

State-Owned Banks and Macroeconomic Performance:
Evidence from the 2008-2009 period.

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Abstract

We test whether economies with presence of State-Owned Banks in their banking systems were able to stand up better the turbulence from the 2007-2009 global financial crisis. By using data from 32 European countries we find that the presence of State-Owned Banks did help the economies. Countries with an important presence of public banks are associated with a higher growth rate of GDP, or lower drops in GDP growth, during the 2008-2009 period.

We also observe that both fiscal policy and monetary policy appear to have been effective in pushing up GDP growth. However, results indicate that monetary policy was effective only when it was aggressive. Besides, we find evidence that the presence of public banks made monetary policy less effective. This finding represents evidence in favor of the model of Andries and Billon (2010), who show that government ownership of banks reduces the effectiveness of monetary policy.

We thus conclude that the existence of State-Owned Banks was beneficial for the countries when confronting 2008-09 world financial crisis.

Keywords: *State-Owned Banks, Financial Crisis.*

JEL classification codes: G21; G28; E44; E65.

1.- INTRODUCTION

The answer to the question of whether should State-Owned Banks (SOB) exist has not been settled. Proponents of SOB argue that state involvement in the banking sector is beneficial for the economy because, among other reasons, SOB can: finance socially (but not privately) profitable projects, may increase banking competition by helping to correct market imperfections, and may facilitate the credit channel of monetary policy. Therefore, SOB would help the process of economic growth (see Gerschenkron, 1962, Myrdal, 1968).

On the other side, opponents of the involvement of the government in the financial sector claim that the benefits mentioned above may be instead generated by proper regulation of the market (increase competition), or by the use of subsidies (finance socially profitable projects). La Porta et al. (2002) find results consistent with the view that government ownership of banks tend to politicize the resource allocation process and reduces efficiency. Furthermore, they state that “SOB retard financial and economic development in poor countries”.

The subprime financial crisis that began in 2007 transformed in a world financial crisis by the second semester of 2008. Most central banks in the world responded by increasing credit lines to distressed banks and financial institutions. However, this inflow of funds did not reach the public. Ivashina and Scharfstein (2010) shows that during the fourth quarter of 2008 (peak of the crisis), new loans to large borrowers fell by 47 percent relative to the prior quarter, and 79 percent relative to the second quarter of 2007 (peak of the credit boom). They point out that “new lending for real investment (such as working capital and capital expenditures) fell by only 14% in the last quarter of 2008, but contracted nearly as much as new lending for restructuring (LBOs, M&As, share repurchases) relative to the peak of the credit boom”.

This credit crunch impacted the world economy. Indeed, most countries in the world fell into a recession. Most fiscal authorities responded with fiscal stimulus packages that complemented the ease in monetary policy pursued by most central banks around the world.

This crisis represents a unique laboratory experience to test whether the existence of SOB in an economy made a difference in its macroeconomic performance during the crisis period.

The objective of this study is to determine whether economies with state involvement in the banking sector better performance in terms of the growth rate of GDP and the volatility of it during the period 2008-2009.

The paper continues with a review of the relevant literature on state banking. Section 3 presents the methodology. Section 4 shows the data. Section 5 displays the results, and Section 6 concludes.

2.- LITERATURE REVIEW

The existence of SOB is usually supported by arguing that (i) SOB may help to increase competition in an otherwise less competitive market, (ii) SOB may finance socially profitable (but privately not lucrative) projects, and (iii) SOB may advance financial development by giving access to banking services to people living in isolated areas.

Regarding the first argument, Cremer et al. (1989) theoretically shows that given some parameter values, a state-owned firm can be used as an instrument to regulate an oligopolistic market. Furthermore, in cases where the market is characterized by tacit collusion, they state that “A state-owned firm could then be seen as a useful device for stimulating greater competition by

forcing the private firms to move from the point of tacit agreement to the Cournot-Nash equilibrium, thus raising total surplus.

