The significance of fiscal space in Europe's response to the crisis

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The textbook response to deteriorating economic performance is monetary easing, the lowering of official interest rates. When the financial and economic crises hit Europe in 2008, however, monetary policy had very little room in most European countries, as the central bank interest rates were already pretty low. Fiscal policy instruments had to be used therefore, a branch of economic policy that was believed to be dated by many mainstream economists.

In contrast to their interest rate conditions, the European countries formed a quite heterogeneous group in regard to their fiscal space: some had more because of balanced budgets and relatively low national debt ratios; others had a lot less. The paper analyses the responses given by 30 European countries to the crisis, and combines the effects with the pre-2008 fiscal characteristics. It identifies some clusters based on their performance and on their major fiscal indicators before and after the crisis.

1. Introduction

According to Eurostat data, the combined real GDP of the EU27 fell by 4.3% in 2009 – the biggest drop in the performance of the European economies since the Great Depression (European Comission, 2009). Although a minor decline in the Western European real GDP could be detected in 1993, Europe's economy fit in nicely with the idea of 'Great Moderation', a concept suggesting that the necessary economic policy instruments were finally found in order to help the advanced economies avoid major variability of output and of inflation. The era of Great Moderation brought us the shift from fiscal policy to monetary policy, and focused the attention of policymakers on inflation (as the main message of the mainstream theory was that the highest long term growth rate can be achieved by ensuring a stable rate of inflation).

When the crisis struck, however, the monetary policy focus could not be maintained, partly because of the liquidity trap, partly because of some other factors. The liquidity trap restricts the scope of monetary policy expansions when the pre-crisis interest rate is already low, like it was in most parts of Europe and America (the European Central Bank's interest rate on the main refinancing operations, for example, was around 4% in the beginning of 2008). In case of an adverse shock the textbook expansionist answer is a decrease of the interest rates, but because the nominal rate cannot go below 0, central banks across the world had little room for action, and so the steps taken by them could not be effective enough.

Hence the practice and analysis of fiscal policy has come to the forefront of attention again. In line with these developments, the paper sets the fiscal answers of the European countries against their economic performance during 2009-2010, and attempts to test the hypothesis that countries with more fiscal space can perform better at handling the crisis.

2. Fiscal space

After the Second World War fiscal policy had been seen as the central macroeconomic tool. Stagflation problems of the '70s slowly shifted the focus to monetary policy, and a number of reasons were listed why fiscal policy cannot be effective: its effect on aggregate demand was questioned based on the Ricardian equivalence; high debt levels made it difficult to further expand government intervention; as fiscal policy decisions are made by politicians, there can be a distinctive lag between the design and the implementation of the tools, and lobby groups can distort the decisions (Blanchard et al., 2010).

2008 on the other hand saw a steep fall in aggregate demand, and the two macroeconomic policies used during the previous two decades to stabilize the economy proved to be insufficient. As the crisis struck worldwide, an export-led recovery strategy was not an option; and monetary expansion, because of the liquidity trap mentioned earlier, had also had limited effect (Spilimbergo et al., 2008). European governments therefore turned to the textbook Keynesian theory: they implemented fiscal stimulus plans that were meant to prop up aggregate demand. The two basic elements of such stimulus plans are the increase of government purchases, and the decrease of government revenues (tax cuts). Either method is used, an increase in the budget deficit is unavoidable, and greater deficits also lead to higher public debt.

Countries that face high levels of public debt are very limited in their possibilities to use fiscal stimulus. High public debt leads to high interest payments, so much of the money that could be used for stimulating demand has to be paid to the creditors. The efficiency of fiscal policy is also limited therefore. Just as the zero bound on the nominal interest rate leads to liquidity trap and a failure of monetary policy, high debt leads to very narrow fiscal space and a failure of fiscal policy.

The crisis gives the opportunity to test the concept of fiscal space. The European countries started 2008 with quite different government debt levels and budget balances. The two indicators used to characterize the fiscal space of the 30 European economies (the EU27 and three EFTA members: Iceland, Norway and Switzerland) are the following:

- general government gross debt, percent of GDP, 2008;
- net government lending/borrowing, percent of GDP, 2008.

Figure 1 clearly demonstrates the differences in fiscal space in Europe. Countries like Luxembourg, Bulgaria or Sweden, with budget surpluses and low levels of public debt naturally had more room for fiscal stimulus, while countries like Hungary, Portugal or Greece were clearly in trouble. The question is, have this difference in fiscal space had any effect on these countries economic performance in the years after 2008?

