Essays on Post-Crisis Fiscal Policy

by

Xuan Hai Dinh

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Abstract of thesis

This thesis comprises of four essays on fiscal policy and fiscal policy adjustment. The first of these essays, Chapter 2, reviews a wide range of literature about fiscal policy. This chapter also discusses the sudden stop and fiscal policy during sudden stops episodes.

Chapter 3 constructs a simple dynamic *deterministic* model to study how the speed of adjustment to a sustainable level of debt affects economic welfare. The simulation results in Chapter 3 suggest that in order to bring the level of external debt to a sustainable level as required by foreign lenders, the small open economy will attempt to delay adjustment as long as possible.

Chapter 4 uses a Structural Vector Autoregression Model to estimate government consumption multipliers for groups of countries. The empirical results suggest that: (i) The higher degree of financial openness, the larger the government consumption multiplier. (ii) The government consumption multiplier is significantly bigger in countries with higher levels of external debt. (iii) The higher the level of financial development, the smaller the government consumption multiplier. (iv) The government consumption multiplier in countries with fixed exchange rates seems to be bigger than in countries with a flexible exchange rate regime.

Chapter 5 of this thesis analyses four case study countries including Greece, Latvia, Pakistan and Turkey. This chapter finds that fiscal policy choice varies across countries because there are many possible determinants for this. It will also be determined that all factors including the level of public debt, level of external debt and monetary policy, especially exchange rate regime, affects the fiscal policy choice of each country. Furthermore, Chapter 5 also points out that political economy can influence fiscal policy directly and indirectly.

Chapter 1. Introduction

1.1 Background

Until the late 1970s, many governments used fiscal policy as a tool to stabilize the economy. The failure of fiscal policy to restore economic growth from the 1970s economic crisis led many economists to doubt its effectiveness in handling smooth cyclical fluctuations (Beetsma and Giuliodori, 2011). This together with large fiscal deficits and high public debts in the 1980s also made economists pay less attention to the active use of fiscal policy. Blinder (2006) proposed that monetary policy should be used as the primary tool for macroeconomic stabilization. However, he also argues that fiscal policy may play an important role as a tool for macroeconomic stabilization under unusual circumstances, such as during a deep or long recession period or when the nominal interest rate is below zero, a viewpoint which is also supported by Sims and Blanchard.

Following the global financial and economic crisis of 2007-2009, most governments have relied heavily on fiscal policy as the ideal response to the subsequent recession, especially since the monetary policy choices have been severely restricted due to the very low interest rate. Many countries have implemented fiscal stimulus packages, such as the European Economic Recovery Plan, which is equivalent to 1.5% of the EU GDP in 2008 (Beetsma and Giuliodori, 2011) and the American Recovery and Reinvestment Act of 2009 which equals 5.5% of the US GDP (Auerbach, 2012). There is still a debate about the effectiveness of fiscal policy in relation to a high and increasing level of fiscal deficits and public debts.

The debate about the effectiveness of fiscal policy has attracted even greater attention since the Eurozone fiscal crisis begin in 2010. Greece, Ireland, Italy, Portugal and Spain were the most affected members in the EU. As a consequence, many countries implemented fiscal consolidation programs in response to the deteriorating fiscal balance. Since 2009, although economic growth has remained low and the unemployment rate has remained high in many European countries, fiscal adjustments have still been undertaken (Auerbach,

2012). The main focus of research has shifted from using fiscal stimulus to manage aggregated demand, to the effectiveness of fiscal austerity programs used to reduce deficits and debt to long term sustainable levels. This shift in policy concerns is a vital aspect of the research presented in this thesis, all of which examines the challenges of fiscal policy adjustment that have emerged since the global financial and economic crisis of 2007-2009.

Since the global financial and economic crisis of 2007-2009, the external debt in many countries increased rapidly, the reason for this is because these countries needed to borrow vast amounts from other countries to escape the harsh aspects of the recession. However, this borrowing can lead to other challenges, such as the fear of "sudden stop" or default. These risks require countries with unsustainable external debt levels to undertake fiscal adjustments in order to bring their external debt to a sustainable level. While the need for such adjustment is understandable, the appropriate speed of adjustment is always up for debate.

The outcomes of fiscal policies used in different countries during and after the financial and economic crisis of 2007-2009 as well as the European public finance crisis, demonstrates the ability of fiscal policy to effectively reduce debt and deficit ratios to sustainable levels, can vary across countries and periods. Unfortunately, this has not been documented well in previous research, meaning the factors which lead to these differences are not really understood.

Furthermore, since the global and financial economic crisis of 2007-2009, fiscal policy choices are no longer simple and clearly defined, for instance, many people consider an expansionary fiscal policy as the optimal choice in a time of recession, whilst a tight fiscal policy would be the ideal choice of most governments facing high levels of public debts and fiscal deficits. In fact, there are many factors which determine one's fiscal policy choice; although, there is still limited research about fiscal policy choice.

1.2 Contribution and Principal Results

The first research chapter, Chapter 3, constructs a simple dynamic deterministic model, presenting simulations to critically analyse how the speed of adjustment to a sustainable level of debt can affect economic welfare. In the model used in Chapter 3, foreign lenders require domestic borrowers to reduce their external debt level to a lower and sustainable level by a certain time. Most studies involving unsustainable external debts in a small open economy solely focus on unanticipated shocks in external debt capacity, which may lead to a sudden stop in access to external borrowing. One drawback to these studies is that a small open economy is not allowed to choose an optimal path to manage a sudden stop.

Chapter 3 constructs a dynamic deterministic model with two types of goods, including tradable and non-tradable goods. In this model, a small open economy faces anticipated shocks in the external debt capacity. As the shocks are foreseen, the small open economy has the ability to choose an optimal path to prevent a sudden stop of inflow capital, while at the same time reducing the risk of debt default. This foresight assumption may appear to be somewhat artificial, but it can be interpreted as a period allowed by multilateral lenders such as the IMF, to enable a country to respond optimally to the reduced borrowing capacity. One of the main assumptions of this model is that the total external debt of the borrowers is limited by a fraction of the total tradable goods output of the economy. It can also be noted that the analysis examines the total borrowing of all domestic borrowers: the government and private sector are consolidated together for the purpose of this welfare analysis.

The simulation results of this chapter confirm that borrowers will try to delay adjustments for as long as possible. This is reasonable because one key assumption used in this model is that borrowers are impatient. When borrowers are unable to delay the adjustment process anymore, they will reduce consumption of tradable goods in order to repay part of the external debt. During the adjustment process, the consumption of non-tradable goods almost remains stable, while there is a significant depreciation in real exchange rates (the relative

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price between non-tradable and tradable goods). An interesting feature of this chapter is that the financial constraint, i.e. the constraint of total external debt, is not binding during the adjustment path.

This chapter also extends the baseline model by altering the financial constraint. In this modified model, the total external debt is limited by a fraction of the nominal GDP. Many of the main simulation results in the modified model are similar to the results in the baseline model; although, one of the simulation results in the modified model determines that the financial constraint is binding during the adjustment path. This can be explained by the effects of change in relative prices, especially as the GDP in the financial constraint is nominal. Chapter 3 also simulates the model from an out of steady state to a new steady state; this enables us to study the effects of credibility, as well as the ability to pre-commit to a debt path and not default on payments on the policy outcome.

Chapter 4 is an empirical work which uses panel-SVAR to estimate the government consumption multiplier for a group of 30 countries including Australia, Canada, Japan, United States and 26 European countries. As mentioned above, there are a limited number of empirical studies about factors that affect the fiscal multiplier, which can be considered as an index to evaluate the effectiveness of fiscal policy. Furthermore, most empirical studies estimate fiscal multipliers for individual countries; this can be a problem when it comes to examining factors which affect the size of a fiscal multiplier. Ilzetzki et al (2013) is one of the first studies which filled the gap in research literature; although, their study only examines how several factors, such as the openness level of the economy, the exchange rate regime and the level of public debt, affect the size of a fiscal multiplier.

To enhance this literature, this chapter examines whether the level of financial openness, the level of external debt, the level of financial development, the level of trade openness and the exchange rate regime affect the size of fiscal multipliers. Chapter 4 focuses on the interaction between financial markets (the level of financial openness, the level of financial development and the level of external debt) and fiscal policy, something which is not studied much by Ilzetzki

et al (2013). There are four main results discovered in chapter 4: firstly, the government consumption multiplier seems to be bigger in countries with higher levels of financial openness than in countries with lower levels of financial openness. Secondly, the higher the level of external debt, the bigger the government consumption multiplier is. Thirdly, the higher the level of financial development the smaller the government consumption multiplier is. Finally, the government consumption multiplier tends to be bigger in countries with a fixed exchange rate regime.

Chapter 5 is a case study: this chapter analyses fiscal policies in four countries including Greece, Latvia, Pakistan and Turkey from 2006 to 2015. This chapter together with Chapter 4 helps us to understand in greater detail fiscal policy, and why the effectiveness of fiscal policy may vary across countries and across time periods. This chapter suggests that policy-makers should design fiscal policy in a broader view, with careful consideration of other factors including economic conditions, monetary policy and political economy.

Chapter 5 discovers that even though all of these countries decided to incorporate fiscal adjustments to cope with unsustainable fiscal deficits, the effectiveness of these decisions vary amongst countries: there are various possible determinants for this, even though Chapter 5 only focuses on several factors. To begin with, a higher level of public debt and external debt may limit the effectiveness of tight fiscal policy in terms of reducing public debt. In fact, the ratio of public debt to GDP in Greece - which had a much higher level of public debt and external debt ratio than other country - still increased dramatically after implementing fiscal adjustments. This is completely different to the changes in public debt ratio that occurred in Latvia, Pakistan and Turkey.

Furthermore, Chapter 5 discovers that as members of the Eurozone, both Greece and Latvia implemented a fixed exchange rate regime which led the fiscal consolidation programs in these countries be more costly than those in Pakistan and Turkey, which have the freedom to decide their own monetary policy, especially an exchange rate regime. In fact, as well as the time it took to implement these fiscal consolidation programs, there was a massive depreciation

of the local currency in Pakistan and Turkey, something which obviously did not happen in Greece or Latvia. Chapter 5 also emphasizes that the political economy is an important factor which needs to be considered carefully when the process of designing fiscal policy is occurring, this is because the political economy has the ability to influence fiscal policy direct or indirectly.

There are two other chapters in this thesis: Chapter 2 reviews a wide range of literature about the relationship between fiscal policy and economic activities. This chapter will also discuss the effectiveness of fiscal policy in relation to Keynesian theory, neo-classical theory, Ricardian Equivalence theorem and New Keynesian theory, whilst also reviewing empirical studies about fiscal policy, public debt, external debt and economic growth. Although a wide range of literature about fiscal policy is discussed in chapter 2, each research chapter also has its own literature review which covers relevant literature on its particular research topic.

Chapter 6 concludes this thesis by summarising the key findings of the three research chapters and makes suggestions for any future research relating to the research compiled in this thesis.

Chapter 2. Fiscal Policy: A Review of the Literature

2.1 Introduction

This chapter examines literature that is relevant to fiscal policy. This chapter consists of five sections: section 2.2 reviews theoretical aspects about the relationship between fiscal policy and economic growth. Section 2.2 discusses the Keynesian view, the neoclassical view, the Ricardian equivalence and the New Keynesian view, in relation to the analysis of the impact of fiscal policy on output, whilst also reviewing the theoretical aspects of fiscal sustainability. Section 2.3 reviews the results of the empirical research regarding the effectiveness of fiscal policy, whilst also discussing the results of fiscal adjustments in OECD countries so as to understand more about the differences between implementing fiscal adjustments by cuts in government spending and incorporating fiscal adjustments by increasing taxes. This section also surveys empirical research relating to the sudden stop and the optimal policy implemented under a sudden stop, which is also the main focus of Chapter 3 of this thesis in section 2.4. Finally, section 2.5 summarises the main aspects discussed in this chapter.

2.2. The effectiveness of fiscal policy: a theoretical review

There has been a long debate about whether fiscal consolidations are contractionary or expansionary. A few of the main views which relate to this topic include the Keynesian view, neo-classical view, the Ricardian equivalence and the New Keynesian theory: all four of these views will be reviewed in this section.

2.2.1 Keynesian view about the relationship between government spending and output

According to the traditional Keynesian theory, public spending is identified as an effective policy tool for policy-makers; the Keynesian model however, only explains the relationship between public spending and the level of output in short-term.

The Keynesian model points out that a decrease in government purchases or an increase in taxes leads to a reduction in the aggregated demand and income directly, which further affects aggregated demand through the negative "Keynesian multiplier" effect. The consequences of this are a decline in output and an increase in unemployment. The Keynesian multiplier was first developed by Kahn (1931), and is defined as an exogenous increase in spending that will lead to an increase in total spending by a multiple of that increase. On this view, deficits stimulate both consumption and savings, implying that national incomes and capital accumulation will increase, which means that appropriately timed deficits do have beneficial consequences.

The value of the Keynesian multiplier is believed to be greater than one. In order to illustrate this, it is necessary to review the simple Keynesian model, which is also known as the Keynesian Cross, which most commonly appears in undergraduate macroeconomics courses. The simple Keynesian model models a closed economy in which output is determined by aggregated demand and output; this is because this model assumes rigid prices and excess capacity. We can write the equilibrium equation of Keynesian Cross:

$$Y = C + I + G \qquad\qquad (2.1)$$

where $I = \bar{I}$ is exogenous planned investment. $C = C(Y - T)$ is the consumption function. $G = \bar{G}$ and $T = \bar{T}$ are government policy variables. *mpc* represents the marginal propensity to consume. It means:

$$\Delta C = \Delta Y.mpc \qquad\qquad (2.2)$$

and *mpc* is less than 1.

Therefore, if there is a change in government spending *(ΔG)* then the equilibrium condition changes to:

$$\Delta Y = \Delta C + \Delta G$$

We have *ΔI* = 0 because *I* is assumed as an exogenous variable.

Substitute (2.2) into (2.1), *ΔY = ΔY.mpc + ΔG*

Thus,

$$\Delta Y = \Delta G . \frac{1}{1 - mpc}$$

$$k = \frac{1}{1 - mpc}$$

k is the multiplier for government spending.

Similarly, by assuming *I* and *G* are exogenous, this model points out that the tax multiplier is *–mpc/(1-mpc)*. Since *mpc* is less than 1, it is easy to see that the government purchase multiplier is greater than 1 and larger than the tax multiplier. If income tax appeared in the model, the Keynesian multiplier would become:

$$k = \frac{1}{1 - mpc(1 - t)}$$

where t is the income tax rate. In this case, the Keynesian multiplier is less than those with no income taxes, but still greater than unity.

Extending the simple Keynesian model for open economy, the equilibrium equation (2.1) becomes:

$$Y = C + I + G + NX \tag{2.3}$$

where *NX* stands for net export, which is equal to imports minus exports. Similarly used for a closed economy, the model also points out the new Keynesian multiplier for open economy:

$$k = \frac{1}{1 - mpc(1 - t) + c}$$

where c signifies the marginal propensity to import. It is clear that the Keynesian multiplier in an open economy is less than the Keynesian multiplier in a closed economy.

According to the IMF research department (2009), "the fiscal multiplier is the ratio of a change in output to an exogenous change in the fiscal deficit with respect to their respective baseline" and its size depends on country, time and

circumstance. Based on the time frame considered, there are many different multipliers:

The impact multiplier $= \Delta Y_t / \Delta G_t$

The multiplier at a given time N $= \Delta Y_{t+N} / \Delta G_t$

The cumulative multiplier, which is defined as the cumulative change in output over the cumulative change in fiscal expenditure at given time N, $= \frac{\sum_{i=0}^{N} \Delta Y_{t+i}}{\sum_{i=0}^{N} \Delta G_{t+i}}$

In a more complete Keynesian model, the appearance of crowding-out effects through induced changes in interest rate and exchange rate alters the size of fiscal multiplier. Therefore, the Keynesian multiplier effects are partially offset during the adjustment process; some of these offsets are illustrated in the following figure:

Figure 2.1 IS-LM model

$$Y_2 = C + I(r_1) + G + \Delta G$$
$$Y_3 = C + I(r_2) + G + \Delta G$$
$$Y_1 = C + I(r_1) + G$$
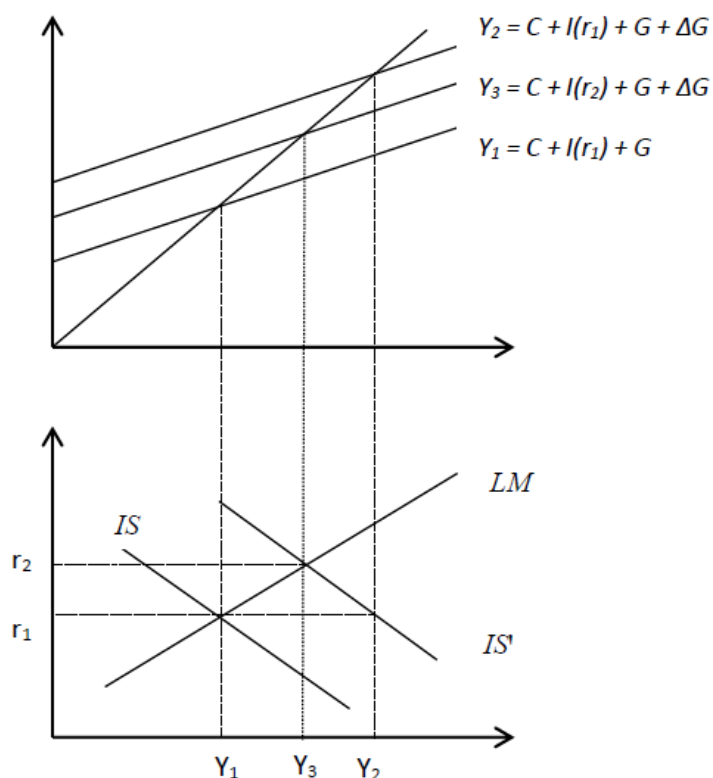
In the *IS-LM* model for a closed economy at equilibrium point,

$$Y = C(Y) + I(r) + G \qquad (2.4)$$

where r is the interest rate. As a result of Keynesian Cross, a fiscal expansion (i.e. government spending) ΔG will lead to an increase in output from Y_1 to Y_2 as can be seen in figure 2.1, with the multiplier being equal to $(Y_2 - Y_1)/ \Delta G$. However, fiscal expansion by issuing debt that leads to higher interest rates (interest rate increases from r_1 to r_2) may reduce private investment. Therefore, the *IS* curve shifts right to *IS'* and the private investment reduces and the output will reduce from Y_2 to Y_3. It is easy to see that the crowding out effect through interest rates will reduce the size of the fiscal multiplier from $(Y_2 - Y_1)/ \Delta G$ to $(Y_3 - Y_1)/ \Delta G$.

In addition, there can also be crowding out through the exchange rate in the open economy IS-LM model. This is because higher interest rates will attract capital inflows which will increase the exchange rate; therefore, there is a decrease in the external current account that offsets the increase in domestic demand, which is the result of a fiscal expansion. It is easy to see that the crowding out effect through the exchange rate is larger if the degree of capital mobility is higher: therefore, if a country has a higher level of financial openness, the multiplier will most likely be smaller.

Hemming et al (2002) review the literature about crowding out effects and summarise that the crowding out through interest rates and the exchange rates can be affected by several features of the IS-LM framework. To begin with, the crowding out effect is affected by the determinants of private investment, it can be determined that the crowding out effect will be larger if the investment is more sensitive to interest rates. Secondly, the crowding out effect through interest rates is based upon the assumption that one's demand for money is linked to interest rates and income: the less sensitive demands for money are to interest rates, the more sensitive they are to income, which causes a larger crowding out effect. Whilst, openness and the exchange rate regime also has an influence over the crowding out effect. In an economy with a flexible exchange rate, capital inflows attracted by higher interest rates will increase the exchange rate; so, if capital mobility is perfect then there is a complete crowding out effect making the fiscal policy ineffective. In contrast, in an economy with a fixed exchange rate, a fiscal

expansion will create a smaller increase in interest rates than it would in a closed economy, this means that if the capital mobility is perfect then the fiscal policy is very effective, because the money supply will increase to ensure that domestic interest rates do not rise.

According to the Keynesian view, fiscal policy only affects the output through the demand side. In a Keynesian economy, a fiscal expansion will shift the aggregated demand curve right, while the aggregated supply curve remains stable. The diagram below of the AD-AS model illustrates the impact of fiscal policy on the output in a Keynesian economy.
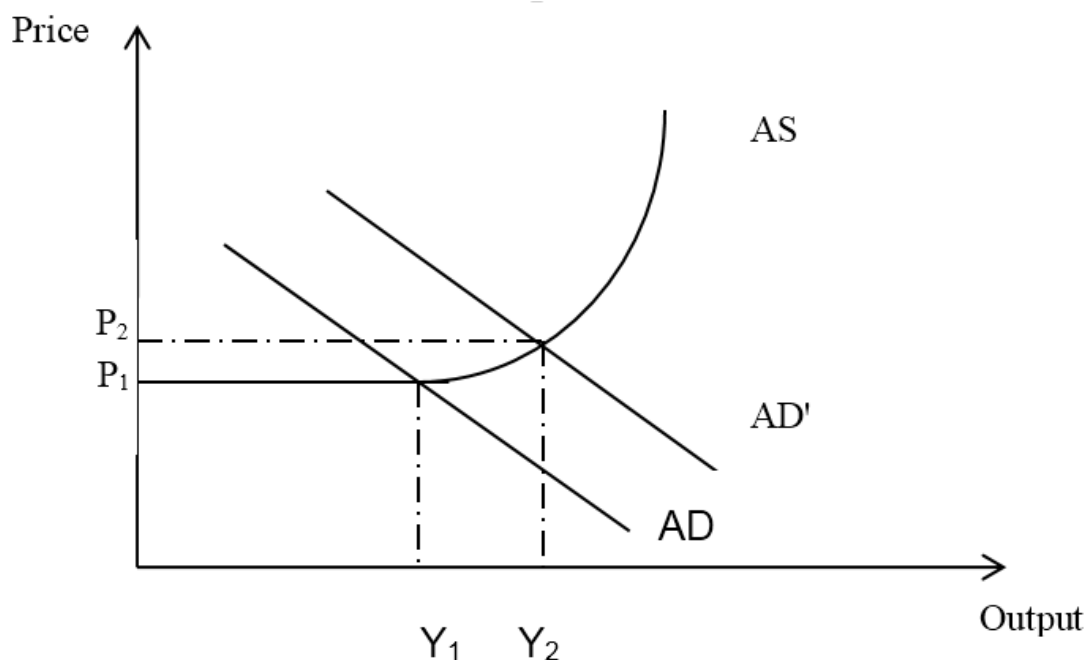
Evidently, it is difficult to obtain an agreement regarding the size of the fiscal multiplier, which can lead to a debate about the size of the fiscal multiplier and the factors that affect its size. This particular debate is important to economies that are in a fiscal consolidation mode; the fiscal multiplier is simply considered as a measure of how changes in fiscal policy (government expenditure and taxation) impact the wider economy; the smaller the multipliers, the lower the cost for fiscal consolidation, the greater the multiplier, the more effective the stimulus package.

2.2.2 Ricardian equivalence theorem

In the 1970s, Robert J. Barro set up what is now called the Ricardian equivalence theorem. Whilst the Keynesian approach is based on an assumption that consumption is related to current income, the Ricardian equivalence is based upon two main assumptions. The first is that the government faces an inter-temporal budget constraint similar to that faced by a consumer. Similar to a consumer's lifetime budget constraint (ignoring interest rates), we can derive a similar budget constraint for the government:

$$\sum_0^\infty \gamma_t = \sum_0^\infty \tau_t$$

where γ_t and τ_t are used for government expenditures and government revenues respectively, rather than *G* and *T* which only refer to government purchases (of goods and services) and tax revenues respectively. Due to this budget constraint, it is easy to see that the government cannot run a primary deficit, i.e. a level of expenditure on goods and services *G,* which is greater than taxation and other revenue *T*, forever. This signifies either an increase in expenditure or a tax cut, which means that spending is greater than revenues and will ultimately have to be financed through a tax increase or a cut in spending in the future to make the revenue greater than spending.

The second key assumption is that consumers are forward-looking and are fully known of the government's inter-temporal budget constraint. Therefore, consumers will anticipate, based upon the governments financial strategies on whether they issue new debt instead of raising taxes, that consumers will most likely need to pay higher taxes in the future. Permanent income is consequently unaffected, and in the absence of liquidity constraints and with perfect capital markets, consumption will not alter (Barro, 1974). It can be conjectured that there is Ricardian equivalence between taxation and debt: perfect Ricardian equivalence considers a decrease in government saving resulting from tax cuts which can be fully offset by higher private saving. Therefore, aggregated demand is unaffected, meaning that the fiscal multiplier is equal to zero.

According to Ricardian equivalence, fiscal policy has no impact on the economy. If the government decides to lower tax, consumers will normally consume more; however, within an economy using assumptions of Ricardian equivalence, consumers will simply consider the government's decision as a trade-off, whereby it may be lower tax today but it will most likely be higher tax in the future, which means consumers are unlikely to increase consumption. Secondly, if the government decides to increase government spending, consumers in a Ricardian world will know that they will face a higher tax in the future, and as a result of this, will reduce their consumption. This decrease will offset any increase in government spending.

Due to a few unrealistic assumptions in the Ricardian equivalence, including perfect capital markets, individuals living forever or caring for progeny as much as caring for themselves, there are numerous arguments against the Ricardian equivalence hypothesis comprising of consumer myopia, borrowing constraints and future generations.

2.2.3 Neoclassical Theory on the relationship between public spending and output growth

Neoclassical economics has developed other theories relating the impact of fiscal policy on economic growth, such as the Ricardian equivalence theorem as well as rational expectations to explain the relationship between fiscal consolidations and economic growth. Neoclassical models consider other transmission mechanisms by which reductions in government budget deficits can affect the economy; it can especially affect wealth and people's expectations, which may outweigh the negative impacts on demand and economies activities. According to neoclassical theory, fiscal policy has an impact on output growth due to its effect on aggregated demand and labour supply. In order to understand these elements in greater detail, we must first look at how fiscal policies affect economic growth through demand side and supply side.

2.2.3.1 The demand side

First of all, how wealth effects on consumption will be considered: as highlighted in Keynesian economy, private consumption solely depends on disposable income, this means that when government spending decreases, private consumption will also decrease. However, a cut in government spending should be a signal to consumers that a reduction in the future tax burden is imminent, which should generate a positive wealth effect. Not only cuts in government spending, but an increase in taxation can also have expansionary effects on consumption, because as Blanchard (1990b) argues, if a tax increase today generates the expectation of less dramatic tax increases tomorrow, it could have expansionary impacts on economic growth.

Bertola and Drazen (1993) construct a model in which national income is assumed to be constant, while government spending, in their opinion, follows a random walk with a positive drift. When there are low levels of government spending, any increase in government spending will lead to a less than one-to-one reduction in private consumption. This means that the multiplier is still be positive.

Bertola and Drazen (1993) ascertain that even a small cut in government spending could have powerful positive effects on private consumption when there are high levels of government spending.

Bertola and Drazen state that "a policy innovation that would be contractionary in a static model may be expansionary if it induces sufficiently strong expectations of future policy changes in the opposite direction".

Giavazzi and Pagano (1996) share Bertola and Drazen's viewpoint; they determine that large fiscal adjustments can have positive impacts on output, as they generate expectations about a permanent and decisive change in the stance of fiscal policy.

Wealth effect is clearly based upon the assumption that large spending cuts signal a permanent change in the stance of fiscal policy. On the other hand, those

who take a more pessimistic stance assume that large spending cuts threaten the political survival of a government committed to fiscal austerity; therefore, a wealth effect may not be as large as expected.

Alesina and Perotti (1997) consider the effects of fiscal consolidation in relation to the output through the demand side and find that a tightening fiscal policy may have positive impacts on the output via the credibility effect. Alesina and Perotti (1997) argue that fiscal adjustments, especially in countries with high levels of public debt, may have an important credibility effect on interest rates through traditional crowding-in mechanisms or by reducing the default risk. Giavazzi and Pagano (1996) argue that a fiscal consolidation can reduce the default premium on public debt if it can restore government solvency, where former policies were deemed unsustainable. Therefore, tightening fiscal policy has the ability to decline interest rates, which in turn generates crowding in effects for private investment and consumption of durable goods. The credibility effect is a complex issue which needs to be looked into in greater detail through empirical research.

2.2.3.2 The supply side

Previous research relating to the role of fiscal policy on economic output traditionally focuses on the demand-side effects. However to truly understand the impact it has on economic growth, the long term issues, such as supply-side effects need to be examined, because if the economy is operating at full capacity, a fiscal expansion has to be crowded out. Only fiscal policies with supply-side effects can affect capacity constraints; however, supply-side effects can make short-term demand-side effects through expectations linked to long-term growth. For fiscal expansion to have positive effects on the supply side the fiscal multiplier should be bigger; although, if a fiscal expansion has negative effects on the supply, the fiscal multiplier should be smaller and in some cases negative.

Numerous economists consider that fiscal policy can affect the supply-side through labour supply. As previously discussed, permanent reductions in government spending can have positive impacts on the demand side via the wealth effect; however, the same wealth effects may reduce labour supply. The

reason for this is because wealth effects on the demand side increase private consumptions, which means that individuals have the option to participate in more leisure activities than work ones, this outcome will most certainly lead to a decrease in labour supply.

It can be determined that fiscal policy has two opposite effects on labour supply: a tight fiscal policy with cuts in government spending financed by taxes will reduce labour supply through a wealth effect, while the substitution effect will increase labour supply because there is a reduction in income tax, which in turn increases work effort and therefore, increases labour supply. A loosening of fiscal policy will work in vice versa.

The wealth effect seems to be a permanent aspect of government spending cuts, whereas the substitution effect seems to be more prominent when governments want to implement temporary spending cuts. Although, according to Alesina and Perotti (1997), empirical works suggest that both the wealth effect and the substitution effect on individual labour supply are small.

2.2.4 New Keynesian theory

According to Cogan et al (2009), "the term 'New Keynesian' is used to indicate that the models have forward looking or rational expectations by individuals and firms, and some form of price rigidity, usually staggered price or wage setting". New Keynesian theory proposes that an increase in government expenditure will crowd out private spending and lead to an increase in interest rates. This theory is certainly contrary to the old Keynesian viewpoint, which considered an increase in government spending had a multiplier effect on output and would therefore lead to an increase in consumption expenditure.

Cogan et al (2009) use the Smets-Wouters (2007) model to estimate the multiplier and discover that the multiplier from a permanent increase in federal government purchases is significantly less in New Keynesian models than in traditional Keynesian models. In the new model the multiplier is less than one because an increase in government spending crowds out investment and private consumption. Galí et al (2007) also use a New Keynesian model to estimate the

multiplier; their estimated multiplier is quite high, however, their model incorporates two assumptions that make it more similar to the traditional Keynesian model. Galí et al assume that at least 50% of consumers are rule-of-thumb consumers, who do not own any assets or any liabilities, and simply consume their current labour income; which makes the marginal propensity to consume much higher. They also assume that employment is demand-determined; therefore, workers are always ready to work whenever the firm requires.

In the new Keynesian model, the multiplier still has the ability to be large, especially in the "Zero Lower Bound".

2.2.5 Institutional aspects of fiscal policy

The previous sections discuss the views of schools of economics such as traditional Keynesian theory, neoclassical theory and New Keynesian theory in relation to how fiscal policy affects output. While these schools of economics try to determine and define channels where fiscal policy affects output, it is easy to see that the impact of fiscal policy on economic activity can also depend on institutional and political factors, which will be discussed in this section.

The impact of fiscal policy on economic activity can depend upon the inside and outside lags. Long lags will reduce short-term fiscal multipliers; but, the difference between inside lags and outside lags should still be distinguished. There are four policy lags: the recognition lag, decision lag, implementation lag and impact lag. The first three are inside lags while the last one is an outside lag. According to Helming et al (2002), "Inside lags reflect the time it takes to recognize that fiscal policy should be change and then to put appropriate fiscal measures in place" while "outside lags reflects the time it takes for fiscal measures to feed through to aggregate demand". The impact of fiscal policy depends on outside lags, whereas inside lags tend to reduce the effectiveness of fiscal policy.

What is more, the effectiveness of fiscal policy can also be affected by political economy considerations; according to Alesina and Perotti (1995), large and persistent deficits may be a result of several political economy factors. For

instance, current voters and policy-makers prefer to delegate fiscal consolidations to future generations rather than dealing with it themselves. Also, fiscal adjustments may be carried out too late due to conflicts regarding sharing costs between various groups: this is because fiscal adjustments are not free; they even cost more in terms of output. Whilst, policy makers and voters may not be fully aware or fully understand the fiscal status; which can cause them to have fiscal illusions which can lead to incorrect fiscal policies. Finally, current governments may issue more debt in order to limit the fiscal maneuvering capabilities of future governments, who may have different priorities when it comes to consumption. If this is the case, debt accumulation is a strategic instrument which can be used to sort out any differences between the current government and future governments. It is clear that these political economy factors may lead to persistent deficits which can have a negative impact on the economy: this negative impact can offset any positive impact of fiscal adjustments.

The level of development also affects the impact of fiscal policy on economic activity. There is limited research about the fiscal multiplier in developing countries; it seems that the Keynesian impact of change in government spending and government tax may not be affected a great deal in developing countries. According to Agenor et al (1999), it is less effective to use fiscal policy for demand management because in developing countries, economic activities seem to be greatly affected by supply shocks. However, there are some features of developing countries which can affect the impact of fiscal policy (the size of fiscal multiplier). For example, fiscal policy seems to be harder to implement in developing countries because these countries usually have relatively poor tax administrations and expenditure management.

The amount of impact deficit reduction will have on demand and output, and how long it will take before the long run effects (if any) materialize cannot be answered by theory alone; empirical research needs to be carried out in order to answer these questions. Findings of some previous empirical studies will be discussed in section 2.3.

2.2.6 Fiscal sustainability

Fiscal sustainability assessment has become an important focus for macroeconomic analysis at the World Bank and IMF. There is, however, no exact definition of fiscal sustainability. There are two popular approaches to assessing fiscal sustainability, including the accounting approach and the present value borrowing constrain approach.

2.2.6.1 The accounting approach

The simpler method to assess fiscal sustainability is the accounting approach, which uses several indicators, such as the debt to income ratio to measures how a sustainable fiscal policy is. This approach presumes that a primary deficit is sustainable if it creates a constant debt to income ratio. A primary deficit is also defined as excess spending, excluding interest payments on existing debt over revenue including seigniorage. Blanchard et al (1990) consider that a sustainable fiscal policy has to make the debt ratio converge to its initial level. While Pasinetti (1998) defines public debt as being sustainable, if the ratio of public debt to GDP declines or at least remains constant.

$$\left(\frac{D}{Y}\right)_t \leq \left(\frac{D}{Y}\right)_0$$

Goldstein (2003) agrees with Pasinetti (1998) that a sustainable fiscal policy needs to keep the debt ratio stable or shrinking. It is easy to see that the accounting approach solely focuses on the debt ratio to evaluate the sustainability of a fiscal policy. Therefore, a sustainable fiscal policy is a policy which keeps the debt ratio stable or decreasing.

2.2.6.2 The present value borrowing constraint approach

The present value borrowing constraint approach provides a fuller consideration about the sustainability of fiscal policy. In this approach, a fiscal policy is sustainable if the present value of future primary surpluses, plus the present value of inflation-related revenues is equal to the initial real value of the government's debt. Fiscal policy is sustainable when it can hold the intertemporal budget

constraint without leading the government into insolvency. To begin analysing fiscal sustainability the intertemporal budget constraint should be incorporated, an analysis which is expressed by Burnside et al (2005) as the following:

$$\dot{b}_t = r b_t - (\tau_t - g_t - v_t) - \frac{\dot{M}_t}{P_t}$$

where b_t is the dollar value of the stock of government's debt of foreign reserves, and r is the constant real interest rate when the government lends or borrows from the international capital market. τ_t is the real tax revenue, g_t is the real government spending and v_t is the real transfer.

Thus, $\tau_t - g_t - v_t$ is the real government surplus, while M_t is the level of money supply and P_t is the price level.

In the above equation, $\dot{x}$ is the derivative of x with respect to time or $\dot{x} = dx/dt$

2.3 The effectiveness of fiscal policy: empirical evidence

2.3.1 Fiscal multiplier: empirical studies

The size of the fiscal multiplier is important for policy-makers to issue a fiscal policy and yet makes it impossible to calculate it theoretically. Even though, there is extensive literature related to this, there is still no consensus regarding the size of fiscal multipliers, even within the IMF.

In March 2009, an IMF staff note prepared for the G-20 Ministerial Meeting used a range of multiplier values which included 0.3 to 0.6 on revenue, 0.5 to 1.8 on capital spending and 0.3 to 1 on other spending.

Previous research relating to IMF staff suggests that, on average, fiscal multipliers were about 0.5 in advanced economies during the three decades before 2009. This, of course, lead to an optimistic view about fiscal consolidation. However, during the current crisis, and after undertaking fiscal consolidation, the question arose of whether negative short-term effects of fiscal consolidation were larger than expected because fiscal multipliers had been underestimated? In order to answer this question, Blanchard and Leigh (2012) used data from 28 economies including advanced economies in the G20 and member countries of

the EU. They discovered that the actual multipliers, since the beginning of the Great Recession, were much higher than originally forecast. According to their findings, the actual multipliers ranged from 0.9 to 1.7; in stark contrast to the 0.5 initially determined by the IMF. This, of course, is welcomed by Keynesian economists, because this backs up their previous warning about the dangers of austerity. Significant changes are required in fiscal policy, especially by policy makers who want to escape the current crisis by an austerity plan aimed at reducing the structural deficit. The IMF (2012) suggests that Britain should relax its fiscal consolidation strategy until the economy improves. Blanchard (2013) also states that Britain should rethink their economic plan; however, the recommendation from the IMF (2012) was later on withdrawn (2013). This confusion adds to the debate on whether austerity policy is an obstruction to recovery and economic growth.

One of the most recent surveys about the size of fiscal multipliers is Ramey's study. Ramey (2011) takes into consideration earlier research and concludes that "…despite significant differences in methodology, the range of plausible estimates for the multiplier in the case of a temporary increase in government spending that is deficit financed is probably 0.8 to 1.5." This paper will divide empirical research regarding the size of fiscal multipliers which are based upon the model to estimate the fiscal multipliers and review results. One debate which centres on the size of the fiscal multipliers has been contested regarding which method should be used to estimate the fiscal multipliers. This contentious debate emanates from the two directions relationship between government consumption and output, as government consumption has the capability to affect output, while output also has the ability to affect government consumption. In order to estimate fiscal multipliers, the model which is used should distinguish these directions of the relationship between government consumption and output.

There are several methods used to estimate the multipliers. Firstly, countless studies use macroeconomic models to estimate fiscal multipliers. There are two main types of macroeconomic models used to estimate fiscal multipliers, including large macroeconomic models which estimate empirically, such as the

IMF MULTIMOD model, and then there are the smaller dynamic general equilibrium models which are calibrated and solved numerically. The limitation of these models is that they cannot obtain a single or definitive fiscal multiplier because the results will depend upon other factors. The estimated results obtained from these models are normally a wide range of fiscal multipliers; this in itself can lead to difficulties in obtaining a clear conclusion from the empirical evidence.

Secondly, there are a plethora of studies which use a vector auto-regression model to estimate the fiscal multipliers, especially after Blanchard and Perotti (2002).

The results obtained from these studies and the methods used will be reviewed in the following sections.