However, at the empirical level the evidence is mixed. Molyneux and Forbes (1995) show that in Europe, SOB are more profitable than other banks. This is by no means indicative of SOB enhancing or decreasing competition as it could imply that SOB are more efficient than the rest, and this would enable them to charge lower rates, or that SOB are less efficient than others but are able to charge higher interest rates. Sapienza (2004) uses data Italian banks and companies borrowing from both private banks and SOB, finding that banks owned by the government charge lower interest rates than private counterparts, to firms with similar characteristics. Furthermore, SOB “mostly favor firms located in depressed areas and large firms”. However, the lending behavior of SOB is affected by local politics. Bichsel (2006) analyze the Swiss banking system and question where state-owned cantonal banks acted as competitors enhancers during the 1996-2002 period. They “do not find evidence that cantonal banks have a positive — from the borrower’s or lender’s point of view — effect on their competitors’ conduct, as those cantons where state-owned banks’ market share is relatively high do not benefit from relatively low interest rates on their mortgages”. Furthermore, SOB offered less favorable interest rates than their private counterparts. Micco et al. (2007) find that, “whereas public banks located in developing countries underperform their private counterparts in terms of profitability, non-performing loans and overhead costs, the performance of public and private banks located in industrial countries does not differ significantly”.

The second argument is grounded on the works of Stiglitz and Weiss (1981), and Greenwald and Stiglitz (1986), where the existence of market failures in credit markets imply that private banks fail in taking into account the social returns of projects. Thus the involvement of the government

in the banking industry is justified by arguing that SOB may take into accounts the externalities that private banks neglect. This is the usual argument given by politicians for the creation of SOB or state-financed credit lines.

The last reason given for the existence of SOB is that these institutions may open access to financial services to individuals in isolated areas. There is worldwide evidence that indeed, SOB do this. However, one should point out that a subsidy to private banks that serve isolated areas could work just as well.

Implicit in the abovementioned reasons is the hypothesis that the presence of the government in the banking sector through SOB helps the process of economic development and long-run growth. The empirical evidence is somehow at odds with this view. La Porta et al. (2002) use data from 92 countries and find that (i) The involvement of government in banking is large and pervasive around the world, (ii) government ownership is “larger in countries with low levels of per capita income, underdeveloped financial systems, interventionist and inefficient governments, and poor protection of property rights, (iii) countries with government ownership of banks are associated with slower subsequent financial development, and (iv) countries with government involvement in banking are associated with slower subsequent growth of per capita income and productivity. Levy-Yeyati et al. (2004) revisit the evidence of La Porta, adding new data and controlling for more variables and find similar results. Korner and Schnabel (2010) show that the findings of La Porta et al. (2002) are not general and depend upon the country’s stage of financial development, and on the quality of its institutions. For less developed countries, the findings of La Porta et al. hold, but in developed countries state-ownership of banks does not affect economic growth. Korner and Schnabel even find, in some econometric specifications, a positive effect on economic growth of state-ownership of banks.

Micco and Panizza (2006) use panel data for 119 countries for the 1995-2002 period, and find that the lending behavior of SOB is less responsive to macroeconomic shocks than their private counterparts. Thus, it seems that SOB may play a role in credit smoothing and therefore in business cycle smoothing.

3.- METHODOLOGY

The econometric specification is

$$PERFORM_i = \alpha + \beta_1 SOB_i + \beta_2 GOVSPENDING_i + \beta_3 OPENNESS_i + \beta_4 TAXBURDEN_i + \beta_5 FINREGULATION_i + \beta_6 LABOR_i + \beta_7 C3_i + \beta_8 FOREIGNB_i + \beta_9 MMR_i + \beta_{10} MMRSQ_i + \beta_{11} MMR_i \times SOB_i + U_i$$

where $PERFORM_i$ corresponds to the macroeconomic performance of country i during the 2008-09 crisis. We use two measures of macroeconomic performance, the growth rate of GDP during the period 2008:q2-2009:q4 ($GDPG$), and the standard deviation of the average quarterly growth rate of GDP during the same period ($STDEV_GDP$). SOB_i is the variable of interest and represents the existence of State-Owned Banks in country i . It is measured as the proportion of total assets in the banking system that is held by public-owned banks. We also use two alternative measures of government involvement in the banking system: $SOB_5\%$, and $SOB_15\%$, which are dummy variables taking the value of 1 when SOB is greater than 5-percent and 15-percent respectively. We control for the following variables: $GOVSPENDING_i$ represents the stand of fiscal policy during the period under analysis, and it is measured by the

growth rate of government spending during the 2008:q2-2009:q4 period.² *OPENNESS_i* measures the degree of trade openness of country *i*. *TAXBURDEN_i* measures the tax burden of country *i*. *FINREGULATION_i* stands for the level of financial regulation in the economy. *LABOR_i* measures the degree of labor freedom in country *i*. *C3_i* captures the degree of concentration in the banking system of country *i*. *FOREIGNB_i* is the sum of market shares of assets of foreign banks in country *i*. *MMR_i* represents the stand of monetary policy in country *i* during the period under analysis, and correspond to the percentage change in the Money Market Rate from 2008:q2 to 2009:q4. We use the absolute value of the change. *MMRSQ* corresponds to the square of *MMR*. The term *MMR_i × SOB_i* is aimed at capturing whether the existence of SOBs alter the effects of monetary policy. *U_i* is an error term.