Figure 1: Fiscal space of 30 European countries

■ General government gross debt, Percent of GDP, 2008

■ Net government lending/borrowing as percentage of GDP, 2008
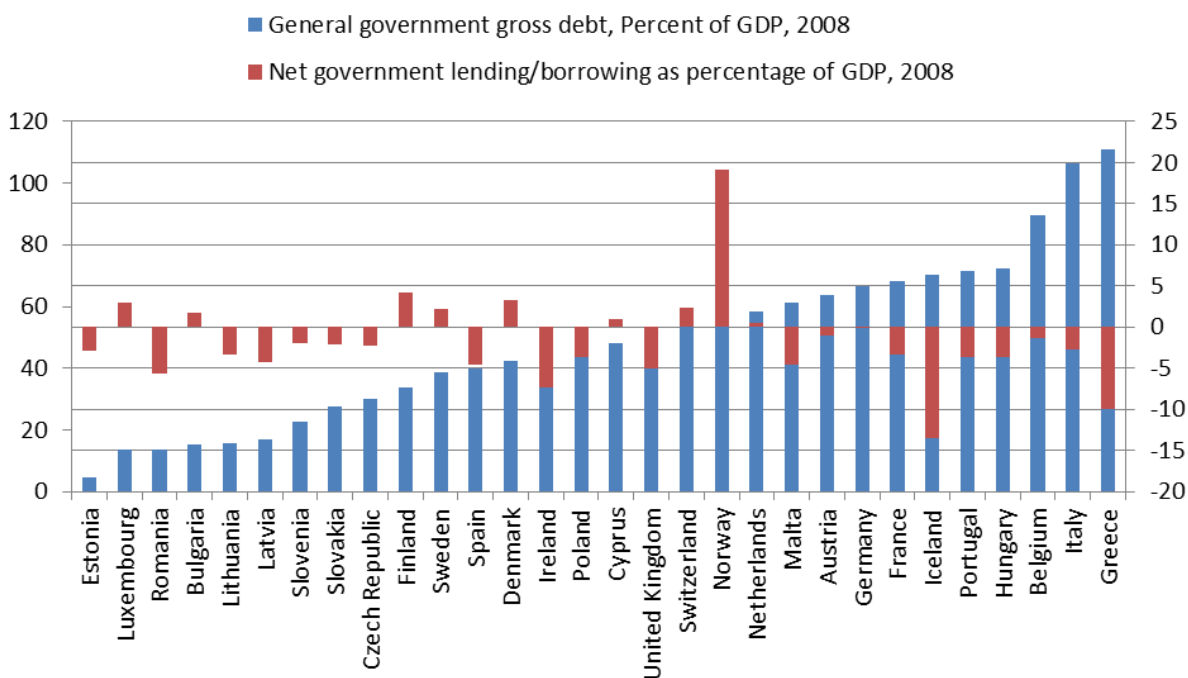
Source: Eurostat and IMF data.

3. Measuring economic performance

Our hypothesis to be tested in this paper is that the European countries with more fiscal space could implement more efficient fiscal stimulus plans, and therefore were able to perform better in the years after 2008. The performance of the countries traditionally is measured with changes in GDP and employment, and that is what we used as well, namely the change in the real GDP growth rate and the change in the unemployment rate (although in most analysis the former was used as the primary indicator, because of the lagging nature of the unemployment rate).

Figure 2 shows the variety of reactions the European economies had after the crisis. There were four countries where the unemployment rate even dropped (the decrease was almost 7 percentage points in Poland), a most surprising development given the circumstances. Poland was the front runner in real GDP growth, too (the only country in the sample that had a positive change in real GDP in 2009), although there were a few other countries with minor growth rates. The Baltic countries or Ireland, on the other hand, took quite a bit of hammering after 2008.