2.3.1.1 Estimate fiscal multiplier by using macroeconomic models

Table 2.1 highlights that most research finds short-term multipliers as a positive aspect and the range of the estimated short-term multipliers is wide, but most expenditure multipliers range from 0.5 to 1.7, whereas most tax multipliers range from 0.3 to 0.8. In short-term spending multipliers there are a greater number of tax multipliers. These findings are consistent with previous studies. This result is also a standard result from a simple macroeconomic model in which a tax cut may lead to additional savings as well as more consumption. While the IMF (1996) found a short-term tax multiplier for the United States at 0.7 while the short-term spending multiplier was 1.1. Dalsgaard, Andre and Richardson (2001) use the OECD INTERLINK model and discovered that spending multipliers for the United States, Japan and Germany were significantly greater than tax multipliers.

Most research determined that long-term multipliers were generally smaller than short-term multipliers. The long-term multipliers were negative in many cases but small in term of absolute value, except for a case involving the IMF (1996) which found a long-term multiplier at -0.6 in the United States. Dalsgaard et al (2001) discovered a negative long-term multiplier in Germany (-0.2) while Hunt and

Laxton (2002) who used the IMF MULTIMOD model to obtain their results found long-term multipliers negative in Germany, France and Italy. There is no evidence for negative short-term multipliers.

Table 2.1 Fiscal multiplier – Estimating by Macro-model simulation

Author, time and model	Monetary policy assumption	Canada		France		Germany		Italy		Japan		UK		US	
		S	L	S	L	S	L	S	L	S	L	S	L	S	L
Richardson (1988) OECD INTERLINK	Unchanged short-term interest rates and exchange rates	0.8	0.5	0.6	1.6	1.0	0.6	0.9	0.8	1.2	1.5	1.0	0.7	1.3	1.3
Dalsgaard et al (2001) OECD INTERLINK	Unchanged real interest rates and nominal exchange rates	0.5	-0.2	0.6	0.2	1.1 *-0.5*	-0.2 *-0.3*	0.9	0.0	1.7 *-0.4*	0.5 *-0.4*	0.2	-0.1	1.0 *-0.6*	0.1 *-0.3*
Roger et al (2002)	+ No interest rate response + Price level targeting	N/A		0.87 0.77	-0.06 -0.05	0.86 0.69	-0.04 -0.04	0.85 0.73	-0.04 -0.03	N/A		0.95 0.51	-0.04 -0.03	N/A	
Hunt et al (2003)	Unchanged nominal exchange rate in 1 year then inflation targeting	N/A		1.33	-0.16	1.26	-0.19	1.32	-0.18	N/A		N/A		N/A	

In table 2.1, S stands for short-term multiplier while L stands for long-term multiplier. Numbers which are written in italic, if any, are tax multiplier.

Alternatively, there are many studies which use dynamic general equilibrium models to analyse the impact effects of fiscal policy on a range of macroeconomic variables including output. A number of previous studies used a neo-classical growth model while more recent studies use New-Keynesian models.

There are different factors that affect the multipliers obtained with DSGE models. In general, a fiscal shock will lead to a negative wealth effect on households, this event reduces consumption and increases labour supply. It can also reduce real wages and consumption. This means that there is a decline in private demand which can offset most of the increase in public demand. As a result of this offset, output will increase less than the increase in government consumption. In other words, the wealth effect makes fiscal policy less effective. The size of the multiplier depends on factors such as the inter-temporal elasticity of labour supply and the persistence of the shock to government spending.

Baxter and King (1993) discover that permanent changes in government spending lead to larger output effects than temporary changes. These findings match those of Aiyagari et al (1992) and Devereux, Head and Lapham (1996); who all determined that a large (permanent) stimulus would increase the steady-state capital stock and cause a greater increase in investment in both the short-run and long-run.

Studies which revolved around the multiplier using the DSGE models found government spending multipliers to be higher than tax multipliers. This is supported by Roeger et al (2010), who determine that the government purchase multiplier is 0.5, while the tax multiplier is below 0.4, an aspect which is supported by Coenen et al (2012).

2.3.1.2 Estimate fiscal multiplier by VAR model

The first application of a structural VAR to investigate fiscal policy, i.e. the relationship between government spending, taxation and output is approached

by Blanchard and Perotti (2002), who consider the structural VAR approach to be more suitable for the study of fiscal policy than for monetary policy. Blanchard and Perotti (2002) use a basic VAR specification:

$$Y_t = A(L,q)Y_{t-1} + U_t$$

where Y_t is a three-dimensional vector in the logarithms of quarterly taxes, spending and GDP, all in real per capita terms.

Data from the US from 1947q1 to 1997q4 is used, where the short-term fiscal multiplier is around 0.5 and the medium-term fiscal multiplier is also around 0.5. Here, "short-term" can be defined as a time gap ranging from the present to one year after the fiscal shock, while "medium-term" is considered a time gap ranging from 1 year to 3 years since fiscal shock.

Countless studies have followed Blanchard and Perotti (2002) and have used VAR or SVAR models to estimate the size of fiscal multipliers. Table 2.2 briefly summarizes the empirical researches regarding fiscal multipliers, by using VAR or SVAR models.

Table 2.2 Fiscal multiplier – Estimating by VAR model

Author and time	Data	Impact fiscal multiplier	Variables
Blanchard and Perotti (2002)	US (1947q1-1997q4)	0.5	GDP, tax and government spending
Perotti (2004)	Germany(1960q1-1974q4) Germany(1975q1-1989q4) UK(1963q1-1979q4) UK(1980q1-2001q2) US (1960q1-1979q4) US (1980q1-2001q4)	0.36 NA 0.48 -0.27 1.29 0.36	Government spending per capita, taxes revenue per capita, real GDP per capita, the GDP deflator inflation and the 10-year nominal interest rate
De Castro (2006)	Spain (1980q1-2001q2)	1.14-1.54 (medium-term multiplier)	Public expenditure, net taxes, real GDP, GDP deflator and the three-month interest rate
Gali et al (2007)	US (1954q1-2003q4)	0.74	Small VAR: Government spending, output, consumption and the deficit

De Castro et al (2008)	Spain (1981q1-2004q4)	1.3	
Burriel et al (2010)	Euro Area (1981q1-2007q4)	0.75	Public expenditure, net taxes, GDP, GDP deflator and the ten-year interest rate of government bonds
Ramey (2011)	US (1939q1-2008q4)	0.9 to 1.8	Total government spending, GDP, total hours worked, nondurable services consumption, private fixed investment, the Barro-Redlick (2010) tax rate and nominal compensation in private business divide by the deflator in private business
Baum and Koester (2011)	Germany (1971q-2004q4)	0.7	The growth rate in government revenue, growth rate in government spending and growth rate in GDP
Ilzetzki, Mendoza and Vegh (2013)	44 countries (24 developing countries)	0.37 high income countries, -0.21 developing countries.	GDP and government consumption

Table 2.2 summaries the main features of some of the studies which used the VAR model to estimate the multiplier. Although all of the papers use similar methodology, there are still some papers which have interesting features. First of all, Galí et al (2007) use both large VAR and small VAR data for the US over the period 1954q1 to 2003q4, to estimate the government spending multiplier. What is interesting about this paper is that it estimates the multipliers by two different VAR models, both the large VAR model and the small VAR model. By using two different VAR models, the results obtained by Galí et al (2007) may guide other economists, who also plan to use the VAR model to study fiscal policy, on how to choose variables to construct a VAR model. According to Galí et al (2007), the large VAR model has 8 variables: government spending, GDP, hours worked, consumption of non-durable goods and services, private non-residential investment, the real wage, the budget deficit and personal disposable income; whereas the small VAR model includes 4 variables: government spending, output, consumption and the deficit. The results highlight that the government spending multiplier estimated by the small VAR is larger than the multiplier estimated by the large VAR in the short-term (0.74 and 0.68) and in medium-term (0.75 and 0.70 at 4th quarter after government spending shock). However, government spending estimated by the large VAR is larger than that estimated by the small VAR in the long-term (1.74 and 1.22 at 8th quarter after government spending shock).

The model most similar to the one I would use to estimate is the one used by Ilzetzki, Mendoza and Vegh (2013). They estimate a SVAR model using a large international data set:

$$AY_{n,t} = \sum_{k=1}^{K} C_k Y_{n,t-k} + B u_{n,t}$$

where $Y_{n,t}$ is a vector of variables comprising government expenditure, GDP and other endogenous variables such as the real exchange rate and the policy interest rate set by the central bank. Furthermore, in order to distinguish the differences between fiscal multipliers in different groups of countries, they only estimate a benchmark model for two variables: government consumption and

GDP. The impact multiplier for high-income countries is 0.37, whereas in developing countries, this number is -0.21. Ilzetzki, Mendoza and Vegh (2013) also discover that there is a significant difference between a multiplier within predetermined exchange rate regimes (0.09 for impact multiplier and 1.5 for long-run multiplier) and a multiplier within flexible exchange rate regimes (the impact multiplier is statistically negative and the long-run multiplier is statistically indistinguishable from zero).

Furthermore, Ilzetzki, Mendoza and Vegh (2013) also base the ratio of total trade to GDP so as to classify countries into groups of open countries and groups of closed countries. For open countries the impact multiplier is 0.11 and the long-run multiplier is 1.4, while in closed countries the impact multiplier is negative and the long-run multiplier is also negative. Ilzetzki, Mendoza and Vegh (2013) also point out that the impact fiscal multiplier may give misleading information, because fiscal shocks such as fiscal stimulus packages are carried out over time and this can lead to lags in the economy's response. Therefore, the cumulative multipliers should be also considered. One of the most important contributions to the literature of Ilzetzki, Mendza and Vegh (2013) is that their paper is the first known attempt of cataloguing available quarterly data on government consumption in a broad set of countries. They use data from 44 countries from 1960q1 to 2007q4, of which 24 are developing countries, classified as such, and based on the World Bank income classifications.

One limitation of the VAR model is known as "fiscal foresight problem". The reason for this problem is that any changes in government spending and taxes can be anticipated due to legislative and implementation lags, therefore, the fiscal shock may appear in the economy the moment agents anticipate the government decisions. Thus, the VAR models may fail to estimate fiscal shocks correctly if agents are assumed to be forward looking. In light of this problem, Ramey (2011) compares the results between standard VAR methods and the narrative approach for identifying shocks to government spending. Ramey illustrates that the main difference is that the narrative approach shocks appear to capture the timing of the news about future increases in government spending much better

than the standard VAR which captures the shocks too late, meaning, it may not capture the initial decline in consumption and real wages that could appear at the moment the agents are aware of the news.

2.3.2 Fiscal consolidation and output

There are numerous empirical studies carried out in order to distinguish the relationship between fiscal consolidations and output. Most research focuses on the question of how fiscal adjustments affect economic growth. Giavazzi and Pagano (1990) used data from some European countries in the 1980s to shed light on two contending views about the effects of a fiscal contraction: the Keynesian view and the "expectation" view or "German view". In order to do this, Giavazzi and Pagano (1990) ran regressions for 10 countries; they ran a regression for each country and each regression used 170 observations. In each regression, the dependent variable is the ratio of private consumption to potential GDP. There are three independent variables included in the ratio of government consumption to potential GDP, the ratio of real money to potential GDP and the ratio of cyclically-corrected taxes net of transfers and subsidies to the output. The results indicate that there is a negative relationship between government spending and private consumption in some countries.

The Irish government attempted the first fiscal adjustment in 1982 and the result turned out as expected in the Keynesian model. This adjustment began in 1982, however, by the end of 1984, while the full-employment deficit had been decreased by more than 7 percentage points of the GDP, of which 5.5 percentage points were due to an increase in discretionary taxes. In contrast to the fiscal adjustment in Denmark, this fiscal adjustment led to an increase in the ratio of public debt to GDP as well as a decrease by 7.1% of real private consumption: making this fiscal adjustment unsuccessful. In spite of this early failure, the new Irish government elected in February 1987 attempted another fiscal adjustment which was successful. The term "successful" is pointed out by the figures relating to the 1987-1989 period in Ireland. Within 2 years, the full-employment primary deficit decreased by 7 percentage points of GDP, while real growth resumed and the ratio of public debt to GDP started to decline. The findings of Giavazzi and

Pagano (1990) encouraged the appearance of other empirical research with similar results. The table below summarises the results of some empirical research which show evidence of expansionary fiscal contractions.

In more recent work, Giavazzi and Pagano (1996) use yearly data from 19 OECD countries from the early 1970s to 1992 on the variables: income, private consumption, business investment, taxes, transfers, public debt and government consumption, to investigate, under what conditions, a fiscal consolidation can lead to an increase in private demand and vice versa, and whether a loosening of fiscal policy can lead to a fall in private demand. Some of the results obtained by Giavazzi and Pagano (1996) are: (i) Fiscal policy changes can indeed have non-Keynesian effects if they are large and protracted enough. (ii) Non-Keynesian effects are not only obtained through changes in public consumption, but can also be achieved through changes in taxes and transfers. The second finding parallels that of Alesina and Perotti (1995), who reported that budget cuts implemented by slashing transfer or public sector wages were more likely to be "successful" at stabilizing the debt-GDP ratio than those obtained without reducing transfer and wages.

Table 2.3 Evidence of Expansionary Fiscal Contractions

Author	Data	Definition of contraction	Evidence of expansionary fiscal contraction
McDermott and Wescott (1996)	20 industrial countries from 1970 to 1995	An increase in primary structural balance by at least 1.5 percentage points of GDP over 2 years and not decrease in either of the 2 years.	For successful consolidation, GDP growth is -0.18% (before), 0.1% (during) and 0.65% (after). If gross debt decreases 5% in relation to GDP three years after the fiscal consolidation, this consolidation is defined as a successful fiscal consolidation.
Giavazzi and Pagano (1996)	19 OECD countries from 1970 to 1992	Fiscal policy "episode" is defined as a period in which the structural component of the primary fiscal balance changed in the same direction without interruptions. A cumulative 5 percentage points of GDP change was marked as a large consolidation.	Estimation results point to large consolidations, an increase by $1 in taxes (cut in transfer) will lead to an increase in private consumption by 15-20 cents in the long run.
Alesina and Perotti (1997)	20 OECD countries for the period from 1960 to 1994	Increase in primary structural balance by at least 1.5 percentage points of GDP in one year or 1.25 percentage points in two consecutive years.	Real GDP growth rate is -0.2% before, 1.1% during and 0.3% after period of successful fiscal consolidations.

McDermott and Wescott (1996) support the "German view" by examining the relationship between fiscal adjustment and economic performance. They used data of the fiscal expansion and consolidation in 20 industrial countries over the period 1970 to 1995. The key finding of their empirical work is that fiscal consolidation does not trigger an economic slowdown, especially in a medium term. McDermott and Wescott (1996) also discover that a tight fiscal policy does not cause a recession.

This section has only discussed some early empirical research which points out the existence of expansionary fiscal consolidations, meaning that it is not likely that any fiscal consolidation will trigger a decline in output.

Besides trying to answer the question of whether the fiscal consolidation is expansionary or contractionary, a key finding of these academic studies is that fiscal adjustments by enforcing cuts in spending tend to be more successful than raising taxes, particularly if they focus on cutting transfers, entitlement spending, and public wages (Alesina and Perotti 1995; Broadbent and Daly 2010). Some studies point out that cuts in government spending are not only successful in reducing fiscal deficits, but in some cases affect economic growth. In theory, "a small reduction in current government purchases could signal large future reductions, and therefore cause consumption to rise by more than the fall in government purchases" (David Romer, 2000, p. 546-7).

David Henderson (2009) researched the Canadian experience of cutting spending in the 1990s and found that Canada reduced its debt from around 70% of GDP to 29% of GDP without giving up economic growth. Furthermore, Harvard's Alberto Alesina and Silvia Ardagna (2010) updated the analysis of Alesina and Perotti (1995, 1997) and obtained similar results: "Not all fiscal adjustments cause recessions. Countries that have made spending adjustments to reduce their deficits have made large, credible, and decisive cuts. Even in the very short run, many reductions of budget deficits, even sharp ones, have been followed immediately by sustained growth rather than recessions". In addition, it seems that a study which was carried out by Goldman Sachs economists Ben Broadbent and Kevin Daly (2010) which used a wider range of dataset had more

impressive results. In this study, authors reviewed every major fiscal correction in OECD countries since 1975 and found that policies for budgetary adjustments which focused on cutting government spending were successful in their main mission – correcting fiscal imbalances. Furthermore, instead of obstructing economic growth, they stimulated growth. Ben Broadbent and Kevin Daly explain these findings through several channels; first of all, according to the Ricardian equivalence theorem, cuts in government spending have the ability to reduce the fear of raising future taxes, thus, encouraging private spending by means of an expectation-driven "income effect". Secondly, cuts in government expenditure mean a decrease in the public sector's demand for workers; this will increase the competitive ability of private investors which in turn stimulates economic growth. In addition, Ben Broadbent and Kevin Daly (2010), highlight that tax-driven fiscal adjustments are, in fact, contradictory to the aim of cutting spending fiscal adjustments. Correcting fiscal imbalances by tax-adjustments are never successful and damage growth.

Although various empirical studies determine that a fiscal consolidation by cuts in spending seems to be better for fiscal adjustment by increasing taxes, some still oppose this viewpoint. According to Christina D. Romer (2011), the economic evidence does not support the anti-tax view; Romer considers that both spending cuts and tax increases have the ability to obstruct the recovery in the near future. However, it does seem that spending cuts can obstruct the recovery more than tax increases, because raising taxes for the wealthy would be least likely to decrease overall demand and would undoubtedly raise unemployment in the short-term.

Romer and Romer (2007) discovered that in the United States, an increase in taxation by 1% of GDP reduced output over the next 3 years by a maximum of about 3%, with the effect being smaller when the only changes in taxation considered were those taken to reduce past budget deficits. Based on this study, many people consider tax increases to have a bigger short-term effect on the economy than spending cuts. However, Christina D. Romer (2011) determined

that this idea was a mistake and she believed that spending cuts could have a greater effect.

In order to discover more about this, it is necessary to evaluate the IMF procedures regarding the situation of some countries. For example in Japan, according to the IMF country report (2011), raising taxes was a better option than reducing spending. There are two reasons behind this decision: firstly, the Japanese government needed to spend more money for reconstruction after the terrible earthquake which happened in 2011. As predicted, the fiscal costs of the earthquake ranged somewhere between 2-4% of the GDP over the next several years. Therefore, it was too difficult for the Japanese government to reduce their spending. Secondly, there was ample opportunity for Japan to increase additional tax revenue, especially consumption tax (VAT). Japan's overall tax revenue was one of the lowest amongst the OECD countries with 17% of GDP. Furthermore, Japan had one of the lowest VAT rates in the world; Japan's consumption tax which was equivalent to VAT in other countries in the world could increase to 10% by 2015 from the present 5%. "10%" is still a low level if compared with the European average rate of 20%: all of these factors highlight the public debt crisis in Japan.

Amongst a large number of empirical researches, regarding the relationship between fiscal contraction and output, there is an interesting study conducted by Vincent Hogan (2004) which examines the ability of the expansionary fiscal contraction hypothesis which discovered that fiscal contraction may have non-Keynesian effects but will not, literally, be expansionary. In order to test the Expansionary Fiscal Contraction hypothesis, Vincent Hogan (2004) estimates consumption functions for 18 OECD countries using data from the OECD Economic Outlook (1970 – 1999). Vincent Hogan's (2004) results could be determined as neutral in relation to the impact fiscal contraction has on output.

2.3.3 Fiscal consolidation and the ratio of public debt to GDP

Although there is renewed interest in the effects of fiscal policy, there are not many studies which focus on the impact of fiscal consolidation on the public debt

ratio, even though this topic is becoming more prominent, especially because the debt reduction is currently one of the most important targets of fiscal policy in a large number of countries. While there are underestimations of fiscal multipliers, policy-makers who design austerity programs believe that austerity programs will obviously reduce the public debt ratio. However, many empirical studies indicate that austerity programs are ineffective. De Grauwe (2014) argues that "on average for every one percent increase in austerity output decline by 1.4%." It can be determined that instead of reducing debt ratio; austerity programs increase the debt ratio, especially in the Eurozone.

These empirical results elevate the debate about the impact of fiscal consolidation on debt ratio: a few studies related to this topic are reviewed in this section.

Forni et al (2009) set up a DSGE model to study the response of macroeconomic variables to a fiscal shock within the Euro area. This study reveals that an increase by 1% in government consumption leads to an initial decrease by 1% in debt ratio. However, the debt ratio will begin to increase in the fourth quarter after the fiscal shock. The response in this study can be deemed symmetric; therefore, a decrease of 1% in government consumption will make the debt ratio increase by about 1% in the first three quarters after the fiscal shock before it decreases in the fourth quarter.

Gros (2011) uses a simple formal analysis to determine that a fiscal adjustment reduces the debt ratio so long as the debt ratio multiples the fiscal multiplier by less than 1. Gross (2011) takes into consideration that the austerity plans may increase the debt ratio in the short-term and have the ability to be self-defeated.

The European Commission (2012) also takes into consideration the austerity programs that are planned by member states does not ensure that the debt ratio will reduce in the short-term. The European Commission (2012) predicts that the debt ratio in some countries, such as Spain, United Kingdom and Portugal will increase between 2011 and 2015.

Eyraud and Weber (2013) consider a simple simulation model, and discover that in countries with high multipliers, fiscal consolidation will initially increase the debt ratio and then reduce the debt ratio after 2 or 3 years. Eyraud and Weber suggest that fiscal gains due to a contractionary fiscal policy are partly offset by the decline in output. However, this effect does not last for long; also the debt ratio will most likely decline once the fiscal is tightened. These findings are consistent with Forni et al (2009). Furthermore, Eyraud and Weber determine that the movement of debt ratio after a fiscal consolidation also depends upon the initial debt ratio of the country. Fiscal consolidation in countries with a higher debt ratio will increase a greater amount of debt ratio in initial time periods. The debt ratio in these countries will also need longer to decrease than those countries with a smaller initial debt ratio.

2.4 Fiscal policy under a sudden stop

2.4.1 Sudden stop and determination

An episode characterized by a sudden drop in capital inflows to developing countries and a corresponding reversal from a large current account deficit to a smaller current account deficit, or a small current account surplus, is labeled a sudden stop of capital flows into a developing country by Calvo (1998). Calvo's analytical framework is considered to be the first framework which is focused on sudden stops, even though it was first introduced by Dornbusch, Goldfajn and Valdes (1995). Since then, there have been numerous theoretical works about sudden stops.

Calvo and Reinhart's (1999) research about the banking crisis and currency crisis in the context of sudden stops, takes into consideration policy options including capital controls, exchange rate flexibility and dollarization under a sudden stop. According to their research, dollarization is the best response to sudden stop, although in their study, they do not provide a clear determination of the term sudden stop.

Calvo et al (2004) focus on the cause of sudden stops by using a panel regression for 32 countries including 15 emerging economies and 17 developed economies

from 1900 to 2001. They discover that sudden stops are normally induced by the degree of domestic liability dollarization and the sensitivity of the real exchange rate to capital flow reversals. They also determined that there was a higher probability of sudden stops in economies with a less open trade sector and higher dollarization. One of the most important contributions of Calvo et al (2004) findings was the definition about sudden stops; they defined sudden stops as periods which met all three of these following conditions:

- A significant decrease in capital inflows which were revealed in terms of a figure which was at least 2 standard deviations declining below the country-specific mean of sample.
- A sudden stop will end when the annual change in capital flows is greater than 1 standard deviation below its sample mean.
- A sudden stop will start once the there is a fall by one standard deviation below the mean in the annual change in capital flows.

Hutchison and Noy (2006) perceive that a sudden stop happens when a country faces a currency crisis and a change by more than 3% of GDP in current account simultaneously. The definition of a sudden stop episode by Jeanne and Ranciere (2006) seems to be simpler; they define that a sudden stop happens when the capital account changes by an amount which is larger than 5% of GDP.

Hutchison et al (2010) considers the definition of Hutchison and Noy (2006) and Jeanne and Ranciere (2006) to use more arbitrary thresholds; therefore, Hutchison et al (2010) follows Honig (2008) to define a sudden stop crisis "as a year in which the financial account decreases by at least 2 standard deviations, while the current account surplus increases (at years t or t+1 by any amount)".

2.4.2 Sudden stop and policies

A sudden stop is normally followed by an economic recession. Therefore, policy-makers need to find an optimal policy in order to reduce the negative effects of sudden stops in the emerging markets. However, there is debate regarding policies that should be used in countries facing a sudden stop, there are two main arguments about this debate in fact.

Stanley Fischer (1998) contemplates whether after a sudden stop; policy makers should tighten monetary and fiscal policy. According to Stanley Fischer, the interest rate should increas in order to make the country more attractive to foreign investors, then, when the confidence issue is restored, the interest rate could be reduced to normal levels. In terms of fiscal policy, Stanley Fischer believes that countries need to define their fiscal fundamentals in order to finance financial restructuring and reduce the current account deficit. Stanley Fischer also argues that tighter monetary and fiscal policies should be used during a sudden stop; a viewpoint which was supported by the IMF in case an Asian crisis occurred in the 1990s: the IMF forced countries in East Asia to increase their interest rates when Asia was in the midst of a crisis.

On the other hand, many people consider that a sudden stop will lead to a recession; therefore, expansionary fiscal and monetary policies should be implemented. One of the most famous economists who supported this view was the Nobel Prize winner Joseph Stiglitz: he believed that tighter monetary and fiscal policies would worsen the recession in countries facing sudden stop. Stiglitz (2002) states that: "For more than seventy years there has been a standard recipe for a country facing a severe economic downturn. The government must stimulate aggregate demand, either by monetary or fiscal policy". According to Stiglitz (2002), the Asian crisis in the 1990s forced some Asian countries into a major downturn period, and with this in mind, the stimulation is necessary.

Braggion et al (2005) constructed a model to examine both viewpoints and discovered that an initial tightening of policies followed by a loosening is optimal policy during sudden stops. Ortiz et al (2009) studied the fiscal and monetary policies of 18 external financial crisis episodes and found that during sudden stops, countries with tightened fiscal and monetary policies experienced a larger output decline than countries with looser policies. Cúrdia (2009) uses a DSGE model and found that a combination of domestic depreciation in exchange rate and rising interest rates were optimal monetary policies for countries facing sudden stops. Hutchison et al (2010) used data from 83 sudden stops in 60 countries and discovered that countries with tight fiscal and monetary policies at

the time of a sudden stop were more inclined to a larger output decline. They also determined that contractionary macroeconomic policies seemed to be better in terms of stabilizing current accounts; however, this action is more associated with larger output losses.

Besides these studies regarding policies that reduce output loss under a sudden stop, there is an array of studies which concentrate on optimal fiscal policy under sudden stops, which focus on other targets besides output.

Calvo et al (2004) use a simple simulation model to estimate the required primary surplus for a country using sudden stops to maintain fiscal sustainability. This mechanism highlights when a sudden stop happens; in theory the local currency should depreciate in order to reduce the current account deficits, however, this depreciation can lead to debt accumulation. Calvo et al (2004) considers maintaining fiscal sustainability by keeping the ratio of public debt to GDP constant or lower than the initial ratio. To define this, simulations are created which determine how much local currency needs to depreciate and how much public debt needs to accumulate to counteract this depreciation; at the same time the primary surplus for the country to keep fiscal sustainability is also defined. Although the model used by Calvo et al (2004) seems to be too simple and specific, this is actually the first paper study about fiscal sustainability under a sudden stop I have encountered.

Benigno et al (2008) uses a model for a small open economy with endogenous sudden stops which is induced by the appearance of a credit constraint. This model includes both tradable and non-tradable goods. Since the focus of this model is to study optimal stabilization policies, it is determined that the optimal tax rate for non-tradable goods equals zero if the constraint is not binding, although this rate will be negative under a sudden stop. These findings imply that when the economy is under a sudden stop, the government should subsidize non-tradable consumption as this will lead to an increase in the supply and demand of non-tradable goods. To achieve this, the credit constraint is relaxed as it is in fact a ratio of the output.

Different to other studies involving sudden stops in relation to inflow capital, Ozkan and Unsal (2010) developed a two-country DSGE model in order to differentiate between sudden stops induced by foreign factors and sudden stops induced by domestic origins. Ozkan and Unsal (2010) discovered that sudden stops arose from financial distress in the global economy, which affected the economy for longer than sudden stops originating from domestic origins. In this study, Ozkan and Unsal highlight that the sudden stop happens when changes are required for investor's interest rates. This opinion is completely different to Benigno et al (2008) who determine that sudden stops are induced by the presence of an occasionally binding credit constraint.

2.4.3 Theoretical models of sudden stop

Chapter 3 considers a theoretical model which shares common features with models related to the literature of sudden stops; therefore it is worth reviewing some previous studies about theoretical models of sudden stop.

This section summarizes the main features of several theoretical studies about sudden stops in the table below.

Table 2.4 Models of Sudden Stop

Author and time	Household	Firms	Government	Sudden stop	Findings
Auernheimer and Garcia-Saltos (2000)	There are an infinite number of identical agents in a perfect foresight and continuous time model. Each agent has a fixed and equal amount of labour. Each agent uses labour and domestic capital (total domestic capital is assumed to be fixed) as input to produce a constant returns to scale production function. Each agent uses it productions and borrows from international markets to finance capital, consumption and pay for debt service. Foreign debt equals the value of an individual's existing capital minus an individual's wealth (collateral constraint). The interest on foreign debt individual's face depends upon the world interest rate, the level of debt and the value of an individual's capital (or collateral). Individuals maximize their utility function by choosing a level of consumption, level of foreign debt and domestic capital.		No governmental sector.	If there is a positive shock to the world interest rate, individuals tend to sell their capital and reduce consumption in order to reduce debt. The price of domestic capital will reduce and the output will also reduce, due to the decrease in input capital.	By introducing collateral constraint, the model can explain a sudden stop. If there is no collateral constraint, the individuals will take any given world interest rate.

Mendoza (2002)	Consumed tradable goods, non-tradable goods and supply labour to firms. They access the international single-period bond market. Individuals face a borrowing constraint that limits their debt as a share of current income. They maximize their utility function subject to a standard budget constraint.	Owned by individuals: hire labour to price non-tradable goods following a Cobb-Douglas function. They also produce a stochastic endowment of tradable goods. Firms maximize their profit by choosing labour demand.	The government runs a simple budget constraint. They finance their spending by obtaining tax from individuals.	This model can study sudden stops which are caused by shocks in tax rate, productivity, in the world interest rates, or mixture of all three.	This study determines that the social costs of sudden stops are huge. This study also suggests that policy intervention should be considered. However, in order to have an effective policy, the policy-maker needs to choose carefully.

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| Mendoza (2006) | Choose sequences of consumption, labour supply, investments in domestic capital and foreign borrowing, or lending in one-period bond international market to maximize the utility function which follows Epstein's (1983) Stationary Cardinal Utility function. The world international credit market is incomplete and the foreign lenders require households to guarantee their debt by a share of the market value of their capital. | Owned by households, producing tradable goods and selling them at world-determined price. Firms maximize their assets by choosing labour demands, investment, imported inputs and the rate of capacity utilization which is equal to the capital depreciation rate. Lenders require the market value of assets, which is used as collateral, to be enough to cover interest and principal on working capital loans. | No governmental sector. | The collateral in the model introduces three credit channel effects. Two of them are in the form of endogenous external financing premia. The other is the debt-deflation mechanism. Through these channels, a shock may lead to a fall in physical investment and equity price. These falls | The simulation results of a sudden stop in an equilibrium business cycle model with collateral constraints are consistent with the main features of a real sudden stop.

This study also suggests that a higher level of financial institutional development can reduce the probability of a sudden stop, and also prevent negative effects of contractual frictions behind the collateral constraints. |

				tighten collateral further, which leads to a reduction in credit, asset price and investment.	Any emerging economy may face sudden stops induced by increases in the world interest rate or the price of imported inputs caused by development in the world.

Benigno et al (2008)	Uses non-tradable and tradable goods, borrows money from international financial markets limited by a fraction of current total income. Individuals are firm share-holders and work for their own firms.	Produce non-tradable goods and pay wage rate for individuals. The economy is endowed with a stochastic stream of tradable goods (follow a random Markov disturbance).	The government runs a simple balanced budget in each period by getting tax from individuals and pay for their consumption of tradable and non-tradable goods.	The endogenous "sudden stops" are induced when there is an occasionally binding credit constraint.	This study determines that when there is an endogenous sudden stop, the government subsidizes non-tradable consumption (negative tax rate) to increase both the demand and supply of non-tradable goods, in order to relax the financial constraint by increasing the value of the collateral increases.

| Ozkan and Unsal (2010) | Use domestic goods and foreign goods, whilst accessing two types of non-contingent one-period debt (domestic and foreign currency). Individuals own all home production and importing firms, therefore, they acquire firm profit, plus, they also work for their firms. | Production firms produce domestic goods. Importing firms buy foreign goods and sell to the domestic market. Unfinished capital producing firms combine investment and rented capital to produce unfinished capital goods. Entrepreneurs are key players in the model. They transform unfinished capital goods to sell to production firms. They finance investment by borrowing from foreign lenders. | The monetary policy; the interest rate rule is the following: $$1 + i_t = (1 + i)(\pi_t)^{\varepsilon_\pi}$$ Where i is the steady state level of nominal interest rate and π_t is CPI inflation rate. | The endogenous sudden stop: an unanticipated shock to the investors' perception of the entrepreneurs' productivity leads to a reversal of capital flows going out of the economy. The exogenous sudden stop: global financial crisis leads to sudden stop. | The sudden stop arising from a global financial crisis lasts longer than sudden stop episodes of domestic origins. |

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2.5 Conclusions

This chapter has reviewed the literature on the macroeconomics of fiscal policy and fiscal adjustment. This chapter reviews the view of Keynesian theory, Ricardian equivalence theorem, Neoclassical theory and New Keynesian theory about the effectiveness of fiscal policy as well as a range of empirical research.

One of the most prominent aspects of the literature relevant to this thesis is the effectiveness of fiscal policy (the size of fiscal multiplier). Reviewing this literature suggests that there is no consensus about the size of the multiplier in either theory or from empirical estimation. This chapter reviews empirical works about the size of fiscal multiplier, especially studies which use VAR approach to estimate fiscal multiplier. These suggests a gap in literature in that there are a limited number of empirical works which study factors affect the size of fiscal multiplier.

Therefore, Chapter 4 of this thesis will use a SVAR model to estimate the fiscal multiplier for a group of 30 countries, in order to find out whether or not financial openness, financial development, the level of external debt, the level of trade openness and exchange rate regime affect the size of the government consumption multiplier.

Furthermore, this chapter also reviewed literature about sudden stops in the flow of capital to small open economies. Most of the theoretical works study how unanticipated shocks in productivity, world interest rate, fiscal expenditure or even a combination of all of these shocks lead to a sudden stop. They also study the consequences of a sudden stop. Reviewing these models suggests how to model a sudden stop by using financial constraints. However, there is still a gap in literature about theoretical models of sudden stop that in most models, shocks are immediate and unanticipated. This means that borrowers do not have any opportunity to choose an optimal path of response to do any adjustment to avoid sudden stop or at least to minimise the damage.

In order to fill this gap, Chapter 3 builds a dynamic deterministic general equilibrium model to study external debt. In this model, borrowers from a small open economy face a reduction in the sustainable level of external debt which may lead to sudden stop. However, in this model, there is the option for the small open economy to negotiate with foreign lenders (for example a multilateral body such as the IMF),

allowing them to choose their optimal path to adjust to reduced access to foreign borrowing. This, thus, can help the small open economy to avoid sudden stop and/or risk of default due to a reduced ability to access international debt markets.

This chapter has also reviewed literature regarding the effectiveness of fiscal policy and determinants of fiscal policy choice. This is motivated by the fact that during and after the global financial and economic crisis 2007-09, the results of the fiscal stimulus package and/or fiscal consolidation program vary across countries and time. However, it seems that there is a gap in literature regarding factors which determinants the effectiveness of fiscal policy and/or fiscal policy choice. In order to address this gap, Chapter 5 of this thesis will analyse case studies from 4 different countries including Greece, Latvia, Pakistan and Turkey, in order to study the determinants of a countries fiscal policy choice.

Chapter 3. External debt reduction: shock therapy versus gradualism

3.1 Introduction

This chapter models the reduction in borrowing by a small open economy, following from a reduction of debt capacity. An occurrence like this could be triggered, for example, by a change in a lenders perception regarding the sustainable ratio of foreign debt to GDP level, perhaps following a slowdown in growth. The purpose of this model is to address the issue of speed adjustment: the length of time it will take the small open economy to reduce the overall external debt ratio to a sustainable level as required by foreign lenders. The core model presented here uses standard modelling assumptions within a perfect foresight setting to investigate this question, and discovers – under a variety of assumptions – that it is in the best interest of an indebted country to delay the speed of adjustment for as long as possible. This deferral is motivated by impatience, relatively high discount rates of households and/or the government in the indebted country.

In reality, when governments are faced with a reduction of debt capacity their reaction should be associated with 'shock therapy' (i.e. reducing their deficits rapidly) rather than a 'gradualism' approach (a delay in adjustment as predicted by this model). This chapter will therefore also consider other reasons, outside of the modelling framework, why a fiscal adjustment should perhaps be undertaken rapidly and not gradually.

There are numerous reasons which may force the economy to reduce its existing fiscal debt and deficit. One of them is a sudden stop which is usually characterized by a sudden drop in inflow of international capital and a corresponding reversal from a large current account deficit to a smaller current account deficit or a current account surplus (Calvo, 1998). This sudden stop is usually followed by a depreciation in local currency, an increase in trade surplus and an economic recession.

A sudden stop may be the result of a change in lenders perceptions. Reviewing the literature on sudden stops suggests a main gap. In most models, a sudden stop occurs after an unanticipated shock which leaves the debtor with no opportunity to create an optimal plan. Most models instead focus on the economic impact of a sudden stop and

the cause of it, for example, how shocks to productivity, the world interest rate, as well as fiscal expenditure or a mixture of all three elements can lead to a sudden stop.

To address this gap in previous literature, this chapter will study the external debt reduction process following a change in lenders perceptions relating to the sustainable ratio level of foreign debt to GDP: the cause of this reduction is not modelled. It is presumed that the small open economy in this chapter can negotiate with lenders (for instance multilateral agencies) allowing them time to bring their foreign debt ratio or deficits to a sustainable level.

The model developed in this chapter is a dynamic deterministic general equilibrium (DDGE) model for a small open economy with two types of goods: tradable and non-tradable. In this model, households with foreign debt constraints want to maximize their utility function by choosing the level of labour supply, consumption and foreign debt, while firms want to maximize their profits by choosing labour demand. To begin with, governments will only run a simple budget constraint, and this model illustrates this type of response with a significant fall in foreign debt capacity. However, one important assumption in this model is that the small open economy is still able to negotiate with current lenders as well as new lenders who allow the economy to essentially roll over their existing debt before bringing the debt ratio to a safe level in the future. The new debt ratio level gives foreign lenders piece of mind regarding the possible risk of debt default. This assumption means a sudden stop episode has the ability to become a limited debt capacity episode.

This chapter does not however, highlight the reasoning behind the foreign lenders change of perception; there are several possible reasons for this change in perception, from financial turmoil to an economic crisis. This chapter also extends the baseline model to study about debt default and find that even the small open economy can choose an optimal plan to do adjustment, they may still want to default external debt if they benefit enough from defaulting.

The rest of chapter 3 is structured as follows: section 3.2 will discuss the speed of external debt reduction and also review the theories in relation to sudden stops, some of which make similar modelling assumptions to the present chapter. Section 3.3 describes in depth the model used in this chapter, while section 3.4 explores the

parameterization of the model. The simulation results will be analysed in section 3.5, whilst section 3.6 summarizes the findings of chapter 3.

3.2 Literature review

This section discusses two main literatures which are most directly relevant to this chapter: the first piece of literature that will be looked at concerns the speed of external debt reduction and will be reviewed in section 3.2.1 (together with the literature about the speed of economic transition from a command to a market economy, because this addresses a similar question about the appropriate speed of adjustment). While, section 3.2.2 investigates literature which focuses on the theoretical models of sudden stops which share similar features with the model used in this chapter.