4.- DATA

We collected data for 32 European countries (see table 3), which comes from different sources. Quarterly data for GDP and government expenditure for the period 2008:q2-2009:q4 come from EUROSTAT. Data for the variables *SOB*, *FOREIGNB*, and *C3* are for the year 2002, and were obtained from Micco et al. (2004). We believe that these three variables do not change significantly from 2002 to 2008. Data for the variables *OPENNESS*, *TAXBURDEN*, *FINREGULATION*, and *LABOR* come from the 2008 Economic Freedom Index published yearly by the Heritage Foundation and The Wall Street Journal. Data for the stand of monetary policy, *MMR*, come from OECD statistics with the exception of the observations for Bulgaria, Latvia,

² We also used the difference between the government spending over GDP during 2009 and the same ratio during 2008. Although the variable is not significant, the results are qualitatively the same. For space reasons we choose not to report them. Those tables are available upon request.

Lithuania, Romania, and Croatia which were obtained directly from their central banks web pages. Table 1 explains in more details the variables used in the estimations.

[INSERT TABLE 1 HERE]

Table 2 shows a summary of the data. We can observe that the sample average growth rate of GDP during the 2008:q2-2009:q4 period was -4.1% . While the worst performer in the sample (Iceland) grew -30.8% from the second quarter of 2008 to the fourth quarter of 2009, the best performer (Bulgaria) grew 12.3% during the same period. Figure 1 shows the growth rates for all countries.

The country with the higher proportion of bank assets controlled by SOBs was Romania with 39% . The average proportion of bank assets held by SOBs was 11% . Belgium, Latvia, Ireland, Spain, Lithuania, and England did not have public-owned banks in their banking system in 2002.

Government spending grew on average a 11.5% from the second quarter of 2008 to the last quarter of 2009. While Iceland contracted government spending by 28.7% , we saw the most expansive fiscal policy in Cyprus with an increase of government spending by 53% during the period the 2008:q2 to 2009:q4 period (see figure 2).

Another interesting figure is what the concentration measure, the $C3$ index, shows. The sample average is about 61% , which indicates that on average, the three biggest banks in each country control about 61% of the bank assets in the market. While Estonia shows the higher $C3$ concentration index with the three biggest banks controlling 98% of the asset's market share, Luxembourg has the lowest $C3$ index with the three biggest banks controlling about 25% of that market share.

Regarding the monetary stimulus we observed through the word during the crisis, the data shows an average decrease in the money market rate of 76%. The most expansive monetary policy during the period under analysis was observed in Switzerland with a drop of 97% in the money market rate. Croatia was the only country in the sample that did not change the rate (see figure 3).

5.- RESULTS

Table 4 presents the results of nine different specifications with the growth rate of GDP for the 2008:q2 to 2009:q4 period as the dependent variable. Columns 1, 2 and 3 show the estimation with three different forms for the interaction effect. Columns 4, 5, and 6 display the results when controlling for the growth rate of GDP during 2007 (GDPG_07). Columns 7,8, and 9 present the estimation when controlling for a proxy for uncertainty (STDEV_GDP). Since it could be argued that a key element of the 2008-2009 financial crisis was uncertainty, and that it may be the case that either fiscal or monetary policy may not have been effective because of the uncertainty on financial markets, it seems necessary to include a proxy to control for it. [INSERT TABLE 4 HERE]

The specifications in columns 1, 4, and 7 use SOB as the variable of interest. Estimations in columns 2, 5, and 8 use SOB_5% as the government involvement in banking variable, while the equations depicted in columns 3, 6, and 9 use SOB_15% as the variable of interest.³

³ Increasing the percentage to 20 or more percent reduces the numbers of 1s to zero in some cases. Thus, we only use SOB_5% and SOB_15%.