Figure 2: Post-crisis performance of European economies
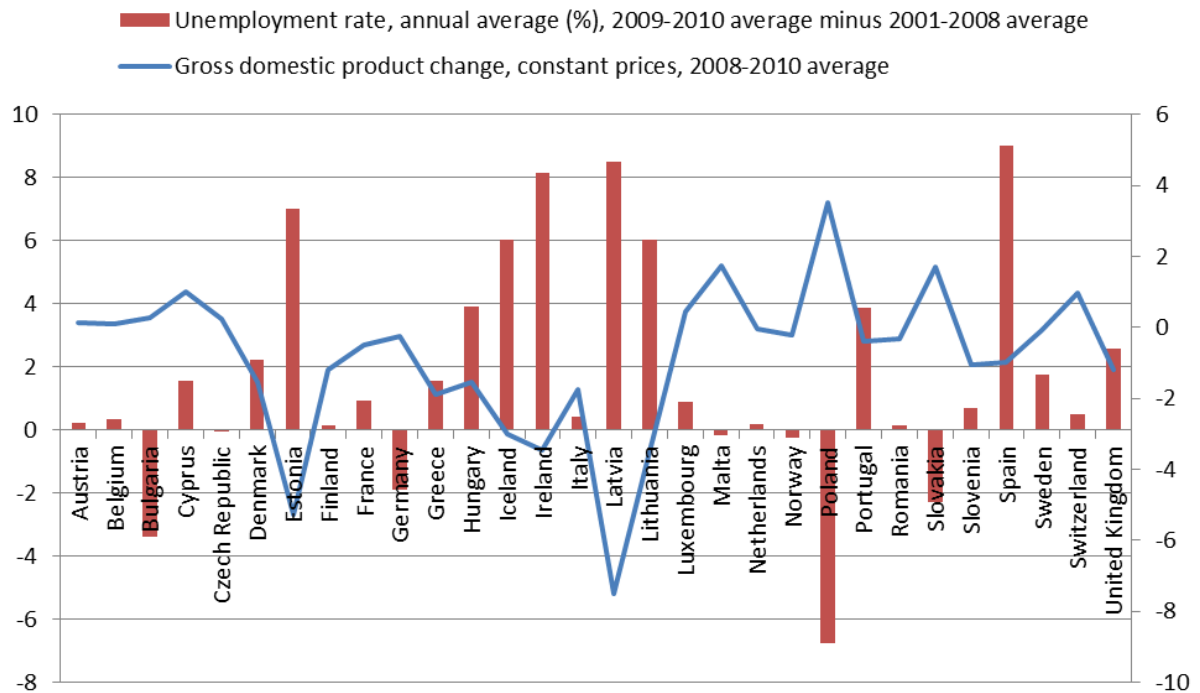
Source: Eurostat and IMF data.

4. Fiscal stimulus in Europe

Assessing the fiscal expansion activity of the European countries is quite difficult as only raw and aggregated data are available for the 30-country sample. We can take a look at the central budget deficit, but as our indicator compares the net government lending/borrowing position to the GDP, changes in the GDP will automatically distort the value of the indicator. Nevertheless it is obvious that most countries ran a higher deficit after the crisis than before it (see Figure 3). The three exceptions are Switzerland that had a more or less balanced budget both before and after the crisis, Malta that had an Excessive Deficit Procedure running, initiated by the EU, and Hungary that had to cut the deficit because of the agreement it made with the IMF and the EU in late 2008.

