

The MacrotHEME Review

A multidisciplinary journal of global macro trends

Fiscal implications of financial crisis: How to prevent another crisis

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Abstract

The 2007-09 financial crisis left us with several important lessons, which should be taken seriously to avoid another crisis. This paper examines what we have learned from 2007-08 financial crisis and how we should change our thinking about monetary policy. Though many economists believe that a sound monetary policy could have avoided the severeness of the great recession, the results of this empirical study suggest that fiscal policy played a more important role in creation and expansion of the financial crisis; and therefore, can play a more important role in preventing it in the future. To investigate the importance of fiscal versus monetary policy, this study implements a series of regression models (OLS, and 2SLS models) with quarterly data for the period of 2003-2017 for core European and peripheral EU countries; including, Germany, Netherlands, France, Spain, Italy, Portugal, and Greece. The dependent variable in our models is the level of debt to GDP ratio, while independent variables include a series of fiscal and monetary policy variables. The estimated results suggest that fiscal policy variables have outperformed monetary and trade policy variables, perpetuating a more important role in shaping foreign debt in these countries. Therefore, policy makers and financial institutions need to revise their priorities and put more emphasis on the role of fiscal policy instead of monetary policy. The use of unconventional monetary policy is outdated and cannot resolve the debt problem; and cannot avoid a future crisis per se. Thus, moving from a non-conventional monetary policy toward a more prudential fiscal policy is the first imperative shift for policy makers as we enter into a new phase of recovery.

Keywords: Foreign debt, fiscal policy, monetary policy, trade policy, corporate tax rate, income tax rate, inflation, openness, trade deficit, budget deficit, interest rate spread.

1. Introduction

What is the role of monetary policy in dealing with a financial crisis? What was the role of fiscal policy and foreign debt in the financial crisis? To safeguard the stability of financial system and mitigate the burden of foreign debt requires a new policy, which is capable of recognizing the roots of problem. Indeed, many advanced economies have focused on monetary policy and quantitative easing, while they have ignored the importance of prudential fiscal policy. Shifting the burden of debt to future generations and spending beyond revenues reflect structural problems of the economy that need to be addressed immediately. The fiscal stimulus and the massive liquidity infusion to the banking system, which was implemented in the U.S. and some European countries helped them to recover from financial meltdown in 2008, but regrettably didn't bring about a robust recovery, as still many advanced economies are struggling to achieve the pre-crisis growth levels.

Indeed, the financial crisis provided us with enough evidence that fiscal policy is an appropriate countercyclical policy tool, when monetary policy is ineffective due to emergence of the liquidity trap (zero bound limit). The empirical result of this quantitative study suggests that fiscal policy variables play a more important role than monetary policy instruments for external debt, and for shaping the financial crisis. However, a number of reservations regarding the use of discretionary fiscal policy remain valid, particularly when facing cyclical fluctuations.

The rest of paper is organized as follows. Section II reviews the literature on the financial crisis. Section III examines the role of fiscal and monetary policy variables through regression models. Section IV present the estimated results of different regression techniques and analyzes the role of fiscal policy versus monetary policy. Finally, Section V discusses the possible implications of the results for policy and provides some conclusions on how we can avoid future crisis.

2. Literature Review

The question that is at the core of current debate is whether fiscal policy performs as an effective stabilization tool and whether monetary policy is capable to pull the economy out of recession in the absence of fiscal stimulus. Indeed the debate is between two school of economic thoughts; on the one hand new-Keynesian economists including (Romer and Romer 2017; Mankiw 2010) advocate government actions as countercyclical fiscal policy. On the other hand, monetary economists argue that fiscal policy must be limited to have its impact through automatic stabilizers (Stiglitz nd, Feldstein 2002, Wieland 2009). They believe that financial crisis was caused by excesses in credit market, which led to creation of bubble, and then later to the recession. Indeed, in the existing literature of optimal monetary and fiscal policy, two branches have appeared; one branch follows the theoretical framework developed by Firedman and Schwartz (1963), Lucas (1972), Lucas and Stokey (1983) and Hamilton (1983) studies optimal monetary under flexible prices with perfect competition; while the second branch emphasizes on the models with nominal rigidities and imperfect competition, including Akerlof (1970), Greenwald, Stiglitz and Weiss (1984) and Romer and Romer (2017).

Gali and Preotti (2003) investigate the view whether Maastricht Treaty and Stability Growth Pact have impaired the ability of EU government to conduct a stabilization fiscal policy. Using data for the period of 1980-2002 on EMU countries with a control group of non-EMU countries they find that discretionary fiscal policy in EMU countries has become more countercyclical. In addition, they find that the decline in public investment experienced by EMU countries is part of worldwide trend that started before the Maastricht Treaty.