The results show that the existence of public banks is associated with better GDP performance during the crisis, as shown by positive and statistically significant coefficients associated to *SOB* and *SOB_15%* in all cases. However, the coefficient on *SOB_5%* is not statistically different from zero in all specifications where it is included. Furthermore, the inclusion of *SOB_5%* affects the explanatory power of the rest of the variables. One possible argument is that having public-owned banks is not enough to influence the economy in a significant way, what would be needed is for that (those) bank(s) to be an important player in the country's banking sector. This makes sense as a small public bank would not have the ability to influence in any meaningful way how banks compete, or be important enough to affect the passing through of monetary policy. Adding to this point, the results display a negative coefficient on the interaction between public banks and monetary policy, which is statistically significant except for *SOB_5%*. This indicates that the higher the change in the money market rate, the smaller the effect of SOBs in the economy. Presumably, the ability of SOBs to charge lower interest rates becomes less important when the central bank pursues a very expansive monetary policy because in that case all banks (not only SOBs) have the ability to do so. On the contrary, when central banks pursue tight monetary policies, the ability of SOBs to charge lower rates becomes relevant as the rest of the banks cannot do that, and thus having public-owned banks positively affects the economy.⁴ To give some idea of the magnitude of the effect, we obtain the marginal effect of SOBs on GDP growth as $\beta_1 + \beta_{11} \times MMR$, and using the estimated coefficients from specification 1 and the average decrease in the money market rate, it results in $0.846 - 0.785 \times 0.763 = 0.247$. This indicates that on average SOBs improved GDP performance by about 0.25 percentage points.

⁴ Among the reasons to justify why SOBs could eventually charge lower rates than private banks are that public banks may work with smaller spreads, and the marginal cost of funds could be lower due to the fact that it is usual for SOBs to manage the accounts of the government apparatus.

Concerning Fiscal Policy, the positive and statistically significant coefficients associated to the variable *GOVSPENDING*, suggest that the fiscal stimulus packages that most countries used during the crisis, may have fulfilled its objectives. The coefficients show that the higher the growth rate of government spending during the 2008-2009 period, the better the GDP performance of the economy.⁵

Regarding monetary policy, most of the specifications show monetary policy related in a quadratic manner with *GDPG*. The lineal coefficient is negative while the quadratic is positive. This would manifest that only countries with aggressive reductions in the money market rate were successful in improving GDP performance. The coefficient on the interaction term between the change in the money market rate and the weight of public banks in the banking system (*MMR*×*SOB*) is negative in all cases and significant at conventional levels in all specifications excepting those where *SOB_5%* is included.⁶ This would indicate that the higher the presence of public-owned banks in an economy, the lower the effect of monetary policy on GDP. Thus SOBs would deteriorate monetary policy's ability to influence the economy. This supports the work of Andries and Billon (2010) who develop a theoretical model with a representative bank whose ownership is shared between the private and public sector. Their main implication is that the larger the government's share in the bank ownership, the less the impact of monetary policy on the level of loan supply.

We can obtain the marginal effect of monetary policy (change in the money market rate) on GDP performance as $\hat{\beta}_9 + 2 \times \hat{\beta}_{10}MMR + \hat{\beta}_{11}SOB$. We can use the estimated coefficients and the

⁵ In other specifications not reported, we incorporated an interaction term between *GOVSPENDING* and *SOB*, and between *GOVSPENDING* and *MMR*. In none of the cases the coefficients associated to them were significant.

⁶ Remember that for estimation we use the absolute value of the reductions in the *MMR*. Since all the countries reduce the rate, with the exceptions of Croatia which maintained it, a negative coefficient means a negative effect of the reduction in the *MMR* on *GDPG*.

sample averages for *MMR* and *SOB* to obtain the average effect of a marginal reduction in the money market rate on the GDP growth rate as $-0.476 + 2 \times 0.617 \times 0.763 - 0.785 \times 0.113 = 0.377$. Thus, on average, a one-percent reduction in the money market rate increased GDP growth by 0.37 percentage points. Should that country not have *SOBs*, the increase in GDP growth would have been 0.466 percentage points.

With respect to foreign ownership of banks (*FOREIGNB*) the results display a positive, albeit not significant in all specifications, effect. It may be an indication that by being able to acquire funds from outside, foreign banks were capable of better sorting the financial crisis. It should be noted that foreign banks were in principle a source of contagion from big economies, but it seems that the former effect dominated the latter.

Another variable that is statistically significant in the most specifications is *LABOR*, which captures labor freedom in the country. Results indicate that countries with a more flexible labor market were able to better withstand the crisis, in terms of GDP growth, as the positive and significant coefficient manifests. This is what the textbook model would predict; an economy that is free to adjust its factors of production is better able to counteract exogenous shocks.

Surprisingly to us were the, not significant, coefficient estimates for the variables *OPENNESS*, *TAXBURDEN*, *FINREGULATION*, and *C3*.