Figure 3: Changes in budget balance and GDP growth rate
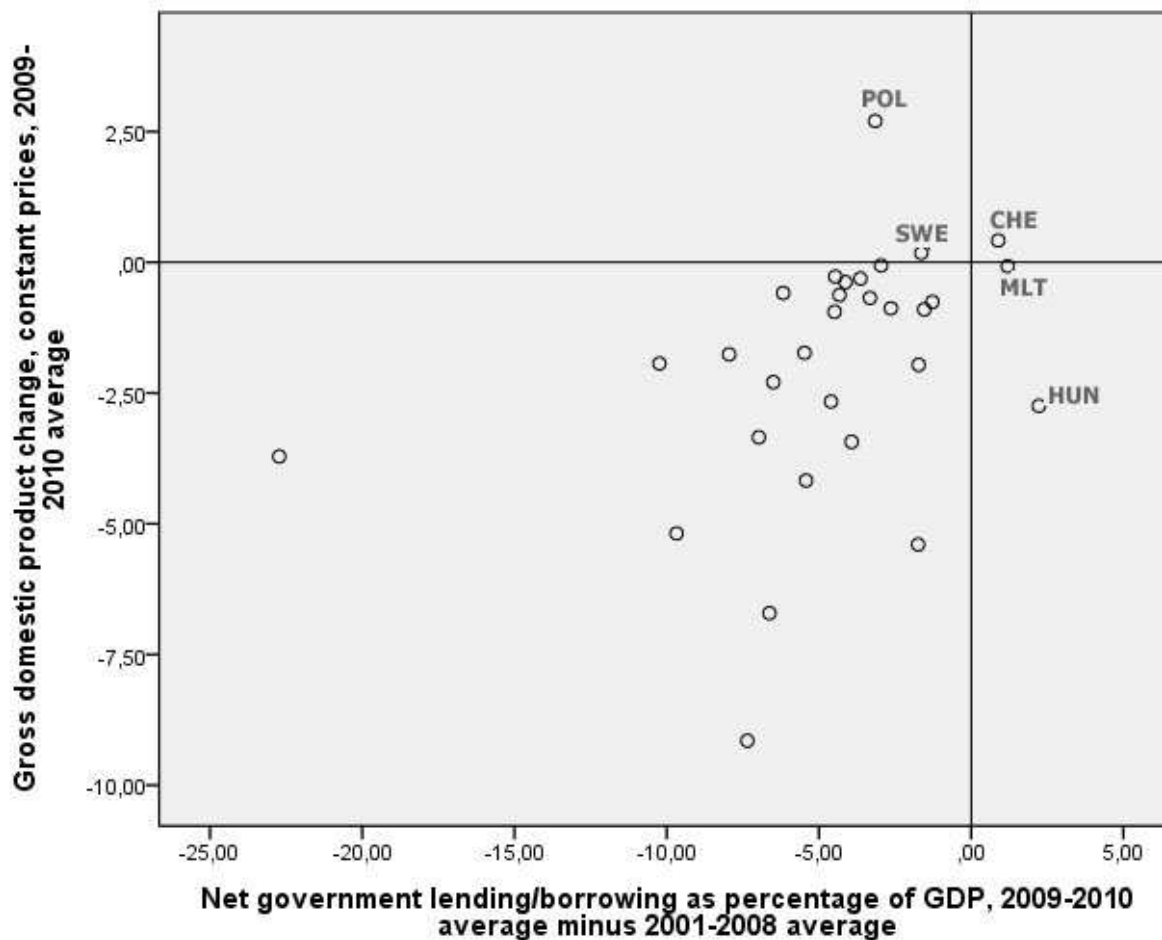
Source: Own calculations based on Eurostat and IMF data.

If we measure the change of budget deficit in national currency, a very similar picture can be drawn, although there are some significant changes. Malta, again, is on the right side of the line, but the other two countries that join them are Estonia and Latvia. The two Baltic countries raised taxes almost immediately after the crisis struck, which resulted in 1) a more or less stable deficit if measured in national currency; 2) a massive decline in demand, and in GDP; and 3) a significant increase in budget deficit compared to the GDP.

Either way, we can conclude that most European countries tried to stimulate their economies with the tools of fiscal policy (be it an automatic tool, like progressive income taxes or unemployment benefits, or a discretionary one, like the scrappage programs or tax cuts). A direct result of the stimulus programs was the increase in budget deficits and public debts, but economic growth was not stimulated. 27 countries registered a drop in their GDP after 2008, Sweden and Switzerland had insignificant increases (an annual growth rate well below 1%), while Poland miraculously enjoyed a healthy rate of GDP growth.

Figure 3 also proves that the path taken by the European economies after the crisis was not unanimous. There is a variety of explanations on the heterogeneous reactions; some of them can be tested on the database that was available for us, some others cannot. The paper discusses some of these explanations, and specifically focuses on fiscal space, as one of the possible explanations.

Table 1: An intuitive classification

Groups	Countries	GDP change, const. prices, 2009-10 av. minus 2001-08 av. (mean)	Net gov. lend./bor., % of GDP, 2008 (mean)	General gov. gross debt, % of GDP, 2008 (mean)	General gov. lend./bor., Nat. currency, 2010/2008 (mean)	Imports of goods & commercial services, % of GDP, 2007 (mean)
Group 1	Belgium France Germany Poland Portugal Switzerland	-1.83	-1.63	66.29	-6.16	50.38
Group 2	Denmark Italy Malta Netherlands Norway Sweden	-2.71	2.97	60.60	-2.83	50.54
Group 3	Austria Cyprus Cz. Rep. Luxemb. Spain UK	-4.19	-1.47	41.25	-2.52	62.46
Group 4	Finland Greece Hungary Ireland Slovakia Slovenia	-6.72	-3.45	51.94	-4.13	64.66
Group 5	Bulgaria Estonia Iceland Latvia Lithuania Romania	-11.82	-4.65	22.77	-1.96	65.66

Source: Own calculations based on Eurostat and IMF data.