Eggertsson & Woodford (2004) investigate the consequences of a tax distortion for aggregate economic activity. They argue the occurrence of a tax distortion will cause zero lower bound to bind, and the central bank will be unable to prevent deflation and a negative output gap. Their result show that there is a role for fiscal policy in responding to liquidity trap, even if it would not be desirable to vary tax rates in response to cyclical disturbances that are not severe enough to cause the zero lower bound. In such a condition, the optimal response would be no change in tax rates. However, in the case of large disturbance to cause the zero bound to bind, they find it optimal for tax policy to respond to the shock. The optimal fiscal response is quite different from conventional wisdom; they find that an optimal policy involves raising the tax rates during the liquidity trap, while committing to cut them when the natural rate of interest is positive again. They conclude that the tax rates matter for output and inflation, only through its effects on aggregate supply.

Schmitt-Grohe & Uribe (2004) study optimal fiscal and monetary policy under imperfect competition conditions. They assume prices are fully flexible and there is no nominal rigidity in the market. In the meantime, they assume each firm operates under monopolistic conditions and produces a differentiated product. Their empirical results indicate that as one moves away from perfect competition assumption, Friedman Rule cease to be optimal. In addition, they find that nominal interest rate is highly persistent, with a serial correlation of 0.88, highly correlated with government purchases with a correlation coefficient of 0.86, and negatively correlated to technology shock with a correlation of -0.5.

Turrini (2008) investigate the cyclical behavior of fiscal policy in euro area countries over the 1980-2005 period, focusing on the role of government expenditures and revenues. Overall the results indicate that pro-cyclicality in the euro area is an expenditure driven phenomenon. The estimated results also suggest that the average stance of fiscal policy is expansionary when output is above potential, which suggests pro-cyclical bias in good times, while there is no evidence of cyclical bias in bad times. In addition, Probit regression models also reveal that the risk of pro-cyclicality in good times is related to expenditure behavior. Therefore, expenditure rules can be helpful to curb the expansionary bias of expenditure policy in good times.

Blanchard (2009) argues securitization had started much earlier but its scale has changed in the last decade. In mid 2008 more than 60% of all US mortgages were securitized and since securities were held by large number of financial institutions the large uncertainty affected a large number of balance-sheets in the economy. Also, globalization increased the connectedness of countries and financial institutions. In the meantime, the leverage increased and financial institutions financed their portfolio with less and less capital; with the main reason of optimism and underestimation of the risk. Also, a number of holes in regulations led banks to move their assets to off-balance sheet assets in so-called “Structural Investment Vehicles”. One of the ways financial crisis affected the economy was through credit rationing, i.e., the tightening of lending standards by banks who were deleveraging. In the process of deleveraging, advanced countries’ banks started drastically reducing their exposure to emerging markets through closing credit lines and repatriating funds, leading to capital outflow from emerging markets. Deleveraging in the form of capital outflow led to additional macroeconomic imbalances because with depreciation, if domestic liability is denominated in foreign currency, it leads to further burden of debt. In fall 2008 the worries became more profound and led to dramatic decrease in stock markets, and dramatic fall in consumer and investment confidence around the world. These evolutions led to large decrease in demand and output. Looking forward the question that arises is how to avoid a repeat of the same scenario. Blanchard argues something that should be done, is decreasing leveraging. Leverage of the financial system as a whole was too high before the financial crisis hit. Highly leveraged firms and households are highly exposed to fluctuations. The irony is that many tax rules favor such leverages, from tax deductibility of mortgage interest payment by household to the tax deductibility of interest payments by firms; therefore, fiscal policy reforms can play a pivotal role. Though there is a belief that monetary policy could fight asset price bubbles, there is not enough evidence the appropriate monetary policy, solely could have avoided the financial crisis.

Cogan, Cwik, Taylor, and Wieland (2009) argue macroeconomists remain completely uncertain about the quantitative effects of fiscal policy on the economy. The uncertainty derives not only from empirical estimation but also from different views on the theoretical framework of econometric methodology. They focus on the New Keynesian models; and estimate the response

of real GDP to a permanent increase in government spending of 1 percent of GDP and contrast it with Romer and Bernstein (2009) model. They find a much smaller boost to GDP than estimates reported by Romer and Bernstein (2009). Indeed, the decline in consumption and investment due to changes in expectation of households and enterprises is greater than increase in government spending because they expect the increase to be financed through taxes. Their results indicate that the impact of government spending on GDP is negative for many years after 2013. Indeed, a sharp increase in government spending is associated with crowding out of consumption and investment; especially with sticky wages and prices under imperfect competition. Indeed, the estimate of Romer and Bernstein (2009) who find the stimulus package in 2009 would raise GDP by 3.6% by the fourth quarter of 2010 is six times larger than estimates of Cogan, Tobias, Taylor, and Wieland (2009).