It can be seen that controlling for the economy's 2007 growth rate of GDP does not qualitatively change the results even though the coefficient on the variable is non-significant. The statement remains true when controlling for the proxy for uncertainty.

Table 5 displays the results of using the standard deviation of the quarterly growth rate of GDP during the 2008-2009 period as the dependent variable. We wanted to know whether the

presence of SOBs could not only affect the mean of GDP growth, but also its volatility. As can be seen, most of the coefficients are not significantly different from zero. Thus it seems that SOBs were able to affect the first moment of GDP growth but not the second. [INSERT TABLE 5 HERE]

6.- CONCLUSIONS

The 2008-2009 financial crisis is a unique laboratory unit to test whether the presence of SOBs made any difference for the performance of a country's GDP during the crisis. By using data from 32 European countries we have found that (i) countries with presence of SOBs in their financial sector grew faster than those without them, (ii) fiscal stimulus packages put in place by most countries seems to have helped the economies GDP, (iii) countries with more flexible labor markets were able to better withstand the turbulences of the crisis, (iv) only aggressive monetary policy seem to have helped the performance of GDP, (v) monetary policy appears to be less effective the higher the presence of SOBs in the economy, (vi) the positive effects of SOBs are reduced in those countries with big reductions in the money market rate (vii) there is some evidence, but not conclusive, that the presence of foreign banks helped the economies to perform better during the 2008-2009 period, and (viii) SOB did not affect the volatility associated to the performance of GDP during that period.

Based on the findings above, we can conclude that at least regarding the financial crisis of 2008-2009, SOBs were beneficial for the economies.

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Table 1: Variables used in the study

Variable	Description and source
GDPG	Growth rate of GDP between the second quarter of 2008 and the last quarter of 2009. Constructed from Eurostat data.
STDEV_GDP	Standard deviation about the average quarterly growth rate of GDP during the 2008:q2-2009:q4 period. Constructed from Eurostat data.
SOB	Total assets held by public-banks over total assets in the banking system in each country in 2002. Obtained from Micco et al. (2004)
SOB_5%	Dummy variable that equals 1 when SOB is greater than 5%.
SOB_15%	Dummy variable that equals 1 when SOB is greater than 15%.
GOVSPENDING	Growth rate of government spending between the second quarter of 2008 and the last quarter of 2009. Constructed from Eurostat data.
OPENNESS	Index of <i>Trade Freedom</i> . The higher the index, the higher trade freedom in the country. It is taken from the 2008 <i>Index of Economic Freedom</i> published by the Heritage Foundations and the Wall Street Journal.
TAXBURDEN	Index of <i>Fiscal Freedom</i> . It measures a country's the tax burden. The higher the index the lower the tax burden. It is taken from the 2008 <i>Index of Economic Freedom</i> published by the Heritage Foundations and the Wall Street Journal.
FINREGULATION	Index of <i>Financial Freedom</i> . It considers the degree of regulation and intervention of the state on financial services, and the influence of the government over the credit allocation process. It is taken from the 2008 <i>Index of Economic Freedom</i> published by the Heritage Foundations and the Wall Street Journal.
LABOR	Index of Labor Freedom. It examines labor regulations that affect "the hiring and redundancy of workers and the rigidity of working hours". It is taken from the 2008 <i>Index of Economic Freedom</i> published by the Heritage Foundations and the Wall Street Journal.
C3	Share of the three largest banks over the total banking system. It is a concentration measure with data from 2002. It is taken from Micco et al. (2004).
FOREIGNB	Total assets help by foreign banks in the country over total banks assets in the country in 2002. It is taken from Micco et al. (2004).
MMR	Percentage change of the Money Market Rate in the country, between the second quarter of 2008 and the last quarter of 2009. It is obtained from OECD statistics and directly from the central banks for Bulgaria, Latvia, Lithuania, Romania, and Croatia.
MMRSQ	The square of Δ MMR

Table 2: Data Summary

Variable	Obs	Average	Standard Deviation	Mín	Máy
GDPG	32	-0.0411752	0.0903963	-0.3082685	0.1237442
STDEV_GDP	32	0.0891206	0.0625711	0.0322826	0.3096111
GDPG_07	32	0.1017075	0.0662208	-0.0022844	0.2818848
GOVSPENDING	32	0.1153843	0.1781766	-0.2879747	0.5314398
OPENNESS	32	85.4625	1.763748	81	87.6
TAXBURDEN	32	65.24375	14.53294	32.7	89.4
FINREGULATION	32	70.3125	13.3161	50	90
LABOR	32	62.44687	14.28952	39.5	100
C3	32	0.6058502	0.1978552	0.2489239	0.9830736
FOREIGNB	32	0.3475213	0.2798911	0.0170698	0.9131452
MMR	32	0.7628016	0.2507653	0	0.9725274
MMRSQ	32	0.6427845	0.2886194	0	0.9458096
SOB	32	0.1128813	0.1220027	0	0.3894902
SOB_5%	32	0.59375	0.4989909	0	1
SOB_15%	32	0.3125	0.4709291	0	1