5. Groups of European economies

Using the SPSS 19.0 software package, an attempt was made to identify possible clusters of European economies based on the pre-crisis fiscal space and post-crisis economic performance. The attempt failed, as it became apparent that there are way too many influencing factors that distort the results. To identify some of these factors, an intuitive grouping of countries was done in the following way:

1. All 30 countries were arranged in rank order based on their GDP growth first (the indicator used: *Gross domestic product change, constant prices, 2009-2010 average minus 2001-2008 average*; this one shows the rate at which economic conditions have deteriorated compared to the pre-crisis levels).
2. Then the countries were sorted into five groups consisting of six members each. Group 1 contains the countries that had the least drop in the GDP growth rate, and Group 5 contains the ones that suffered the most (see Table 1).

Columns 4 and 5 of Table 1 contain the group averages for the two indicators that were chosen to measure the fiscal space. The values for net government lending/borrowing position might back our hypothesis, as higher ranked groups have a larger average, than the lower ranked ones. However they are not very convincing and they become even less so, if we control for a couple of extreme scores. Group 2, for example, would have an average of -0.26%, if Norway's huge surplus of 19.1% (a result of channeling oil revenues into a sovereign wealth fund) was disregarded. Group 5 on the other hand, would have an average of -2.88% which is not very different from the average of all the other groups, if Iceland's -13.5% deficit (a result of the fact that the crisis hit Iceland the earliest in Europe) was disregarded. The correlation between the budget balance and the change in the GDP growth rate is significant at a significance level of 0.06 and with a correlation coefficient of 0.348, which indicates a weaker than modest connection between fiscal space and economic per-formance.

If we called the averages of the previous indicator not convincing, then the indicator for public debt downright contradicts our hypothesis. Countries with lower levels of public debt, thus more fiscal space should perform better, but column 5 of Table 1 shows that Group 5 has by far the lowest public debt level, while Group 1 has the highest one.

Table 1 also includes some data that might explain why our initial hypothesis is not backed by the group averages for net government lending/borrowing and public debt (both as percentages of the GDP). Column 6 shows the change in government lending/borrowing position between 2008 and 2010, measured in the national currency of the countries. In case of aggregate shocks it is natural for this indicator to become worse, turning surpluses into deficits, or moderate deficits into larger ones, partly because of the automatic stabilizers, and partly because discretionary steps taken to boost the aggregate demand. There is a significant difference however between the group averages: Group 1 members worsened their budget balances six times on average, while Group 5 members only doubled it.

One of the reasons why the effects of fiscal space cannot be shown robustly is the institutional environment in Europe. Estonia, for example, has an operative balanced-budget amendment, as a result of which the country turned a minor deficit from 2008 into a slight surplus in 2010.

The other factor brought to explain the discrepancy between fiscal space and GDP growth is the openness of the economy (see the final column of Table 1). Open economies have a lower multiplier (be it a tax multiplier or a government purchases multiplier), because some of the extra money pumped into the economy will end up in the pockets of foreigners (stimulating the foreign and not the

local economy). Therefore it is less rewarding for an open economy to adopt fiscal stimulus at the price of huge budget deficits. So the other factor distorting the effects of fiscal space is the openness of the economy, which is measured as the ratio of imports to the GDP.

Principal component analysis is a tool that allows us to control for the deviations caused by different budget balances and openness levels in the effect of public debt ratios on GDP growth rate changes. It merges the effects of the three factors to be found in column 4, 6 and 7 of Table 1 into one single data stream. Figure 4 presents the correlation between the merged indicator and the indicator chosen to measure the post-crisis economic performance. The correlation is significant (with a significance level 0.014, which is way under the usually accepted 5% mark), so there is a link between the three factors and the GDP growth rate, but it's a medium to week one, the correlation coefficient has a value of -0.446.

