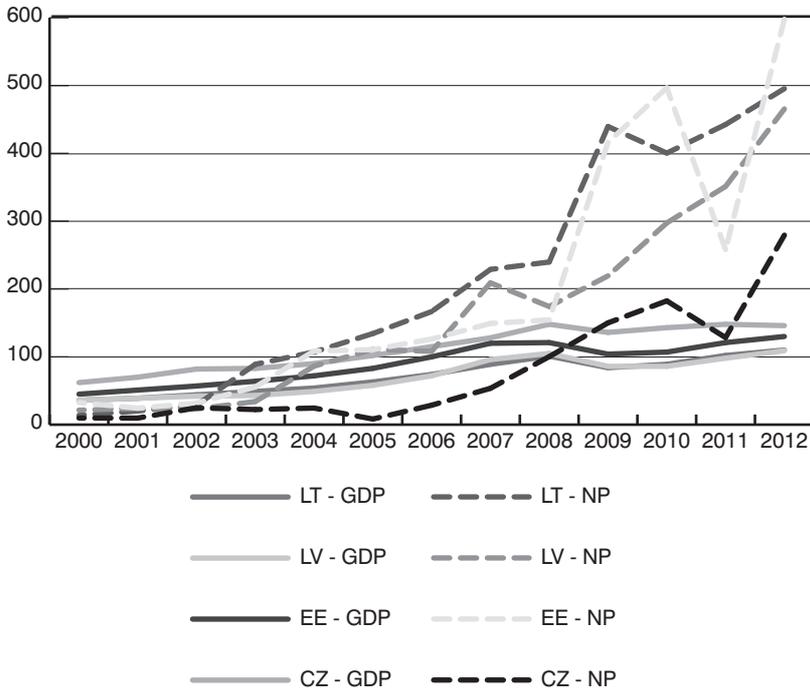
Source: Own calculations based on European Commission (2007, 2010, 2012, 2013); Eurostat (2013).

3. The Statistical Background

Based on above mentioned Figure 1 it is possible to make another partial conclusion that despite the recalculation per capita, the development of net position and GDP is different in analysed countries. The question to solve is, whether the differences in the developments are significant or not.

As a statistical tool for this analysis was chosen a selective correlation coefficient, which can analyse the size of interaction between GDP per capita and net position per capita (Kubanová 2003).

$$r_{X,Y} = \frac{\sum\limits_{i=1}^{n} X_i Y_i - n\overline{xy}}{\sqrt{\sum\limits_{i=1}^{n} X_i^2 - n\overline{x}^2} * \sqrt{\sum\limits_{i=1}^{n} Y_i^2 - n\overline{y}^2}} \qquad (1)$$

By using of this coefficient it is possible to verify the null hypothesis that there is no correlation relationship, against the alternative hypothesis that there is correlation relationship in the GDP and net position development.

For the testing of this null hypothesis there will be used the following test criterion.

$$T = \frac{r}{\sqrt{1-r^2}} * \sqrt{n-2} \qquad (2)$$

Assuming validity of null hypothesis, the test criterion will have the Student probability distribution with n – 2 degrees of freedom. The critical value of this distribution on the level of significance α = 0.05 with 11 degrees of freedom (analysed data since 2000 until 2012) is 2.2010. The null hypothesis about no correlation relationship will be valid, when the value of test criterion falls into the acceptable value area, in this case value lower than above mentioned 2.2010 (Linda, Kubanová 2000). The results of selective correlation coefficient are in the Table 3.

According to these results, the null hypothesis about no existence of correlation between the GDP per capita and net position per capita development will be valid in Greek, Portugal, Malta and Slovenia. The null hypothesis will be denied and the alternative hypothesis that there is some correlation relationship between GDP per capita and net position per capita will be valid in Luxembourg, Czech Republic, Estonia, Latvia, Lithuania, Hungary, Poland, Slovakia, Bulgaria, and Romania.

The countries, where the null hypothesis was valid, have different share of net position on GDP (see Table 2, Greek 2.34, Portugal 3.05, Malta 1.07 and Slovenia 1.51). Therefore, it is not possible to make a conclusion, that in the countries, where this share is quite high, there is a relationship in GDP per capita and net position per capita development. Moreover, the shares in countries, where the null hypothesis is denied, are different as well. For example, in Romania is the selective correlation coefficient higher than 5, but the share is only 1.5 that means lower than in Greek or Portugal.

Tab. 3: The Results of Selective Correlation Coefficient

State	Result	Acceptance
Greek	0.955009496	2.2010
Luxembourg	5.492982021	2.2010
Portugal	0.71801003	2.2010
Czech Republic	4.176891855	2.2010
Estonia	3.332266084	2.2010
Latvia	6.026177239	2.2010
Lithuania	6.800727981	2.2010
Hungary	2.950980121	2.2010
Malta	1.270585785	2.2010
Poland	7.093545751	2.2010
Slovenia	2.134054623	2.2010
Slovakia	6.28769039	2.2010
Bulgaria	6.020134943	2.2010
Romania	5.450490683	2.2010

Source: Own calculations.

It is also not possible to make a conclusion that the relationship exists only in the not developed countries, because of the Luxembourg. Luxembourg belongs to the developed countries, but according to the correlation coefficient there is a relationship, while at least Malta and Slovenia belong to the not developed countries, and according to the results there is no correlation in these countries.