Table 3: Countries used in the estimation

1. Austria	9. Finland	17. Latvia	25. Romania
2. Belgium	10. France	18. Lithuania	26. Slovakia
3. Bulgaria	11. Germany	19. Luxemburg	27. Slovenia
4. Check Republic	12. Greece	20. Malta	28. Spain
5. Croatia	13. Hungary	21. Netherlands	29. Sweden
6. Cyprus	14. Iceland	22. Norway	30. Switzerland
7. Denmark	15. Ireland	23. Poland	31. Turkey
8. Estonia	16. Italy	24. Portugal	32. United Kingdom

Table 4: OLS estimations
 Dependent variable: GDPG

Specification:	1	2	3	4	5	6	7	8	9
GOVSPENDING	0.1678 (0.026)**	0.2374 (0.018)**	0.2213 (0.002)***	0.1663 (0.039)**	0.2374 (0.022)**	0.2145 (0.005)***	0.1657 (0.033)**	0.2179 (0.021)**	0.2212 (0.003)***
OPENNESS	0.0059 (0.451)	0.0063 (0.419)	0.0051 (0.544)	0.0054 (0.525)	0.0063 (0.445)	0.0022 (0.792)	0.0059 (0.472)	0.0050 (0.524)	0.0051 (0.555)
TAXBURDEN	-0.0015 (0.127)	-0.0013 (0.211)	-0.0010 (0.222)	-0.0016 (0.204)	-0.0013 (0.248)	-0.0016 (0.178)	-0.0014 (0.234)	-0.0015 (0.215)	-0.0010 (0.316)
FINREGULATION	-0.0018 (0.167)	-0.0022 (0.052)*	-0.0008 (0.577)	-0.0018 (0.198)	-0.0022 (0.067)*	-0.0003 (0.844)	-0.0019 (0.172)	-0.0019 (0.063)*	-0.0009 (0.579)
LABOR	0.0020 (0.031)**	0.0026 (0.010)**	0.0016 (0.053)*	0.0020 (0.046)**	0.0026 (0.014)**	0.0013 (0.106)	0.0020 (0.036)**	0.0024 (0.010)***	0.0016 (0.056)*
C3	-0.0137 (0.803)	0.0100 (0.844)	-0.0132 (0.815)	-0.0155 (0.789)	0.0106 (0.864)	-0.0236 (0.657)	-0.0106 (0.856)	0.0164 (0.749)	-0.0123 (0.836)
FOREIGNB	0.0816 (0.034)**	0.0333 (0.424)	0.0440 (0.205)	0.0803 (0.041)**	0.0333 (0.445)	0.0379 (0.224)	0.0783 (0.073)*	0.0438 (0.323)	0.0426 (0.280)
ΔMMR	-0.4760 (0.000)***	-0.2117 (0.594)	-0.5879 (0.000)***	-0.4865 (0.000)***	-0.2058 (0.620)	-0.6327 (0.000)***	-0.4653 (0.001)***	-0.0894 (0.824)	-0.5850 (0.000)***
ΔMMRSQ	0.6166 (0.000)***	0.3529 (0.161)	0.6557 (0.000)***	0.6240 (0.000)***	0.3498 (0.195)	0.6880 (0.000)***	0.6008 (0.000)***	0.3605 (0.112)	0.6498 (0.000)***
SOB	0.8465 (0.000)***			0.8328 (0.000)***			0.8662 (0.000)***		
SOB_5%		0.1792 (0.219)			0.1817 (0.210)			0.2673 (0.148)	
SOB_15%			0.2176 (0.000)***			0.2090 (0.000)***			0.2184 (0.000)***
ΔMMR*SOB	-0.7853 (0.002)***			-0.7681 (0.004)***			-0.8103 (0.004)***		