3.2.1 The speed of external debt reduction: arguments within the literature about the speed of economic transition

Key issues that arise during an external debt reduction episode will be addressed in this chapter, including how fast external borrowing should be reduced and what particular adjustment path government and household deficits should choose to achieve this goal? In other words, it is a choice between shock therapy (rapid adjustment) and gradualism (slow adjustment)? When a decision is being made, trade-offs between the cost of external debt reduction (for example, decrease in consumption, investment and output) and the cost of high levels of external debt (for example, the risk of a funding crisis and additional cost of debt service because of risk of default) should be taken into account.

While there are a substantial number of political and economic commentaries on the cost of rapid fiscal consolidation and the associate problems of 'austerity', there appears to be a gap in the research literature relating to the speed of external debt reduction, following a reduction in external debt capacity. Once again, this is a choice between "shock therapy" and "gradualism". The term "shock therapy" originated in debates in the 1990s about the speed of economic transition from a centrally administered system to a system based on market relations. "Shock therapy" is, to a certain extent, significant when it comes to adjusting the lower external debt capacity, as this may also require structural adjustment; for example, the re-allocation of resources from non-tradable to tradable output. This sub-section reviews this debate on "shock therapy" versus "gradualism" in relation to transition economies and

assesses its relevance to the challenge of emerging market countries adjusting to a lower debt capacity.

A succinct statement of shock therapy is quoted by Sachs (1990): "you don't try to cross a chasm in two jumps". Sachs believed that a rapid economic transition can avoid painful and costly periods of adjustment. Parker, Tritt and Woo (1997) compare transitions in Asia and Eastern Europe; they consider the speed of transition to have a negative relationship with the continuance of output decline and a positive relationship with the intensity of output recovery. Whereas, Bruno et al (1988) analyses case studies of Latin American experiences with macroeconomic stabilisation in the 1980s and discovers that a comprehensive and radical program is the best option for transition.

A comprehensive and radical program was devised by John Williamson (1990), the "Washington Consensus"; this program was based upon neo-classical mainstream economic theory. Many economists have had similar ideas about the necessity of a radical program for economic reform, including Blanchard et al (1991), Fischer and Gelb (1991), Aslund (1992) and the World Bank (1996). According to the Washington Consensus, numerous interdependence, mutually supportive and interactive features of economic relationships, should be introduced into the economy. However, the protagonists of shock therapy consider separate changes to not be as successful unless they are introduced simultaneously: there are several reasons for this view. Firstly, Kornai (1990), Boycko (1991) and Winiecki (1991) believe that a command economy could be theoretically superior to a new economy which is not cohesive and consistent. This viewpoint is shared by Balcerowicz (1995), who reviewed failed and reversed reforms, concluding that the reason for these failed reforms was because they were not radical enough to allow the economy to reach a level which would perform better than the previous command economy.

Secondly, protagonists of "shock therapy" believe that the imperfection of a new market may be the reason why societies maintain the old system which is less reliable. Gomulka (1989) argues that in order to break the hold of the old system, it is necessary to deliver a "shock" reform.

There is an agreement amongst standard economic theories which state that it is necessary to stabilize macroeconomics quickly in order to break the inflationary expectations (Aslund, 1994).

Whilst, Sachs and Woo (1994) consider that while a transition can have negative impacts on the economy, it is unnecessary to extend output decline by doing a gradual adjustment. Whereas, Sachs and Lipton (1990) argue that a transition should carry the recession because a long-run growth was guaranteed. This argument parallels the notion of external debt reduction as the debt reduction process which often triggers a recession and a decrease in living standards. Similar to an economic transition, better conditions are also guaranteed after an external debt reduction process has taken place, including a reduction in debt burden and a reduction in the risk of a debt crisis and the potential of a sudden stop.

Gradualists, however, consider China and Vietnam as the ideal success stories of the step by step transitions process. Gradualists consider a nonexistent recession and a high growth rate in these countries resulting from a low speed transition. Aslund (2007) believes that the fundamental difference between gradualists and radical reformers was their view regarding the viability of the command economy. Gradualists claim that a radical reform will lead to a greater fall in output and will be more costly than a gradual reform. Even protagonists of radical reform such as Fischer and Gelb (1991) understand that various changes could not be undertaken instantly, realizing that it can take at least a decade for this transition to work. For example, the privatization of large enterprises would most likely take years to finalize, due to the complex reform procedures. Stiglitz (2002) and Goldman (2003) also support the notion of gradualism: Stiglitz criticized the IMF policy on Russia arguing that the Washington Consensus did not work in Russia, he determined that Russia should have followed China's example.

While the cases involving successful gradual reforms are explained in terms of political factors and initial conditions, there are also numerous logical arguments for the gradual adjustment of external debt. Firstly, there is a broad consensus in theoretical and empirical studies regarding the positive relationship between the speed of debt reduction and the reduction in living standards. In order to repay the external debt, the domestic economy needs to reduce its consumption. Also, in order to repay the external debt, the domestic economy needs to increase its net exports and relinquish

consumption, although these may be limited by the individuals' preferences. Greece is a primary example.

3.2.2 Theoretical models of sudden stops

The model used in this chapter shares some common features with the models used in sudden stop literature, although the issue of optimal speed of adjustment is not considered, something which is the main focus point of this chapter. Therefore, it is worth while discussing the theoretical models of sudden stops before divulging into how the model is employed and has developed in this chapter.

There are various ways a sudden stop can be simulated in theoretical models. There are in fact two distinct categories: a group of models where sudden stop happens due to the ability to repay debt, and a group of models where sudden stop occurs because of the economy's willingness to pay the debt.

This review focuses on the first category: models with sudden stops induced by the debtor's ability to repay the debt. One of the most widely known models which incorporates' the ability to pay is Calvo's (1998) model. Calvo (1998) explains sudden stops by setting up a perfect foresight small open economy model and three periods (period 0, 1 and 2) with unlimited liability firms owned by households. There is an endowment of tradable goods in period 2 (future output); firms borrow so they are able to import tradable goods at period 0 and produce non-tradable goods which are to be sold at period 1. At period 1, both tradable and non-tradable goods are consumed and the debt is due, which means firms borrow more to import tradable goods for consumption. At period 2, tradable goods are consumed and the debt is paid.

If there is a temporary shock which affects a country's ability to access the capital market in period 1 when non-tradable goods productions are implemented, as is the plan at period 0, this means that firms are unable to repay the debt (bankruptcy). This bankruptcy, which is assumed to entail fixed bankruptcy costs, increases the real debt service at period 2, lowering the permanent income of the small open economy. Bankruptcy will lead to a decrease in consumption of tradable goods, which will mean the price of non-tradable goods will reduce as a consequence of a fall in the marginal rate of substitution between tradable and non-tradable goods, which ultimately leads to the bankruptcy of the firm. One important assumption in this model is that bankruptcy comes at a cost. If bankruptcy did not come with any consequences, then

households would simply borrow more (unlimited liability firms) to fulfil the firms' obligation and the equilibrium would prevail. However, bankruptcy does come at a cost. This particular model is very simple compared to the model in this chapter and ones in other studies (i.e. it is only a three-period model. It does not have a labour and government sector). Although, Calvo (1998) does introduce a clear mechanism to explain sudden stop in a theoretical model.

Another way to model a sudden stop, something which is widely used in the literature, is to introduce an upper bound for external debt. For instance, the economy is only allowed to borrow internationally a fraction of its income, the reasoning for this is in case there is a negative shock to income, resulting in a sudden stop, if the debt is greater than its new upper bound. Mendoza (2002) and Begnino et al (2008) use a financial constraint to limit foreign borrowing of households as a share of total current income. Mendoza's (2002) model is used to study sudden stops caused by shocks in tax rate, productivity and in world interest rates, or a mixture of all three. In order to do this, Mendoza (2002) introduces an occasionally binding financial constraint into his model. The presence of the occasionally binding constraint explains how a shock in productivity, in world interest rates, tax rates or a mixture of all three may cause a sudden stop. For example, if there is a negative shock in productivity, this will lead to a drop in the current income of households, which means that the upper bound of external debt decreases and could potentially lead to a sudden stop.

There are other forms of foreign debt constraints; Kiyotaki and Moore (1997) use a collateral constraint which limits the upper bound of debt by the liquidation value of the capital stock one period into the future. Izquierdo (2000) and Edison, Luangaram and Miller (2000) also use this type of constraint in the context of modelling constraints in relation to international borrowing.

Besides these limits on debt to income, and the collateral constraint form of Kiyotaki and Moore, several other forms of financial constraint are used in other models of sudden stops. Auernheimer and Garcia-Saltos (2000) use a different form of debt constraint which limits the upper bound of foreign debt at the same level as the market value of the capital stock. While, Christiano, Guts and Roldos (2001) and Mendoza and Smith (2001) study models in which the current liquidation value of assets is used as collateral.

In sharp contrast to other studies, Mendoza (2006) introduces debt constraints into both the demand side and the supply side of the model (debt constraints for both firms and households). Mendoza (2006) reveals that this type of model with financial constraints can reproduce quantitatively well during sudden stop episodes in emerging economies. Mendoza also argues that it is a challenge for a large class of DSGE models to simulate the sudden stop, because these models assume there is a perfect world credit market. This means that when there is a drop in output, individuals will try to maintain their consumption by borrowing more from foreign lenders, while data on most episodes of output declines determines the opposite outcome, with a drop in borrowing following a fall of output.

In the models in the second group, the debtor will not fulfil their obligation when the lifetime payoff of default exceeds the lifetime payoff of continuing with credit contracts. As a result of this, sudden stops may happen, especially as foreign lenders will not want to take any risks in the future. These types of models were extremely popular after the developing country debt crisis of the 1980s. One of the first studies involving sovereign debt default is that of Eaton and Gersovitz (1981); they set up a global financial market which was fully informed. This market included a sovereign debtor who would be excluded from the market permanently if they defaulted. In this model, there is a maximum lending ceiling, where lenders are only willing to lend at a default risk premium which is at least as high as the market interest rate. In the model of Eaton and Gersovitz, the default risk premium is an endogenous outcome that reflects the probability that debtors consider whether it is optimal to default because the participation constraints have failed. Atkeson (1991) also considers a model where sovereign debtors are unable to participate in the international capital market if they end up defaulting. Therefore, for models with this assumption, the penalty for sovereign debt default is financial autarky.

There are other studies which take into consideration models where a default debtor may have access to financial contracts with certain conditions and restrictions. Bulow and Rogoff (1989) consider a model in which default debtors may have direct trade sanctions by lenders imposed, whilst Kletzer and Wright (2000) study an environment which limits the set amount of financial contracts the default sovereign debtors can access, that is if they default. In this environment, both lenders and borrowers lack any sort of commitment.

3.3 The model

This section introduces a model for a small open economy with two types of goods: tradable and non-tradable goods. In this small open economy, households consume tradable and non-tradable goods; their consumption is financed by the outcome of their own firms' profits, their wage from working for any non-tradable goods production sector and borrowing overseas. Households have access to an incomplete asset market with a occasionally binding financial constraint.

In this small open economy, firms are owned by households. Firms are expected to produce a fixed amount of tradable goods, and they also hire necessary labour to produce non-tradable goods using a Cobb-Douglas function.

In the baseline version of this model, the government runs a balanced budget in each period.

This model is similar, in a number of respects, to the model originally proposed by Mendoza (2002). One similarity is the presence of a constraint on the level of external debt; this constraint assumes that only a fraction of current household income can be claimed if there is a default, which means that lenders are more unwilling to allow households to borrow more than their limit. In the Mendoza model, the constraint is occasionally binding because the presence of unanticipated shocks in all time periods reduces output or government revenue or increases the world interest rate. If these shocks are large enough then the external debt constrain will bind. In the model used in this chapter, shocks only occur at a single period. The specific shock analysed involves an alteration in foreign lenders' perceptions regarding sustainable external debt ratio (not shocks of productivity, world interest rate and tax receipts as analysed by Mendoza).

The main aspect of this model assumes that borrowers from a small open economy can obtain temporary access to external credit (for example from a multinational lender such as the IMF) in order to gradually adjust the external debt so as to balance the foreign lenders' new required external debt ratio. This allows a small open economy to manage a sudden stop: the key issue addressed here is the timing and speed of the required reduction of debt.

From a technical perspective this simply highlights the vast difference between this model and the Mendoza (2002) model. The shock of foreign lenders' perception regarding sustainable external debt of a small open economy in this model is perceived as an anticipated shock, whereas shocks in the Mendoza (2002) model are unanticipated.

Another important assumption is that households are impatient: this is a reasonable assumption because if households are in fact patient, they accumulate assets and the financial constraint is not binding, which means that a change in a foreign lenders' perception may not affect the small open economy.

3.3.1 Households

A representative household is infinitely-lived and seeks to maximize:

$$E_0 \sum_{t=0}^{\infty} \beta^t \left(lnC - \frac{H_t^{1+\varphi}}{1+\varphi} \right)$$

(3.1)

where C_t denotes the individual consumption basket and H_t the individual supply of labour at time t. β is the discount factor and $\varphi > 0$ is the inverse elasticity of labour supply.

The consumption basket C is a composite of traded and non-traded goods:

$$C_t = \left[\omega^{\frac{1}{\eta}} C_{T,t}^{\frac{\eta-1}{\eta}} + (1-\omega)^{\frac{1}{\eta}} C_{N,t}^{\frac{\eta-1}{\eta}} \right]^{\frac{\eta}{\eta-1}}$$

(3.2)

where the parameter η is the elasticity of intra-temporal substitutions between consumption of traded and non-traded goods while ω is a weighting factor.

The corresponding aggregated price index is given by:

$$P_t = \left[\omega + (1-\omega)P_{N,t}^{1-\eta} \right]^{\frac{1}{1-\eta}}$$

(3.3)

The price of tradable goods is normalised to 1.

Households can maximize their utility, subject to the following period budget constraint:

$$C_{T,t} + C_{N,t}P_{N,t}(1 + \tau_{N,t}) + D_{t-1}(1 + i*) = \pi_t + W_t H_t + D_t - T_{T,t} - T_{N,t}P_{N,t}$$

(3.4)

where W_t is the wage rate. π_t denotes the firm profits, while $W_t H_t$ represents the household labor income. $\tau_{N,t}$ is a distortionary taxation on non-tradable goods consumption. T_T and T_N are lump sum taxes in units of tradable and non-tradable goods. D_t is the amount of foreign borrowing denominated in local currency from the international financial market with the world interest rate i^*. This assumption is a reasonable one if one of the countries' is a member of a monetary union. That being said it does not take into account the possibility of a higher "peso premium" being paid if there is a future risk of depreciation.

If that is the case, there is a financial constraint for the external debt of households who have a share of the total output of tradable goods of the economy:

$$D_t \leq \theta Y_{T,t} \tag{3.5}$$

Households maximize (3.1), subject to (3.4) and (3.5) by choosing $C_{T,t}$, $C_{N,t}$, D_t, and H_t. The first order conditions for this problem are as follows:

$$\frac{C_{T,t}}{C_{N,t}} = \frac{\omega}{1-\omega} P_{N,t}^{\eta} \left(1 + \tau_{N,t}\right)^{\eta} \tag{3.6}$$

$$\mu_t = \frac{1}{C_t} \omega^{\frac{1}{\eta}} \left(\frac{C_t}{C_{T,t}}\right)^{\frac{1}{\eta}} \tag{3.7}$$

$$\mu_t - \lambda_t = \beta E[(1 + i*)(\mu_{t+1})] \tag{3.8}$$

$$H^{\varphi} = W * \mu_t \tag{3.9}$$

λ_t is multiplier on the financial constraint while μ_t is multiplier on the budget constraint. Equation (3.6) determines the optimal allocation of tradable and non-tradable goods while equation (3.7) determines the multiplier μ_t. Equation (3.8) is obtained from the optimal external debt of the households. Finally, equation (3.9) determines the labour supply for non-tradable production as a function of wage rate.

3.3.2 Firms

The small open economy produces a constant output of tradable goods Y_T for each period.

Firms also produce non-tradable goods $Y_{N,t}$ expressed in a Cobb-Douglas function:

$$Y_{N,t} = A K^{\alpha} H_t^{1-\alpha} \tag{3.10}$$

where *H* is the amount of labour used in the non-tradable sector. AK^α is the production factor. α is the labour share in production in the non-tradable sector.

Firms find it difficult to choose H_t to maximize profit in the current period:

$$\pi_t = Y_T + P_{N,t}AK^\alpha H_t^{1-\alpha} - W_t H_t \tag{3.11}$$

Equation (3.11) implies that the profit of firms is equal to total revenue minus the cost of labour of non-tradable goods production.

The first order condition for labour demand is:

$$W_t = (1 - \alpha)P_{N,t}AK^\alpha H_t^{-\alpha} \tag{3.12}$$

Equation (3.12) determines the labour demand for non-tradable production as a function of wage rate and price of non-tradable good.

3.3.3 Government

The consolidated government budget constraint is:

$$G_{T,t} + G_{N,t}P_{N,t} = \tau_{N,t}P_{N,t}C_{N,t} + T_{T,t} + T_{N,t}P_{N,t} \tag{3.13}$$

Equation (3.13) implies that in each time period, the government spends both tradable goods and non-tradable goods. The government consumption is financed by collecting tax from households. In this model, we follow Benigno et al (2008) by assuming that government spending of non-tradable goods is financed by a constant lump-sum tax. For simplicity, we assume that $G_{N,t} = T_{N,t}$. This means that changes in the distortionary tax rate on individual consumption for non-tradable goods are financed by a combination of endogenous changes in relative price (P_N) and lump-sum transfer on tradable goods (T_T).

3.3.4 Aggregation and equilibrium

Combining the household budget constraint and a firm's profit equation, the aggregated constraint for the small open economy can be rewritten as:

$$C_{T,t} + D_t(1 + i *) + G_{T,t} = Y_T + D_{t+1} \tag{3.14}$$

The equilibrium for non-tradable goods sector is:

$$Y_{N,t} = C_{N,t} + G_{N,t} \tag{3.15}$$

There is a financial constraint for the total external debt of the economy expressed by the following equation:

$$D_t \leq \theta Y_T \tag{3.16}$$

This financial constraint implies that the amount that a country as a whole can borrow is constrained by a fraction of the value of its total output of tradable goods.

3.3.5 Steady state (result in Appendix 2)

As presented in appendix 1 and 2, the steady state of the model can be solved through several steps. To begin with, I have rewritten the first condition equations for households' utility maximization problem in appendix 1.

Secondly, I incorporate the equilibrium condition of the labour market (equation 3.28) and the equilibrium condition of the non-tradable goods market (equation 3.30).

Finally, I substitute the values of parameters, which are discussed in the following section, into these two equations and solve using Matlab.

For simplicity, the price of a tradable good is normalized to 1. Furthermore, the output of tradable goods is also normalized to 1.

The steady state value of main variables are shown in table 3.2 in appendix 2.

3.3.6 Calibration

The calibration of the model is shown in the following table. This chapter set the quarterly world interest rate (i^*) as being equal to 0.0147, which yields an annual world interest rate of 6 percent. The quarterly discount factor (β) is equal to 0.9832. The product of $(1+i^*)$ x β is less than 1, enhancing the assumption that the individual is impatient. The inverse elasticity of labour supply (φ) is set at 2 since it is assumed that half of the time is spent working.

This chapter shadows Ostry and Reinhart (1992) in setting the elasticity of intra-temporal substitution between tradable and non-tradable goods (η) at 0.76. Ostry and Reinhart estimated this value for developing countries.

Table 3.1 Value and description of parameters

Parameter:	Description	Value
β	Discount factor	0.9832
i*	World real interest rate	0.0147
φ	The inverse elasticity of labour supply	2
ω	Relative weight of tradable and non-tradable goods	0.344
η	Elasticity of substitution between tradable and non-tradable goods	0.76
α	The labour share of production in the non-tradable goods sector	0.636
AK^α	Production factor	1.723
θ	Ratio of Household external debt to total output of tradable goods	0.70
ρ_N	Fraction of non-tradable output consumed by government	0.141
ρ_T	Fraction of tradable output consumed by government	0.017
τ_N	Distortionary tax rate imposed on households with non-tradable consumption	0.0793

This chapter then follows Benigno et al (2008) who constructed the most similar model to the one used in this chapter, in setting the labour share of production in the non-tradable goods sector (α) equal to 0.636, with the production factor (AK^α) being equal to 1.723, whilst the relative weight of tradable and non-tradable goods (ω) equal to 0.344. Aspects of Benigno et al (2008) are used to set government spending at 14.1% of non-tradable goods output and 1.7% of tradable goods output. In this model, the ratio of foreign debt to GDP is set at 70%.

3.4 Simulation results

3.4.1 Simulation from old steady state to new steady state

The baseline mode is simulated with the assumption that there is a change in foreign lenders' perceptions about the sustainable external debt ratio going from 70% to 65% of the total output of tradable goods. However, there is an agreement between foreign lenders and the economy, that there will be 16 quarters (4 years) for small open economy to undertake any adjustments.

As can be seen from the simulation results, borrowers do not do anything in the first 9 quarters. The model presents a perfect foresight and highlights that households are impatient, with this attitude; borrowers try to delay adjustments for as long as possible. When borrowers realize they are unable to delay anymore, without undertaking an undesirably rapid reduction in consumption, they begin making adjustments.

Individuals reduce their tradable goods consumption in order to reduce the external debt; this can be seen in figure 3.1, where within 7 quarters, the tradable goods consumed by households reduced from 0.9727 to 0.9601, which means that tradable goods consumed by households decreased 1.26% within 7 quarters. At the end of this period, there is a jump to the new steady state level: this is higher than the old steady state level, as the debt service on the new lower level of debt is also reduced.

Figure 3.1 Tradable goods consumed by Households
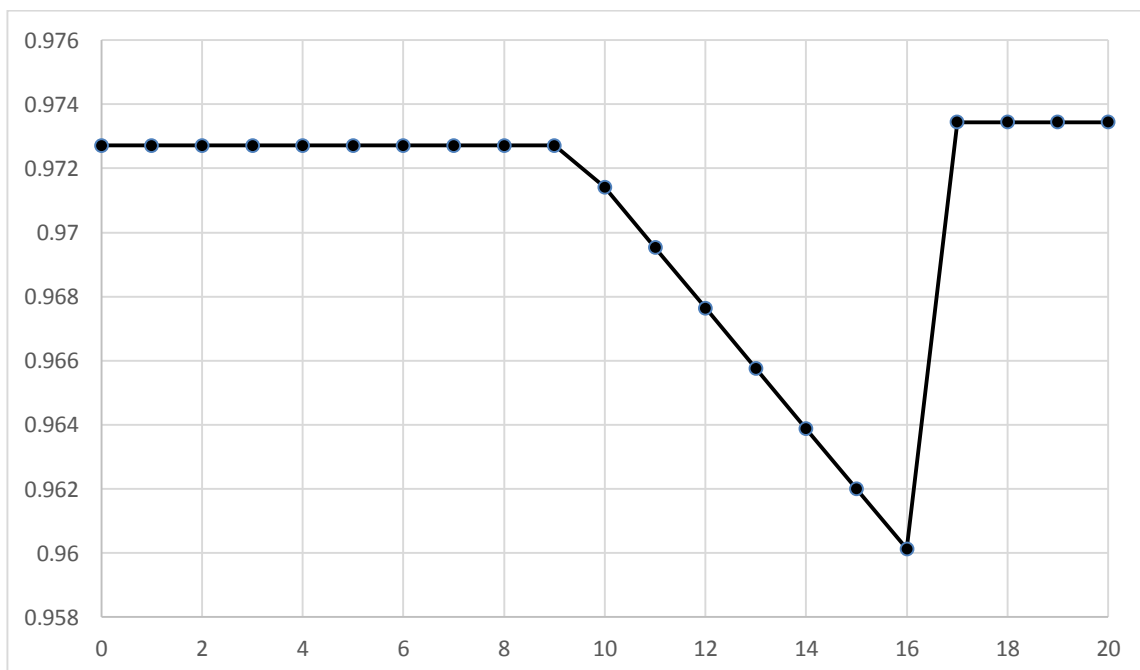
Figure 3.2 Non-tradable goods consumed by Households
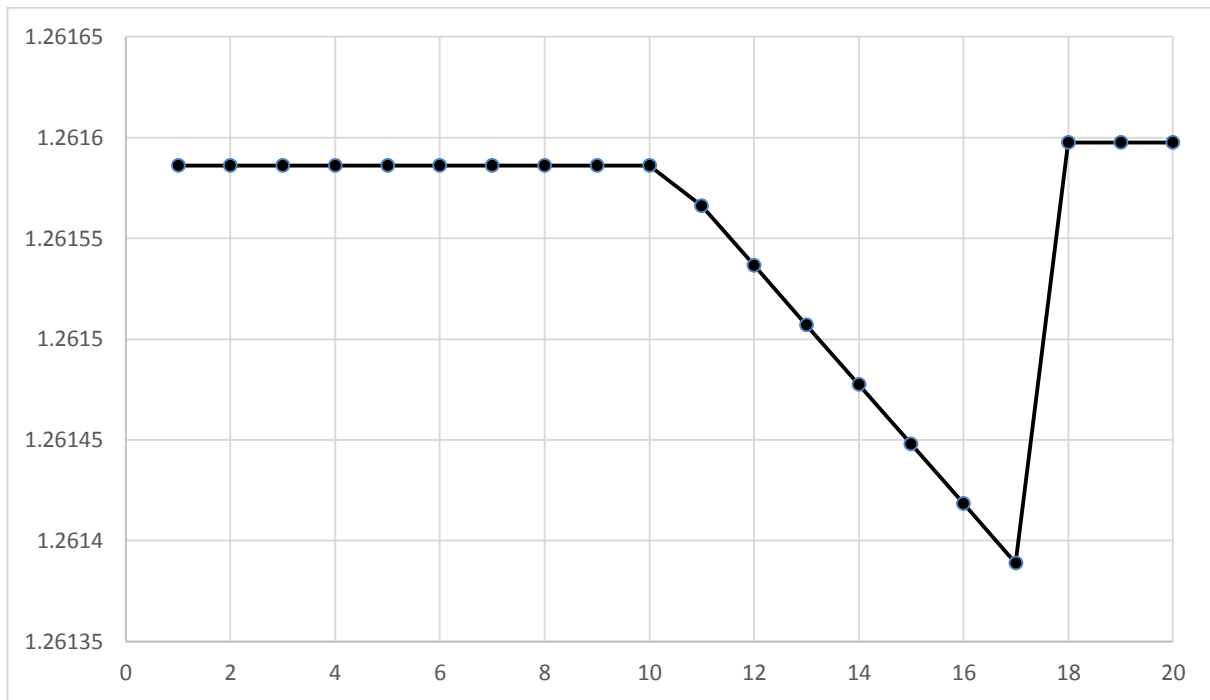
During the time period, figure 3.2 reveals that non-tradable goods consumed by households remain almost stable. Within the 7 quarters from the 10th quarter to the 17th quarter, non-tradable goods consumed by households diminish from 1.261586 to 1.261389, which is equivalent to a decrease of 0.016%.

Figure 3.3 Total consumption basket
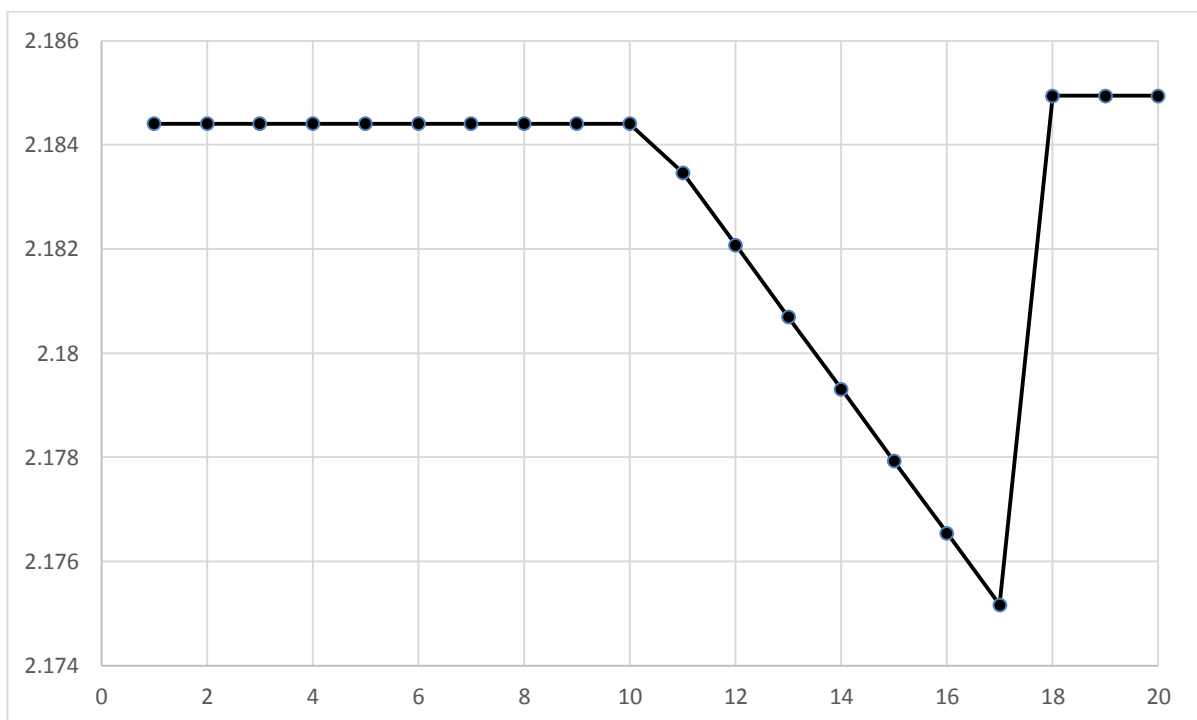
Since it outlines a weighted average of tradable goods consumption and non-tradable goods consumption, total consumption also gradually decreased during the adjustment path. Figure 3.3 highlights that the total consumption reduced from 2.1844 to 2.1752 within 7 quarters, which means the total consumption of households reduced 0.42% within 7 quarters, then jumping to the new steady state level which is higher than its old steady state level.

Another interesting simulation result is that, during the adjustment path, the real exchange rate depreciates. This is evident from figure 3.4, where the relative price of non-tradable goods (as the price per unit of tradable goods normalizes to equal 1) decreased from 1.5386 to 1.5128 within 7 quarters, which meant that the price of non-tradable goods reduced 1.68% within 2 years. This reduction is similar to Calvo (1998) in that during the adjustment path the decline in tradable goods consumption (because a bigger fraction of output of tradable goods is used to repay debt) induced a fall in the marginal rate of substitution between tradable and non-tradable goods, thus affecting the relative price of non-tradable goods.

Figure 3.4 Price of non-tradable goods (real exchange rate)
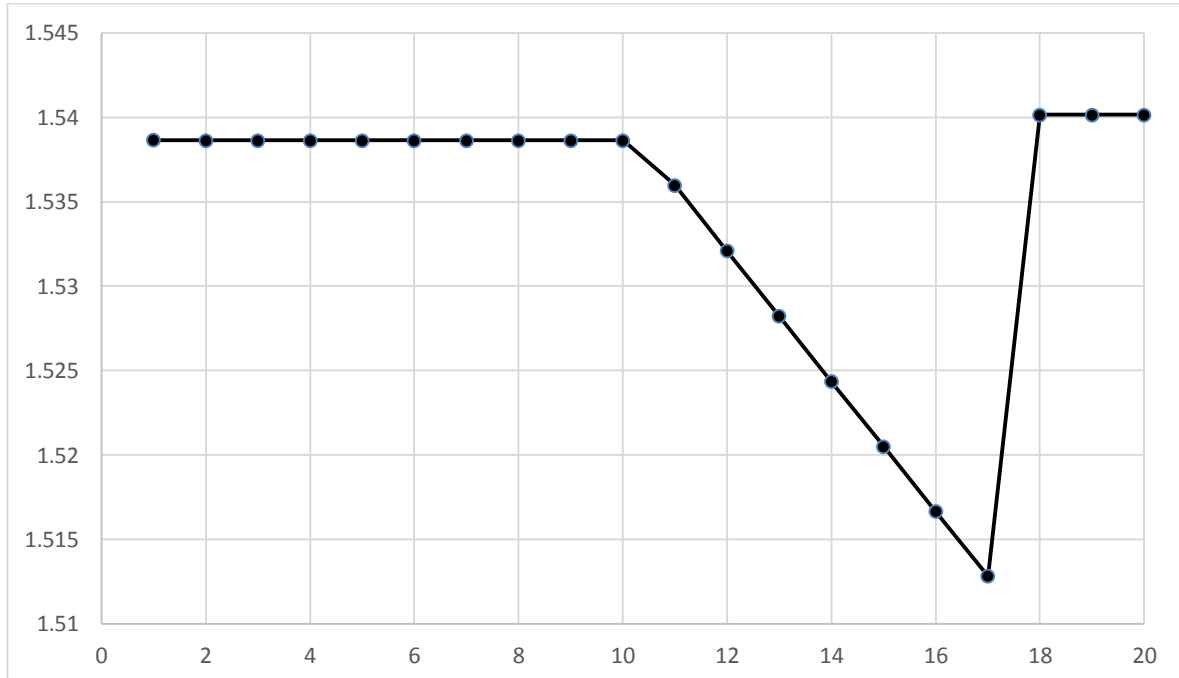
The reduction in the relative price of non-tradable goods, led to a decrease in the wage rate of the non-tradable goods production sector (as in figure 3.5) because during the same time period the output of non-tradable goods remained almost stable.

Figure 3.5 Wage rate in non-tradable goods production sector
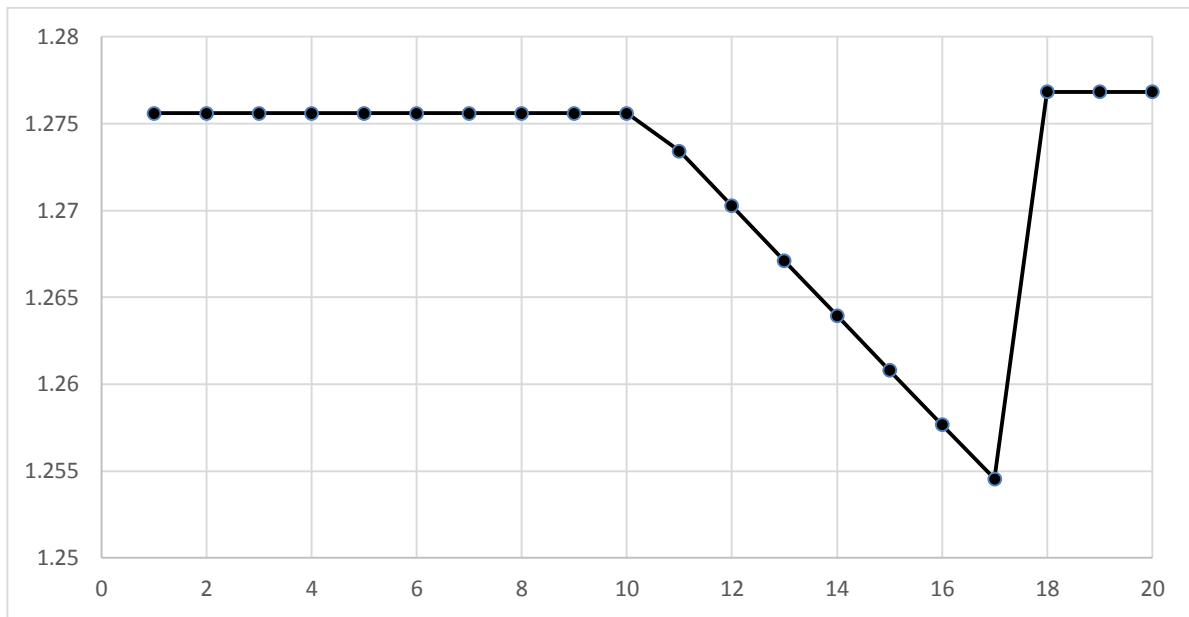
Figure 3.6 Total external debt
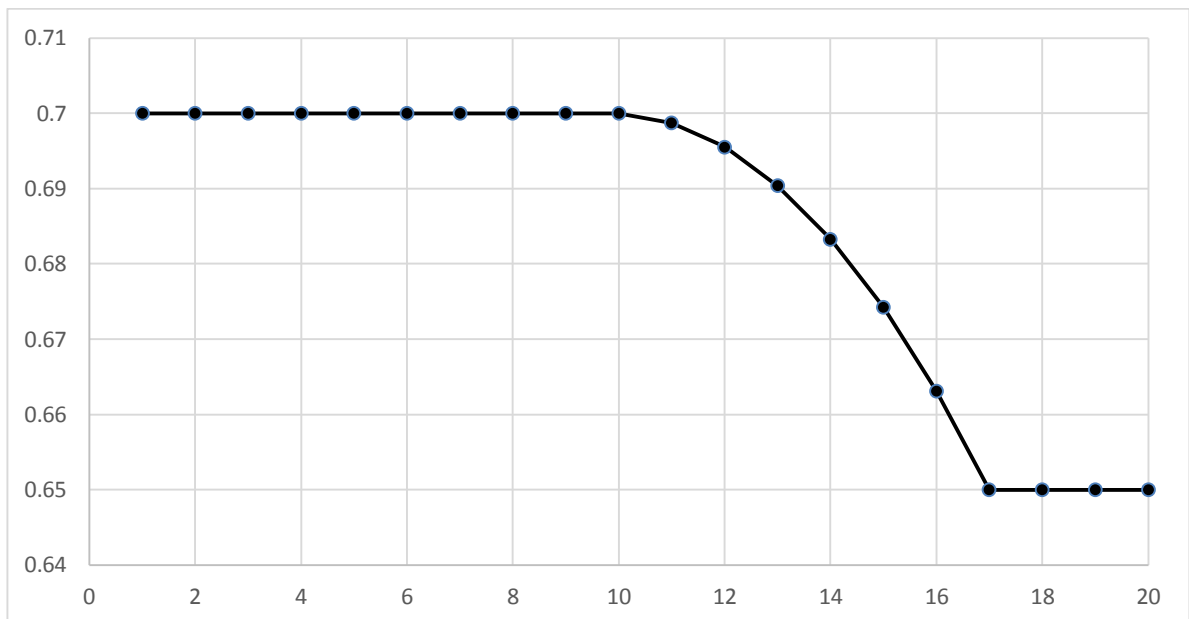
Figure 3.6 shows that during the adjustment path, the total external debt of the small open economy diminished from 0.7 to 0.65. Figure 3.6 also reveals that households attempted to bind the financial constraint as long as possible, even though during the adjustment path the financial constraint is not binding.

Figure 3.7 summarises the baseline simulation, presenting the dynamics of the main variables during the adjustment path as being a percent of the initial steady state level.

Figure 3.7 Compare percentage change in main variables

3.4.2 Simulation from out of steady state to a new steady state

In reality, the adjustment of external borrowing, an external debt crisis or a sudden stop in inflow capital, as portrayed in Chapter 5 of this thesis, do not usually occur when the economy is in an initial steady state and the ratio of external debt to GDP is stable. Instead these factors occur when the economy is not in a steady state and the ratio of external debt to GDP is rising rapidly - Latvia and Greece are examples of this. As members of the European Union, both of these countries were able to borrow at low interest rates, and even before the global financial and economic crisis of 2007-2009, positive outlooks of economic growth (especially regarding Latvia which has had one of highest growth rates in Europe since 2000) made it easier for these countries to borrow money from overseas, hence, their external debt levels kept rising until the crisis happened.

Therefore, in this section, the model used is simulated for when a reduction of debt capacity occurs, when the economy is in an out-of-steady state position and the external debt ratio continues to rise. The problem is whether this affects the speed of adjustment.