Figure 4: GDP growth and fiscal space when public debt is controlled for openness and budget balance
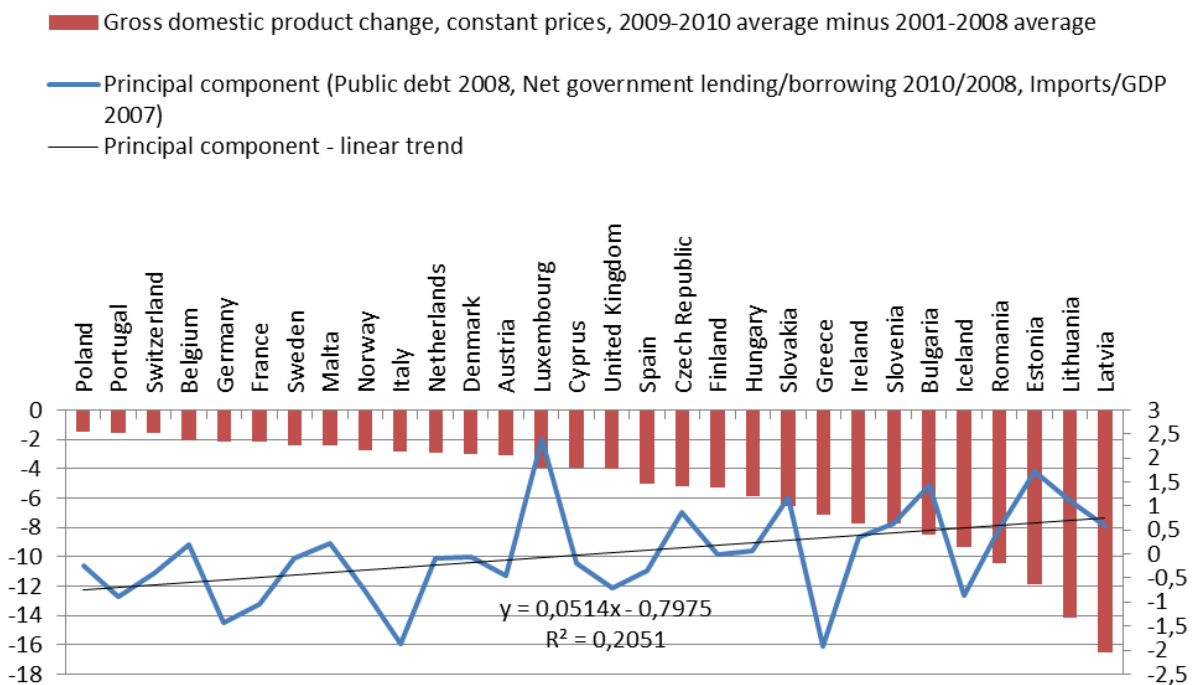
Source: Own calculations based on Eurostat and IMF data.

By calculating the principal component of the public debt per GDP, net government lending/borrowing position change and value of import per GDP, some evidence (be it a not really convincing one) was found to the assumed interaction between fiscal space and economic performance. As the correlation is negative, it is no longer true that a higher debt ratio, thus less fiscal space leads to a lesser drop in the GDP growth rate. Quite the contrary, when debt is controlled for the openness of the economy, and for some institutional factors that do not allow the government to overspend even if the public debt level is very low, it was found that bigger fiscal space actually results in a lower drop of GDP growth rates.

6. Eliminating outliers

To check if the results are distorted by the data values of some of the outlier countries, the correlation between the performance indicator (change in the GDP growth rate) and the fiscal space indicators (budget balance and government debt compared to the GDP) was recalculated after eliminating some

outliers. The elimination was based on the cluster analysis conducted earlier (clustering the European countries with the help of economic performance and fiscal space variables). The countries that fit the least into the European clusters were Belgium, Luxembourg, Iceland and Norway. After removing these four countries from the database, the correlation was tested again, but no stronger evidence was found to back our hypothesis:

- the correlation between the government debt and the GDP growth rate remained positive, more than that, the correlation coefficient even increased (again: the hypothesis would be backed by a negative correlation between the two variables);
- the correlation between the central budget balance and the GDP growth rate on the other hand became only significant at the significance level of 0.1 (an increase from 0.06, which might be a result of the smaller sample size), making the weaker than modest correlation even less convincing.

7. Main influencing factors of GDP change

As it became clear that the fiscal space doesn't explain the post-crisis performance of the European economies in a convincing way, an attempt was made to identify the main factors that contributed to the change of the two indicators chosen to measure economic performance. Two regression models were built with the two indicators as the dependent variable, and using stepwise regression all independent variables were eliminated that didn't have significant explanatory power (Table 2 and 3). From the two models the second one has more explanatory power.