Continuation Table 4

Δ MMR*SOB_5%	-0.1451 (0.390)				-0.1479 (0.393)			-0.2482 (0.249)	
Δ MMR*SOB_15%		-0.1827 (0.021)**				-0.1610 (0.041)**			-0.1835 (0.027)**
GDPG_07			0.0532 (0.867)	-0.0087 (0.983)	0.2229 (0.370)				
STDEV_GDP							-0.0860 (0.743)	0.2890 (0.414)	-0.0302 (0.890)
CONSTANT	-0.5560 (0.418)	-0.6544 (0.307)	-0.4814 (0.497)	-0.5047 (0.505)	-0.6631 (0.343)	-0.2251 (0.751)	-0.5475 (0.444)	-0.6712 (0.309)	-0.4792 (0.512)
Adjusted R ²	0.7840	0.7326	0.8027	0.7845	0.7326	0.8122	0.7854	0.7446	0.8029
Obs	32	32	32	32	32	32	32	32	32

Numbers in parenthesis are p-values. *, **, ***: significant at the 10%, 5%, and 1% respectively. Robust standard errors used in estimations.

Table 5: OLS estimations
 Dependent variable: STDEV_GDP

Specification:	1	2	3	4	5	6
GOVSPENDING	-0.0240 (0.663)	0.0675 (0.245)	-0.0014 (0.983)	-0.0149 (0.764)	0.0674 (0.257)	0.0076 (0.887)
OPENNESS	-0.0007 (0.889)	0.0045 (0.207)	-0.0001 (0.974)	0.0025 (0.564)	0.0043 (0.218)	0.0037 (0.401)
TAXBURDEN	0.0013 (0.211)	0.0008 (0.424)	0.0013 (0.179)	0.0020 (0.183)	0.0007 (0.584)	0.0020 (0.177)
FINREGULATION	-0.0005 (0.632)	-0.0009 (0.213)	-0.0004 (0.734)	-0.0008 (0.493)	-0.0009 (0.225)	-0.0011 (0.467)
LABOR	0.0002 (0.807)	0.0008 (0.430)	0.0003 (0.735)	0.0004 (0.657)	0.0008 (0.444)	0.0006 (0.550)
C3	0.0363 (0.539)	-0.0222 (0.549)	0.0301 (0.631)	0.0475 (0.423)	-0.0237 (0.544)	0.0439 (0.506)
FOREIGNB	-0.0389 (0.485)	-0.0364 (0.227)	-0.0467 (0.335)	-0.0307 (0.495)	-0.0365 (0.235)	-0.0385 (0.338)
ΔMMR	0.1245 (0.415)	-0.4230 (0.133)	0.0970 (0.577)	0.1879 (0.218)	-0.4374 (0.165)	0.1565 (0.407)
ΔMMRSQ	-0.1839 (0.265)	-0.0262 (0.876)	-0.1957 (0.260)	-0.2288 (0.173)	-0.0184 (0.921)	-0.2385 (0.190)
SOB	0.2292 (0.465)			0.3126 (0.241)		
SOB_5%		-0.3049 (0.018)**			-0.3111 (0.024)**	
SOB_15%			0.0259 (0.753)			0.0373 (0.619)
ΔMMR*SOB	-0.2912 (0.412)			-0.3956 (0.215)		
ΔMMR*SOB_5%		0.3568 (0.022)**			0.3638 (0.026)**	
ΔMMR*SOB_15%			-0.0272 (0.797)			-0.0561 (0.591)
GDPG_07				-0.3233 (0.270)	0.0217 (0.907)	-0.2965 (0.350)
CONSTANT	0.0986 (0.810)	0.0581 (0.818)	0.0704 (0.851)	-0.2136 (0.585)	0.0799 (0.774)	-0.2704 (0.479)
Adjusted R ²	0.5811	0.6997	0.5699	0.6239	0.6998	0.6049
Obs	32	32	32	32	32	32

Numbers in parenthesis are p-values. *, **, ***: significant at the 10%, 5%, and 1% respectively. Robust standard errors used in estimations.

Figure 1: Growth rate of GDP during the period 2008:q2 -2009:q4.