In economic terms, the economy is initially in a steady state with the maximum ratio of total external debt to total output of tradable goods being 65%, but then there are two further developments: first there is an increase in the maximum external debt ratio to

70% in period 0 (a positive shock), followed subsequently by a decrease in the maximum external debt ratio (a negative shock). It is then presumed that foreign lenders permit an increase in the maximum level of total external debt ratio from 65% to 70% after 2 quarters (although the reason for the alteration in the lenders' perception is not modelled, a possible reason for this change may be a more comprehensive view about growth potential). At some point in the future, during the adjustment path of the small open economy (when the economy is no longer in a steady state), foreign lenders alter their perception regarding sustainable ratio of total external debt of the small open economy again, reducing it from 70% to 68% at any given time. Once this has happened the country is able to arrange interim borrowing from multilateral lenders such as the IMF in order to ease the transition to a lower maximum debt ratio.

Technically, the model is simulated with two perfect foresight shocks in the theta (the maximum level of external debt ratio). However, the two shocks will be announced at two different times; the first is announced when the ratio of total external debt to total output of tradable goods is at -2, increasing from 65% to 70% after 2 quarters. The second shock is announced at a point later than time 0 that the external debt ratio reduces from 70% to 68% at any given time in the future. With this in mind two cases are considered: the second shock is announced at the end of the 1st quarter and at the end of the 5th quarter. The choice of debt ratios of 65%, 70% and 68% are somewhat arbitrary, and may appear rather trivial compared to the actual decline in debt capacity in countries such as Greece and Latvia. It must not be forgotten that the main purpose is to investigate qualitatively the difference in behavior debt capacity reductions that occur in an out-of-steady state; therefore the exact ratios are not vital.

When the second shock is announced at the end of the 5th quarter, three sub-cases are considered in the second announcement, this is the time frame foreign lenders will give the small open economy, 3, 5 or 7 quarters, before they reduce the maximum level of total external debt ratio to 68%. The results of this behaviour are shown in figure 3.8. The simulation from the 5th quarter, when the second shock is announced, is our key focus in this section (simulation from out of steady state). As it can be determined from figure 3.8, at the 5th quarter, the financial constraints are not binding; this means that households can borrow more because the current ratio of total external debt to total output of tradable goods is 69.5%.

Figure 3.8 Dynamics of ratio of total external debt for out of steady state shocks
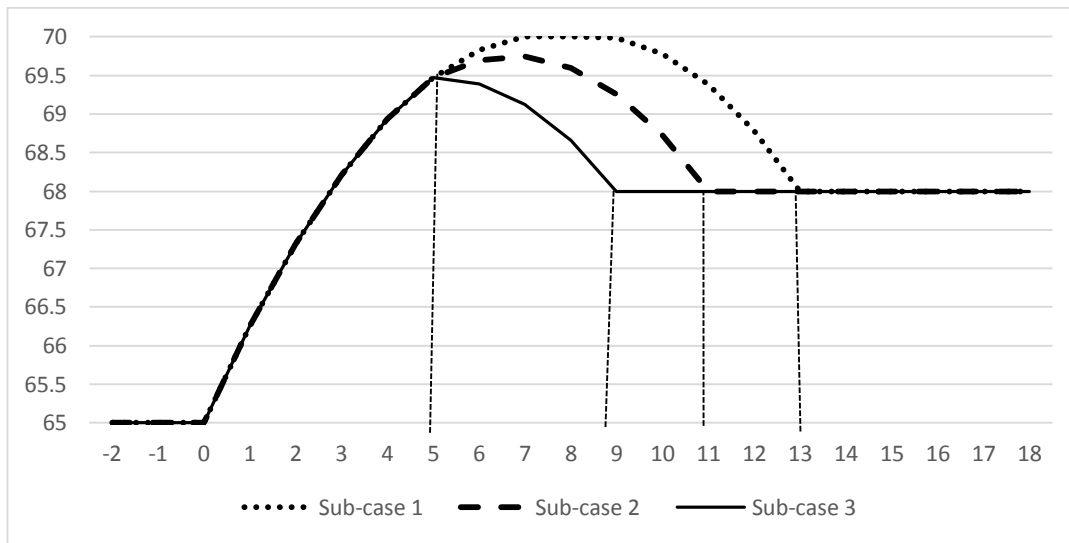
However, the behaviour of households depends on the amount of time they have before the maximum level of total external debt to ratio reduces to 68%. If they have only 3 quarters, as in sub-case 1, households will reduce their external debt immediately. If households have 5 quarters, as in sub-case 2, then they will increase their external debt to 69.7% and then start reducing. If households have enough time (7 quarters as in sub-case 3 or longer), they will continue to increase their external debt to bind the constraint and reach a steady state with the ratio of total external debt at 70%, staying there as long as possible before implementing a new adjustment system to meet the new requirements of the foreign lenders.

Figure 3.9 Dynamic of ratio of total external debt
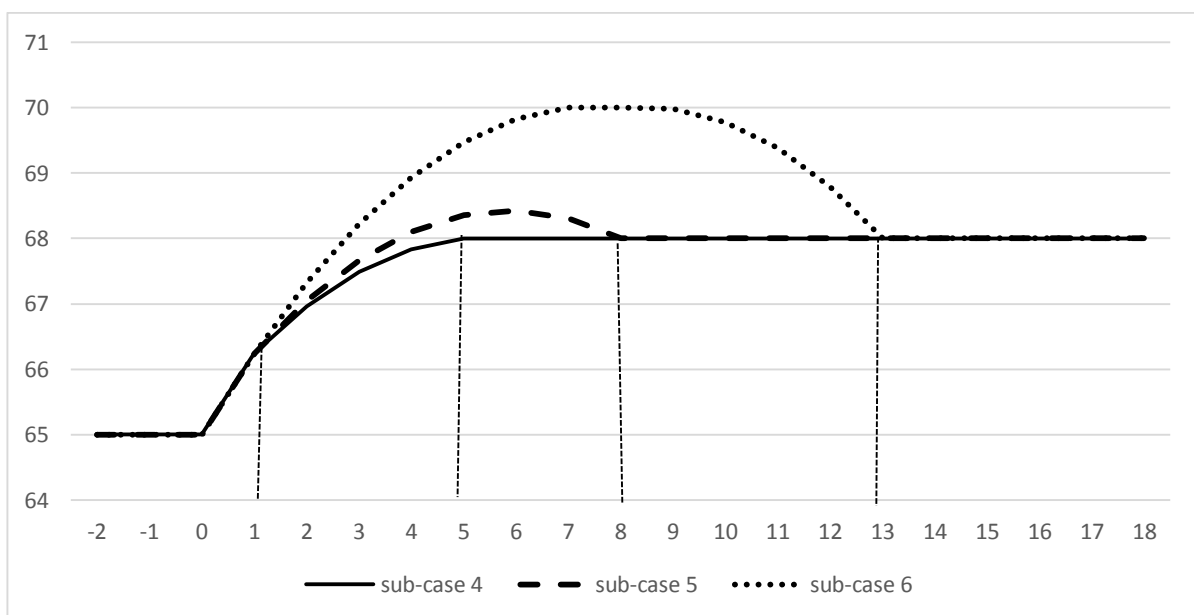
Figure 3.9 demonstrates the dynamic of ratio of total external debt to total output of tradable goods, when the second shock is announced at the end of the 1ˢᵗ quarter rather than at the end of the 5ᵗʰ quarter. There are again three sub-cases 4, 5 and 6, in which households have 3, 6 and 11 quarters respectively, to make adjustments in order to meet these new requirements of foreign lenders. The behaviour of these households in these sub-cases is similar to their behaviour in sub-case 1, 2 or 3.

The reason behind the simulation of two different case studies is to accommodate when the level of the total external debt ratio of the second shock is announced. In case the second shock is announced at the 5ᵗʰ quarter, the external debt ratio is already higher than the new requirement, whereas if the second shock is announced at the 1ˢᵗ quarter, the external debt ratio is lower than the new requirement. This variation leads to differences in the movement of total external debt between sub-case 3 (reducing to the new steady state level begins immediately) and sub-case 4 (increasing to the new steady state level begins right away).

3.4.3 Model with default

In this section, the model is extended even further to study the possibility of a debt default.

In order for this to happen, the model is based upon the economic story that: at time $t=0$, the maximum level of total external debt of the small open economy is 70% of the total output of tradable goods (normalize to 1). At $t=5$ (out of steady state), there is another announcement that the maximum level of total external debt is 68% of the total output of tradable goods. However, there is an agreement between the small open economy and some foreign lenders, such as the IMF and ECB, which permit the small open economy to borrow up to 70% of the total output of tradable goods until $t=12$. This means that from $t=13$, the maximum level of total external debt will be 68% of the total output of tradable goods. One important assumption is that from period $t=5$ to $t=12$, the country may default on additional debt from the IMF or ECB if it is better for them (in term of total utility).

It is assumed that if one default's, households will face a higher interest rate due to the reduction of credibility; the interest rate will increase in each case study by (i) 0.1% (ii) 0.2% (iii) 0.3%, 1 period after default.

Simulation results are shown in table 3.2, where households are most likely to default if the total expected utility is larger if they did default than if they did not default. As can be seen from the table; if the interest rate increases by 0.3 percentage points after default, and after this households decide to default, they will always acquire less utility than if they had not have defaulted. If interest rates increase by 0.2 percentage points after default, households may decide to default at period 8, 9 or 10, because the total expected utility will be greater than in if there was no default. Similarly, if interest rates increase by 0.1 percentage points after default, households may decide to default at period 6, 7, 8, 9, 10, 11 or 12.

In order to analyse the optimal borrowing decision, it is necessary, at each period $t,$ to consider one's options between defaulting at period t or defaulting one period later at period $t+1$. A default will only occur at period t if the total expected utility from defaulting at t is greater than the total expected utility from defaulting one period later at $t+1$.

Table 3.2 Total expected utility in case of default and no default

Period	No default	Interest rate increase 0.1% after default		Interest rate increase 0.2% after default		Interest rate increase 0.3% after default	
		default at t	default at $t+1$	default at t	default at $t+1$	default at t	default at $t+1$
5	41.16065	41.160429	41.162185	41.157196	41.1590064	41.153963	41.155828
6	41.15886	**41.160429**	41.161569	41.157196	41.1583903	41.153963	41.155212
7	41.15768	**41.160429**	41.160953	41.157196	41.1577745	41.153963	41.154596
8	41.1571	***41.160429***	***41.160388***	***41.157196***	***41.15718***	41.153963	41.15403
9	41.15708	**41.160429**	41.160335	**41.157196**	41.15715	41.153963	41.153978
10	41.15712	**41.160429**	41.159719	**41.157196**	41.15654	41.153963	41.153361
11	41.15779	**41.160429**	41.159102	41.157196	41.1559233	41.153963	41.152745
12	41.15909	**41.160429**	41.158485	41.157196	41.1553063	41.153963	41.152128

Households will decide to default at the first period *t* when the total expected utility exceeds the total expected utility in case of no default (the first column of table 3.2) and when it exceeds the total expected utility if the default is at period *t+1* (a second comparison made in the second and third, fourth and fifth, sixth and seventh columns of table 3.2). There are two cases where default is preferred: it is preferred when the interest rate increases by 0.1 percentage points after default and when the interest rate increases by 0.2 percentage points after default. In both scenarios, households decide to default at period 8; however, when the interest rate costs of default are higher, with an increase of 0.3 percentage points after default, then it is never ideal to default.

Figure 3.10 Dynamic of ratio of total external debt - default versus no default
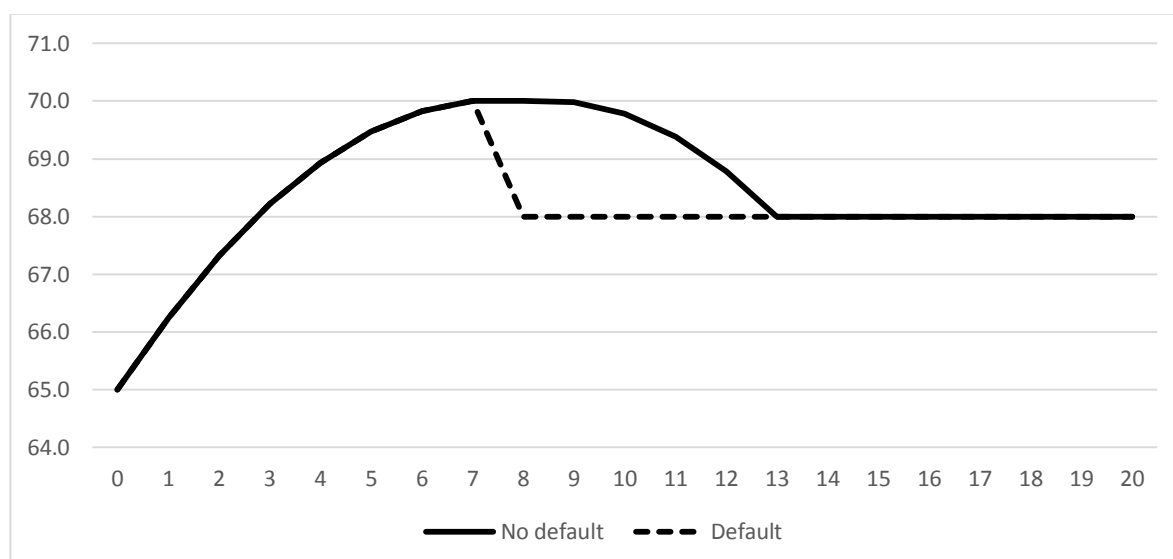
The previous findings are illustrated clearly in figure 3.10, where as soon as the total external debt reaches its maximum level, households will then decide to default additional debt from foreign lenders such as the IMF and ECB if the total expected utility from defaulting is greater than if there is no default.

3.5 Sensitivity analysis

In this section, key parameters of the model are altered, whereby it is now the simulations duty to explore the robustness of the model.

The first alteration implemented is the actual parameters, parameter ω – relative weight of tradable and non-tradable goods and parameter η – elasticity of substitution between tradable good and non-tradable goods: these aspects do not greatly affect

the main results in these simulations. This is completely different to a modified version of the model, which is discussed in appendix 3, in which the total external debt of the economy is constrained by a fraction of nominal GDP instead of the total output of tradable goods as in the baseline model. This will be discussed in greater detail in appendix 3 and 4 of this chapter.

Alterations to i* - the world interest rate and β - the discount factor affect the speed of adjustment. The smaller the value of *β(1+i*)* the faster the adjustment path and vice versa (suppose that *β(1+i*)* less than 1 assumes that households are impatient). This is a reasonable assumption in mathematical terms: mathematically, the tradable goods consumed by households will adjust so as to follow the Euler equation 3.8. During the adjustment path, the financial constrain is not binding; this means that the Lagrange multiplier of the financial constraint is equal to 0 ($\lambda = 0$), therefore, the equation 3.8 will convert to:

$$\mu_t = \beta(1 + i *)\mu_{t+1}$$

Hence, the smaller the *β(1+i*)*, the bigger the change in μ (or tradable goods consumed by households) is. The bigger the change in tradable goods consumed by households in each period also means that the adjustment path is shorter (or the speed of adjustment is faster).

In economic terms, the smaller the value of *β (1+i*)* the more impatient households are likely to be. The more impatient households will try to delay the adjustment for longer; however, households need to reduce their total external debt to meet the new requirements of the foreign lenders which may come into action any time in the near future. Therefore, when households delay the adjustment for longer, they will need to do adjustment quicker to meet the requirements. This means that their adjustment path will be shorter.

3.6 Summary and Conclusions

This chapter builds a deterministic dynamic model in which an exogenous sudden stop can happen when there is a change in foreign lenders' perceptions regarding the sustainable level of total external debt. One assumption of the model is that there is an agreement between the foreign lenders (such as IMF and ECB) and the domestic borrowers about the adjustment path, which will reduce the current level of total

external debt to a new sustainable level at any given time in the near future. This will prevent a sudden stop and, therefore, reduce the risk of a default, which is a costly consequence for both lenders and borrowers.

The simulation results of the model reveal that borrowers will try to delay the adjustment for as long as possible before reducing consumption of tradable goods in order to repay part of the debt. During the adjustment procedure, the real exchange rate depreciates (the relative price of non-tradable goods to tradable goods keeps decreasing during the adjustment path). However, during the adjustment path consumption of the non-tradable goods by households almost remains stable. Another important finding of this section is that during the adjustment path the financial constraints are not binding.

This particular model is also simulated from an initial out-of-steady state position (in which debt can still increase during the transition). This raises the possibility of debt repudiation. Lenders providing temporary additional finance must consider whether the borrowers may choose to default on borrowing if the benefit of reducing debt outweigh the resulting costs. These simulation results help understand circumstance when households will default on part of their external debt and suggests that limits on borrowing during the transition period may be required to prevent default.

Furthermore, this chapter also examines an extended version of the baseline model (in appendix 3 and 4). The findings from the simulation results of the extended model confirm the findings of the simulation results from the baseline model. The extended model looks at in greater detail the transfer between the tradable goods production sector and the non-tradable goods production sector during a period when foreign debt capacity is depleting.

The model used in this chapter can be extended in number of ways to study about post-crisis fiscal policy. Firstly, the assumption about fixed output of tradable goods can be relaxed in order to study about source transfer between tradable sector and non-tradable sector during the time of limited external debt capacity. Secondly, the government's debt should be introduced to study about fiscal policy.

This model can be used to predict the behavior of a small open economy if they can have an agreement with multilateral lenders such as IMF and/or ECB when external

debt capacity is reducing. Furthermore, the model can be also used by both lenders and borrowers as a guideline when negotiate credit contracts (terms and time) to obtain an optimal agreement which help the borrowers to avoid sudden stop or debt default due to borrowers' inability to repay and also help the lenders to avoid debt default due to borrowers' unwillingness to repay.

Appendix 1. First condition equations in steady state

In order to determine the steady state equilibrium, the following set of equations will be used. To begin with, the conditions for the household maximization problem have been ordered:

$$\frac{C_T}{C_N} = \frac{\omega}{1-\omega} P_N^{\eta} (1 + \tau_N)^{\eta} \tag{3.17}$$

$$\mu = \frac{1}{C} \omega^{\frac{1}{\eta}} \left(\frac{C}{C_T}\right)^{\frac{1}{\eta}} = \frac{1}{C_N P_N (1+\tau_N)(1+\frac{\omega}{1-\omega} P_N^{\eta-1}(1+\tau_N)^{\eta-1})} \tag{3.18}$$

$$\lambda = \mu[1 - \beta(1 + i^*)] \tag{3.19}$$

$$H^{\varphi} = W\mu \tag{3.20}$$

The equilibrium conditions for the non-tradable sector:

$$Y_N = A K^{\alpha} H^{1-\alpha} \tag{3.21}$$

$$W = P_N(1 - \alpha)A K^{\alpha} H^{-\alpha} = \frac{Y_N P_N}{H}(1 - \alpha) \tag{3.22}$$

$$Y_N = C_N + G_N \tag{3.23}$$

Additional equilibrium conditions are prearranged by the liquidity constraint and the equilibrium condition in the tradable sector:

$$Y_T = C_T + G_T + Di^* \tag{3.24}$$

In a steady state, it is assumed that the ratio of total external debt to GDP is θ:

$$D = \theta Y_T \tag{3.25}$$

Appendix 2. Equilibrium in steady state
The labour market:

From equation (3.20) the labour supply for the non-tradable sector is:

$$W = \frac{H^{\varphi}}{\mu} \tag{3.26}$$

While the labour demand for the non-tradable sector is expressed in equation (3.22):

Therefore, the equilibrium condition for the labour market is as follows:

$$H^{\varphi+1} = (1 - \alpha)Y_N P_N \mu \tag{3.27}$$

Or

$$H^{\varphi+1} = \frac{(1-\alpha)}{(1-\rho_N)(1+\tau_N)\left[1+\frac{\omega}{1-\omega}P_N^{\eta-1}(1+\tau_N)^{\eta-1}\right]}$$ (3.28)

The non-tradable goods market:

The non-tradable goods supply is expressed by the equation (3.21):

$$Y_N = AK^\alpha H^{1-\alpha}$$

While the non-tradable goods demand can be derived from the equation (3.17), (3.23), (3.24) and (3.25):

$$Y_N = \frac{(Y_T - \theta i^* Y_T - \rho_T Y_T)(1-\omega)}{\omega P_N^\eta (1+\tau_N)^\eta (1-\rho_N)} = \frac{(1-\theta i^* - \rho_T)(1-\omega)}{\omega P_N^\eta (1+\tau_N)^\eta (1-\rho_N)}$$ (3.29)

For simplicity, we normalize Y_T equal to 1.

Subsequently, the equilibrium condition for the non-tradable good market is:

$$H^{\alpha-1} = \frac{AK^\alpha \omega (1+\tau_N)^\eta (1-\rho_N)}{(1-\theta i^* - \rho_T)(1-\omega)} P_N^\eta$$ (3.30)

According to (3.28), (3.30), the parameters and exogenous variables, the steady sate of the model as shown in table 3.3 can be solved.

Table 3.3 Value of main variables in steady state

Variable	Description	
H	Individual labour supply to the non-tradable goods sector	0.6448
P_N	Price of non-tradable goods	1.5386
Y_N	Output of non-tradable goods	1.4687
C_N	Per capita non-tradable consumption	1.2616
Y_T	Output of tradable goods	1
P_T	Price of tradable goods	1
C_T	Per capita tradable consumption	0.9727
C	Per capita consumption	2.1844
W	Wage rates in the non-tradable goods sector	1.2756
P	Aggregated price of the economy	1.3333
D	Foreign debt of private households	0.7
G_N	Non-tradable goods consumed by Government	0.2071
G_T	Tradable goods consumed by Government	0.017

Appendix 3. Model in which the total external debt is constrained by a fraction of nominal GDP

In the baseline model, the total external debt of households is constrained by a fraction of the total output of tradable goods, as highlighted in equation 3.5.

In the modified model, there is a different form of the financial constraint implemented in which the total external debt of the economy is constrained by a fraction of nominal GDP.

This means that equation 3.5 will become:

$$D_t \leq \theta_t (W_t H_t + \pi_t)$$

Therefore, the total external debt of households will be constrained by a fraction of their income. Thus, equation 3.16 will turn into:

$$D_t \leq \theta_t \left(Y_{N,t} P_{N,t} + Y_{T,t} \right)$$

These alterations mean that the total external debt of the economy will become constrained by a fraction of nominal GDP.

To make things simple, Y_t will be normalized to 1, just like it is in the baseline model.

This modified model will then be simulated using the same assumptions that were used in the baseline model, whereby the lender requires the domestic borrower to reduce the ratio of external debt to the nominal GDP from 70% to 65% after 16 quarters. During that time, the domestic borrower is able to borrow money to roll their debt, but the ratio of external debt to the total output of tradable goods cannot exceed 70%.

Figure 3.11 Dynamic of the ratio of total external debt to nominal GDP
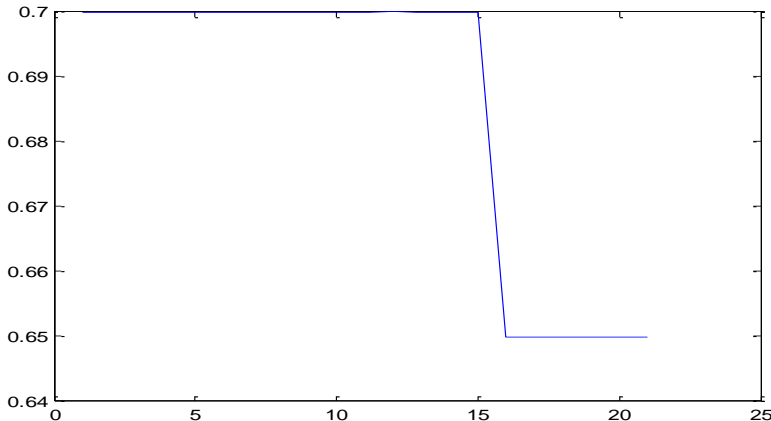
Figure 3.11 highlights an interesting aspect of the modified model: the financial constraint is always binding during the adjustment path; something which can be explained by the effects of changes in the relative price.

Figure 3.12 Dynamic of main variables (index)
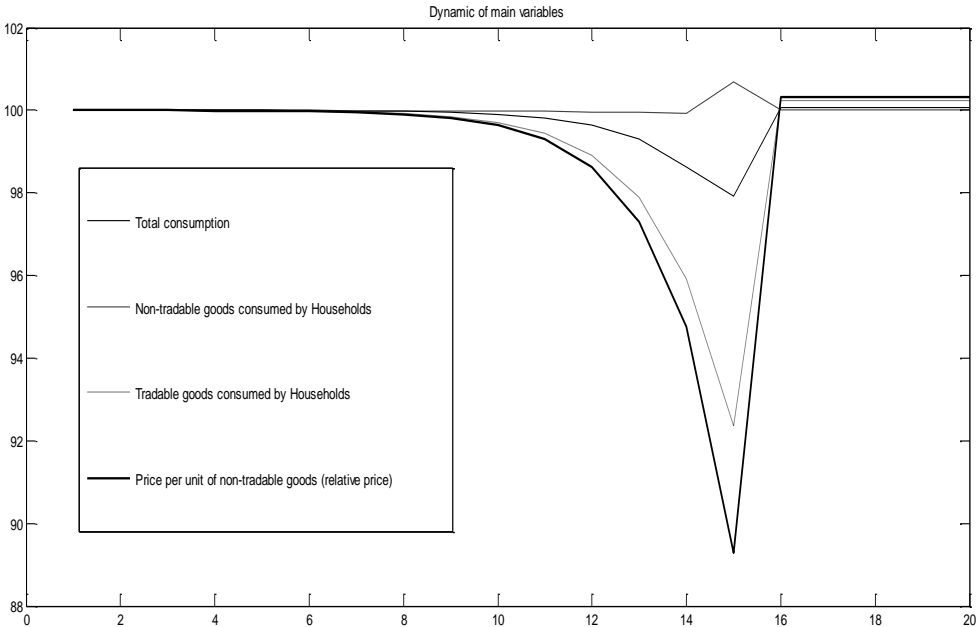
As can be seen in figure 3.12, apart from financial constraint, the behaviour of the economy in the modified model is quite similar to the baseline model. One obvious difference between the modified model and the baseline model is the movement of non-tradable goods consumed by households; in the modified model, there is a change in non-tradable goods consumed by households by 0.7% and -0.6% at the 15th and 16th quarter. These alterations are justified by the obvious adjustments in relative price and tradable goods consumed by households: equation 3.6 and the figure above clearly illustrate this.

Another difference between the baseline and modified model was first of all mentioned in section 3.5, which related to the sensitivity of parameters. Unlike the baseline model, the modified model, incorporated changes in parameter ω – the relative weight of tradable and non-tradable goods as well as parameter η – elasticity of substitution between tradable and non-tradable goods; changes in other parameters, including the interest rate and the discount factor did not affect the main results. Evident from the simulation results in appendix 4, changes in parameter η – elasticity of substitution

between tradable and non-tradable goods led to a change in the speed of adjustment. Even with a change in the speed of adjustment individuals still attempted to delay these adjustments for as long as possible. The less elasticity of substitution between tradable and non-tradable goods, the longer the adjustment process: for example, if the value of η was reduced so it was now equal to 0.5, the adjustment process would last till the 16th quarter, meaning this adjustment only lasts for 10 quarters with the value of η being equal to 0.76. On the other hand, if the parameter η was altered, so it was now equal to 0.1, then the adjustment process would last for 160 quarters (40 years), with the adjustment process only lasting for 5 quarters when the parameter η increases to 0.99.

Although modifications in the elasticity of substitution between tradable and non-tradable goods can lead to changes in the time of adjustment, these alterations do not affect the way that a small open economy reacts to meet lenders' requirements. A small open economy can still attempt to delay the adjustment, so long as it has enough time to actually adjust. These findings can be perceived as reasonable because when the elasticity of substitution between tradable and non-tradable goods is high, it is a lot easier for individuals to spend more on non-tradable goods, less on tradable goods and be able to repay the external debt quickly and vice versa. Furthermore, even when the elasticity of substitution between the tradable and non-tradable goods parameter is modified, the financial constraint is permanently binding along the adjustment path; these findings are consistent with the assumption that the households are impatient, which means they will constantly borrow as much as they can in order to consume as much as possible.

Appendix 4. Simulation results for modified model with alternative parameter η - Elasticity of substitution between tradable and non-tradable goods

η=0.99

Dynamics of main variables

- Total external debt
- Non-tradable goods consumed by Households
- Tradable goods consumed by Households
- **Price per unit of non-tradable goods**

η=0.5

Dynamic of main variables

- Total external debt
- Non-tradable goods consumed by Households
- Tradable goods consumed by Households
- **Price per unit of non-tradable goods (relative price)**

η=0.01

Dynamic of main variables

Legend:
- Total external debt
- Non-tradable goods consumed by Households
- Tradable goods consumed by Households
- Price per unit of non-tradable goods

Chapter 4. The impact of changes in government consumption on economic output

4.1 Introduction and summary

After the global crisis of 2007-2009, many Eurozone countries have been facing a fiscal crisis due to the increasing fiscal deficit and public debts, and even though the effectiveness of tight fiscal policy and its ability to reduce fiscal deficit and public debts is still debatable, numerous countries have implemented fiscal consolidation programs in order to reduce their deficits and public debts to sustainable levels. Due to the implementation of fiscal consolidation programs, the main contention regarding fiscal policy and its effectiveness, which has been receiving a great deal of attention since the global crisis, shifted from a fiscal stimulus to a fiscal austerity. The debate regarding fiscal consolidation programs has become popular in recent times, due to the fact that the results from fiscal adjustments vary across countries. Due to the failure of fiscal consolidation programs in reducing fiscal deficit and public debts in some advanced countries, such as Greece, many economists (for example, Blanchard and Leigh, 2013) consider fiscal multipliers to have been severely underestimated. This means that fiscal consolidation programs are more costly than expected; therefore, in terms of size, how large are fiscal multipliers? Which factors affect the size of a fiscal multiplier? This chapter attempts to address these two questions, whilst focusing on government consumption.

This chapter uses a panel structural vector auto-regression (or SVAR) model to estimate the government consumption multiplier for 30 countries (26 European countries and 4 others: the United States, Canada, Australia and Japan). The data used in this chapter spans from as early as 1980q1 to as late as 2013q4, and is collected at quarterly intervals. This study estimates government consumption multipliers for groups of countries based on a varied set of criteria:

(i) countries with high levels of financial openness versus countries with low level of financial openness

(ii) countries with high levels of external debt versus countries with low levels of external debt

(iii) countries that have a high degree of financial development versus countries with a low degree of financial development

(iv) open trade economies versus closed trade economies

(v) countries with flexible exchange rate regimes versus countries with fixed exchange rate regimes.

This chapter divides the whole sample into sub-samples based on criteria such as the level of financial openness, the level of external debt, the level of financial development, the level of trade openness and the exchange rate regime. It is worth to explain briefly why this chapter focus on these criteria. As discussed in Chapter 2 of this thesis, an expansionary fiscal policy may lead to crowding out effects induced by changes in interest rates and/or exchange rate. Therefore, the effectiveness of an expansionary fiscal policy (size of fiscal multipliers) may depends on the size of crowding out effects. Since this discussion, we believe that some factors which affects the size of crowding out effects (through changes in interest rates and/or exchange rate) may affect the size of fiscal multiplier. That's why we try to examine the relationship between the size of government consumption multiplier and the level of financial openness, the level of external debt, the level of financial development, the level of trade openness and the exchange rate regime.

The main findings of this chapter can be summarised as follows: first of all, the most likely response to an output of shock in government consumption in a country which has a higher degree of financial openness will be bigger than that of a country with a lower degree of financial openness, with the cumulative multiplier in both countries being positive (95% confidence level). Justifying these results regarding the relationship between the level of financial openness and the size of a fiscal multiplier, this chapter will divide the samples being used into two observation groups: one group will have observations of a high level of financial openness and the other will have observations of a low level of financial openness. It is assumed from the initial estimations that the higher the level of financial openness the bigger the government consumption multiplier.

What is more, the government consumption multiplier is greater in countries where there is a high level of external debt. This implies that in a number of countries, due to the rapid accumulation of the debt burden in recent years, the government consumption multiplier has rose, an aspect which is consistent with the findings of Blanchard and Leigh (2013) who determine that since 2009 the fiscal multipliers in advanced countries have increased in size, much more so than was expected.

Whilst from this chapter is can be explained that the higher the level of financial development, the smaller the government consumption multiplier.

Furthermore, it will be highlighted that the government consumption multiplier in "open" economies is not significantly different to the government consumption multiplier in "closed" economies, results which are not consistent with Ilzetzki et al (2013).

Finally, this chapter divides the whole sample into groups of countries with flexible exchange rate regimes and those with fixed exchange rate regimes. The government consumption multiplier for the group of countries with flexible exchange rate regimes is not only less than the fixed exchange rate regime, but it also performs in an entirely different way. While the cumulative multiplier in countries with fixed exchange rate regimes increases over time reaching its peak after 4 quarters and staying at that level; the cumulative multiplier in countries with flexible exchange rate regimes reaches its peak after just one quarter then drops sharply after two quarters. What's more, the cumulative multiplier in flexible exchange rates is not statistically different from zero after the second quarter.

The rest of this chapter is structured as follows: section 4.2 reviews the literature which discusses the fiscal multiplier and the factors which affect the size of the fiscal multiplier. Section 4.3 sets out the empirical methodology used in this chapter, while section 4.4 describes the data used in this chapter. The empirical results and the interpretation of these results are reported in section 4.5, whilst this section also highlights the results of the robust tests which were carried out. Finally, section 4.6 reiterates the findings and discusses the interpretations of these findings.

4.2 Literature review

A more comprehensive review of the literature relating to fiscal policy and the fiscal multiplier is presented in Chapter 2. This particular section reviews the empirical studies that estimate the size of the fiscal multiplier and examine the factors which can alter the size of a fiscal multiplier.

After the financial crisis of 2007 and the global economic crisis of 2009, interest in the effectiveness of fiscal policy increased, resulting in many studies focusing on the fiscal multiplier. The academic paper which is most similar to this chapter is Ilzetzki, Mendoza and Vegh (2013); who use the panel VAR approach to analyse data from 44 countries, including 20 high-income countries and 24 developing countries, to study the size of

the government consumption multiplier. Ilzetzki, Mendoza and Vegh (2013) determine that government consumption multipliers in industrial countries are greater than those in developing countries. The government consumption multiplier is also lower in open economies than in closed economies. Countries with a fixed exchange rate regime have a superior government consumption multiplier than countries that have flexible exchange rates. Finally, Ilzetzki, Mendoza and Vegh (2013) discover that the government consumption multiplier is lower when the level of public debt is high.

Ilzetzki et al (2013) replicate Blanchard and Perotti (2002) by using SVAR to estimate the fiscal multiplier. Blanchard and Perotti (2002) is one of the first to use a SVAR approach to research the effects of fiscal policy. SVAR is used to study the effects of changes in government spending and taxation on output in the United States during the post-war period. Their results revealed that positive changes in government spending led to positive changes in output, while positive changes in taxation led to negative changes in output. However, they discovered that both positive changes in government spending and taxation led to strong negative changes in investment spending.

Another paper which uses similar methods to this chapter is Corsetti et al (2012); Corsetti et al (2012) use a two-step approach which identifies government spending shocks and trace the effects of government spending in different economic environments to determine how the exchange rate regime, public indebtedness and the state of the financial system affect the size of the fiscal multiplier. They discover that the government spending multiplier is higher in a fixed exchange rate regime than in an economy which has a flexible exchange rate regime, and determine that a weak public finance reduces the effectiveness of the fiscal policy. Finally, according to their results, the government spending multiplier seems to be larger when there is a financial crisis.

While Ilzetzki et al (2013) and Corsetti et al (2012) research the variations in the effects of fiscal policies in different economic environments; Auerbach and Gorodnichenko (2012) and Baum et al (2012) study the relationship between the state of the economy and the effectiveness of fiscal policy. Baum et al (2012) investigates fiscal multipliers on a country-by-country basis for G7 economies (excluding Italy) concluding that the multiplier varies amongst countries. Furthermore, they all determine that, on average, the fiscal multiplier is greater when there is a downturn (periods with negative output

gap) than when there is an expansion (periods with positive output gap). Auerbach and Gorodnichenko use a SVAR approach and data from a large number of OECD countries (34 countries), to estimate the government purchase multiplier and discover that the government consumption multiplier is larger in a recession. The SVAR model is extended by the use of direct projections that are able to economise the degree of freedom, and relax the assumptions of the impulse response function which are used by the SVAR approach to estimate the multiplier. This alternative model yields the same results as the standard SVAR model; with the government consumption multiplier being lower in recessions.

Hall (2009) uses several models to estimate government consumption multipliers using US data. Hall (2009) uses a direct regression model which uses government spending for the military for total purchases, treating the change in non-military government purchases as one of the sources of the noise. Hall assumes that the change in military spending is uncorrelated to any other components, such as output and private consumption. The estimated multiplier for his model is about 0.5; he also uses a vector auto-regressions model, discovering that the multiplier is between 0.5 and 1. Hall determines that the neo-classical model predicts a small positive fiscal multiplier and a fairly large crowding out in consumption after an expansionary fiscal policy. He also considers a reduced form of the New Keynesian model based upon a negative elasticity of the markup ratio in respect to output. Hall's model predicts that the multiplier has the potential to rise to 1.7 when the monetary policy is passive because the interest rate has fallen to the lower bound of zero, but just under 1 when the monetary policy is normal. In this model it can be concluded that the New Keynesian model predictions are better than a neo-classical model, this is because the predicted multiplier in the New Keynesian model complements the observed multiplier.[1]

Kara and Sin (2012) use a different New Keynesian model to Hall, which takes into account credit constraints. Kara and Sin discover that the presence of credit constraints increases the fiscal multiplier, which are consistent with Hall (2009).

The present chapter reexamines some of the questions that have already been addressed in previous research; analysing the impact of trade openness and exchange

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[1] Another interesting discovery by Hall is that the effectiveness of an expansionary fiscal policy depends on two features of the economy: a negative response of mark-up price over cost and an elastic labour supply. Both of these features relate to the traditional Keynesian viewpoint of price stickiness and wage stickiness.

rate regimes in relation to the size of the government consumption multiplier. This section also investigates the impact of three other factors which have not been addressed in any previous research – financial development, financial openness and the level of external debt's impact on the government consumption multiplier.

4.3 Methodology

4.3.1 Identification of the fiscal multiplier

A difficult task in studies of the fiscal multiplier is identification. This is because the relationship between government spending and output goes in two directions. Firstly, government spending can affect output. Secondly, output can affect government spending. The first channel needs to be captured in order for the fiscal multiplier to be estimated. In order to explore this problem, some authors focus on military expenditure, the reasoning for this is because military expenditure is exogenous to current and recent changes in the GDP (as Hall (2009) determined above). This approach relies on the basis that changes in government spending for the military sector does not affect the structure of the business cycle. Therefore, military build-ups have the ability to be used as exogenous fiscal shocks. However, there are limitations to this approach. Shocks in government spending, because of military reasons, are most likely to occur before or during wars that have an independent and strong economic impact. This makes it much more difficult to identify changes in economic activities which are purely caused by fiscal shocks. Also, there are not many identifiable alterations in which the change in military expenditure is clearly exogenous. Hall (2009) argues that there are only two observations in which the US economy are to estimate fiscal multipliers using this approach: military build-ups in World War II and the Korean War. Therefore, variations in government spending of military expenses for the Vietnam War and the two Iraq Wars were not large enough to provide a reliable estimate of the fiscal multiplier.

Another way of analysing the identification problem is by using a structural vector autoregressive model (SVAR). An important assumption of this SVAR model is that the level of government consumption in each quarter will only affect the output level of future quarters, it will not affect the current quarter. How this assumption can be practically tested is discussed in greater detail in the following sections. One of the advantages of using a SVAR model is that it can explain both of the potential directions

of the relationship between government spending and output, whilst, only a limited amount of data is required to estimate fiscal multiplier by SVAR.

The SVAR model of the government consumption multiplier estimated in this chapter uses panel data i.e. it is a panel-SVAR. The advantages and disadvantages of using a panel-SVAR model are discussed in the following sections.