Table 2: Regression model for the unemployment rate

Independent variable	Unstandardized coefficient	Zero-order correlation	Partial correlation
(Constant)	.778		
General government revenue, National currency, 2010/2008	-25.809	-.445	-.466
Net government lending/borrowing as percentage of GDP, 2008	-.219	-.348	-.377

Source: Own calculations based on Eurostat and IMF data.

Table 2 shows the details of the regression model built with having the indicator *Unemployment rate, annual average (%), 2009-2010 average minus 2001-2008 average* as the dependent variable. The dependent variable measures the effects of the crisis on the unemployment rate, by comparing the usual rate to the level that was observed after 2008. Two factors were found to be in significant correlation with the dependent variable, although both the zero-order and the partial correlation coefficients only show a lower than average linkage. According to the model an increase in government revenues (basically: raising taxes) allows the country to survive the crisis with a less vivid increase in the unemployment rate (as the government revenue variable is part of the second model as well, we will shortly get back to this topic).

The change in unemployment rate is also in a significant negative correlation with the 2008 net government lending/borrowing position, although the correlation coefficient is quite low (another sign of a correlation between fiscal space and economic performance).

Table 3: Regression model for the GDP change

Independent variable	Unstandardized coefficient	Zero-order correlation	Partial correlation
(Constant)	-3.013		
General government revenue, National currency, 2010/2008	22.404	.608	.498
Volume of exports of goods and services, percent change, 2009-2011 average	-.497	-.321	-.625
Total investment, percent of GDP, 2011 minus 2008	.501	.605	.617
General government total expenditure, National currency, 2010/2008	16.171	.469	.614

Source: Own calculations based on Eurostat and IMF data.

Using the *Gross domestic product change, constant prices, 2009-2010 average minus 2001-2008 average* factor as the dependent variable, a more manageable model can be built. Again, the indicator measures the effect of the crisis on the growth rate, by comparing the rate of growth that was usual for the economy before the crisis to that one observed after 2008. With four significant factors (government revenue and expenditure, changes in the volume of exports and investments) built into the model, the explanatory power of the independent variables is close to 79% ($R = 0,887$, $R^2 = 0,787$). Here are some of the conclusions that can be drawn from the regression model presented in Table 3:

- Countries that managed to keep the investment level relatively high could get through the crisis by having a lower drop in the GDP growth rate. After taking a look at the other significant variables, it can be stated that using government money to boost the investments proved to be an effective way of stimulating aggregate demand in Europe.
- Both the change in government expenditures and revenues (measured in national currency) are in significant positive correlation with the change in the GDP growth rate. So governments that spent extra money on the stimulus the economy, and raised revenues by raising taxes, could moderate the cooling down of the economy significantly. The data seem to prove that government expansion and a more influential role of the state in times of a crisis can actually decrease the burden taken by the society.

8. Tax cuts vs. government purchases

One of the never ending topics of fiscal stimulus is the opposition of arguments for tax cuts and for the increasing of government purchases. Both steps should have a boost on aggregate demand, as tax cuts increase the disposable income, and therefore households can consume more (companies can have

more money for investments), while government purchases directly increase the demand in the economy. There is no consensus in the literature on which of the two steps has a greater effect on the economy – a detailed analysis on the topic can be found in Auerbach and Gale (2009). Various multiplier effects can be calculated using a variety of economic models. Mankiw (2010) mentions that the fiscal stimulus plan adopted by the Obama administration was based on calculations stating that the government purchases multiplier was 1.57 (every dollar spent will ultimately increase the GDP by 1.57 USD), while the tax multiplier only 0.99 (cutting 1 dollar in taxes increases the GDP by 99 cents).