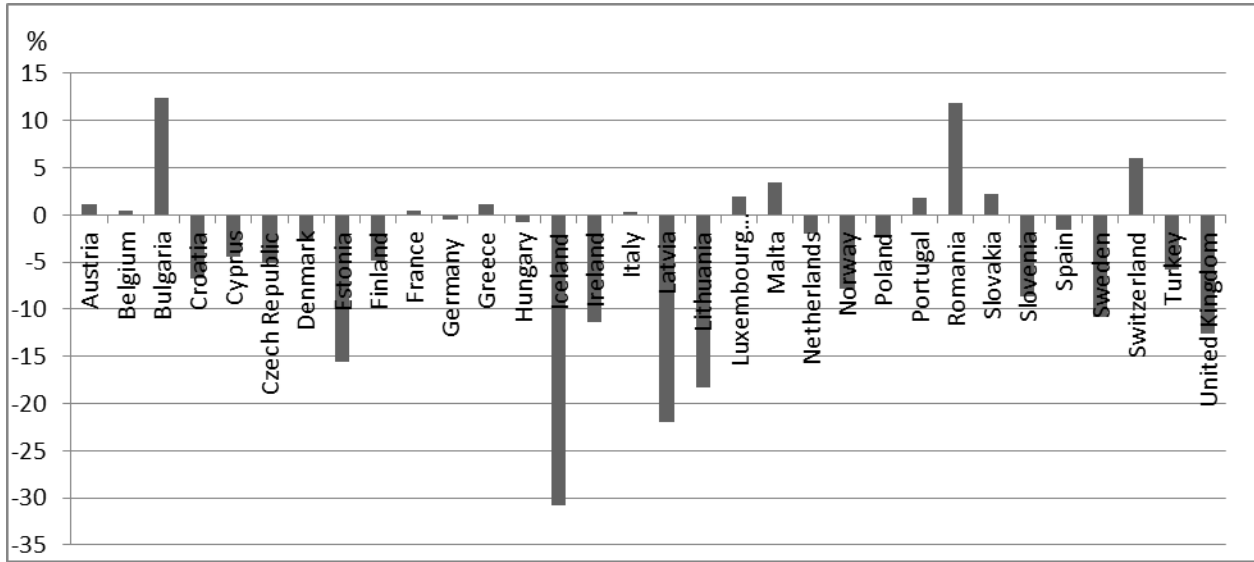


Figure 2: Growth rate of government spending during the period 2008:q2-2009:q4.

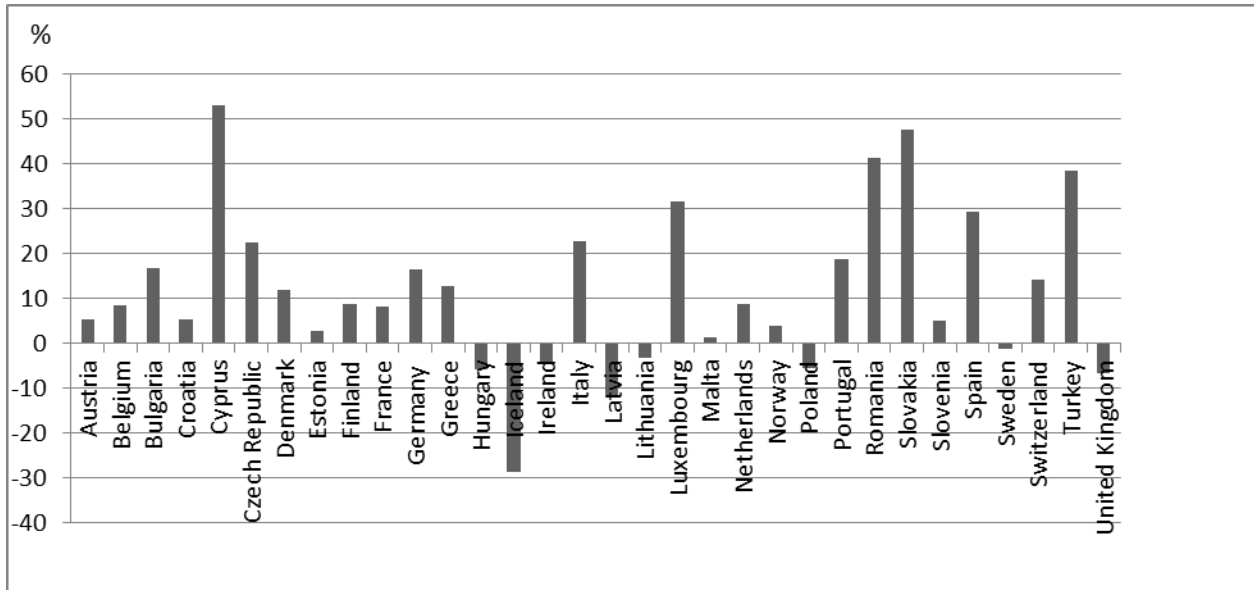


Figure 3: Reduction (in percentage change) of the Money Market Rate during the 2008:q2-2009:q4 period.