Cwik and Wieland (2010) investigate whether the spending package by the Euro area is likely to boost GDP by more than one for one. They use macroeconomic models with Keynesian features such as price and wage rigidity to evaluate the impact of fiscal stimulus. Their results suggest that planned increase in government spending will reduce private consumption and investment significantly. They find that zero bound effect may lead the central banks to abstain from interest rate hikes and offset the increase in the GDP of government spending. They find that New Keynesian models provide a strong case for government saving packages. In addition, announced spending cuts can create a significant short-run stimulus and crowding in effect for private spending.

Pleinescu and Caraiani (2010) argue fiscal policy plays a major role in unfolding financial crisis. The budget deficit was not reduced sufficiently during the period of economic growth, where state revenues were high, hence limiting the fiscal maneuver space. They argue after integration of Romania into EU, the efforts to control government expenditures slowed down and the fiscal deficit increased on an unsustainable level in 2008 influenced by the strong electoral cycles and popular measures to increase wages and pensions. They investigate the effect of fiscal policy in Romania. They argue that evolution of revenues in Romania was due to two main reforms: (i) The early 2000 main tax adjustment and reduction of profit tax from 38% to 25% and (ii) the cut in profit tax from 25% to 16% and the introduction of a flat tax rate of 16% on income tax. Despite these reforms, the deficit to GDP ratio registered negative levels during 2001-2006, and in 2007, it was around -10.14% of GDP. These negative numbers reflect a massive spending accumulation in the last quarter, which contributed to the financial crisis.

Aizenman and Jinjark (2011) argue the growing financial integration led to fast growth but deep crisis starting with Mexican Tequila, continued with East Asia, Russian and Brazilian crises. These events forced the emerging markets to deal with fundamental deficiencies, consolidating their fiscal position, reducing their overall balance, and cushioning their position with remarkable accumulation of foreign reserves. In contrast, U.S. and EU avoided tough choices. The emerging economies would substantially benefit from a coordinated adjustment of fiscal policies to replace foreign demand with domestic demand.

Mishkin (2011) examines how monetary policy strategy has changed during the aftermath of financial crisis. The tsunami of 2007-2009 financial crisis, not only flattened economic activity, producing the most severe economic contraction since Great Depression, but also reduced the ability of central bankers to successfully manage the economy. The global financial crisis of 2007-2009 demonstrated that financial frictions should be at the center of macroeconomic analysis.

Indeed, there is a new literature on its infancy on how financial frictions would modify the prescriptions provided by traditional monetary policy. There is a stronger case for monetary policy to lean against credit bubble rather than just cleaning up after the bubble has burst. Finally, the financial crisis has made it clear that the interactions between the financial sector and macroeconomics are strong and that monetary policy and financial stability are strongly intertwined.

IMF (2013) policy paper on fiscal policy suggests there is strong evidence that fiscal policy can have powerful effects on the economy in the short-run. Especially, there is numerous empirical evidence that fiscal multipliers are larger when monetary policy is constrained by zero lower bound rate (ZLB).

Coenen et al. (2012) quantify the effects of ZLB on fiscal multipliers based on seven macroeconomics models developed at six policy institutions. In all models, fiscal multipliers rise substantially at ZLB. Blanchard and Leigh (2013) indicate that fiscal multipliers have been above one in economies with the ZLB, at least in the early years of the crisis.

Wyplosz, C. (2013) argues fiscal policy has lacked discipline for several decades. The current public debt crisis has called to reverse the long-run deficit bias, which seems unlikely to occur without a change in the budgetary process. Fiscal rules have attracted the attention of several countries. Rules are neither necessary nor sufficient to achieve fiscal discipline; yet they can and do help a lot.

Socol and Feraru (2017) investigate the sustainability of public finances at the selected group of CEE states, to highlight the role of fiscal policy in the divergent performance of countries. They use panel regression models where fiscal stance (balance of budget as a percentage of GDP) as dependent variable is a function of some independent variables including stock of debt, output gap, unexpected government spending, inflation, and primary balance of previous period. Their estimated results suggest that the primary balance has a persistent effect over time; thus, promotion of an expansionary fiscal policy, which triggered the increase of the budget deficit by 1% of GDP, will cause the latter increase by 0.23% GDP in the following year. The estimated result also suggests the impact of unexpected expenditures on the budget balance. A measure of fiscal discipline proves to have a favorable impact on the budget balance equivalent to 0.5% of GDP.