The point of view of old and new member states is also not working. Greek and Portugal are old member states of EU, while the Malta and Slovenia are new ones. On the other hand, Luxembourg is old member state, while the other countries are new ones. In this case is Luxembourg the only exception. Therefore it is possible to make a conclusion that in almost all new member states (which have been analysed) exist some relationship in the development of net position and GDP per capita. This development is usually connected with the high share of net position on GDP. It could be explained in such way, that the position of net recipient is helping to improve economic situation in these countries.

4. Points for Discussion

This analysis is of course not the perfect one. There are some points, which could be criticized. First of all, some of analysed countries have been paying con-

tributions into the common EU budget since 2004 or 2007, when they became members of EU. Therefore the net position as a difference between expenditures and revenues could be calculated since 2004 or 2007. On the other hand, all of these countries used some kind of aid from European sources before the entrance into EU, therefore there were some positive net positions in the period 2000–2003 (resp. 2000–2006), but it was not the difference between the expenditure and revenues. Nevertheless, it is possible to use the data from the period 2000–2012 for this analysis. The length of analysed period could be another criticized point, but there was almost no aid from EU budget before the year 2000 for the new member states.

The other possible criticized point could be the selection of selective correlation coefficient. The reason for application of this coefficient was its simplicity. There could be of course chosen other statistical tool, but this one is quite simple and it could verify the hypothesis about existence of correlation due to simple calculation.

The other possible point for discussion could be the share of net position on GDP. Is 1% significant share or not? According to the results of correlation coefficient, all analysed countries with some relationship have this share higher than 1.49%.

The other problem is the time-lag of effects of net position on GDP development. There is probably some time-lag, but it is not possible to determine how long this lag is. Therefore the author did not calculate this time-lag in above mentioned verification and there were used the data from the same years for statistical verification.

Another important point is connected with the position of Belgium and Luxembourg. These countries have significant results in the share of net position on GDP (around 0.5% for Belgium and around 3% for Luxembourg) while both countries could be considered as economically developed countries. However, the data for these countries are distorted, because the revenues from the EU administration (sources for the EU institutions) are included into the values of these two countries. The European Commision, however, does not take into account these administrative payments during the calculation of net position.

In broader context, it is quite obvious that the payments from the EU have direct impact on the GDP in the short-time period, especially due to the higher consumption and higher government investments. Therefore the support from EU in one year will probably improve the position of GDP (and possibly the payments into the EU budget too) in the following years. However, the analysis of the GDP development without the EU support is almost impossible. It is very difficult to determine how big part of government investments or which part of consumption has been made only because of the EU support. In theoretical point of view, extrapolation of GDP development before the support from EU could

be done; however, such extrapolation will be probably statistically meaningless because of the long period of time of EU support.

There could be found also other problems. The decision making process about the utilization of resources is more political than economical. In some countries, there are problems connected to drawing EU resources from Structural Funds. Questionable is also the future development of EU, especially decisions connected to Fiscal pact, or the future development of Eurozone. However, these problems are generally and not connected directly with this article.

Conclusion

This article deals with the issue of European Union budget. This topic is very important for the Czech Republic, because the Czech Republic is a member state since 2004 and a net recipient for a whole period. It is obvious, that membership in European Union is useful for the Czech Republic among other things because it receives more resources from European Union than it provides into European Union, as well as other net recipients.

It is also obvious that resources from European Union helped to overcome economic crisis (e. g. in the case of Baltic countries) or at least reduce impacts of the crisis in the countries, where this crisis has been very strong (e. g. Greece, Malta, or Portugal). Nevertheless, the resources from EU could be used for the restarting of economic growth. Of course, economic crisis can have an impact also on the development of net position, because one of the symptoms of the economic crisis is decrease of the GDP, and because of this reduction the payments into the European budget could decrease as well. This analysis could be done in more complicated way, but the author decided to make only short and relatively simple analysis for verification of basic correlation in this article.

The above mentioned results are showing that there is a correlation relationship between the development of GDP per capita and the development of net position per capita in ten analysed countries, where there is no correlation relationship in four countries. The correlation relationship exists in those countries, where the share of net position per capita on GDP per capita is higher than 1.49 %. This conclusion only supports the importance of EU budget for analysed countries.

In the view of lingering economic crisis, problems of euro in some countries, and of course upcoming new period 2014–2020, it should be good idea to pay attention on European Union budget. These resources from European Union could be used in Czech Republic, as well as in other member states, which are net recipients, for restarting of economic growth.

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Summary:

The Comparison of Net Budgetary Position Development and GDP Development for Selected Net Recipients of the European Union

The topic of European Union budget is very important for each member state, especially nowadays because of recessive economic crisis and on-going crisis of euro zone. This article analyses not only development of net position for selected countries of EU, but also compares the net position development with the GDP development. The level of GDP should be one of the most important indicators for calculation of contributions for each member state, but because of many exceptions and very complicated mechanism its influence could be low. The aim of this paper is to verify the hypothesis that there is some correlation between the development of net position per capita and the development of GDP per capita for selected net recipients of EU. For verification of this hypothesis is used especially selective correlation coefficient.

Keywords:
Budget, European Union, Expenditure, Net Position, Revenues, Selective Correlation Coefficient

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