4.3.2 SVAR for a single country

Sims (1980) and Asteriou et al (2007) consider that all of the variables should be treated as endogenous variables if they are determined together simultaneously. This method is different to most econometric models which normally include a dependent variable which is treated as an endogenous variable and several independent or explanatory variables which are treated as exogenous variables. After the publication of Sims (1980) seminal paper, the vector autoregressive approach became one of the most popular methods used to study the effects of monetary policy.

Following Blanchard and Perotti (2002), the objective of this study is to estimate the following system of equations (in matrix form):

$$AY_t = \sum_{k=1}^{K} C_k Y_{t-k} + u_t \qquad (4.1)$$

where Y_t is a mx1 vector of variables comprising of government expenditure variables, GDP and some endogenous variables for a given quarter t. A is the square matrix containing the structural contemporaneous parameters of the variables. C_k is an mxm matrix of the cross-effects of the kth lag of the variables in their current observations and u_t is a mx1 vector or an m (exogenous) shocks (this model has m variables).

One issue with this equation is that we can only estimate the reduced-form VAR of the model in the equation (4.1):

$$Y_t = \sum_{k=1}^{K} A^{-1} C_k Y_{t-k} + A^{-1} u_t$$

In order to estimate the multiplier, we need to estimate the matrices A, C_k and u_t. However, the OLS or GMM only provide the estimates of $A^{-1}C^k$ and $A^{-1}u_t$. In order to calculate the estimates for A, C_k and u_t, this chapter uses the lower triangular Cholesky decomposition as an identification scheme. Meaning that the changes in the first variable of this model are able to affect others contemporaneously, while fluctuations

in variables occurring later in the model need at least the length of one period to affect the first variable.

When reckoning the government consumption multiplier (the first variable in the model is government consumption, while the second variable is the output), using the Cholesky decomposition as an identification scheme is the most reliable and popular method; a method which is also used by Blanchard and Perotti (2002) and Ilzetzki et al (2013). While a shock in government consumption can affect output immediately, any changes in output need at least a quarter to affect the government consumption. This assumption can be described in the form of the lower triangular matrix A:

$$A = \begin{pmatrix} 1 & 0 \\ a_{21} & 1 \end{pmatrix}$$

4.3.3 Panel-SVAR

This chapter estimates a structural VAR using panel data; therefore, the model can be rewritten as follows:

$$AY_{i,t} = \sum_{k=1}^{K} C_k Y_{i,t-k} + f_i + Bu_{i,t} \qquad (4.2)$$

in this equation the index *i* refers to the *i*-th observation cross section. B stands for a diagonal mxm matrix, where the vector u_t contains orthogonal independents, identically distributed shocks to the endogenous variable, with the expectation of this vector being zero (*E[u_{i,t}]*=0) and *E[u_{i,t} u_{i,t}']* in the identity matrix. In accordance with Holtz-Eakin et al (1988), it is possible to treat lagged values of Y as instrumental variables.

One of the advantages of using Panel-SVAR instead of SVAR is that with Panel-SVAR there are a greater number of observations. A hindrance of Panel-SVAR is being forced to impose certain homogeneity restrictions; this concern is lessened if the different units of the cross-section are economically similar. However, the underlying structure requirement is the same for each cross-sectional unit, not to mention it is still a strong assumption; therefore, this chapter includes the fixed effects denoted by *f_i* in equation (4.2). The use of these fixed effects will allow the model to capture some degrees of "individual heterogeneity". Holz-Eakin et al (1988) argue that including individual effects in the model means that the time series relationship between the dependent variables and its lag values are not considered identical.

However, introducing fixed effects into the model, including lags of variable leads, fixed effects can be correlated with regressions. Hence, the mean-differencing transformation, which is normally used to eliminate fixed effects, will create biased coefficients. To solve this problem, this chapter incorporates aspects of Love and Ziccino (2006) study by using forward-mean differencing (Helmert procedure, see appendix 2). Arellano and Bover (1995) consider that by using this transformation it will keep homogeneity of variance (homoscedasticity) and will not induce serial correlation.

Furthermore, using the Helmert procedure enables this study to use lagged regressions as instruments and do coefficient estimations by using the system general method of moments. Therefore, this paper uses a STATA Panel VAR code developed by World Bank staff member, Inessa Love, to estimate the Panel VAR model using forward-mean differencing. This code generates 95% confidence intervals for the impulse response functions with Monte Carlo simulations.

4.3.4 Lag structure

One important task when using the SVAR approach is to choose the optimal lag length - K in the model (equation 4.2). This chapter uses a model with one lag to estimate all sub-samples as well as the whole sample. This decision is justified by using the HQIC and SBIC information criteria, both of which suggest one period lag for all sub-samples.

In SVAR analyses, the results can often change significantly depending upon the number of lags chosen in the SVAR. In econometrics, there are some popular specification tests used to help decide the optimal number of lags for the model such as AIC, HQIC and SBIC. In this paper, the Panel SVAR is estimated instead of SVAR. Therefore, this chapter calculates AIC, HQIC and SBIC for each cross section and then uses the modal value of the optimal lag length as the optimal lag length for the Panel SVAR model: the optimal number of lags will be chosen between 1 and 12.

Ivanov and Kilian (2001) suggest that in order to select the most appropriate optimal lags for the SVAR model, AIC works better in accordance with monthly data. For quarterly data, HQIC seems to be more accurate, especially if the number of observations is greater than 120, while SBIC is the best criteria to use for samples which have less than 120 observations. Furthermore, Lutkepohl (2005) considers that while SBIC and HQIC provide consistent estimations of the true lag order, AIC tends

to overestimate the true lag order with positive probability even when an infinite sample size is being used. Taking this into consideration, this chapter uses the optimal lag length chosen by HQIC and SBIC.

4.3.5 Calculating multipliers

In order to estimate government consumption multipliers, the model is estimated using logarithms of real GDP and real government consumption.

This paper will focus on the impact multiplier, cumulative multiplier and the long-run multiplier. These are defined as follows:

The impact multiplier is expressed in the formula as:

$$Impact\ multiplier = \frac{\Delta Y_0}{\Delta G_0}$$

where the change in output ΔY used in this formula is caused by a change in government consumption ΔG.

The cumulative multiplier:

$$Cumulative\ multiplier(t) = \frac{\sum_{i=0}^{t} \Delta Y_i}{\sum_{i=0}^{t} \Delta G_i}$$

The long-run multiplier is also the cumulative multiplier, as t goes to infinite. In this study, the estimation reveals the impact of a shock in government consumption on output is always horizontal by 3 years. Therefore, the estimated long run multipliers in this chapter are in fact the cumulative multiplier after 12 quarters.

In order to calculate the multiplier, this chapter highlights that the orthogonalized impulse-response functions illustrate the response of a variable to an orthogonal shock in one other variable with no disturbance to other variables. This helps to clarify the effect of one shock at a time, while keeping other shocks at zero.

In order to estimate the government consumption multiplier (main focus of this chapter), the Panel-VAR for variable real government consumption in the form of *ΔlogG* and real output in the form of *ΔlogY* require estimating. After analysing the impulse response function, it can be determined that if there is a shock in *ΔlogG* by 1 unit at time t=0, then *ΔlogY* at time t will increase by IRF_t (*ΔlogY)* unit and *ΔlogG* at time t will increase by IRF_t (*ΔlogG*). If time t=0, then IRF_t (*ΔlogG*)=1. Therefore:

$$\frac{IRF_0(\Delta logY)}{IRF_0(\Delta logG)} = \beta = IRF_0(\Delta logY) = \frac{\Delta logY}{\Delta logG} = \frac{\Delta Y}{Y} \cdot \frac{G}{\Delta G} = \frac{\Delta Y}{\Delta G} \cdot \frac{G}{Y}$$

The impact government consumption multiplier can easily be defined as:

$$\frac{\Delta Y}{\Delta G} = \beta \cdot \frac{Y}{G}$$

It is highly complicated to calculate a cumulative multiplier from the impulse response function, an aspect which is expressed in the following formula:

$$Cumulative\ multiplier(n) = \frac{\sum_{t=0}^{n} IRF_t(\Delta logY)}{\sum_{t=0}^{n} IRF_t(\Delta logG)} \cdot \frac{\bar{Y}}{\bar{G}}$$

in this formula $\frac{\bar{G}}{\bar{Y}}$ is average in relation to the ratio between government consumption and GDP of the sample used to estimate panel VAR.

4.4 Data

This chapter uses quarterly data from 30 countries from 1980q1 to 2013q4 (unbalanced panel data), including 26 European countries and 4 non-European countries. These countries are listed in the appendix. Focusing mainly on EU countries (23 countries) helps to limit potential heterogeneity especially as EU countries tend to have numerous economic similarities. The data used in this chapter excludes 5 EU countries including Bulgaria, Croatia, Greece, Luxembourg and Romania; this is solely due to the shortage of data on these countries. The data used in this chapter also includes 7 non-EU countries including Australia, Canada, Iceland, Japan, Norway, Switzerland and United States. The reasons for including these countries in the dataset are: the availability of data relating to these countries, and these economies share a range of economic similarities with EU countries.

Quarterly data was chosen for this study simply because it is better suited for identification; take for instance Blanchard and Perotti (2002), who determine that the impact of change in fiscal policy in relation to output can be identified using the assumption that fiscal authorities require at least one period to respond to new economic data with discretionary policy. One of the disadvantages of using quarterly data is the limited availability of the data.

Data relating to 26 European countries was collected from Eurostat, the data for United States, Canada, Japan and Australia was collected from Oxford Economics.

The data used is also required to determine financial openness, financial development and openness of the economy. The Chinn and Ito (2006) index of capital account openness is used in this study as a measure of financial openness. According to the Chinn-Ito website, "The Chinn-Ito index (KAOPEN) is an index measuring a country's degree of capital account openness. The index was initially introduced in Chinn and Ito (Journal of Development Economics, 2006). KAOPEN is based on the binary dummy variables that codify the tabulation of restrictions on cross-border financial transactions reported in the IMF's Annual Report on Exchange Arrangements and Exchange Restrictions (AREAER)".

Incorporating the financial development index, this chapter uses the figure of domestic credit in relation to the private sector (as % of GDP). There are several indicators of financial development, for example the ratio of liquid liabilities to GDP and the ratio of market capitalisation to GDP. However, in this study the ratio of domestic credit of the private sector in accordance with GDP is used because of the broad consensus that this ratio is a good indicator of financial development along with the fact that the data of this ratio is quite easy to accumulate. This particular data is taken from the World Development Indicators (WDI).

In order to determine whether an economy is an open or closed one, this chapter uses the ratio of total trade to GDP (this data is also taken from World Development Indicators).

The data used to define whether a country implementing a fixed exchange rate regime or a flexible exchange rate regime is the same data used by Ilzetzki, Reinhart and Rogoff (2011).

The figures which highlight the external debt as part of the GDP were collected from the Oxford Economics; due to the availability, this data was collated from 2003q1 to 2013q4.

4.5 Results and interpretation

4.5.1 Results

The level of financial openness

In order to answer the question whether or not the level of financial openness affects the size of the fiscal multiplier, the whole sample has been divided into two sub-

samples. Due to the fact there is no literature about the level of Chinn-Ito capital account openness index to be classified as a high level or low level, this chapter uses the mean of variable *kaopen* of the whole sample as criteria.

The first sub-sample includes observations which have the value of variable *kaopen* (the Chinn-Ito capital account openness index) greater than 1.85 (mean variable of *kaopen*), while the second sub-sample includes observations with the value variable of *kaopen* less than or equal to 1.85.

Figure 4.1 reveals the cumulative multiplier for both sub-samples: the impact multiplier for groups of higher level financial openness observations and groups of lower level financial openness observations are 0.63 and 0.28 respectively. Both figures are statistically different from zero as well as from each other at a 95% confidence level. In Figure 4.1 and other figures in this chapter, the dashed lines show the 95% confidence interval; for instance, the 95% confidence interval of the impact multiplier in groups of lower financial openness level observations equates to (0.1 - 0.44), while the ones in groups which are of a higher financial openness level observation are between (0.52 - 0.75).

Figure 4.1 Government consumption multiplier – High level of Financial Openness group versus Low level of Financial Openness group

Higher Level of Financial Openness Group

Long run: 1.19

Impact: 0.63
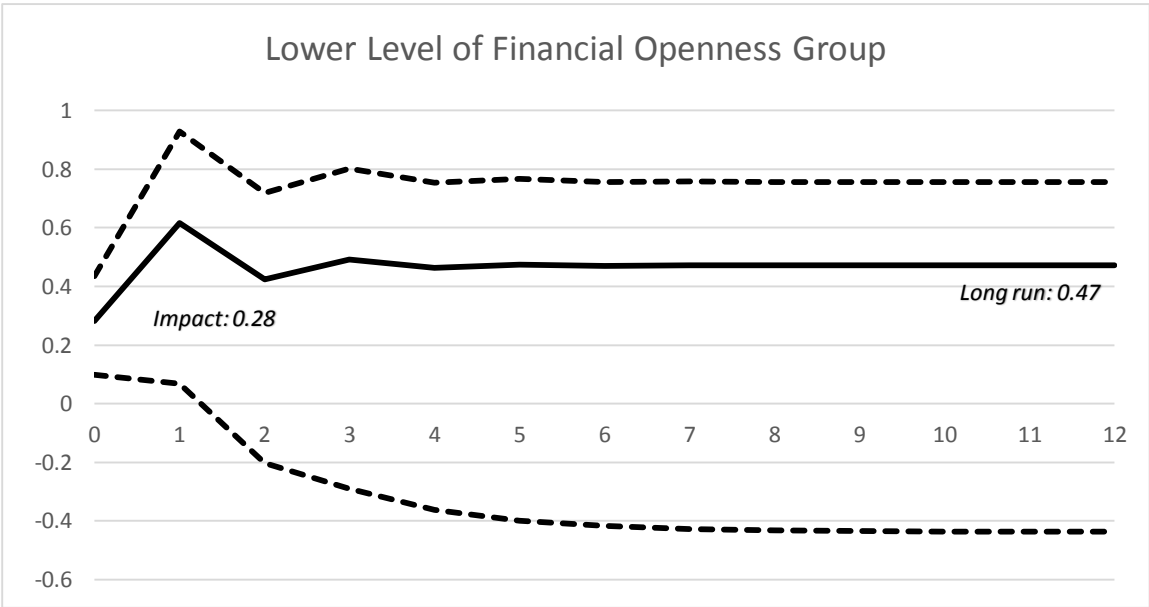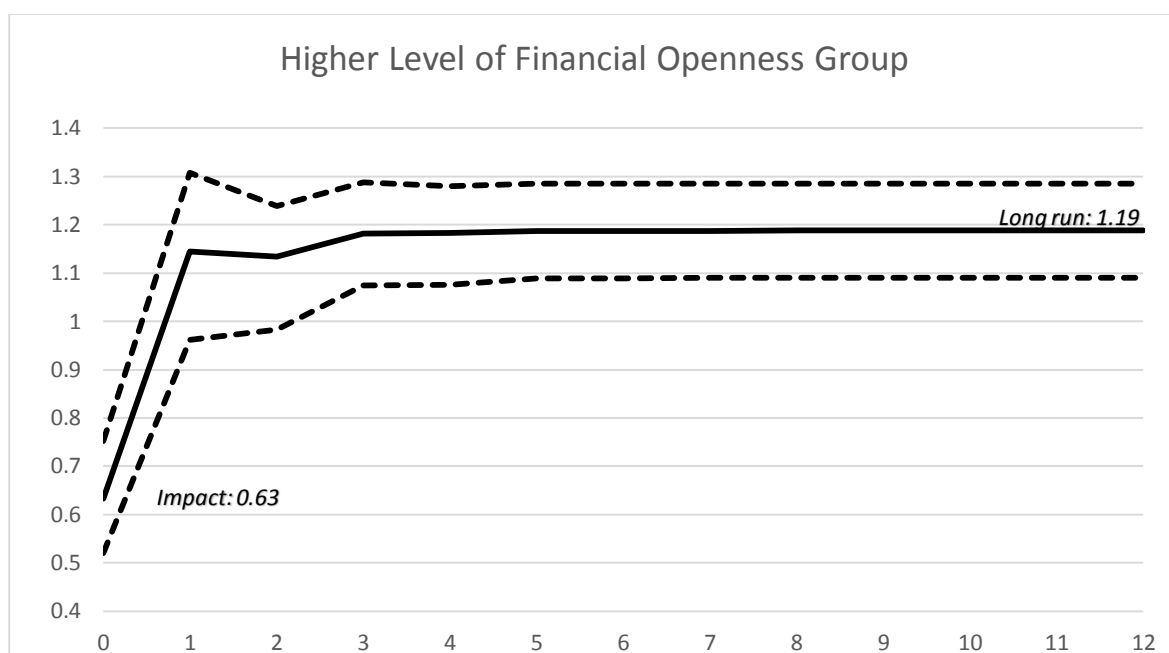
Since fiscal policy can only be implemented over a period of time and the economy will most likely take time to respond to these changes, this chapter also takes into consideration the cumulative multipliers for both groups at horizons ranging from 0 to 12 quarters.

The estimation results show that the cumulative multiplier in the higher level of the financial openness group is greater than the cumulative multiplier in the lower level of the financial openness group at every time horizon (Figure 4.1). Furthermore, the cumulative multiplier in the higher level of the financial openness sub-sample is significantly different from zero at every time horizon, while this does not happen for the lower level of the financial openness sub sample. As revealed in Figure 4.1, the cumulative multiplier of the lower financial openness level only differ from zero at quarter 0 and quarter 1, after quarter 2 the level does not dramatically alter. This means that the impact of a shock in government spending in relation to the output may be offset totally after 2 quarters by crowding out effects in time of low levels of financial openness.

The long-run multiplier (the cumulative multiplier at the quarter 12) in higher levels of the financial openness group and lower levels of the financial openness group are 1.19 and 0.47 respectively (Figure 4.1).

The sample was also divided into high level financial openness countries and low level financial openness countries (which is different to the classification used for Figure 4.1,

which allowed individual countries to move between classifications). For simplicity, the average capital account openness index for each country is calculated, if this value of a country is greater than 1.85, then this country is classified as a high level of financial openness country. Other countries are classified as a low level of financial openness country: this classification is revealed in Table 4.3.

Figure 4.2 Government consumption multiplier – High level of Financial Openness Countries and Low level of Financial Openness Countries

Lower Level of Financial Openness Countries

Long run: 0.57

Impact: 0.33

Higher Level of Financial Openness Countries

Long run: 1.63

Impact: 0.97
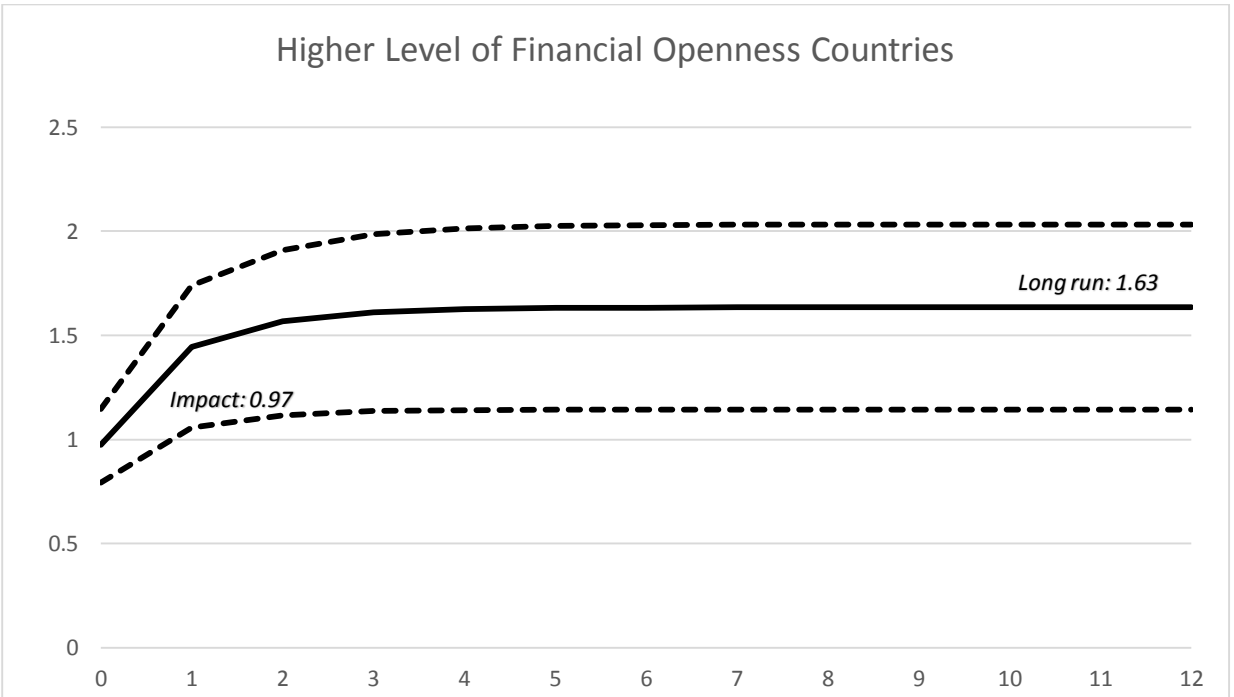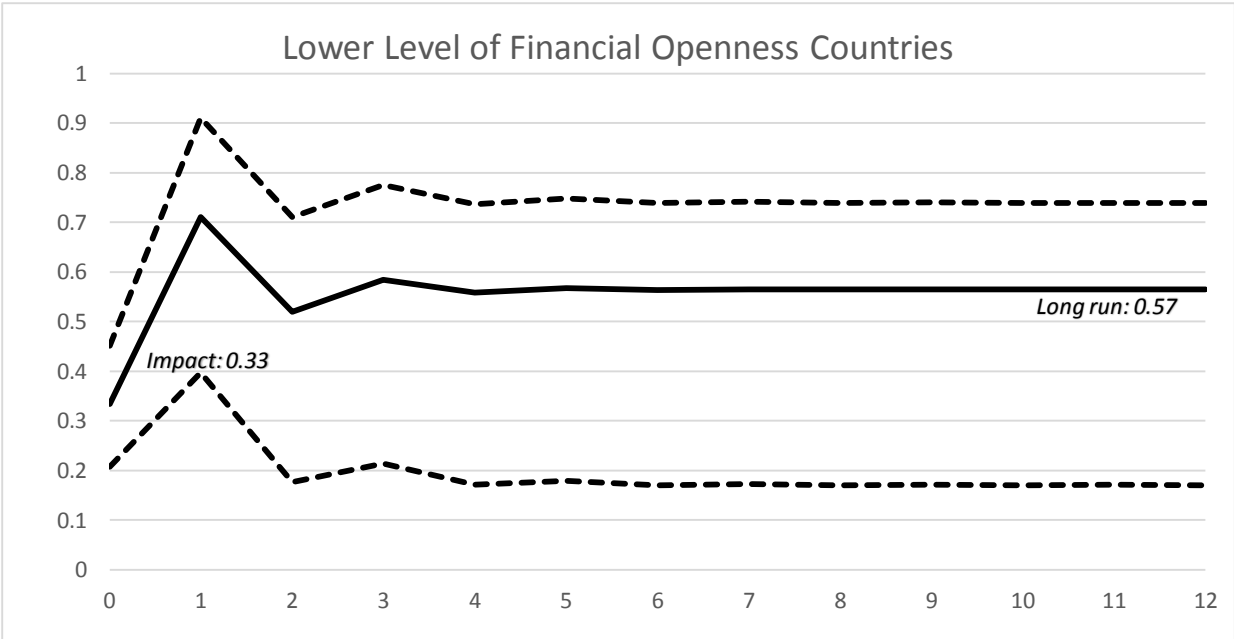
In figure 4.2, it can be determined that the multiplier in countries with high levels of financial openness is significantly greater than the multiplier in countries with low levels of financial openness at every time horizon. These findings are consistent with the results presented in figure 4.1, whereby the higher the level of financial openness, the bigger the multiplier. In other words, the higher the levels of financial openness the more effective fiscal stimulus packages will be in term of raising output.

The level of external debt

In order to examine whether the level of external debt affects the government consumption multiplier, this chapter splits the data used into countries with high levels of external debt and countries with low levels of external debt, using the ratio of total external debt to GDP as a criterion. Countries with a ratio of external debt to GDP greater than 100% are classified as high external debts, while others are classified as low external debts. One reason for this cut-off level is that although the ratio of external debt to GDP varies during this period in many countries, it rarely crosses the cut-off level (100%). As a result, there are 20 "high external debt" countries and 10 "low external debt" countries: these results are presented in Table 4.7.

Figure 4.3 Cumulative multiplier – Low external debt countries and High external debt countries

High External Debt to GDP Countries
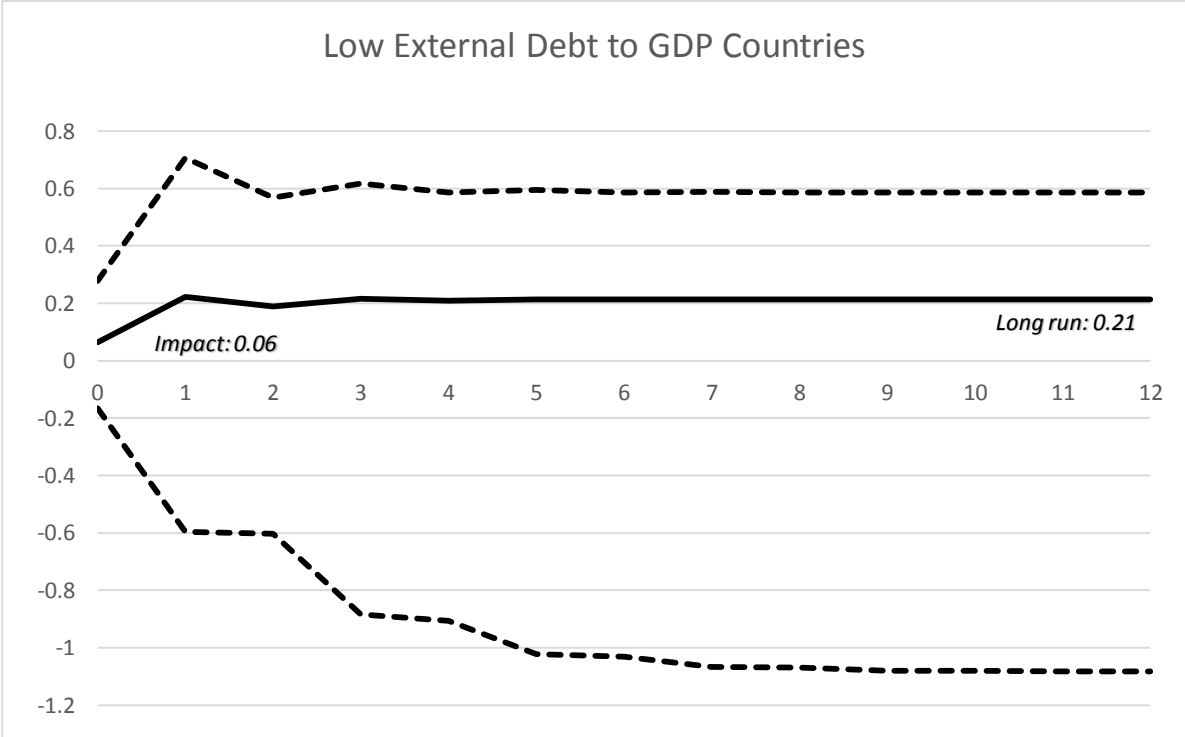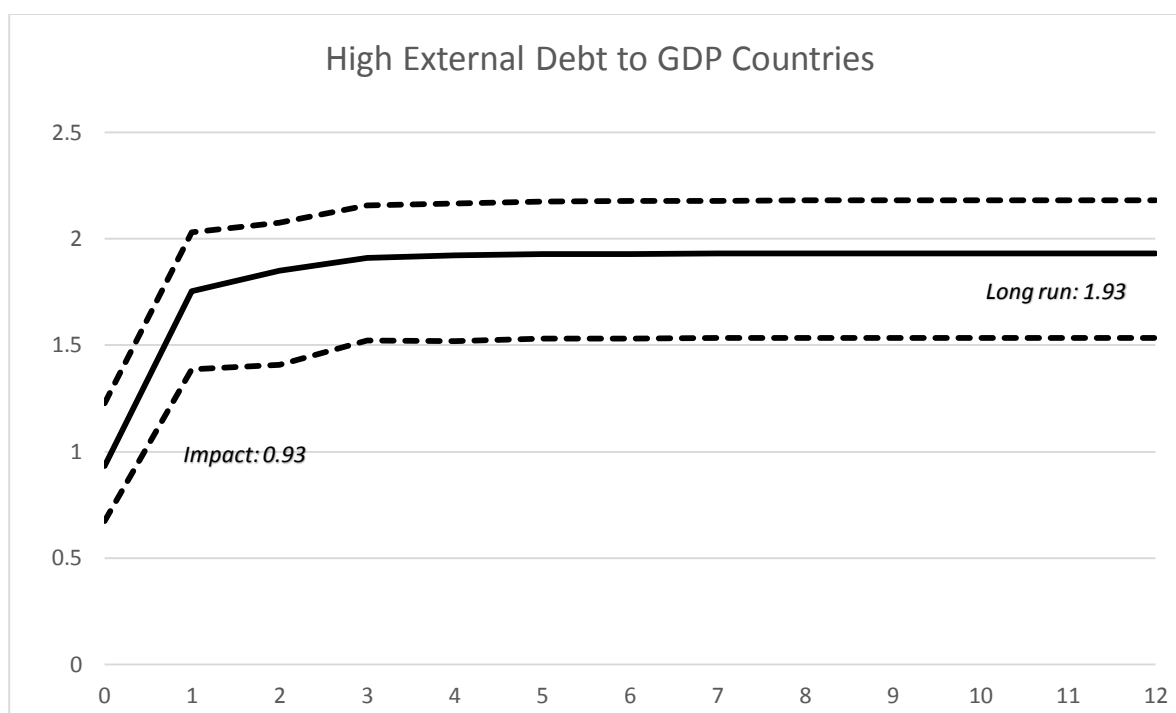
Figure 4.3 reveals that the cumulative multiplier in countries with low levels of external debt is small, it increases from the initial value 0.06 (impact multiplier) to 0.21 (long run multiplier). This level is not only small but it is also not statistically significant from zero at every time horizon.

Furthermore, Figure 4.3 also highlights that the effects of a fiscal shock in countries with high levels of external debt is quite large; increasing from the initial value of 0.93 (impact multiplier) to the long run value 1.93. This value is statistically positive and greater than the cumulative multiplier in low level external debt countries at every time horizon. In other words, in countries with high levels of external debt, the government consumption multiplier is larger than in low external debt countries.

The level of financial development

To determine how the level of financial development affects the size of the government consumption multiplier, the SVAR is re-estimated for two groups of countries, one that includes high level of financial development countries and one with countries that have a low level of financial development. This classification is based upon the financial development index which uses the ratio of domestic credit to private sector to GDP as a proxy for the financial development.

Countries with a ratio of domestic credit to private sector of less than 100% GDP are classified as low level financial development countries, countries above this 100% level

are considered to be high level of financial development countries. One reason for this cut-off level is that although the ratio of domestic credit to private sector varies during this period in many countries, it rarely crosses the cut-off level (100%).

Figure 4.4 Cumulative multiplier – Low level financial development countries and High level financial development countries

Higher Level of Financial Development Countries

Long run: 0.63

Impact: 0.28

Lower Level of Financial Development Countries

Long run: 1.68

Impact: 0.98
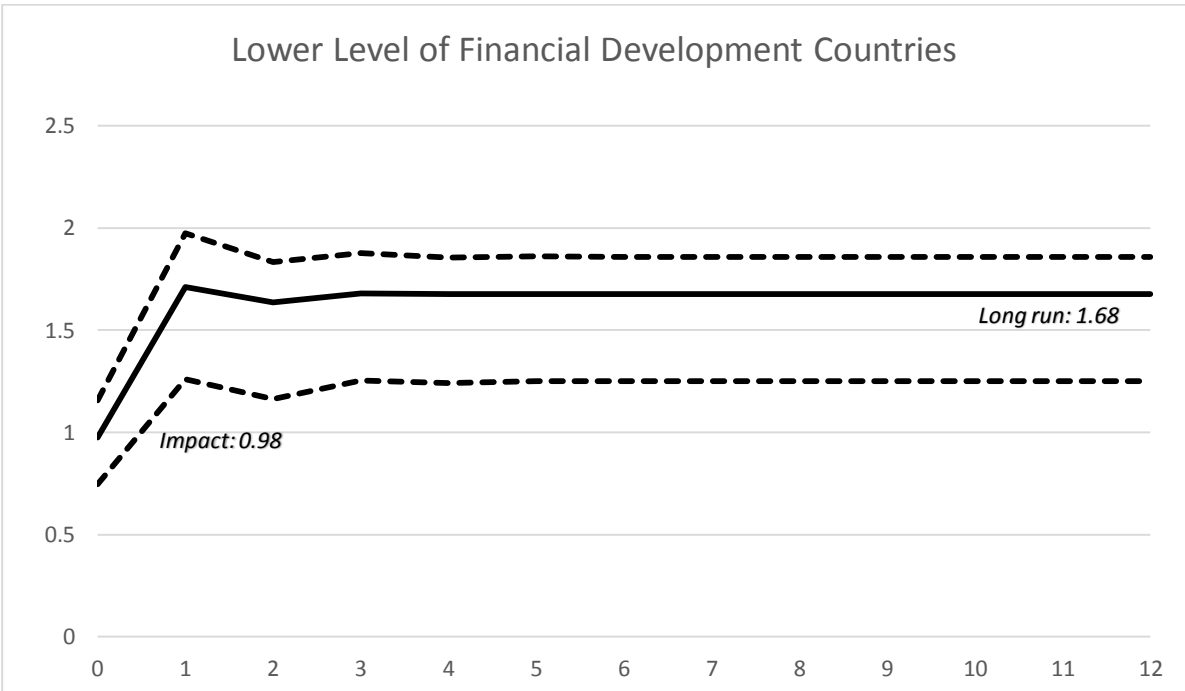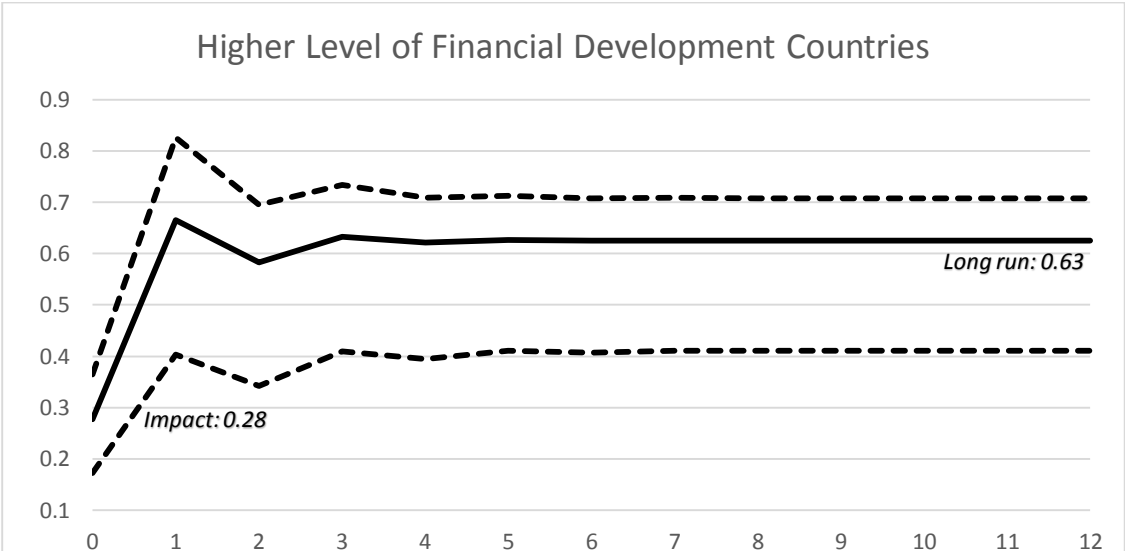
The estimation results are shown in Figure 4.4. The cumulative government consumption multiplier in both groups of countries are significantly positive.

The government consumption multiplier in the group of low level financial development countries increases from 0.71 (impact multiplier) to 1.52 (long-run multiplier), while the

multiplier in groups of high level financial development countries increases from 0.28 (impact multiplier) to 0.63 (long-run multiplier). Furthermore, the results determine that the effects of increases in government consumption in groups of low level financial development countries is significantly larger than in groups of high level financial development countries.

The level of trade openness

To investigate the impact of trade openness, the SVAR is re-estimated for two sub-samples: open economies and closed economies. The classification is based upon the ratio of total trade in services and goods to GDP. The data of total trade to GDP is collected from World Development Indicator, and due to data availability, data collected for the year 2012 is used for classification.

Following Ilzetzki et al (2013), countries with a ratio of total trade to GDP greater than 60% are classified as being open, while other countries are deemed as closed. On this basis, there are 25 open countries and 5 closed countries (as listed in Table 4.5).