Figure 5: Government revenues and GDP growth rate change
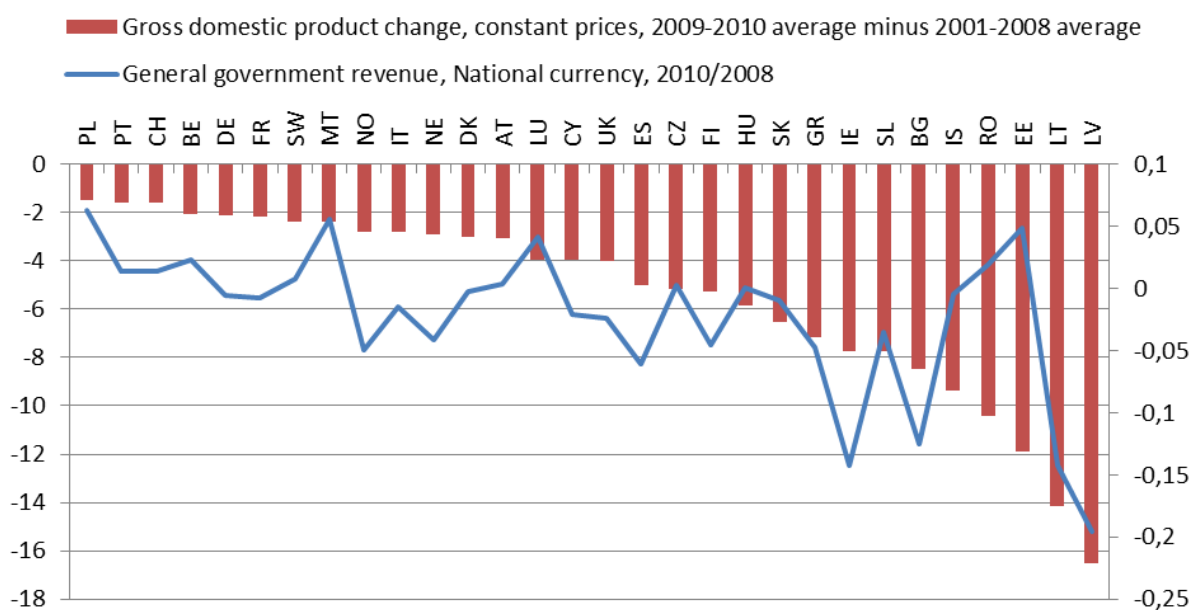
Source: Own calculations based on Eurostat and IMF data.

The debate on the multipliers is not a l'art pour l'art one, because with limited public resources the government should obviously concentrate on the method that can have the largest multiplier effect on the economy. Although multipliers cannot be calculated from the database we used, it is interesting to note that the change in public revenues has the strongest influence on the change in GDP growth rate, and the correlation is positive, i.e. the more revenues are raised, the less drop in the GDP growth rate is sustained (for a graphic presentation see Figure 5). In the tax cuts vs. government purchases debate this might be an argument for neglecting tax cuts in times of depression, and concentrating on stimulus plans that pump extra money from the central budget into the economy instead.

9. Conclusion

Strong and convincing evidence that proves the positive correlation between fiscal space and economic performance was not found. In fact the indicator *General government gross debt, percent of GDP, 2008*, which was chosen as the main indicator of fiscal space, is in positive correlation with *GDP change, constant prices, 2009-10 average. minus 2001-08 average*, the indicator of economic performance, meaning that the less fiscal space a country has, the less GDP growth rate drop it has to sustain. Our explanation to this finding was that at least a couple of factors can distort the results: institutional restraints, which could prevent governments spending over the revenues even if the country has a huge fiscal space; and economic openness, because fiscal stimulation is less efficient in a very open economy, and that might motivate governments of open economies to restrain themselves

from fiscal stimulus. When the public debt indicator is controlled for these two factors with principal component analysis, a negative correlation is found, which is in slight support of our initial hypothesis.

As fiscal space does not explain convincingly the differences in economic performance after the crisis, the most important determining factors were identified with the help of regression models. It was found that the change in government revenues and expenditures (from 2008 to 2010, measured in national currency) have the strongest influence, together with the change in total investments (from 2008 to 2011, measured as percentage of the GDP). Apparently the governments that allocate more resources to investments, can effectively lower the drop in GDP growth.

Finally, the positive correlation between the change in government revenues and the change in the GDP growth rate, worth mentioning, too. According to the data of the 30 European countries in our sample (the EU27 plus the three major EFTA members), the more revenue is raised by the government in the time of crisis, the lesser drop there will be in the GDP growth rate. This may sound strange, as the increase in government revenues means a drop in the disposable income of households and companies. A possible explanation can be that the money spent on stimulus by the government boosts aggregated demand a lot more efficiently than money left in the pockets of the people. It is well known that the propensity to save of households increases during crises, because people become insecure about the future. When faced with uncertainty, people tend to save more and spend less, which might explain why the countries with increases in the government revenue performed better during 2008-2010.

Acknowledgement

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