Romer and Romer (2017) examine the role of macroeconomic policy in explaining the variation in the aftermath of crisis. They find that the degree of monetary and fiscal policy space prior to the financial distress affects the aftermath of crisis. They use a regression model where real GDP as dependent variable is a function of financial distress, country fixed effects, and time fixed effects. They argue if monetary policy space variable measured by policy interest rate is well above zero, then when the crisis starts the Central Bank will have much greater ability to use conventional monetary policy to deal with the effects of the crisis. Similarly, if a country begins crisis with low level of debt to GDP ratio —where it has fiscal space—policy makers are more likely able to bailout the financial crisis or use fiscal stimulus to cushion the impact of the crisis than if the debt load at the start of the crisis is already high. They use a dummy variable if the policy interest rate is greater than 1.25% at the end of previous half year and zero otherwise. Their results suggest that monetary policy space matters substantially. For fiscal policy space, they use the ratio of gross and net debt to GDP ratio. Their estimated results suggest that fiscal policy space also matters greatly. As the ratio of debt to GDP falls, the aftermath of financial distress will be better. In sum, they find that a

decline in output following the crisis is less than 1 percent when a country poses both type of policy space, but almost 10 percent when it has neither.

3. Data and Methodology

Using panel data for the period of 2003-2017 for core European and peripheral EU countries including, Germany, Netherlands, France, Spain, Italy, Portugal, and Greece this study attempts to investigate how did monetary policy versus fiscal policy contributed to the financial crisis in Europe and what should be done to avoid future crisis. Indeed, the econometric specification of the model is a combination of models developed by Socol and Feraru (2017), and Romer and Romer (2017), which is described in Equation (1):

$$Debt = \beta_0 + \beta_1 Bd_{t-1} + \beta_2 Debt_{t-1} + \beta_3 FD + \beta_4 Gap + \beta_5 Exp + \beta_6 Inf + \beta_7 i_{t-1} + \beta_8 FRI + \beta_9 D$$

Equation (1)

Where *Debt* is the ratio of debt to GDP ratio, *Bd_{t-1}* is budget deficit in previous period, *Debt_{t-1}* is Debt ratio in previous period; *FD* represents financial distress as measured in Romer and Romer (increase in the cost of credit intermediation prepared by OECD and scaled from zero to 15); *Gap* stands for output gap; *Exp* represents unexpected government expenditures; *Inf* denotes inflation rate, *i_{t-1}* presents policy interest rate, *FRI* quantifies Fiscal Policy Rule Index provided by EC; and finally a dummy variable, *D*, for changes in fiscal policy behavior by adopting the Euro area membership, which takes 1 for periods being a member of EU and zero otherwise. Indeed, fiscal policy space is measured by the ratio of debt to GDP in the previous period, and monetary policy space is measured by policy interest rate as explained in Romer and Romer (2017).

The data for estimating above equation have been retrieved from European Central Bank, Euro Stats, IMF, and OECD website.

4. Estimated Results

The estimated results presented in Table 1 suggest that debt in the previous period appears to have a high degree of persistence over time. Indeed, countries that start with higher level of debt are likely to observe higher level of debt to GDP in the future. The persistence of fiscal policy stems from a series of institutional and structural criteria, reflecting the price and wage stickiness and persistence of the level of spending. Indeed, a one percent increase in the stock of debt to GDP in the previous period triggers a 0.10 to 0.12% increase in the ratio of debt to GDP in current period. In other words, countries that have little fiscal policy space will do worse during the financial crisis. Financial distress seems to play the most important role in explaining the level of debt to GDP, and has a positive significant coefficient. In other words, one percent increase in the level of financial distress can lead to 0.27 to 0.29 percent increase in the level of debt. Budget deficit also plays an important role and 1 percent increase in budget deficit can trigger 0.22 to 0.23% increase in the level of debt, highlighting the importance of fiscal discipline.

If the coefficient of output gap is positive, fiscal policy can be considered counter-cyclical. Thus with a negative (positive) output gap the debt ratio will decrease (increase). Based on the estimated results, the sensitivity of dependent variable to the cyclical fluctuations (output gap) is 0.11% of GDP for OLS model and 0.12% for 2SLS model, which suggest existence of a counter-cyclical

fiscal policy. Thus, an output gap of 1% of GDP will trigger an increase in the debt ratio by 0.11 to 0.12% of GDP.