Figure 4.5 Cumulative multiplier – Open economies and Closed economies

Closed to trade countries

Long run: 1.26

Impact: 0.63
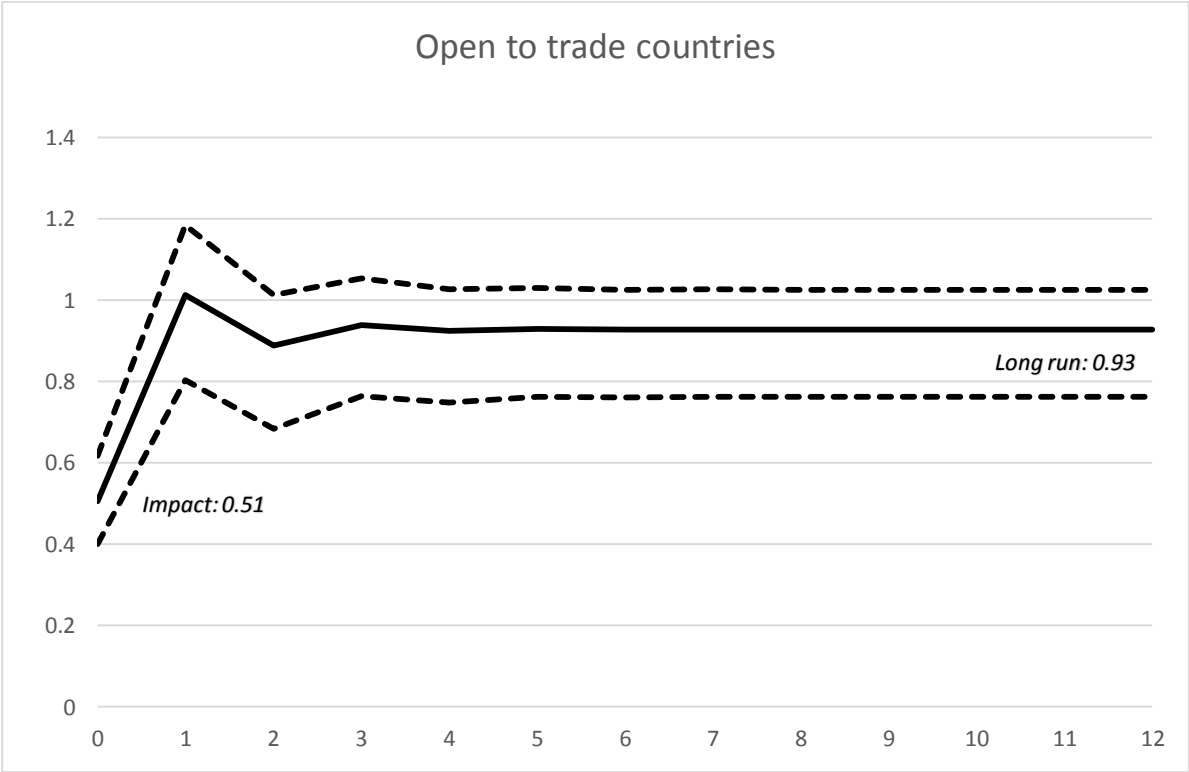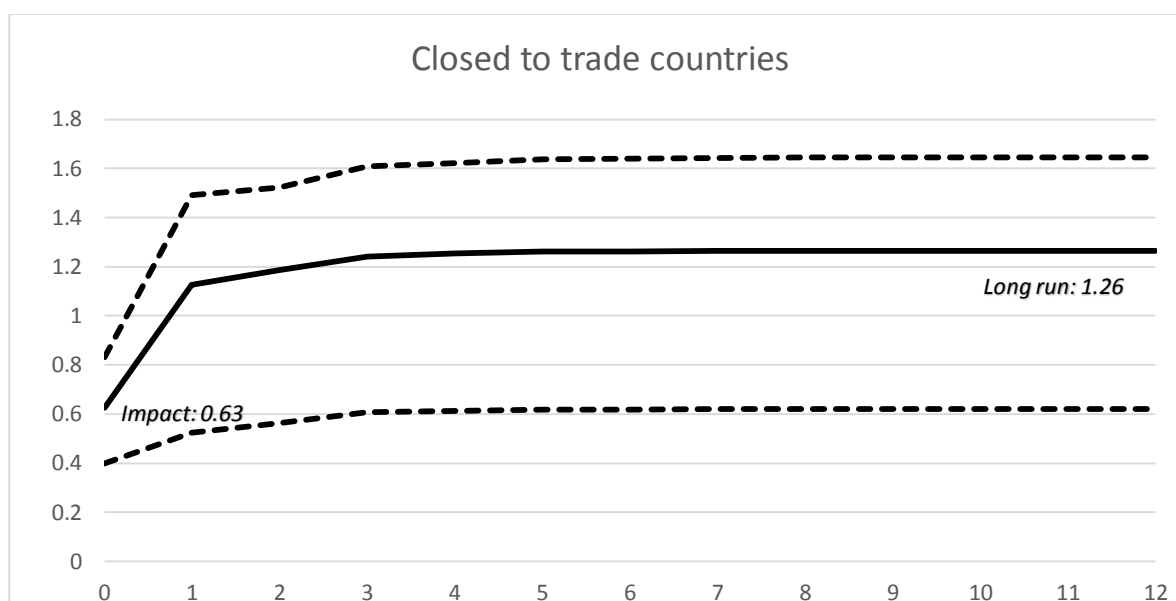
As shown in Figure 4.5, the cumulative multiplier in "open" economies increases from 0.51 (impact multiplier) to 0.93 (long-run multiplier), being positive for every time horizon. Whereas the cumulative in "closed" economies increases from 0.63 (impact multiplier) to 1.26 (long run multiplier) and is also positive for every time horizon. Figure 4.5 also reveals that the cumulative multiplier in "open" economies is not significantly less than the cumulative multiplier in "closed" economies at each time horizon.

Flexible exchange rate regime vs Fixed exchange rate regime

When examining the impact of the exchange rate regime in relation to the size of the government consumption multiplier, the SVAR is re-estimated into two sub-samples comprising of: fixed exchange rate regime countries and flexible exchange rate regime countries. This is based on the de facto classification of Ilzetzki, Reinhart and Rogoff (2011), where a country with no separate legal tender, crawling pegs, de facto or pre-announced bands or crawling bands narrower than or equal to +/-2% is classified as a fixed exchange regime country. Other countries are classified as flexible exchange regime countries. In case there are countries which change from a fixed exchange rate regime to a flexible exchange rate regime or vice versa, for the purpose of this research they have been referred to as their dominated regime. In line with this classification, there are 12 countries with flexible exchange rate regimes, and 18 countries that have a fixed exchange rate regime (as listed in Table 4.6).

Figure 4.6 Cumulative multiplier - Flexible Exchange Rate Regime Countries and Fixed Exchange Rate Regime Countries

Flexible Exchange Rate Regime Countries

Fixed Exchange Rate Regime Countries
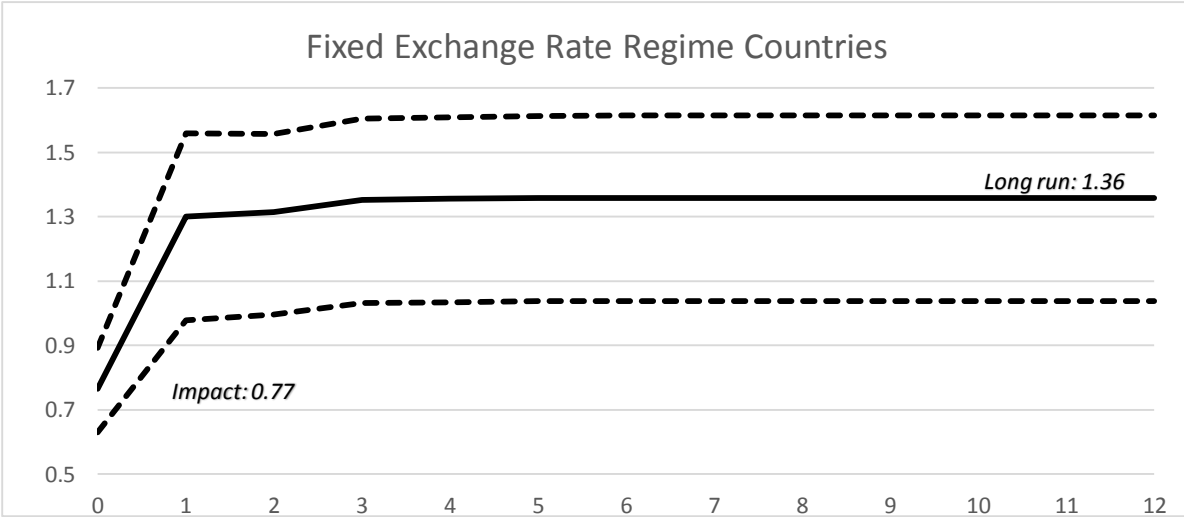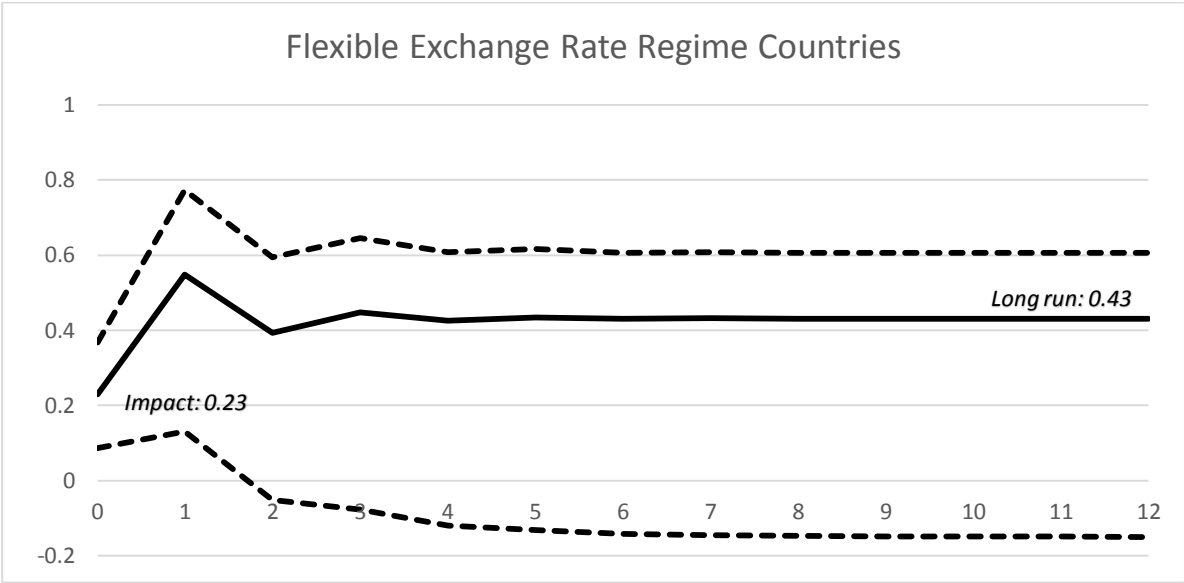
As determined in Figure 4.6, the impact multiplier in countries with fixed exchange rate regimes is 0.77 and is statistically positive at 95% confidence level. The impact multiplier in countries with flexible exchange rate regimes is 0.23, and even though this is small it is still statistically positive. However, it is also statistically less than the similar number in countries with fixed exchange rate regimes.

Furthermore, Figure 4.6 reveals that the cumulative multiplier for countries with fixed exchange rate regimes increases from an initial value of 0.77 to 1.30, 1.31 and 1.35 after 1, 2, 3 quarters respectively, reaching its peak at 1.36 after 4 quarters then staying at this level. The cumulative multiplier for fixed exchange rate regime countries is

statistically positive at every point, in contrast, the cumulative multiplier in countries with flexible exchange regimes increases from an initial value of 0.23, peaking at 0.55 after 1 quarter, and then dropping to 0.39 after 2 quarters. This value fluctuates slightly and then stays at 0.43 from the fourth quarter onwards. In flexible exchange rate regime countries, the cumulative multiplier is even not statistically different to zero after the second quarter.

4.5.2 Interpretation

The level of financial openness, external debt and financial development

As reported in the above section, the government consumption multiplier tends to be larger in countries with a high level of financial openness, a high level of external debt or a low level of financial development, in comparison to countries with a lower level of financial openness, a lower level of external debt or a higher level of financial development. All of these results seem to be reasonable in terms of economic theory regarding crowding out effects through changes in interest rates following changes in fiscal policy.

The IS-LM model considers that an increase in government spending may be followed by an increase in interest rates, which in turn can lead to crowding-out effects on investment. These crowding-out effects will partly offset the impacts of an expansionary fiscal policy on output; this means that the crowding-out effects will reduce the size of the multiplier. The reason behind an increase in interest rates is that the government will need to issue more debt to finance the purchasing of more goods and services. This effect can lead to an increase in demand in the financial market, which can cause an upward pressure on the interest rate. However, a high level of financial openness means that the government can easily borrow from overseas at a given interest rate, which means that the interest may not increase at all or may just increase slightly. Therefore, crowding-out effects will be smaller in high level of financial openness countries.

In addition, a higher level of external debt means that a greater number of economic activities in the economy are financed by foreign capital. As predicted by the IS-LM model, this will limit the crowding out effects via an increase in domestic interest rates following an expansionary fiscal policy. Therefore, the government consumption multiplier is bigger in countries with higher levels of external debt than countries with

lower levels of external debt. These findings are also consistent with Kara and Sin (2012). In theory, without financial constraints, both private investment and consumption become crowded out through an increase in the real interest rate, which normally follows a fiscal expansion. Moreover, there may be negative wealth effects on private consumption because forward-looking households expect taxation to rise in the future in order to finance the budget deficits. As a result, the effects of an expansionary fiscal policy will be offset partly, which means the government consumption multiplier in low external debt countries is smaller. In contrast, countries with a high level of external debt or those with credit constraints, have to deal with a nominal interest rate is stuck at a fixed level i.e. zero lower bound. In these periods, an expansionary fiscal policy leads to an increase in output, which is followed by a rise in the inflation rate. An expansionary fiscal policy may lead to a decrease in real interest rates which can cause additional increase in outputs further down the line, meaning, the government consumption multiplier is larger in high external debt countries.

This result explains Blanchard and Leigh (2013) study which discovers that the fiscal multiplier in advanced countries since 2009 is greater than expected before (about 0.9 to 1.7 instead of 0.5 calculated by IMF (2009)). The empirical results discussed in this chapter certainly correlate to findings of Blanchard and Leigh: the debt burden has been accumulating rapidly over the years, and as a result the government consumption multiplier becomes much larger, which also reduces the effectiveness of austerity programs.

A higher level of financial development means that more private consumption and private investments are financed by domestic credit. A larger proportion of private consumption and private investments financed by domestic credit can create stronger negative effects in the form of an increase in domestic interest rates on private consumption and investments. This larger proportion also means that a higher level of financial development, or more private consumption and investment financed by domestic credit creates stronger crowding-out effects on private consumption and investments and a smaller government consumption multiplier.

The level of trade openness and exchange rate regimes

The estimated results highlight that the government consumption multiplier in open economies (countries with higher levels of trade openness) is not significantly less than

the government consumption multiplier in closed economies (countries with lower levels of trade openness).

These findings are inconsistent with the results of Ilzetzki et al (2013). Furthermore, Ilzetzki et al determine that both impact multipliers and long-run multipliers in "open" economies are negative, whereas the results from this chapter show that these numbers are positive: these differences may be caused by the differences in the sample.

These findings are also inconsistent with the Mundell-Fleming model; in this model, a more open economy appears to have a lower fiscal multiplier. There are two main reasons for this: firstly, a portion of government consumption is imported from foreign producers, which means the increase in government consumption will be partly offset by the increase in imports. Also, as already explained by the Mundell-Fleming model, increases in government spending may be followed by a depreciation of the local currency; this may lead to an increase in imports and a decrease in exports. In other words, a depreciation of local currencies will lead to a decrease in net export, which will reduce the effectiveness of an expansionary fiscal policy, meaning an expansionary fiscal policy in a more open economy will be less effective than one in a closed economy.

However, since this analysis, a possible explanation of why the cumulative multiplier in the open economies sample is not significantly less than the cumulative multiplier in the closed economies sample as predicted in the Mundell-Fleming model is because both fixed exchange rate regime countries and flexible exchange rate regime countries have been used in this research.

As outlined in the above section, this chapter also examines the impact of the exchange rate regime on the size of the government consumption multiplier and discovers that the government consumption multiplier in fixed exchange rate regimes is significantly larger than the government consumption multiplier in flexible exchange rate regimes. These results parallel the predictions of the Mundell-Fleming model, and also help to explain why the cumulative multiplier in closed trade economies is not statistically different to the cumulative multiplier in open trade economies.

Furthermore, these results determine that although flexible exchange rate regimes reduce the effects of an expansionary fiscal policy by crowding-out effects through

exchange rates, these effects will be greater if an economy is more open to trade: because even most closed economies in the sample implement a flexible exchange rate when the multiplier is still high. In other words, the crowding-out effect through exchange rates is still small in flexible exchange rate regime countries if this country is not open to trade.

4.5.3 Robustness check

Sample variation

A question which needs to be considered is whether the behaviour of a single country or a small group of countries can influence these results? In order to complete a robustness check for the results of this chapter, the estimated SVAR for single countries must be taken into consideration. Based on these single country estimations, this chapter excludes four countries including Belgium, Iceland, Ireland and Lithuania, all of which have much larger multipliers than any other countries: while the multiplier in other countries spans from -0.6 (Slovenia) to 1.8 (Japan), the multipliers in Belgium, Iceland, Ireland and Lithuania are 2.68, 2.06, 3.76 and 2.23 respectively.

After excluding these four countries, the estimated results have become slightly different in terms of value (smaller). However, the main results still hold. The cumulative government consumption multiplier is still bigger in high level financial openness countries, bigger in high external debt countries, bigger in low levels of financial development and bigger in fixed exchange rate regime countries.

The financial openness – The Lane and Milesi-Ferreti (2007) "index of financial integration"

As an alternative to the Chinn-Ito index used as the financial openness index, the panel-SVAR is re-estimated using the Lane and Milesi-Ferretti (2007) "index of financial integration" (IFI) instead. The IFI is the ratio of the sum of gross external financial assets and liabilities to GDP. Due to there being no literature regarding the level of IFI and whether it can be classified as high level or low level, this chapter chooses a 500% cut-off level because this will divide the whole sample into two equal groups: one which has 15 higher level IFI countries and one with 15 lower level IFI countries (as listed in Table 4.8).

The government consumption multiplier in countries with a higher level of IFI is not significantly different to the government consumption multiplier in countries with lower levels of IFI: an aspect which is not consistent with the results delivered in section 4.5.1, this is due to the differences in classification. For example, the United States, Canada and Japan are high level financial openness countries (based on the Chinn-Ito index); however, their IFIs are much lower than other countries in the sample.

Net external indebtedness

As an alternative to gross external debt, the panel-SVAR is re-estimated on two sub-samples, distinguished using the ratio of net foreign liabilities to GDP. Countries with the average ratio of net foreign liabilities to GDP greater than 20% are being classified as low net foreign liabilities countries, while others are being classified as having high levels of net foreign liabilities. The full classification of this is shown in Table 4.9. The results of the panel-VAR estimation (Figure 4.7) indicate that the cumulative government consumption multiplier in countries with higher levels of net foreign liabilities is significantly greater than the cumulative government consumption multiplier in countries with lower levels of net foreign liabilities at every time horizon. These findings are consistent with the results which used gross external debt; the government consumption multiplier in countries with high levels of net external debt or gross external debt is greater than in countries with low levels of net external debt or gross external debt.

Figure 4.7 Cumulative multiplier – Net Foreign Liabilities

High Net Foreign Liabilities to GDP Countries

Impact: 0.79

Long run: 1.45
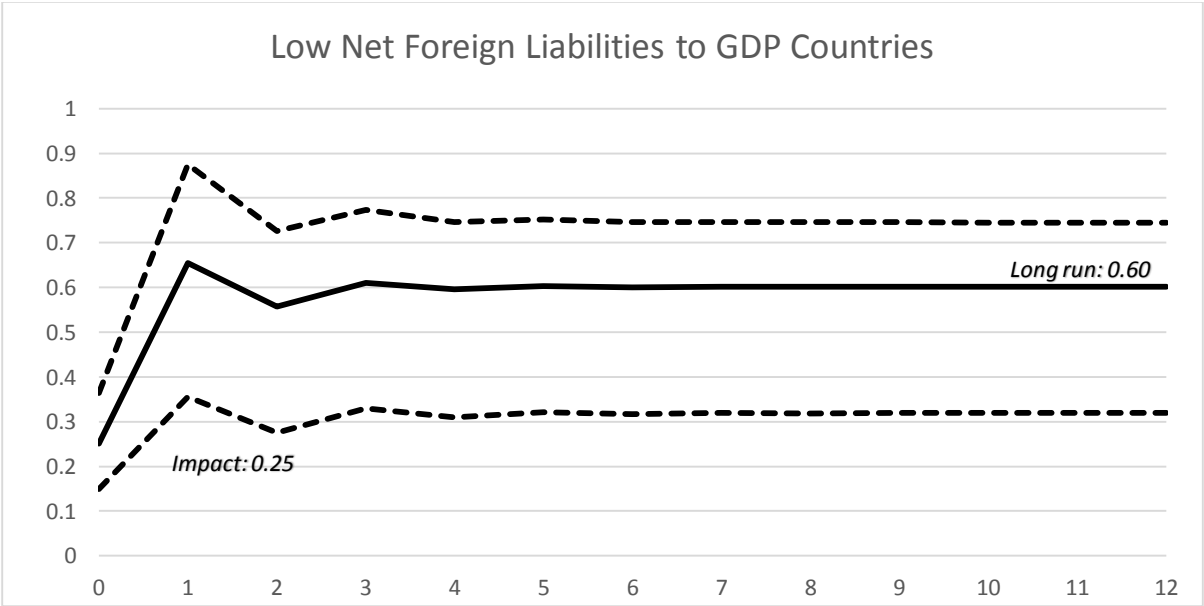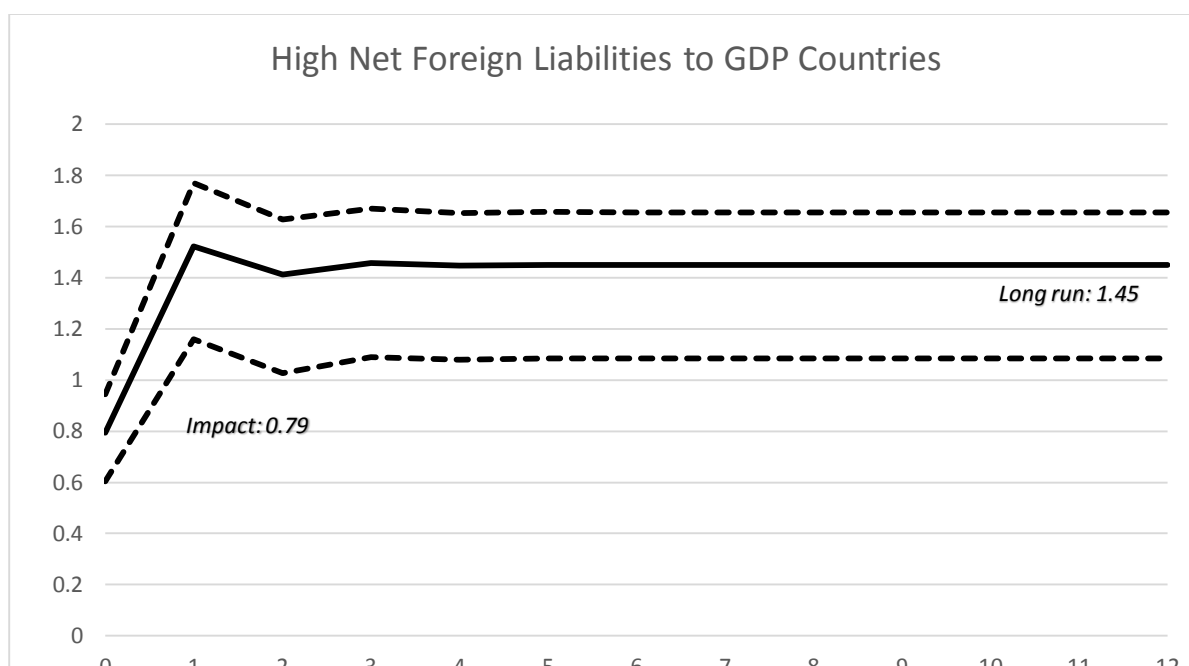
4.6 Summary and conclusions

This chapter provides empirical evidence on the magnitude of the government consumption multiplier and how this is affected by a number of economic factors: financial openness, financial development, level of external debt, trade openness and exchange rate regime using panel-SVAR estimation with quarterly data for 26 European countries and 4 non-European countries. Dividing the whole sample into sub-samples allows investigation of how these economic factors affect the government consumption multiplier (an approach also adopted by Ilzetzki et al (2013)). These classifications are based upon several criteria, such as the level of financial openness, the level of external debt, the level of financial development, the level of openness to trade and the exchange rate regime.

This reveals that government consumption multiplier is bigger in countries with higher level of financial openness, higher level of external debt, lower level of financial development and fixed exchange rate regime. This chapter also examines the relationship between trade openness and the size of government consumption multiplier. However, the estimation result suggests that the cumulative government consumption multiplier in countries with higher level of trade openness is not significantly differ to the cumulative government consumption multiplier in countries with lower level of trade openness. This is inconsistent with Ilzetzki et al (2013) as well

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as the prediction of Mundell-Fleming model which considers that trade openness may affect the size of government consumption multiplier through crowding out effects induce by changes in exchange rate following any change in government consumption. However this inconsistency may be explained that when using trade openness level to divide the whole sample into sub-samples, each sub-sample include both countries with fixed exchange regime and countries with flexible exchange regime.

Two of these criteria – exchange rate regime and level of financial openness -- are motivated by Mundell-Fleming model of fiscal policy in an open economy. According to the Mundell-Fleming model if the exchange rate is allowed to float then the expansionary impact of fiscal expansion is offset by exchange rate appreciation and so the fiscal multiplier is lower with a floating exchange rate. In a financially closed economy a fiscal expansion will be 'crowded out' by higher domestic interest rates, but a greater degree of financial openness will allow more borrowing from overseas and reduce this crowding out, hence increasing the fiscal multiplier. The results reported here are consistent with both these predictions of the Mundell-Fleming model.

The methods employed in this chapter could be extended in a number of ways. The sample could be increased to cover more countries. The investigation could be pursued using a multivariate SVAR model instead of bivariate SVAR model, which would make it possible to investigate for example the dynamic response of monetary policy to fiscal policy shocks or the role of asset prices in macroeconomic transmission. More economic factors could also be considered. A larger sample might allow investigation of the interaction of the various economic factors.

Despite these limitations and simplicity of the model employed, these results reveal two major limitations to the Mundell-Fleming model and other related macroeconomic models. Mundell-Fleming in common with most macroeconomic models before the global financial crisis of 2008 -- takes no account of the financial sector. The measure of financial development employed here – the ratio of credit to GDP – is an indicator of the extent to which the financial sector provides consumer and corporate credit and of the magnitude of such credit expansion in response to fiscal and monetary policy. The finding that countries with a higher level of financial development have a lower government consumption multiplier indicates that the structure and development of the financial sector needs to be taken into account in analyzing fiscal and monetary transmission. Further research is merited to obtain a better understanding of how the

structure and development of the financial sector affects monetary transmission. One possibility is that crowding out effects of higher interest rates are more powerful in economies with relatively large ratios of credit to GDP.

A second limitation of these standard pre-crisis models is the assumption that the government and private sector are financially unconstrained and that changes in their debt levels do not alter their ability to reallocate spending over time either now or in the future i.e. fiscal and monetary transmission should be invariant to debt stocks. This is contradicted by the finding here that a higher level of external debt is associated with a higher government consumption multiplier. Again further research is merited to identify the channels through which debt levels affect fiscal and monetary transmission. One possibility is that higher levels of debt limit the ability of the private sector to increase corporate investment and household investment and consumption when government spending is reduced and domestic interest rates fall.

Appendix 1. Data overview

Table 4.1 Government Consumption (% GDP) and Number of observations for samples

Sample	Government Consumption (% GDP)	No of Obs
Full	19.89	2851
Lower Financial Openness	20.47	677
Higher Financial Openness	19.70	2146
Lower Financial Openness (countries)	20.18	1075
Higher Financial Openness (countries)	19.71	1776
Lower Financial Development	20.43	837
Higher Financial Development	19.45	1682
Open to Trade	20.07	621
Closed to Trade	19.25	2230
Flexible Exchange Rate	19.04	1295
Fixed Exchange Rate	20.59	1556
Lower External Debt	17.92	419
Higher External Debt	19.88	836

Table 4.2 List of Countries

	Country	Source	Period		Country	Source	Period
1	Australia	Oxford Economics	1980q1 - 2013q4	16	Japan	Oxford Economics	1980q1 - 2013q4
2	Austria	Eurostat	1988q1 - 2013q1	17	Latvia	Eurostat	1995q1 - 2013q4
3	Belgium	Eurostat	1980q1 - 2013q4	18	Lithuania	Eurostat	1995q1 - 2013q4
4	Canada	Oxford Economics	1980q1 - 2013q4	19	Malta	Eurostat	2000q1 - 2013q4
5	Cyprus	Eurostat	1995q1 - 2013q3	20	Netherlands	Eurostat	1988q1 - 2013q4
6	Czech	Eurostat	1996q1 - 2013q4	21	Norway	Eurostat	1980q1 - 2013q4
7	Denmark	Eurostat	1990q1 - 2013q4	22	Poland	Eurostat	1995q1 - 2013q4
8	Estonia	Eurostat	1995q1 - 2013q4	23	Portugal	Eurostat	1995q1 - 2013q3
9	Finland	Eurostat	1980q1 - 2013q4	24	Slovakia	Eurostat	1997q1 - 2013q4
10	France	Eurostat	1980q1 - 2013q4	25	Slovenia	Eurostat	1995q1 - 2013q4
11	Germany	Eurostat	1991q1 - 2013q4	26	Spain	Eurostat	1995q1 - 2013q4
12	Hungary	Eurostat	1995q1 - 2013q4	27	Sweden	Eurostat	1993q1 - 2013q4
13	Iceland	Eurostat	1997q1 - 2013q3	28	Switzerland	Eurostat	1980q1 - 2013q3
14	Ireland	Eurostat	1997q1 - 2013q3	29	United Kingdom	Eurostat	1980q1 - 2013q4
15	Italy	Eurostat	1991q1 - 2013q4	30	United States	Oxford Economics	1980q1 - 2013q4

Table 4.3 High level of financial openness countries and low level of financial openness countries

High level of Financial Openness countries (*kaopen*)

	Name	Mean	Max	Min
1	Austria	2.16	2.44	1.12
2	Canada	2.44	2.44	2.44
3	Denmark	2.43	2.44	2.18
4	Estonia	2.39	2.44	1.91
5	Finland	1.9	2.44	1.12
6	Germany	2.44	2.44	2.44
7	Ireland	2.44	2.44	2.44
8	Italy	2.25	2.44	0.41
9	Japan	2.35	1.65	2.44
10	Latvia	2.30	2.44	1.91
11	Lithuania	2.26	2.44	1.38
12	Netherland	2.44	2.44	2.44
13	Portugal	2.44	2.44	1.91
14	Spain	2.34	2.44	1.64
15	Sweden	2.30	2.44	1.38
16	Switzerland	2.44	2.44	2.44
17	United Kingdom	2.39	2.44	1.65
18	United States	2.44	2.44	2.44

Low level of Financial Openness countries (*kaopen*)

	Name	Mean	Max	Min
1	Australia	1.42	2.44	-0.11
2	Belgium	1.71	2.44	0.51
3	Cyprus	0.49	2.44	-1.16
4	Czech Republic	1.55	2.44	-0.11
5	France	1.41	2.44	-1.17
6	Hungary	1.32	2.44	-1.17
7	Iceland	0.5	1.12	-1.17
8	Malta	0.93	2.44	-1.17
9	Norway	1.24	2.44	-0.11
10	Poland	-0.38	-1.17	0.0644
11	Slovakia	0.01	1.38	-1.17
12	Slovenia	1.16	2.44	-1.17

Table 4.4 List of high level of financial development countries and low level of financial development countries

	Country	Private Credit (% GDP)	Classification		Country	Private Credit (% GDP)	Classification
1	Australia	123	High	16	Japan	177	High
2	Austria	118	High	17	Latvia	68	Low
3	Belgium	92	Low	18	Lithuania	51	Low
4	Canada	NA (updated to 2009)	NA	19	Malta	128	High
5	Cyprus	305	High	20	Netherlands	200	High
6	Czech	57	Low	21	Norway	NA (updated to 2006)	NA
7	Denmark	205	High	22	Poland	54	Low
8	Estonia	77	Low	23	Portugal	184	High
9	Finland	99	Low	24	Slovakia	NA (updated to 2008)	NA
10	France	116	High	25	Slovenia	87	Low
11	Germany	101	High	26	Spain	193	High
12	Hungary	57	Low	27	Sweden	139	High
13	Iceland	97	Low	28	Switzerland	176	High
14	Ireland	186	High	29	United Kingdom	176	High
15	Italy	124	High	30	United States	184	High

Table 4.5 List of "open" economies and "closed" economies

	Country	Total Trade (% GDP)	Classification		Country	Total Trade (% GDP)	Classification
1	Australia	42	Closed	16	Japan	31	Closed
2	Austria	111	Open	17	Latvia	122 (figure of 2011)	Open
3	Belgium	171	Open	18	Lithuania	157 (figure of 2011)	Open
4	Canada	61	Open	19	Malta	186 (figure of 2011)	Open
5	Cyprus	86 (figure of 2010)	Open	20	Netherlands	168	Open
6	Czech	150	Open	21	Norway	68	Open
7	Denmark	104	Open	22	Poland	92	Open
8	Estonia	181	Open	23	Portugal	78	Open
9	Finland	81	Open	24	Slovakia	176 (figure of 2011)	Open
10	France	57	Closed	25	Slovenia	142 (figure of 2011)	Open
11	Germany	98	Open	26	Spain	65	Open
12	Hungary	181 (figure of 2011)	Open	27	Sweden	91	Open
13	Iceland	113	Open	28	Switzerland	94	Open
14	Ireland	191	Open	29	United Kingdom	65	Open
15	Italy	59	Closed	30	United States	30	Closed

Table 4.6 List of countries with flexible exchange rate regimes and countries with fixed exchange rate regimes

	Country	Classification		Country	Classification
1	Australia	Flexible	16	Japan	Flexible
2	Austria	Fixed	17	Latvia	Fixed
3	Belgium	Fixed	18	Lithuania	Fixed
4	Canada	Flexible	19	Malta	Fixed
5	Cyprus	Fixed	20	Netherlands	Fixed
6	Czech	Flexible	21	Norway	Flexible
7	Denmark	Fixed	22	Poland	Flexible
8	Estonia	Fixed	23	Portugal	Fixed
9	Finland	Fixed	24	Slovakia	Fixed
10	France	Fixed	25	Slovenia	Fixed
11	Germany	Fixed	26	Spain	Fixed
12	Hungary	Flexible	27	Sweden	Flexible
13	Iceland	Flexible	28	Switzerland	Flexible
14	Ireland	Fixed	29	United Kingdom	Flexible
15	Italy	Fixed	30	United States	Flexible

Table 4.7 List of countries with low level of external debt and countries with high level of external debt

	Country	Classification			Country	Classification
1	Australia	Low		16	Japan	Low
2	Austria	High		17	Latvia	High
3	Belgium	High		18	Lithuania	Low
4	Canada	Low		19	Malta	Low
5	Cyprus	Low		20	Netherlands	High
6	Czech	Low		21	Norway	High
7	Denmark	High		22	Poland	Low
8	Estonia	High		23	Portugal	High
9	Finland	High		24	Slovakia	Low
10	France	High		25	Slovenia	High
11	Germany	High		26	Spain	High
12	Hungary	High		27	Sweden	High
13	Iceland	High		28	Switzerland	High
14	Ireland	High		29	United Kingdom	High
15	Italy	High		30	United States	Low

Table 4.8 List of countries with high levels of "index of financial integration" (IFI) and countries with low levels of IFI

	Country	Classification		Country	Classification
1	Australia	Low	16	Japan	Low
2	Austria	High	17	Latvia	Low
3	Belgium	High	18	Lithuania	Low
4	Canada	Low	19	Malta	High
5	Cyprus	High	20	Netherlands	High
6	Czech	Low	21	Norway	Low
7	Denmark	High	22	Poland	Low
8	Estonia	Low	23	Portugal	Low
9	Finland	High	24	Slovakia	Low
10	France	High	25	Slovenia	Low
11	Germany	High	26	Spain	Low
12	Hungary	High	27	Sweden	High
13	Iceland	High	28	Switzerland	High
14	Ireland	High	29	United Kingdom	High
15	Italy	Low	30	United States	Low

Table 4.9 List of countries with low levels of net foreign liabilities and countries with high levels of net foreign liabilities

	Country	Classification			Country	Classification
1	Australia	High		16	Japan	Low
2	Austria	Low		17	Latvia	High
3	Belgium	Low		18	Lithuania	High
4	Canada	High		19	Malta	Low
5	Cyprus	Low		20	Netherlands	Low
6	Czech	High		21	Norway	Low
7	Denmark	High		22	Poland	High
8	Estonia	High		23	Portugal	High
9	Finland	High		24	Slovakia	High
10	France	Low		25	Slovenia	Low
11	Germany	Low		26	Spain	High
12	Hungary	High		27	Sweden	High
13	Iceland	High		28	Switzerland	Low
14	Ireland	High		29	United Kingdom	Low
15	Italy	Low		30	United States	Low

Appendix 2. Forward-mean differencing transformation

The forward-mean differencing transformation is a transformation in which each observation will be removed from the mean of later (future) observations. This transformation is otherwise known as orthogonal deviations or the Helmert transformation which is described in Arellano and Bover (1995).

It is worth describing how forward-mean differencing transformation can be achieved.

For example we have n observation of variable x: x_1, x_2… x_n. x_i is observation at the time t of variable x.

y_i is forward-mean differencing transformation of x_i. We can calculate y_i by using the following formula:

$$y_i = x_i - \frac{\sum_{k=i+1}^{n} x_k}{n-i}$$

Since this formula, it is easy to see that this transformation make us lose one observation because y_n does not exist.

Chapter 5. What determines fiscal policy choices? Case studies of unsustainable fiscal deficits in Greece, Latvia, Turkey and Pakistan

5.1 Introduction

A range of governments have implemented austerity programs in order to achieve fiscal sustainability, especially since the global financial and economic crisis of 2007-2009. However, individual countries situations vary considerably and it is difficult to determine in econometric or simulation models every factor influencing the choice of fiscal and other policies as well as their subsequent economic impact. To provide a similar complementary approach that was applied to the other chapters of this thesis, this chapter analyses four case studies relating to the adjustment of unsustainable fiscal deficits in Greece, Latvia, Turkey and Pakistan. This analysis is undertaken in order to address two main questions.

  (i)   How different were the policy choices in these countries?
  (ii)   What defines the differences in their fiscal and other policy choices?

There are many factors which determine fiscal policy choices. However, this chapter's focus is on three main factors: firstly, this chapter reviews how fiscal policy was influenced by economic conditions such as growth, public debt and external debt.

Also, this chapter discusses fiscal policy choice in a broader context of fiscal policy and monetary policy, discussing the exchange rate regime and considering how fiscal policy choices interact with other macroeconomic policy decisions.

Finally, this chapter analyses the relationship between political conditions, including the influence of politics on the sovereign debt risk and fiscal policy choice.

There are several reasons behind choosing these four particular case studies; to begin with, all of these countries faced unsustainable fiscal deficits in 2009. The ratio of deficit to GDP is 15.2%, 9.1%, 5.9% and 5.5% in Greece, Latvia, Pakistan and Turkey respectively. Furthermore, this chapter focuses on the interaction between fiscal policy and monetary policy; by choosing two EU countries (less flexible in monetary policy) and two non-EU countries (more flexible in monetary policy) it can be deemed as a reasonable

choice. Also, these particular countries have different economic conditions which are focused upon in this chapter, such as the level of external debt and the level of public debt. Finally, the different social and political situations in these four countries, especially the uncertainties relating to the political situation in Greece, Pakistan and Turkey, detail how political economies can affect fiscal policy.

The main results can be summarised as follows:

(i)   After the global financial crisis in 2009, all four countries faced unsustainable fiscal deficits. Greece, Latvia and Turkey implemented fiscal consolidation programs from 2009, while Pakistan undertook fiscal adjustments in 2011. However, the outcome of these fiscal consolidation programs was different across all countries.

(ii)   Fiscal adjustments seem to be less effective in terms of reducing public debt in Greece than in Latvia, Pakistan and Turkey due to several reasons. At the beginning of the fiscal adjustments episode, Greece had a much higher level of public debt than Latvia, Pakistan and Turkey. Furthermore, at that time, the level of total external debt in Greece and Latvia was also much higher than it was in Pakistan and Turkey.

(iii)   Fiscal adjustments cost more in Greece and Latvia than in Pakistan and Turkey. The most obvious explanation for this is because that Greece and Latvia are small economies within the Eurozone, or it is because they fixed their exchange rates against the Euro (Latvia before 2014) i.e. they used an identical monetary policy with a target of a fixed exchange rate regime. According to the predictions presented in the Mundell and Fleming model and several empirical studies, fiscal multipliers appear to be bigger in countries with fixed exchange rate regimes than in countries with flexible exchange rate regimes. This also means that a tight fiscal policy is more costly in countries where there is a fixed exchange rate regime in place.

(iv)   Political economy can influence fiscal policy directly by making decisions which affect the level of government expenditures and government revenues. Furthermore, it also affects fiscal policy indirectly through changes in credibility

of sovereign debt which may lead to changes in credibility of the private sector and financial credibility of the economy. These changes, in turn, affect fiscal choice and the effectiveness of fiscal policy.

The rest of this chapter is structured as follows: section 5.2 draws on the literature review and earlier research chapters to distinguish some of the principal factors which can affect fiscal policy choice. Section 5.3 reviews the four case studies, using the main structure of analysis developed in section 5.2. Section 5.4 summarises the main contents of this chapter, while four appendices provide further detail about economic conditions and fiscal policy in the four countries separately.

5.2 Factors affecting fiscal policy: general discussion

When a government is faced with an unsustainable fiscal deficit, a tighter fiscal policy is always the first choice considered. However, policy choices and economic outcomes differ across countries because there are many factors which affect the scale of adjustment required as well as the effectiveness of fiscal and other macroeconomic policies. This section will discuss these factors, which are possible determinants of fiscal policy choice, and will examine them in detail in relation to the four case studies.