The estimated coefficient for unexpected government expenditures has a negative effect on the level of debt. An increase of 1% in government expenditures lead to a contraction of debt ratio by 0.24% for OLS model and 0.29% of GDP for the 2SLS model. This relationship makes sense since an increase in government expenditures is associated with higher level of budget deficit, and debt as a result.

The coefficient on inflation suggests that 1% increase in the inflation rate triggers a decrease in the debt ratio by 0.03 for GDP for OLS and 0.04% for 2SLS model. This negative impact is justified because with a higher inflation rate government expenditures will increase, leading to a higher debt level.

The coefficient of policy interest rate is expected to have a negative association with the ratio of debt to GDP. As the estimated results suggest a 1 percent increase in the policy rate triggers 0.06 to 0.07 percent decrease in the ratio of debt to GDP. Indeed, monetary policy space matters significantly and the estimated coefficients are statistically significant. In other words, the higher the level of monetary policy rate, the lower the ratio of debt to GDP. The results here support Romer and Romer (2017) who argue countries will do better after the crisis if they start with some monetary policy space.

Fiscal policy rule index is statistically significant and has a negative effect on the level of debt ratio as suggested by Socol and Feraru (2017). The results here suggest that a one percent increase in the fiscal policy rule is associated with 12 to 14% decrease in the ratio of debt to GDP, highlighting the importance of fiscal policy rules in avoiding future crises.

List of Variables	OLS Model	2SLS Model
Constant	-3.7	-3.1
Bd_{-1}	0.23**	0.22*
$Debt_{-1}$	0.10**	0.12**
FD	0.27**	0.29**

<i>Gap</i>	0.11*	0.12*
<i>Exp</i>	-0.24**	-0.29**
<i>Inf</i>	-0.03*	-0.04*
i_{-1}	-0.07**	-0.06**
<i>FRI</i>	-0.12*	-0.14*
<i>D</i>	-0.06*	-0.09**
R-Squared	77%	79%
Adjusted R-Squared	75%	77%
F	122.14	13.25
Durbin Watson	1.80	1.78
No. of observations	60	60

Table 1.
The estimated results for Equation 1 (dependent variable ratio of debt)

Source: Author estimation (** significant at 0.01; * significant at 0.05)

Finally, the dummy variable measuring the effect of fiscal policy behavior by adopting the Euro area has a negative significant relationship with the debt ratio irrespective of estimation technique. Indeed, adoption of fiscal policy by EU has helped countries to reduce the level of debt ratio. In sum, the estimated results suggest that fiscal policy variables play the most important role in shaping the debt and financial crisis and therefore, can play a more important role in avoiding future crisis. In addition, the estimated results suggest that countries with better monetary policy space have done better in the aftermath of financial crisis.

5. Discussion and Policy implications

There is great controversy among economists on the roots of financial crisis; and how we may avoid future crisis. The main difference between New-Keynesians and monetarist economists is due to the existence of imperfect competition and sticky wages and prices. Indeed, the effects of fiscal policy are much smaller under sticky wages and prices, since government spending can have crowding out effects on consumption and investment due to adjustment in their expectations as they believe higher government spending will be accompanied with higher taxes and less income and revenues. Therefore, they adjust their consumption and investment and as a result, the effects of fiscal policy multiplier would be much smaller compared to old Keynesian models and monetary models (Cogan, Tobias, Taylor, and Wieland, 2009)

Following Romer and Romer (2017) and Socol and Feraru (2017) this study estimated an econometric model with different monetary and fiscal policy variables and different techniques. The estimated results indicate that financial distress and unexpected government expenditures have the greatest effect on the level of debt. In addition, the estimated coefficient on output gap suggests the existence of a counter-cyclical fiscal policy. Therefore, to control the level of debt and avoid future crises we need a more prudential fiscal policy that limits the government spending. Particularly, the effects of monetary policy variables including policy interest rate, and inflation are much smaller compared to the fiscal policy variables. However, the results suggest that countries with higher monetary policy space do better after the crisis.

This paper may be extended in several directions. One direction is to incorporate nominal rigidity into the model. Addition of such variables may reduce the effectiveness and significance of government expenditures. Adding wage stickiness as an independent variable to the model to account for sluggish nominal wage adjustments, may affect the significance and importance of fiscal and monetary policy variables. Another variable that can be considered here, and is likely to

have a significant effect on the debt ratio is the tax rate that has been ignored in this study. In addition, the study may benefit from using different estimation techniques including GMM, GARCH and ARCH models.

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