This section will start by discussing the concept of fiscal sustainability and the reasons for the emergence of unsustainable fiscal deficits. The way monetary policy has the ability to affect fiscal policy choices will then be discussed: fiscal policy and monetary policy are two of the most important influential tools in economic activities. With this in mind, a fiscal policy should be issued with careful consideration especially regarding the interaction with monetary policy and vice versa. Also, this section will consider how economic structures affect fiscal adjustment; finally discussing the relationship between political economy, sovereign debt and fiscal policy choice.

5.2.1 Economic shocks and fiscal sustainability

After the global financial and economic crisis of 2007-2009, many countries faced the challenge of reducing unsustainable high fiscal deficits. Before the four case studies are examined in this chapter, this subsection first considers what is meant by "fiscal

sustainability" and "fiscal unsustainability" and how economic shocks can lead to the emergence of unsustainable fiscal deficits.

Before the determinants of fiscal policy choices are discussed, it is worth considering the definition of an unsustainable fiscal deficit. There is no official definition for an unsustainable fiscal deficit. In fact, the EU instigated a formal rule which set the overall budget deficit threshold at 3% of GDP. However, what makes any particular level of fiscal deficit or public debt unsustainable?

The term "fiscal sustainability" is mentioned numerous times throughout this thesis, and it is worth recalling briefly. Depth discussions about fiscal sustainability were presented in the literature review (section 2.2.6), which detailed two popular approaches to assessing fiscal sustainability: the accounting approach and the present value of borrowing constraint approach.

The accounting approach simply states that a fiscal policy or a fiscal deficit is sustainable so long as it keeps the ratio of public debt to GDP stable or decreasing (Blanchard et al, 1990; Pasinetti, 1998; Goldstein, 2003).

The present value of borrowing constraint approach determines that a fiscal policy or a fiscal deficit is sustainable if the present value of future primary surpluses (and deficits) and inflation-related revenues is equal to or greater than the initial current value of a government's debt (Burnside et al, 2005).

In theory, these two approaches should yield the same outcome, because although the ratio of public debt to GDP will either stabilize or decrease so long as the present value of surpluses and inflation related revenues exceeds the real value of government debt. In reality, these two approaches are complementary. The accounting approach highlights the fiscal contraction that is necessary to stabilize the ratio of public debt to GDP, while the present value of borrowing constraint approach highlights the short-term impact of both current deficits and inflation.

In both approaches, it is necessary to distinguish between total deficit (budget balance) and primary deficit (primary budget balance). The primary budget balance (primary deficit) is the government fiscal balance, excluding interest payments. It seems that the primary

government deficit is more likely to result from a fiscal policy (a contractionary fiscal policy or an expansionary fiscal policy), whereas total deficit involves debt services of the accumulation of the net government debt. For example, after the implementation of a contractionary fiscal policy, a countries government primary budget balance may reduce sharply to a low level deficit or even a surplus, however, the overall government deficit will still be high, due to the high cost of debt services (a high interest rate or/and a high level of public debt to GDP). Greece is an example of this: while the ratio of the Greek government's primary budget balance to GDP increased from 0.4% in 2014 to 0.7% in 2015, the Greek government's overall budget balance reduced from -3.6% of GDP in 2014 to -7.2% of GDP in 2015.

Both approaches do suggest that a total deficit is not the only information which can be used to assess fiscal sustainability. Fiscal sustainability may depend upon several other key parameters, such as the ratio of debt to GDP, the primary budget balance (primary deficit or primary surplus), real interest rates and the growth rate. Furthermore, when debt comes in the form of foreign currency then the exchange rate is another factor which should be considered when assessing fiscal sustainability.

These examinations also propose how economic shocks such as shocks in productivity, shocks in fiscal expenditure as well as financial and exchange rate crisis can lead to the emergence of unsustainable fiscal deficits.

For example, if the real interest rate was high during the same time the growth rate was low, a "sustainable fiscal deficit" may become "unsustainable"; in other words, a high real interest rate would lead to high costing debt services. This means that a larger proportion of the budget would be used to serve debt services rather than repay the debt: the public debt may accumulate faster than the economic growth rate. As a result, the ratio of public debt to GDP will increase, meaning the government face an unsustainable fiscal deficit and fiscal unsustainability.

According to two popular methods, fiscal sustainability also depends upon the ratio of public debt to GDP; however, how can it be determined what level of public debt is unsustainable? There is much contention within the academic field regarding public debt,

and at what level it is truly unsustainable. In reality, Japan has maintained a high level ratio of public debt to GDP since 2000; Japan's ratio increased dramatically from 100% in 2007 to 229.2% in 2015. Whereas, the ratio of public debt to GDP in Greece peaked to 180.1% in 2014; obviously the ratio of public debt in Japan was much higher than it was in Greece, however, it is hard to say whether the Japanese ratio of public debt to GDP was more unsustainable than it was in Greece. Reinhart and Rogoff (2010) study the relationship between economic growth, inflation rate and the level of government debt; considering whether a government debt of more than 90% of GDP is an unsustainable government debt. They determined that when the ratio of government debt to GDP is greater than 90%, the median growth rate falls by one percent, while the average growth rate falls even further. Reinhart and Rogoff (2010) also discover that when a countries government debt exceeds 90% of its GDP, that countries economy tends to contract about 0.1% annually. This particular study is criticized by Herndon et al (2013) who replicated Reinhart and Rogoff (2010) and found serious errors due to coding errors and selective omitted data being available. Herndon et al (2013) concluded that these serious errors led to inaccurate findings by Reinhart and Rogoff regarding the relationship between public debt and growth amongst 20 advanced countries. Herndon et al (2013) also calculated that the growth rate in countries with public debts that exceed 90% of GDP is just about a percentage point lower than it is in countries with lower ratios of public debt to GDP. This suggests that a high level of public debt may reduce the effectiveness of fiscal policy in terms of stimulus economic activities.

According to the Keynesian viewpoint, an expansionary fiscal policy will stimulate economic activities and economic growth; therefore it should be used to help the economy escape recession. On the other hand, when the economy faces a high level of public debt as well as high levels of budget deficits, a tight fiscal policy is the most suitable option to reduce budget deficits and public debt in order to bring public finance back to a sustainable path.

However, the simple Keynesian model appears to only be appropriate when the temporary demand shock is being studied; examples of which are evident during the economic crisis of the 1970s when the fiscal policy failed to increase economic activities

as expected. One of the main reasons behind this failure was that the economies in the US, UK as well as in other major countries were hit by supply shocks (an increase in oil price) instead of temporary demand shocks.

To avoid this in the future, policy-makers may design fiscal policies based on the opposite viewpoint regarding the effects of fiscal policy. For instance, in 1993 the UK government decided to increase taxes; it was explained that a tight fiscal policy would lead to a stabilization of public debt which was a precondition for a sustained recovery from recession. Also, in the middle of a recession in 1981, the UK government introduced large tax increases, whilst Denmark in 1982 and Ireland in 1982 and 1987 also implemented similar public debt stabilization programs.

Public debt stabilization programs are based on the viewpoint that high levels of budget deficits and public debt may discourage private sector spending, due to the consequences of accumulating public debt. Sutherland (1997) refers to this view as being an "anti-keynesian" view. Giavazzi and Pagano (1990) studied in greater detail the case of Denmark and Ireland, and found that the Danish case was more of an "anti-keynesian" viewpoint while the Irish case was consistent with the traditional Keynesian view. Alesina and Perotti (1995) and Giavazzi and Pagano (1996) studied cross sections of OECD countries and found empirical evidence for an "anti-keynesian" view. Sutherland (1997) constructed a theoretical model and discovered that at a moderate level of public debt and an expansionary fiscal policy had traditional Keynesian effects (expansionary), while such a fiscal policy can have contractionary effects when public debt reaches an extremely high level.

Beside this "anti-keynesian" view, public debt may affect the effectiveness of fiscal policy with regard to the crowding out effects of private consumption and investment through interest rates. Therefore, an expansionary fiscal policy may lead to lower or higher expensive credit for the private sector, meaning the interest rate may increase; as a consequence, the private sector may reduce their investment and consumption.

There are a limited number of papers which study how the level of external debt can affect fiscal policy choices. However, it seems that fiscal policy is far more efficient in terms of

stimulating economic growth, so long as an economy can borrow from overseas easily. When a country can easily access the international finance market, an expansionary fiscal policy may not reduce credit for the private sector, which will not lead to an increase in interest rates. Therefore, the crowding out effects in private consumption and investment through interest rates will be smaller (a viewpoint which is supported by the empirical results of Chapter 4 of this thesis).

5.2.2 The interaction of fiscal and monetary policy

Before discussing how monetary policy can affect the effectiveness or in fact the choice of fiscal policy, it is worth recalling the brief definitions of monetary policy and fiscal policy.

Fiscal policy refers to the choices a government makes regarding taxation and government spending, whether this choice is to stimulate economic activity or help to achieve other government objectives. When fiscal policy is being analysed the several key macroeconomic variables which are normally focused on are taxation, expenditure levels, government debt and a government's budget balance.

Monetary policy refers to the choices of the central bank and its procedures in controlling any available money and credit in the economy, in order to achieve several objectives related to the economy such as price stability (inflation), exchange rate stability, controlling the balance of external payment and promoting economic development. Monetary policy is also directly linked to fiscal policy because an increase in state issued money, including central bank money, is a source of finance for government spending.

During the 1990s, alongside the growth of central bank independence, there was a trend of separation between government debt management from the central banks; this meant that the ministry of finance or the debt management office concentrated on financing the fiscal deficit, while the central bank played its part by supporting the money market liquidity. This separation is based upon the reducing conflicts of interest; several examples for this conflict of interest of whether the central bank is ultimately responsible for government debt management are defined as follows: while the central bank needs to limit its volatility of yields on government bonds, adjustments to interest rates may be

required to boost the economic condition, whilst, the central bank may bring forward the government bond issuance if they decide to increase the interest rate.

However, many economists consider that government debt management cannot be separate from monetary policy. According to Tobin's equivalence, there is an obvious logical difficulty in separating monetary policy from public debt management. Tobin (1963) argues that the issuance of government short-term debt is similar to a monetary expansion especially in relation to a portfolio choice: an opinion which Friedman (1959) also shares. Furthermore, Tobin (1963) concludes that the Federal Reserve (US monetary policy-maker) needed to know about the decisions made by the Treasury (US government debt management office) in order to make its decision and vice versa.

The global financial and economic crisis of 2007-2009 and its aftermath, has led to some radical rethinking about government debt management and central banks. Raising traditional debate about the separation of fiscal policies and monetary policies in terms of government debt management and economic development: the quality of government debt management and a better central bank are the most important factors for economic development.

Although monetary policy and fiscal policy are nowadays often implemented by different bodies, they are not independent, because a change in one may affect the effectiveness of the other.

Several views regarding the relationship between fiscal policy and monetary policy are discussed in the literature review (Chapter 2); however, it is useful to recall briefly the most important points.

According to the Keynesian viewpoint of aggregated demand, the impact of fiscal policy will depend upon how a deficit is financed. If the government finances its spending by printing more money, an expansionary fiscal policy (an increased deficit) will lead to an expansionary monetary policy, which in turn may increase inflation rates and depreciate the exchange rate. If a government chooses a non-monetary financing program by borrowing more money through issuing debt, then a fiscal expansion may lead to

crowding out effects: meaning there will be too little credit or it will become too expensive for the private sector.

Another way fiscal policy can affect monetary policy directly is if the government increases indirect taxes including valued taxes or sales taxes, this will increase price levels, which will lead to an increase in the inflation rate.

A fiscal policy can also affect a monetary policy indirectly; when economic agents expect the government to increase taxes in the future in order to finance current spending, economic agents will prepare for this eventuality by saving more and consuming less at present. This is known as the Ricardian equivalence: where a fiscal policy may lead to changes in the financial behaviour of economic agents, with the monetary policy most likely requiring change as well.

Another indirect impact of an expansionary fiscal policy in relation to monetary policy is that expectations about the unsustainability of government finance have the potential to become a destabilizing factor within the financial market, which can result in the collapse of the monetary regime. Externally, if the government borrows too much from overseas, this can lead to doubts relating to the stability of exchange rates or can result in financial problems regarding the balance of payments.

Furthermore, fiscal policy can lead to alterations in both interest rates and exchange rates. For example, an expansionary fiscal policy usually leads to an increase in government debt. However, if the impact of an expansionary fiscal policy to output, is not as good as expected, the risk of the government defaulting on their debt increases. As a result of this, interest rates will increase. An increase in interest rates normally leads to an appreciation in local currency. However, when interest rates and the level of indebtedness are both high, the opposite (a depreciation in local currency) may happen. This means that an increase in domestic interest rates may make the local currency more attractive, due to high expected returns; however, when the level of indebtedness and interest rates are high, the available resources for repayment decrease because of the increase in the cost of debt service: meaning that the probability of debt default increases.

As a consequence, the local currency becomes less attractive, creating a depreciation in the local currency.

As well as fiscal policy affecting monetary policy, monetary policy also affects fiscal policy.

Monetary policy has the ability to affect the effectiveness of fiscal policy by either increasing or reducing the crowding out effects of a fiscal policy. According to Mundell (1963) and Fleming (1962), extension of the IS-LM model to the open economy under flexible exchange rates, fiscal policy is less effective in terms of stimulating economic growth (a smaller fiscal multiplier): a view which is also supported by several empirical studies such as Ilzetzki et al (2013) and the results presented in Chapter 4 of this thesis.

In addition, monetary policy may impact the effectiveness of fiscal policy indirectly through wealth effects: higher interest rates caused by an expansionary fiscal policy reduce the value of assets held by households, thus dampening private consumption (wealth effect).

The global financial and economic crisis of 2007-2009 and the Euro-zone fiscal crisis which began in 2010 are good examples of a "vicious circle" with a financial crisis, a sovereign debt crisis and an economic crisis: an aspect which can be deemed as an interaction between fiscal policy and monetary policy.

Diagram 5.1 Vicious circle of financial crisis, fiscal crisis and economic crisis
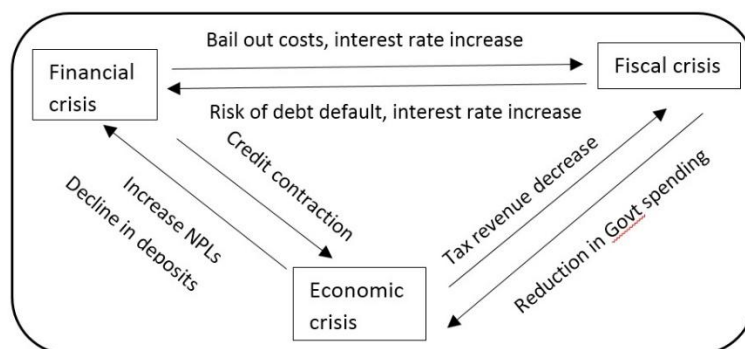
As perceived in the diagram, it is evident that in order to support the banking system, the government will be forced to bail out domestic banks. This action will lead to an increase in government spending and an increase in government debt. A financial crisis like this will also lead to higher interest rates. As a consequence, the risk of the government

defaulting on its debt also increases. All of this leads to increases in both a sovereign and financial credit default swap (CDS), due to the close relationship between them. These actions will also increase interest rates further and worsen both the countries financial problems and fiscal deficits.

5.2.3 The interaction between financial market and fiscal policy

The relationship between monetary policy and fiscal policy depends on the development of the financial market. Both monetary policy and fiscal policy makers must consider the operations of financial markets. Hilbers (2004) determines that there are four stages of transition in financial development; from a simple financial market to a fully developed financial market, the central banks and monetary policy will have a strong impact on fiscal policy choices. During the un-developed stage of the financial market, fiscal deficits are mainly financed by money creation; this is because there is no public debt outside of the central bank. In the next stage, although there are marketable securities, there are no secondary markets and also no flexibility in interest rates, meaning that fiscal deficits are still mainly financed through money creation. Within the transition stage, there is a secondary market for government debt instruments; also the interest rate is much more flexible. Highly active and independent liquidity managements are conducted by central banks; allowing the government greater scope to finance a deficit through bond issue. In the final stage of the transition, the financial market has medium-term debt instruments; the interest rates are fully flexible and the central banks control liquidity in the financial market.

In both the transition stage and the final stage, good coordination between fiscal policy and monetary policy is required. It is evident that a higher level of financial development means a more flexible interest rate as well as more economic activities financed by domestic credit. These factors may lead to stronger crowding out effects in private consumption and investment; therefore, an expansionary will be more effective in terms of stimulating economic growth (a view which is also supported by empirical evidence found in Chapter 4 of this thesis).

5.2.4 Political economy, credibility and fiscal choice

The political economy can affect the fiscal choices of the government directly and in-directly: both are discussed in this section.

The direct impact of political economy on fiscal choice is quite clear. There are three literary resources which relate to how political economy determines fiscal choice directly. First of all, several policy-makers tend to use expansionary fiscal policy in order to win elections; as voters normally underestimate the costs of an expansionary fiscal policy (tax burdens, especially if they are postponed), but value government spending (Nordhaus, 1975; Buchanan and Wagner, 1977). Although the main assumption of this viewpoint – voters always make mistakes – is criticized (Alesina and Perotti, 1995; Drazen, 2000), research explains why rational voters are still persuaded by expansionary fiscal policy. One of the reasons for this is that voters do not have enough information given to them about politicians; therefore, they tend to vote for politicians who have more government programs which require more government spending (Rogoff and Sibert, 1988; Rogoff 1990). However, empirical studies do not support this view: Alesina et al (1998) study of the behaviour of various macroeconomic indicators, election outcomes and opinion polls for 19 OECD countries from 1960 to 1995, found that governments with tight fiscal policies were not more likely to be replaced than governments with expansionary fiscal policies.

An expansionary fiscal policy may be the result of a distribution fiscal decision conflict between policy makers and a group of voters. Persson and Svensson (1989) and Alesina and Tabellini (1990) consider that when there are differences in fiscal preferences between policy makers, the ones who are most likely to be replaced tend to run deficits. One argument explains why conflict between groups of voters may lead to an expansionary fiscal policy: Weingast et al (1981) contemplate that while the benefits of government programs are centralized; the cost of these programs is being concentrated or shared through all geographic units. So, if budget decisions are made to accommodate geographic units, fiscal deficits are more likely to increase.

The literature discussed above points out that political motivation may increase fiscal deficits (determine fiscal policy choice), and the political economy may reduce fiscal deficits by issuing constraints for policy makers who design fiscal policy. These

constraints have been defined as a set of rules, procedures and practices (Alesina et al, 1999). There are two types of rules: the first type of rule is in the form of a numeric target. There is an agreement amongst 28 member states of the European Union (the Stability and Growth Pact) about the upper limit of 3% of GDP for budget deficit and 60% of GDP for public debt. The second type of rule is in the form of a three-stage process budget decision including drafting, approval and implementation.

This section also discusses the indirect impact of political risk regarding the fiscal choices of authorities through credibility, something which received limited concern in the research literature about political economy. It is clear that a country with political instability is more of a risk for lenders and investors, an aspect which reduces that countries financial credibility. But how can financial credibility affect one's fiscal policy choice? The term "financial credibility" refers to the possibility that borrowers can fulfill their obligations, including paying the interest and debt principal repayment on time; therefore, the more financial credibility, less of a risk to lenders and vice versa.

In order to determine the impact of financial credibility on fiscal choice, this chapter discusses the impact of credit default swap (CDS) spread on the effectiveness of fiscal policy. The CDS spread is considered an indicator of default risk: a tighter (smaller) CDS spread indicates a lower risk of debt default, while a looser (bigger) CDS spread indicates a higher possibility of debt default. There is a vicious circle between fiscal policy and CDS spread. When investors become aware of a risk in relation to the sovereign debt default (the sovereign CDS spread is bigger), a higher interest rate is required (default premia), as this lowers the price of the government bond. However, a higher interest rate will lead to a bigger budget deficit and a higher level of government debt, which increases the risk of government debt default. Furthermore, as the price of government bonds decrease, the value of assets held by financial intermediaries, such as commercial banks, will reduce. This, forces the financial intermediaries to increase interest rates and credit spread their loans to the private sector. As a consequence, private investment will diminish. On the other hand, higher interest rates force governments to cut their spending; this together with reductions in private investments can lead to the beginning of an economic recession.

The presence of the vicious circle is supported by the empirical investigation of Cottarelli and Jaramillo (2012); that ran a simple OLS regression to examine the determinants of the CDS spread. The regression results reveal that fiscal fundamentals such as public debt and primary balance have a significant impact on the CDS spread in advanced countries. An increase in the ratio of public debt to GDP leads to an increase in the CDS spread, while a decrease in the ratio of primary deficit to GDP reduces the CDS spread. Cottarelli and Jaramillo also discover that a decrease in the growth rate increases the CDS spread. These results, predict an interesting outcome of fiscal adjustment, whereby a tight fiscal policy could increase the CDS spread so long as the fiscal multiplier was high enough: this would indeed create a problem regarding fiscal policy choice. As a tight fiscal policy, which increases the CDS spread, may lead to an increase in the overall deficit due to a higher financing cost, whilst, such a painful fiscal adjustment may force the government to give up their consolidation program.

5.3 Review of case studies

This section analyses four case studies that focus on Greece, Latvia, Pakistan and Turkey from 2004 to 2015, which discover the differences between fiscal policies in these four countries (scale of adjustments and results) and what determines these countries fiscal policy choice and results?

This section first of all reviews the fiscal situation in these four countries (section 5.3.1); the rest of this section including section 5.3.2, 5.3.3, 5.3.4 and 5.3.5 discusses how the decision and outcomes of fiscal choice in these countries were affected by economic conditions, monetary policy, the financial market and political economy respectively. Detailed information of each country during the period 2004 to 2015 is described in separate appendices.

5.3.1 Fiscal situation

As can be seen from Figure 5.1, except for Pakistan, the Government budget balance in the other three countries reduced dramatically from 2007 to 2009. In 2009, the ratios of overall fiscal deficit to GDP are 15.2%, 9.1%, 5.9% and 5.5% in Greece, Latvia, Pakistan and Turkey respectively. In Pakistan the fiscal deficit deteriorates fairly steadily between 2005 and 2011, whereby their fiscal problems appear to be less closely associated with

the global financial crisis. All countries faced unsustainable fiscal deficits in 2009, in fact, the Greek public sector deficit was already unsustainable before the global financial and economic crisis of 2007-2009 (from 2004 as can be seen in figure 5.1).

Figure 5.1 Government general budget balance from 2004 to 2015


Government general budget balance (% of GDP)
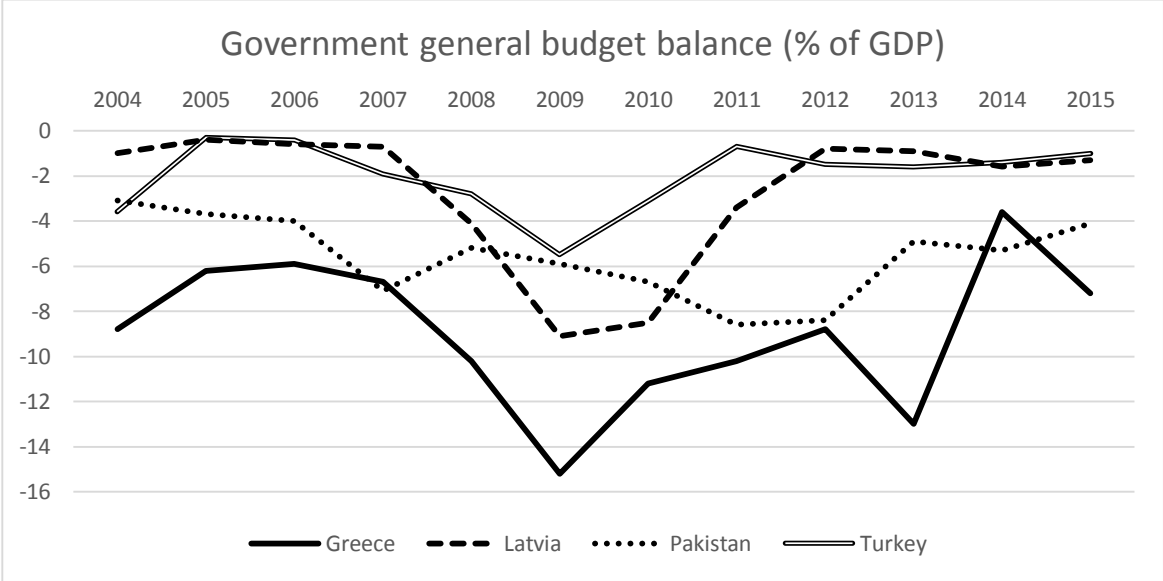
Source: IMF and Eurostats

In response to their deteriorating fiscal situation since 2009, Greece, Latvia and Turkey all implemented fiscal consolidation programs. As shown in figure 5.2, the primary deficits in these three countries decreased sharply over the next three years. The primary balance in Turkey was even restored to a surplus in 2011 (2% of GDP, there was previously also a surplus of more than 4% of GDP during the years 2004-2006), while the primary balance in Latvia reached surplus in 2012 (0.8%). The primary deficit in Greece reduced dramatically from around 10% of GDP in 2009 to only 3% of GDP in 2011. In Pakistan, fiscal adjustments had been implemented since 2011; this reduced the ratio of primary fiscal deficit to GDP in Pakistan from 4.2% in 2011 to 0.5% and 0.1% in 2014 and 2015. From this figure (5.2) and the previous one (5.1), it can be portrayed that all four countries achieved a fairly substantial adjustment in relation to their fiscal position from the unsustainable deficit in 2009.

There are two possible reasons for the reduction of government deficits in Greece, Latvia and Turkey in 2010 and 2011 and Pakistan in 2012 and 2013. The first being the active fiscal consolidation programs implemented for cutting government spending and/or increasing tax rates, and the second being the recovery of tax revenues as economic output recovers after the global financial and economic crisis of 2007-2009. As can be seen in Figure 5.4, this growth recovered in Turkey (in 2010) and Latvia (in 2011): further discussions about this are presented in the following section.

Figure 5.2 Government primary budget balance

Government primary budget balance (% of GDP)
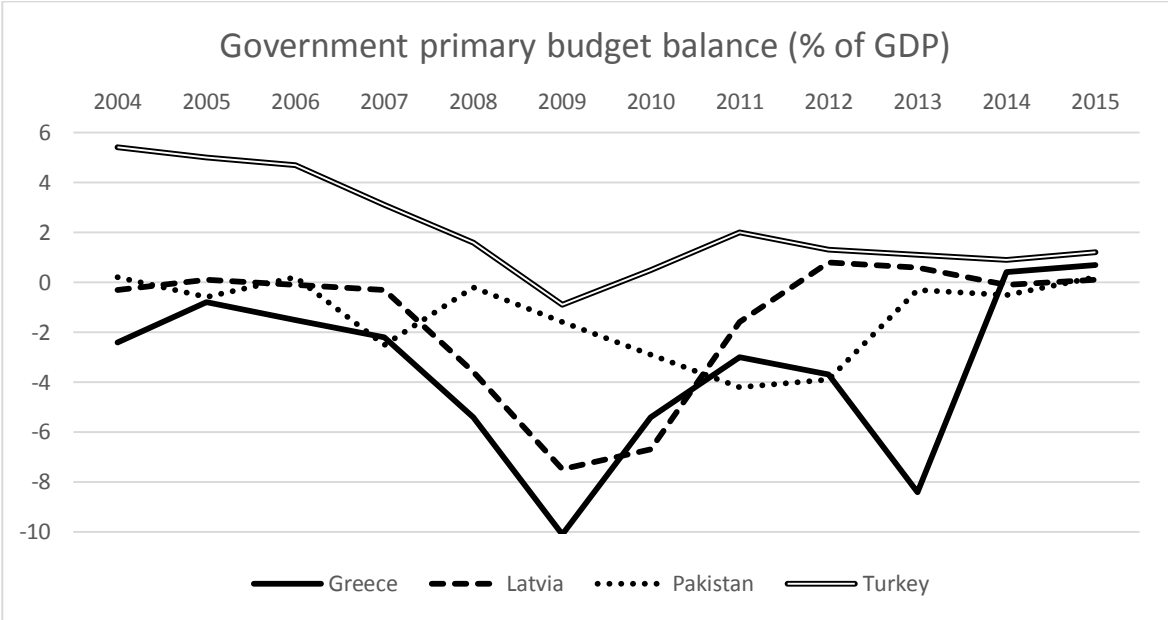
Source: IMF and Eurostats

Figure 5.3 highlights that except Turkey, the total government debt continued to rise after the fiscal consolidation programs began in Greece, Latvia and Pakistan before they eventually started to decline. After the implementation of fiscal adjustments, the ratio of public debt to GDP in Greece still increased rapidly from 126.7% in 2009 to more than 170% in 2011, except for a drop to 159.6% in 2012, it reached a peak of 180.1% in 2014.

In Latvia, after the introduction of fiscal consolidation programs, the ratio of public debt to GDP jumped from 36.6% in 2009 to 47.5% in 2010, before beginning to decline to about 39% in 2013. In 2014, this figure increased to 40.8% and then dropped to 36.4% in 2015, which is slightly lower than it was in 2009. In Pakistan, the ratio of public debt to GDP

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also increased from 60.5% in 2011 to 63.7% in 2013 then reduced to about 63% in 2014 and 2015. The effect these implementations had on Turkey was completely different; after introducing fiscal consolidation programs, the ratio of public debt to GDP in Turkey started to decline immediately from 46.1% to only 32.6% in 2015. It is evident that while all four countries used similar fiscal policies – tight fiscal policies - the results were very different. The reasoning behind these differences will be discussed later in this chapter.

Figure 5.3 Total government debt from 2004 to 2015

Total government debt from 2004 to 2015 (% of GDP)
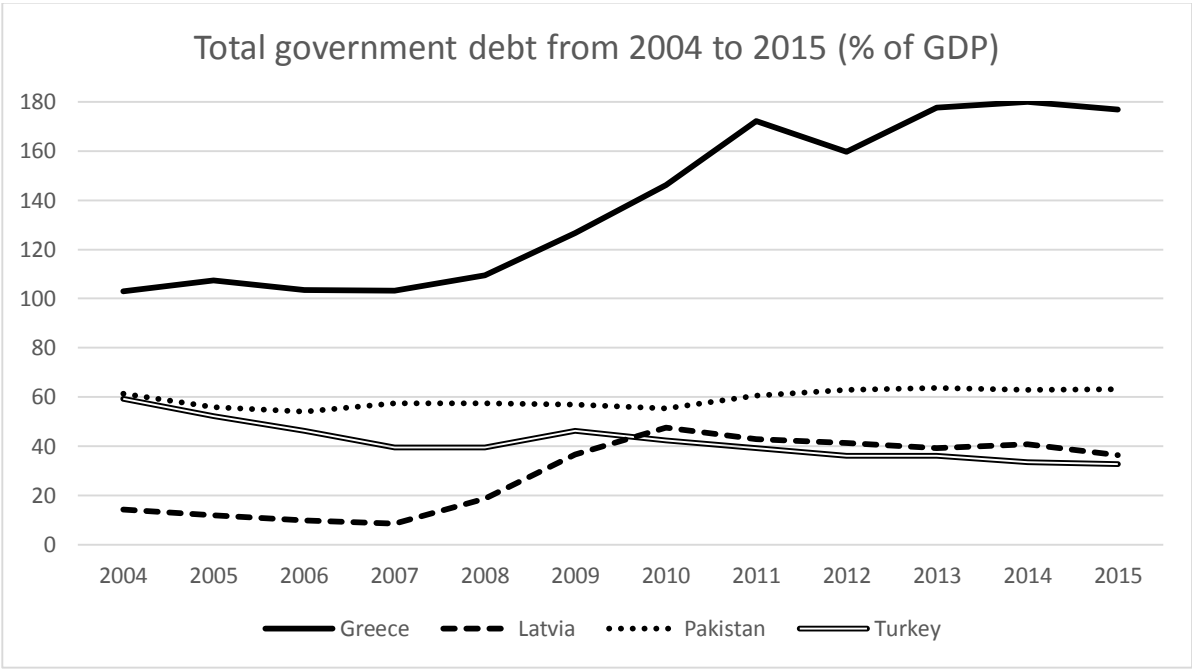
Source: IMF and Eurostats

5.3.2 Preceding economic conditions

As discussed in the previous section, although all four countries implemented fiscal consolidation programs, the outcome of deficits and the issue of public debt as a share of GDP varied considerably. There are several possible reasons for this. One reason is the level of government debt at the beginning of the fiscal adjustment episodes; the ratio of government debt to GDP in Greece was much higher than in Latvia, Turkey and Pakistan. This may be because a country with a high level of public debt, the fiscal adjustments cost more to implement, making them more difficult to implement than in countries with lower levels of public debt.

Figure 5.4 provides some useful data on the output effects of fiscal adjustments in four countries. As shown in Figure 5.4, after starting to implement fiscal consolidation programs, the annual real GDP growth rate in Latvia (2009), Pakistan (2011) and Turkey (2009) increased rapidly. Turkey even escaped recession only one year after undertaking fiscal adjustments. Annual real GDP growth rate in Turkey increased from -4.8% in 2009 to 9.2% in 2010. The annual growth rate in Latvia also increased dramatically from -14.2% in 2009 to -2.9% in 2010 and reached a positive 5% in 2011, while the annual real GDP growth rate in Pakistan increased from 3.8% in 2011 to 4.5% in 2015. The data for GDP in Greece shows a completely different trend; after starting fiscal consolidation programs in 2009, the annual real GDP growth rate kept decreasing from -4.4% to -8.9% in 2011 before it eventually began to increase from 2012. However, the real GDP growth rate in Greece remained negative in every year since 2008 except 2014 (0.8%).

**Figure 5.4 Real GDP growth rate from 2004 to 2015**
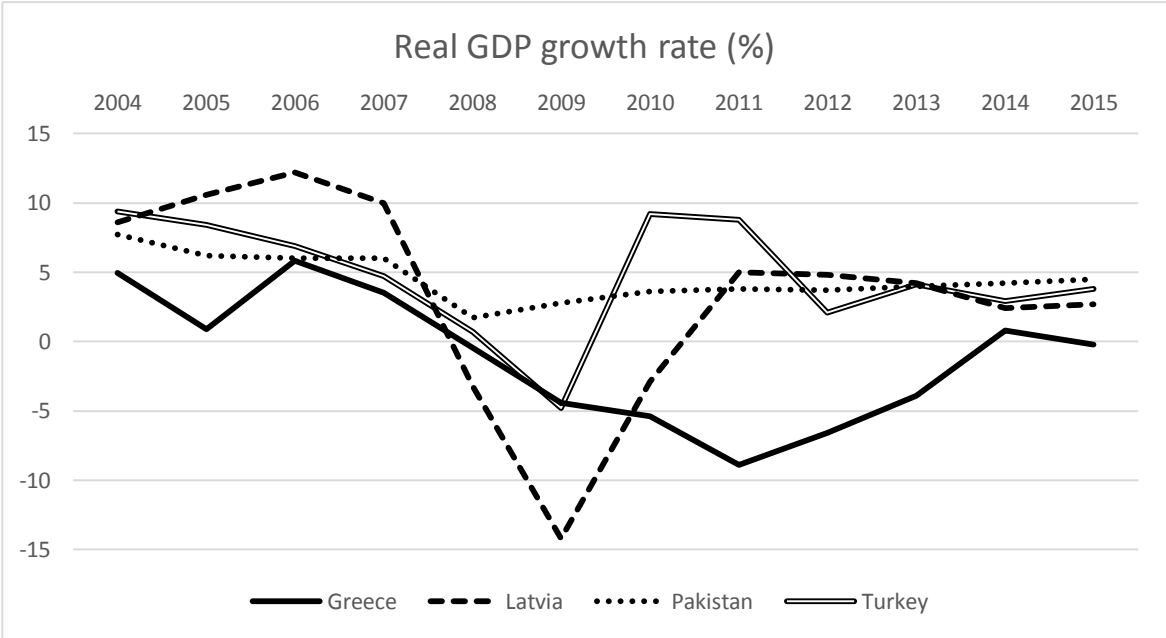
Another factor which can determine differences in the effectiveness of fiscal consolidation programs in Turkey and Greece is the level of total external debt. Figure 5.5 reveals that the ratio of total external debt to GDP in Greece and in Latvia was much higher and rose more rapidly than it did in either Turkey or Pakistan. Furthermore, as evident from Figure

5.5, there is an extremely different post-crisis pattern for gross external debt occurring in Greece and Latvia. Since 2010, while the ratio of external debt to GDP has fallen quite rapidly in Latvia from 165.8% in 2010 to 132.6% in 2015, this ratio in Greece has increased rapidly from 174.5% to 249.5%. This contrasting experience of two European countries can be explained in large part by the relatively quick resumption of economic growth in Latvia and the continued decline of GDP in Greece (see figure 5.4)

Figure 5.5 Gross external debt (total external public and private debt)

Gross external debt (% of GDP)

Legend: Greece, Latvia, Pakistan, Turkey
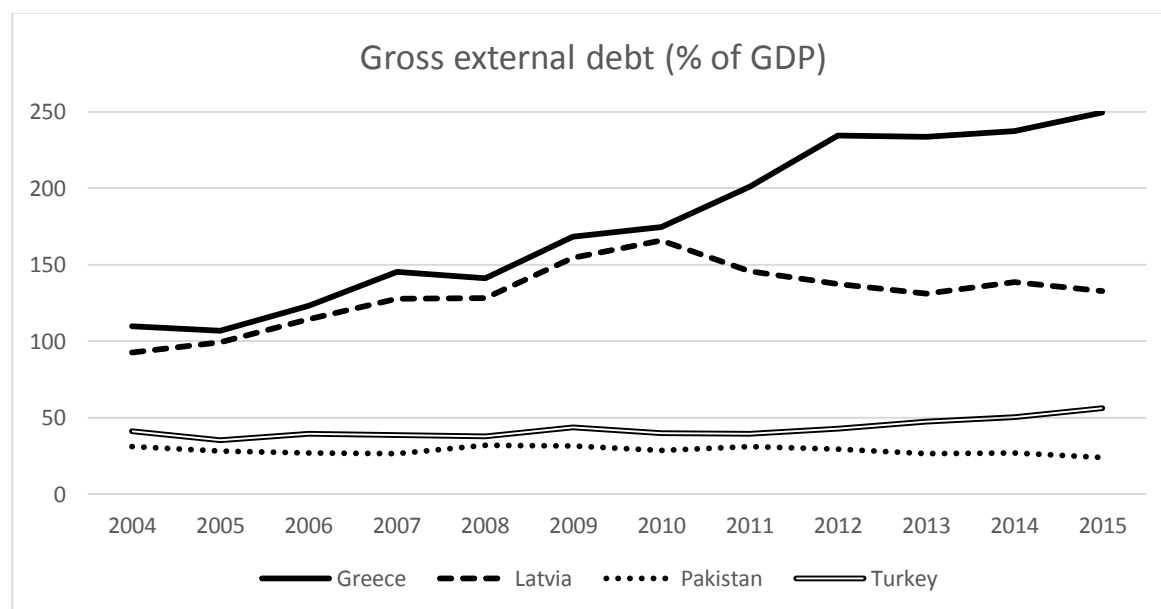
Source: IMF and Eurostats

In the years leading up to and including the 2008 crisis, all four countries had current account deficits (see figure 5.6). The current account deficits, before the crisis, were especially large in two EU countries, Latvia (around 20% of GDP) and Greece (nearly 15% of GDP). The Latvian current account deficit altered dramatically to a current surplus in 2009, while in Greece the current account deficit declined relatively slowly. From 2012 onward, both Greece and Latvia have maintained a modest current account deficit of around 2% of GDP.

Pakistan and Turkey both had a smaller current account deficit before the crisis, in comparison to the other two European countries, and went through a much smaller modification in their current account deficits post crisis. Turkey had a current account

deficit close to 5% or more of GDP every year since 2006 to 2015, except for 2009 when it was reduced to 2% of GDP. Pakistan reduced its current account deficit from around 5% of GDP in the years before the crisis, to around 2% of GDP after the crisis.

Figure 5.6 Current account balance
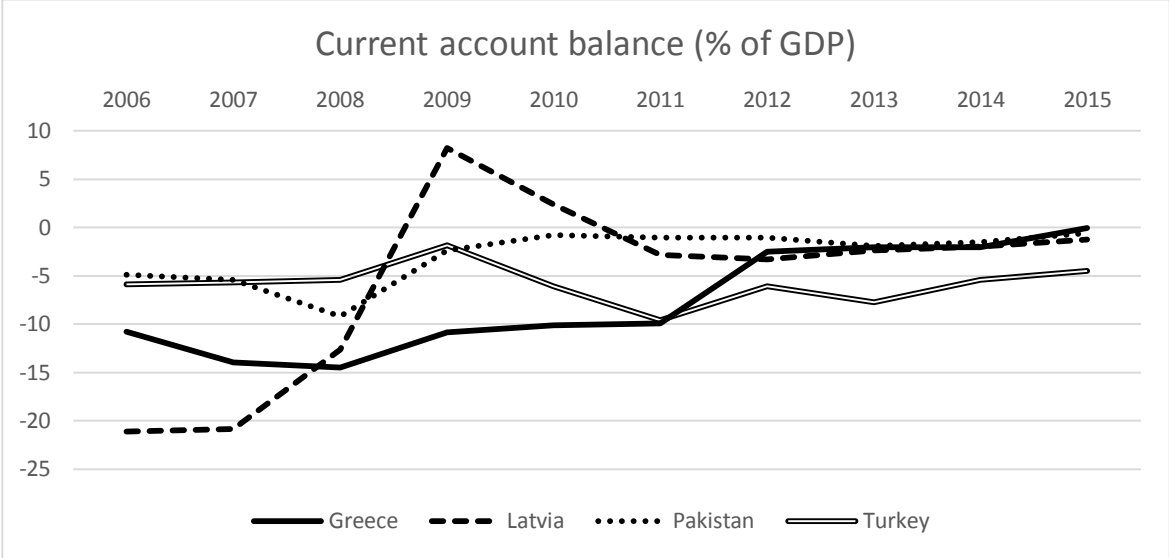
<div align="right">Source: World Bank</div>

Analyzing the ratio of external debt to GDP in four countries highlights a negative relationship between this ratio and the effectiveness of fiscal policy in terms of reducing the public debt-GDP ratio. This means that a tight fiscal policy is likely to be less effective in terms of reducing public debt-GDP ratio and vice versa. One obvious explanation for this is that when a large proportion of funds for economic activities are sourced from overseas, the crowding out effect through interest rate becomes smaller, which means that the fiscal multiplier is bigger. Nonetheless, a larger fiscal multiplier means a less effective tight fiscal policy (fiscal consolidation programs are less effective) in terms of reducing the ratio of public debt to GDP, this is consistent with the discussion in section 5.2.1.

5.3.3 Monetary policy and inflation

As discussed in section 5.2, monetary policy is one of the factors which can influence the effectiveness of fiscal policy. This section will review how monetary policy, especially exchange rate regimes, can affect fiscal policy in the four countries studied in this chapter.

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As members of the European Union, Latvia and Greece were easily able to borrow before the crisis at relatively low interest rates; this induced the ratio of government debt to GDP to increase.

After 3 years, 2008 to 2011, Latvia received a financial assistance package of up to 7.5 billion Euros from the IMF and the EU, an amount which is equivalent to about 41% of Latvia's GDP in 2009. Similarly, in 2010 Greece announced an agreement with the IMF and the EU regarding a 3-year financial assistance package of up to 110 billion Euros, which is equal to 47.6% of Greece GDP in 2009. These financial assistance packages, together with the sharp decline of output, explain the substantial increase in the ratio of government debt to GDP in these countries.

**Figure 5.7 Exchange rate movements from 2006**
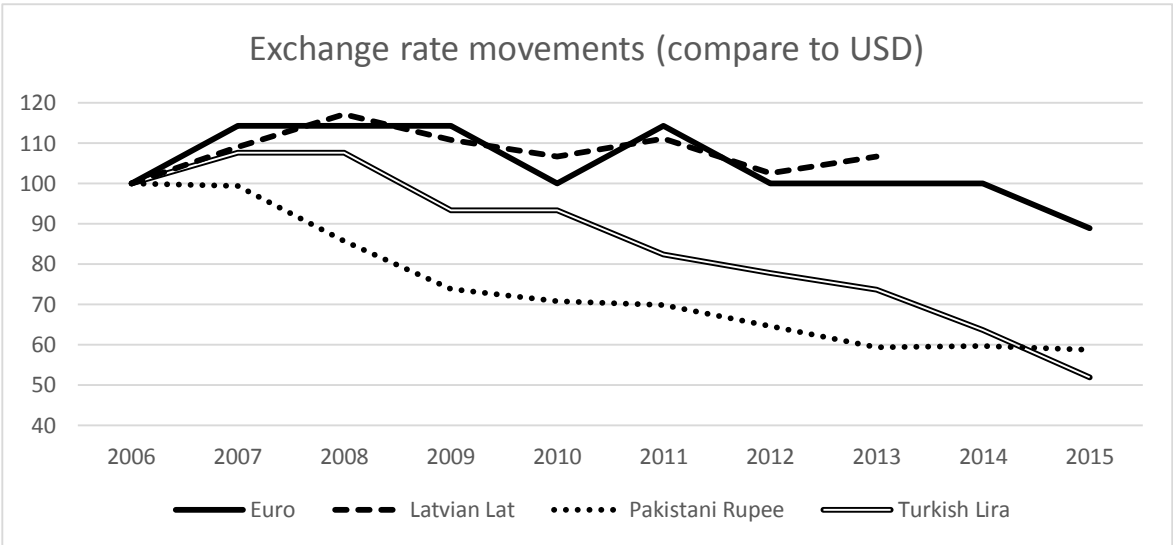
Source: IMF and World Bank

Note: Greece used Euros completely as a local currency from 2002, while Latvia started using Euros as a local currency from 2014.

Furthermore, Figure 5.7 reveals that, over the same period, there was a large depreciation in the exchange rate in Turkey and Pakistan, whereas this did not happen in Latvia and Greece. As members of the European Union, both Greece and Latvia had a fixed exchange rate regime, one as a Eurozone country (Greece), the other from maintaining an exchange rate pegged to the Euro (Latvia). By 2015 the Pakistani Rupee

and the Turkish lira had depreciated by around one-third relative to the Euro and by even more in comparison to the US dollar.

Figure 5.8 The inflation rate from 2006 to 2014

Inflation rate (% change in consumper price)
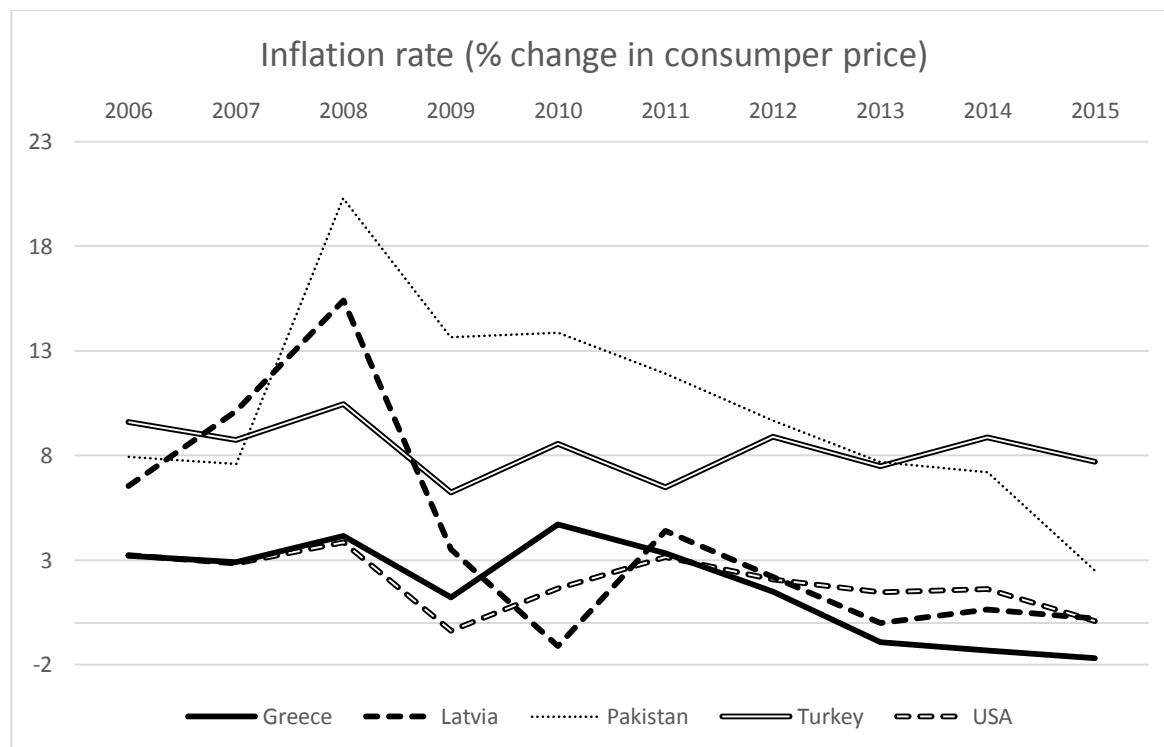
During the same time period, there are huge differences between the inflation rates of these countries, as can be seen in Figure 5.8. The above section considered exchange rates between local currency and the US dollar in Greece, Latvia, Pakistan and Turkey, therefore, Figure 5.8 also includes the inflation rate of the US, which can help determine more about the transformations in real exchanges in these countries. After the global financial crisis of 2007-2009, except in Turkey, there was a similar trend in the inflation rate; it increased in 2010 (Pakistan and Greece) or 2011 (Latvia and the US) then kept decreasing. The inflation rate in Greece was even negative from 2013 to 2015, and in 2015, the inflation rate in Latvia and USA reduced to just over zero at 0.2% and 0.1%, respectively. The different exchange rate regimes highlight the difference in inflation outcomes post-crisis; the fixed exchange rate regimes of Greece and Latvia ensured that inflation remained subdued in both countries, whereas the depreciation of the nominal

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exchange rate in Pakistan and Turkey became associated with a relatively rapid inflation post-crisis.

5.3.4 Political economy and credibility

As discussed in section 5.2, political economy can affect fiscal choices directly as governments may spend more, as a temporary solution to numerous problems. Pakistan in the late 1990s (prior to the main period of the case study examined in this chapter) is a prime example: since the early 2000s, the Pakistan government implemented structural policy reforms and improved the economy governance which led to good results, including a drop in government debt and a high real GDP annual growth rate (Naseem, 2008). However, the political instability of Pakistan once again pushed the Pakistani economy to a recession in 2007, which was then acerbated by the global financial crisis of 2007-2009. The inherent political instability made the government incorporate economic reforms and governed the country poorly, which eventually led to an economic crisis (IMF, 2009 and IMF, 2012).

In Turkey, the 2001 political crisis led to political instability, financial instability and further panic in the financial market (IMF, 2002). Rodrick (2009) considers these instabilities raise doubts about the sustainability of exchange rates based on stabilization programs. As a result, there was a massive withdrawal of funds; Turkey faced a second financial crisis (the first one was in 1994) since its capital account liberalization in 1989. The AK Party won the 2002 election and also won other two general elections in a row after that; this led to political stability in Turkey since 2002 to 2015. Since 2004, except for the global financial and economic crisis of 2007-2009, the Turkish government had maintained a sustainable fiscal stance (see section 5.3.1). The Turkish government's primary budget balance was always positive, except in 2010, and the ratio of government debt to GDP in Turkey decreased sharply from 59.2% in 2004 to 32.6% in 2015.

This section also examines how the risk of government debt default can affect fiscal policy; Figure 5.9 shows that from late 2008, the sovereign CDS spread in four countries increased sharply during the global financial and economic crisis. The sovereign CDS spread in these countries reached its peak during the crisis period in the first quarter of 2009, reducing sharply in the second half of 2009, all except Pakistan.

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Figure 5.9 5-year Sovereign CDS spreads (monthly average denominated in USD)

5-year sovereign CDS spreads (monthly average)
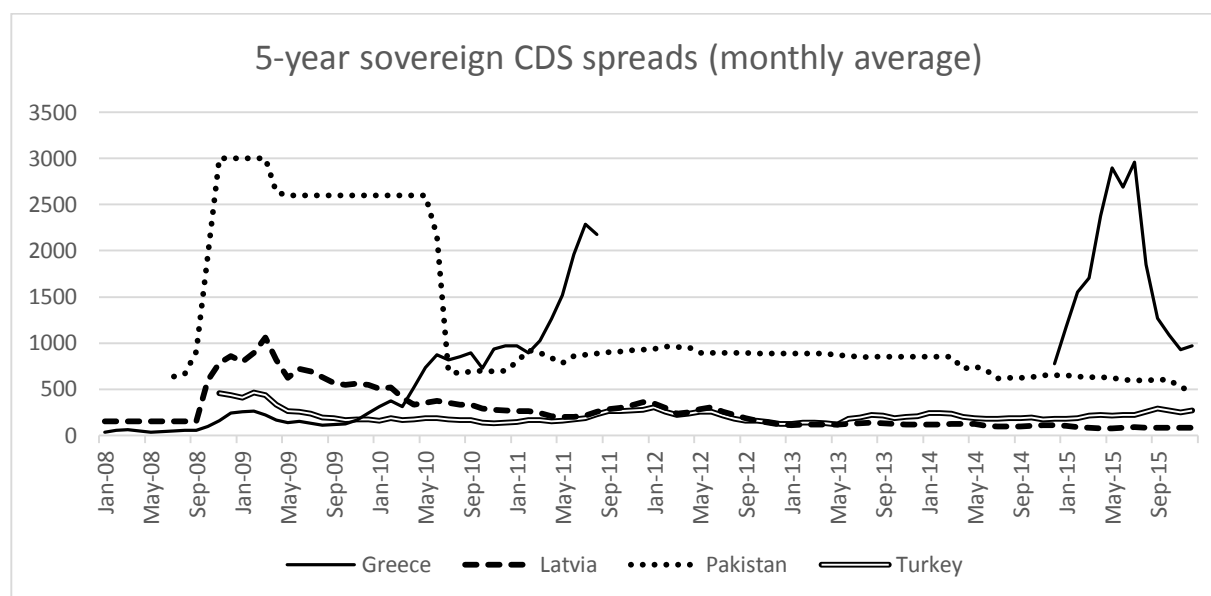
Note: Figure does not include the Sovereign CDS spreads in Greece from September 2011 to November 2014 as it is extremely high and meaningless for investors. There are also several Greek government debt restructures during this period, with the first one in mid-2011 (Heinz and Sun, 2014) and an agreement between the Greek government and its private creditors in February 2012 with about a 53.5% cut on the face value of the Greek government bond (Coudert and Gex, 2013).

In fact, the crisis in Pakistan was mainly caused by political instability; this can determine why the sovereign CDS in Pakistan was much higher than it was in other countries during the period November 2008 to May 2010. The sovereign CDS in Pakistan increased sharply during the period 2007 to 2010, from about 230 at the beginning of 2007 to more than 3000 in 2009/2010. During this time, the ratio of public debt to GDP in Pakistan also increased sharply from 54.9% in 2007 to 60.8% in 2010. Contrary to Pakistan, changes in the sovereign CDS spread in Turkey were mainly caused by shocks in the financial market. It increased sharply during the global financial and economic crisis of 2007-2009, and increased again in 2015, when there was a large depreciation in local currency, due to investor's perceptions about the FED's possible decision to increase interest rates: this perception led to a depreciation of local currencies in most emerging markets.

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Figure 5.9 does not include the sovereign CDS spreads of Greece from September 2011 to November 2014 as the figures are extremely high and do not divulge any economic meaning. At the same time, although Greece implemented fiscal consolidation programs, the ratio of public debt to GDP kept increasing dramatically, whereas with a much lower sovereign CDS spread, a tight fiscal policy seemed to work better in Latvia and Turkey in terms of reducing public debt and restoring economic growth, a perception which mirrors the discussion in section 5.2.4.

5.4 Conclusions

This chapter's analysis of four case studies including Greece, Latvia, Pakistan and Turkey attempted to define how several factors such as public debt, external debt, monetary policy and political economy could influence fiscal policy, especially the effectiveness of tight fiscal policies in terms of reducing public debt.

By choosing four countries all of which have different situations in relation to the factors mentioned above, but sharing the same problem (facing unsustainable fiscal deficits); this chapter discovered that a higher level of public debt, a higher level of external debt, a flexible exchange rate regime, a higher risk level of public debt or a mixture of all of them had the ability to influence a country's choice of fiscal policy and the effectiveness of that fiscal policy in terms of reducing public debt and restoring fiscal sustainability.

There are several possible ways to improve this study: firstly, in some sections such as political economy and credibility, it would be better if empirical works could be implemented to compare them with the findings of this chapter. However, due to the time limit and availability of data, such empirical works have not yet been carried out. There may also be other factors which should be taken into consideration if this is the case, this chapter could be extended to incorporate these other factors.

Appendix 1. Greece

In 2001, Greece joined the Euro area and became the 12th member of the Eurozone. Greece is a developed country whose economy relies mainly on the service sector and less upon industry and agriculture.

Before 2009, Greece was one of the fastest growing economies in Europe. During 2000-2007 the GDP of Greece increased their average annual growth rate by more than 4.2%, more than two times the average figure in the Eurozone (1.9%). The reasoning behind the high growth rate of GDP in Greece was down to a rapid increase in domestic demand. This growth was supported by an expansionary fiscal policy in Greece. During the period 2000-2008, public deficits in Greece always exceeded the EU's Stability and Growth Pact threshold of 3% of GDP. The public deficit in Greece even reached 8.8% of GDP in 2004; during the same period, although the ratio of public debt to GDP in Greece remained stable, it remained very high in comparison with the average figure of the Eurozone.

Another reason for a rapid increase in domestic demand in Greece during the 2000-2007 was a credit expansion to households and private businesses at average annual rates of 29.6% and 14.8%. This was due to a lower interest rate in Greece after joining the Eurozone, which also made private debt burdens increase rapidly. After joining the Eurozone, the inflation rate in Greece dropped dramatically. The average inflation rate in Greece during 1980-2000 was 14.7% whereas the figure during 2000-2011 was only 3.4%. However, the inflation rate in Greece was still higher than the average inflation rate in the European Union over the same period.

In addition, during the period 2000-2008, the average net saving in Greece was negative; meaning the only source of finance for public deficits and private sector debt was external debt. Evident from Figure 5.10, in the period 2000-2008, external net annual borrowing in Greece was around 10% of GDP, in 2009, 80% of total public debts in Greece were from external borrowing.

Further evidence for rapid accumulation in external debt in Greece over this period can be seen in Figure 5.11. In this period, 2000-2008, Greece maintained a negative current account balance and external balance. The current account deficit and external deficit in

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Greece increased dramatically from 2005, whereby the current account deficit increased from 7.3% of GDP in 2005 to 14% and 14.5% in 2007 and 2008 respectively, while the Greek external deficit also increased from 8.2% of GDP in 2005 to 13% in 2008.

Figure 5.10 Net borrowing of Greece's economy from 2000 to 2008

Net annual external borrowing of Greece's economy
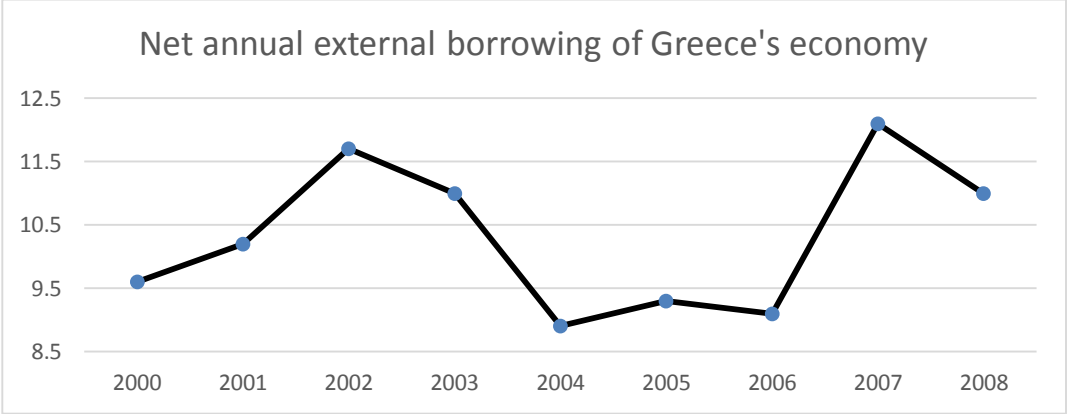
Source: National Statistical Service of Greece, Bank of Greece

Figure 5.11 Current account balance and external balance on goods and services in Greece
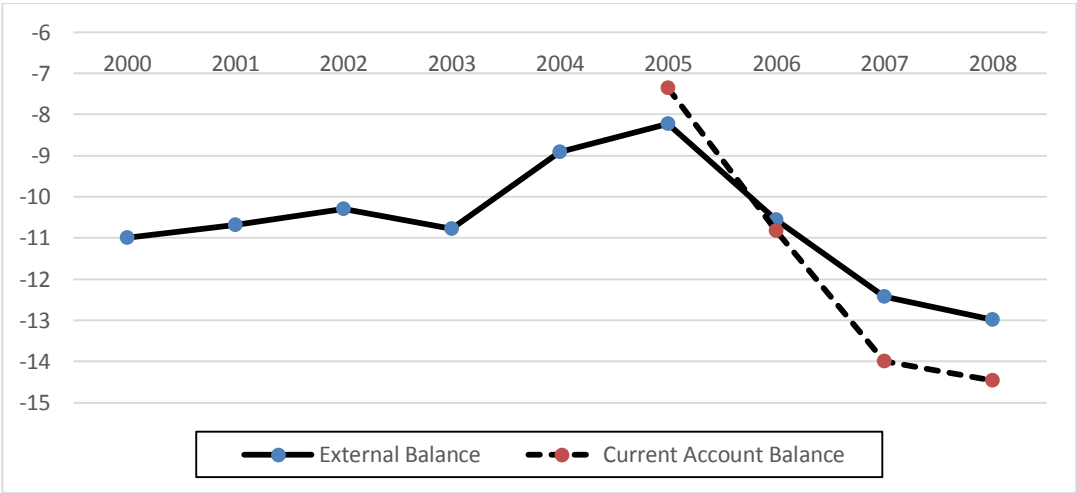
Source: World Development Indicators, World Bank

Theoretically, the situation in Greece during 2000-2007 would sooner or later lead to a devaluation of local currency so as to reduce the import demand, whilst encouraging the export of close external imbalances. However, as Greece was a small economy in the Eurozone and used the Euro as their local currency, there was no devaluation in the local

currency of Greece. What's more, Greece's government and private sector could still borrow from overseas with a low interest rate just like all other Eurozone economies. Hence, the real interest rate in Greece during this period was extremely low due to a low nominal interest rate and a high inflation rate (higher than the average of the Eurozone). With a high and increasing public debt before 2009, Greece would choose a fiscal consolidation; however, their option was an expansionary fiscal policy. According to the IMF (2007), one possible reason for this choice was "in view of Greece's EMU membership, the availability of external financing is [was] not a concern".

In addition, the global crisis of 2007-2009 increased the cost of debt services which faced Greece's economy. In 2009, the "new" Greek government revised government deficits from 3.7% to 12.5% of GDP, at this point Greece officially stepped into a crisis.

There was a broad consensus amongst the IMF, ECB and European leaders which meant that they needed to avoid default on Greek debts as this could lead to a contagion and financial turmoil. As a result, in May 2010 one of the first crisis responses was implemented, which was a combination of financial assistance from the IMF and Eurozone with an austerity package implemented by the Greek Government. A three-year package accumulating in a 110 billion euros loan to Greece, with conditions on economic reform was announced by the IMF (30 billion euros) and the Eurozone countries (80 billion euros). As a condition of this package, Greek governments also announced an ambitious austerity package which aimed to reduce the budget deficit to below 3% of GDP by 2014. This austerity package focused mainly on government spending cuts (civil services, health care and pension reforms) and raising revenues (increasing the average value added tax rate and taxes on certain commodities such as fuel, tobacco and alcohol).

In 2011, it became apparent that the Greek economy was contracting more than expected; meaning further actions were required in order to avoid defaulting on Greece's debt. In June 2011, the Greek government announced the second fiscal consolidation program which, together with the first austerity program, aimed to reduce the government deficit down to 0.9% of GDP by 2015. Furthermore, European leaders also announced a

second financial assistance program which consisted of a 109 billion euros loan to Greece, which comprised of a lower interest rate and longer maturities.

However, because of this a series of crisis responses were implemented, the Greek's ratio of public debt to GDP kept increasing from around 100% before 2009 to 172.1% in 2011, and in 2012, this ratio dropped temporally to 159.6%,reaching a peak of 180.1% in 2014 before reducing to 176.9% in 2015.

Appendix 2. Latvia

Latvia became an official member of the European Union in 2004; from 2000-2007, Latvia had one of the highest annual real GDP growth rates in Europe: the reasoning behind this rapid development was high consumption and investment in real estate.

Before 2008, Latvia had one of lowest level ratios of public debt to GDP in the EU. Latvia's government debt remained between 10-15% of GDP from 2000 to 2006. In 2007, it shrank to 8.4%, which was still higher than the figures in Luxembourg and Estonia.

Before the crisis in 2008, Latvia also had a low level government deficit, especially after joining the Eurozone in 2004. From 2004 to 2007, the government budget deficit in Latvia was less than 1% of the GDP.

However, even though Latvia had a high real GDP growth rate, and a low level government deficit and government debt, Latvia's economy still showed some early warning signs which predicted a crisis. Similar to other Baltic countries (Lithuania and Estonia), the rapid real GDP growth rate mainly came from domestic demand, including private consumption and investments which were encouraged by the positive views regarding the economic conditions, such as negative real interest rates, high GDP growth rates and a declining unemployment rate.

Figure 5.12 Latvia's current account balance

Source: Eurostats

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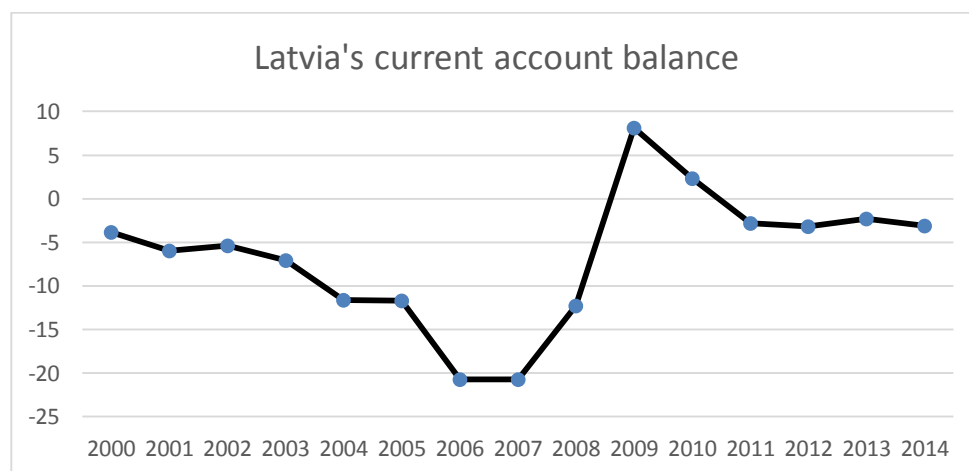
Over the same period, the country's share relating to manufacturing in GDP was decreasing, while external trade continued to negatively contribute. A large proportion of rapid increasing investment was invested in the real estate sector, which could not contribute to medium or long-term development. As can be seen in Figure 5.12, Latvia's current account balance increased quickly. The current account deficit in Latvia increased more than five times within 6 years from 3.8% of GDP in 2000 to 21.1% of GDP in 2006. Similar to Greece, private debt in Latvia increased sharply after joining the Eurozone as the Latvian economy could easily borrow money with a lower interest rate.

The global financial and economic crisis of 2007-2009 hit Latvia in late 2008 to early 2009; this made Latvia's real GDP drop to 3.2% in 2008. In 2009, Latvia's real GDP fell by a record level, 14.2%. Within two years (2007 to 2009), Latvia's government debt increased dramatically from 8.4% in 2007 to 36.6% in 2009, reaching a height of 55.3% in 2010, while Latvia's government budget deficit jumped from 0.7% in 2007 to 9.1% in 2009. As a result of this crisis, the labour demand in Latvia decreased dramatically, with the unemployment rate increasing from 7.5% in 2008 to 17.1% in 2009 and 18.7% in 2010. During this crisis, Latvia also experienced the biggest alterations to its current account, which started with a -20.8% of GDP (deficit) in 2007 to an 8.2% of GDP (surplus) in 2009.

In order to respond to this crisis, the Latvian government executed a budget consolidation program. The Latvian government implemented six consolidation packages within 3 years; from 2009 to 2012 the fiscal consolidation measures of 16.9% of GDP were completed, including approximately 6.7% of GDP taken from the revenue side and 10.2% of GDP taken from the expenditure side. The Latvian fiscal consolidation was one of the most severe in Europe, with an average fiscal consolidation measurement of 3.4% of GDP per year. It is also worth mentioning the importance of the Latvian consolidation program; this program was implemented in order to meet the conditions which the IMF and the EU had made mandatory which would then allow Latvia to receive a financial assistance package of 7.5 billion euros from 2008 to 2011 to help stabilize the Latvian economy and restore growth.

As a consequence of these austerity policies, Latvia's macroeconomic situation became stable; the Latvian annual real GDP growth rate was 5% in 2011 - one of the highest

annual growth rates in the EU (only lower than two other Baltic countries Estonia and Lithuania), this decreased to 4.8%, 4.2% and 2.4% in 2012, 2013 and 2014 respectively. Latvia's annual real GDP growth rate increased to 2.7% in 2015. The Latvian government budget deficit also dropped to less than 1% in 2012 and 2013 before increasing to 1.6% and 1.3% in 2014 and 2015. However, these austerity policies also reduced public service in both quantity and quality, meaning the Latvian government was eventually able to restore adequate funding for public services during 2013-2016 (the post-crisis period).

Appendix 3. Pakistan

According to the IMF, in terms of purchasing power parity, Pakistan's economy is the 26th largest in the world. In 1999, the Pakistani government faced numerous challenges, such as high public debt, high fiscal deficit, a weak balance of payments as well as rising poverty and unemployment. These difficulties forced the Pakistani government to enforce structural policy reforms and improve economy governance. As a consequence, during 2002-2007, the annual growth rate in Pakistan increased sharply reaching a peak, which had not been seen in the last 40 years, of 7.7% in 2004.

The best alteration during this time was a huge reduction in the Pakistani government's debt. Within just four years, 2003 to 2007, Pakistan's government debt decreased 20.4 percentage points from 74.5% in 2003 to 54.9% in 2007. Over the same period, Pakistan's government debt from external borrowing also decreased from 35.6% in 2003 to 24.9% in 2007.

**Figure 5.13 Pakistan's public debt to GDP**
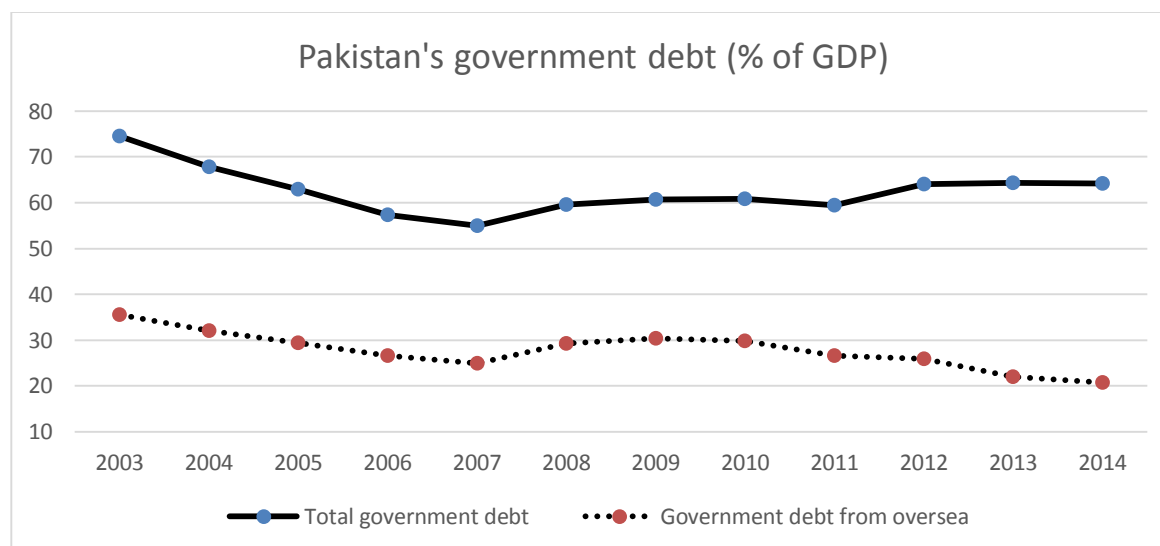
Source: International Monetary Fund

During 2002-2007, Pakistan's current account deficit and external deficit for goods and services increased dramatically. The reason for this was a discrepancy between an increase in imports and an increase in exports. Throughout five years of strong growth,

Pakistan's import demand increased sharply at an average rate of 23% per annum, while Pakistan's exports only grew at an average rate of 13.3%.

Figure 5.14 Current account balance and external balance on goods and services in Pakistan
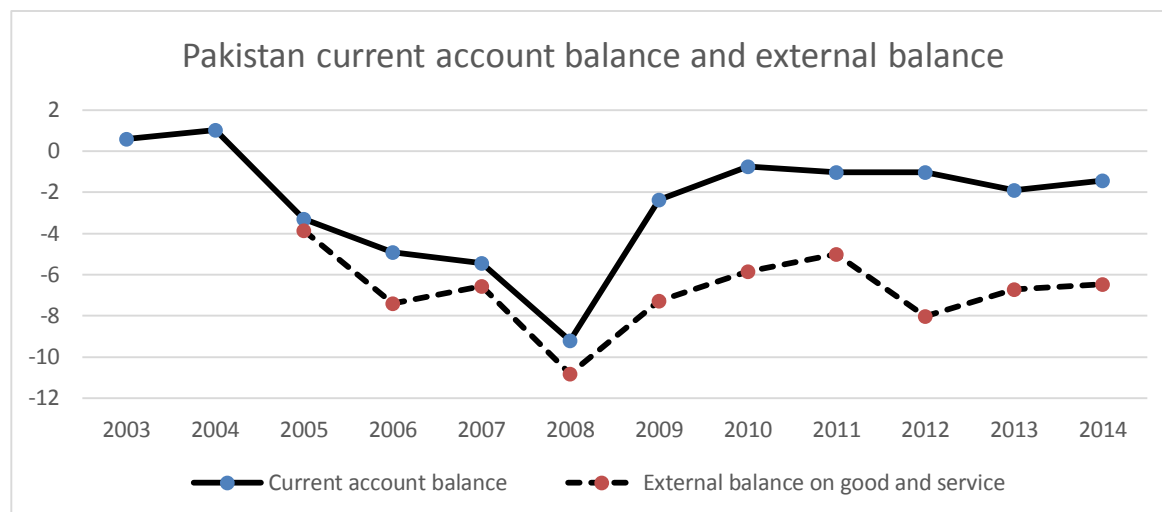
Source: World Development Indicators, World Bank

Since 2007, the situation in Pakistan has worsened. Political instability was one of the main factors behind Pakistan's economic crisis, especially as agenda reforms were not implemented properly. The Pakistani government did not adequately manage the economy, because the country stepped into a judicial crisis which then transitioned from a military government to civilian-elected government. Even though the global financial and economic crisis of 2007-2009 was not the main factor for the crisis in Pakistan, it still made the situation worse. The global financial turmoil reduced inflow capital to Pakistan and reduced the export demand of Pakistan's economy. The current account deficit reached a record level high of 9.2% of GDP in 2008, whilst the annual growth rate of real GDP dropped from 6% in 2007 to 1.7% in 2008. Pakistan's government debt increased from 54.9% to 59.6%, which is extremely close to the limit of 60% under the Fiscal Responsibility and Debt Limitation Act of 2005.

Pakistan responded to the economic crisis of 2007-2008 preparing a "homegrown stabilization package" of macroeconomic reforms which were designed to improve fiscal performance and tighten monetary policy. These alterations led to a quick agreement

between Pakistan and the IMF about a standby arrangement for Pakistan: under this standby arrangement the IMF gave Pakistan a financial assistance package of 11.3 billion US dollars.

As a result of the standby arrangement for Pakistan, the current account deficit decreased from 9.2% in 2008 to 2.4% in 2009 and has been remaining below 2% since 2010. The annual growth rate of real GDP increased from 1.7% in 2008 to 4.5% in 2015; however, Pakistan's fiscal deficit also increased rapidly from 5.2% of GDP in 2008 to 8.4% of GDP in 2012. Therefore, the IMF (2012) recommended a set of short-term measures, as the IMF believed that reducing the fiscal deficit was the most fundamental task to stabilize the macroeconomics and support higher growth: fiscal deficit dropped to 4.1% of GDP in 2015 as a result of these measurements. The IMF (2015) considers Pakistan's macroeconomics to be one of the most promising, with the possibility of another crisis occurring in the future much lower than previous analysis suggested; this is due to the effectiveness of stabilization policies in terms of reducing macroeconomic imbalances. The Pakistani authorities kept pursuing a fiscal consolidation program in order to bring public debt below 60%, as Pakistan's government debt was still higher than 60% since 2012.

Appendix 4. Turkey

The IMF (2015) has classified the Turkish economy as being an emerging market; Turkey is one of the leading producers of agricultural products, transportation and electronic consumer products in the world.

The Turkish annual growth rate of real GDP fluctuated dramatically from 2000 to 2015. The real GDP dropped 5.7% in 2001 when Turkey experienced the 2001 economic crisis; growth was restored several years after the crisis. However, the global financial and economic crisis reached Turkey and then reduced the Turkish annual growth rate of real GDP from 6.9% in 2006 to 0.7% in 2008. In 2009, the real GDP fell to 4.8%, which then restored in 2010 and 2011 with an impressive 9.2% and 8.8% growth rate. Surprisingly, the annual growth rate of real GDP was only 2.1% in 2012 due to a dramatic reduction in domestic demand, which an increase in export could not compensate. The Turkish real GDP growth rate then increased to 4.1% in 2013 before dropping to 2.9% in 2014, due to an announcement by the FED to implement an interest rate hike in January 2014. After this announcement, a significant amount of international funds flowed from countries such as Brazil, India and Turkey, which of course, reduced growth in Turkey, with the Turkish real GDP growth rate then increasing back up to 3.8% in 2015.

The government budget deficit in Turkey increased rapidly from 0.4% of GDP in 2006 to 5.5% in 2009. According to the IMF (2010), there were two reasons for this increase; first of all, a loose fiscal policy was already implemented at the time the crisis hit Turkey in late 2008, and a stimulate package was implemented in early 2009 so as to boost the economy's demand. These implementations really helped the Turkish economy retract its losses after being hit hard by the global financial and economic crisis of 2007-2009.

The effects of the global financial and economic crisis in late 2008 are evident from Figure 5.15; whereby the Turkish current account deficit slumped from 5.4% of GDP in 2008 to 1.9% of GDP in 2009 due to weak demand. However, as imports surged in 2010 and 2011, and exportation grew at a much slower pace, the Turkish current account deficit restored quickly in 2010 and 2011.

Figure 5.15 Turkish current account balance

Current account balance
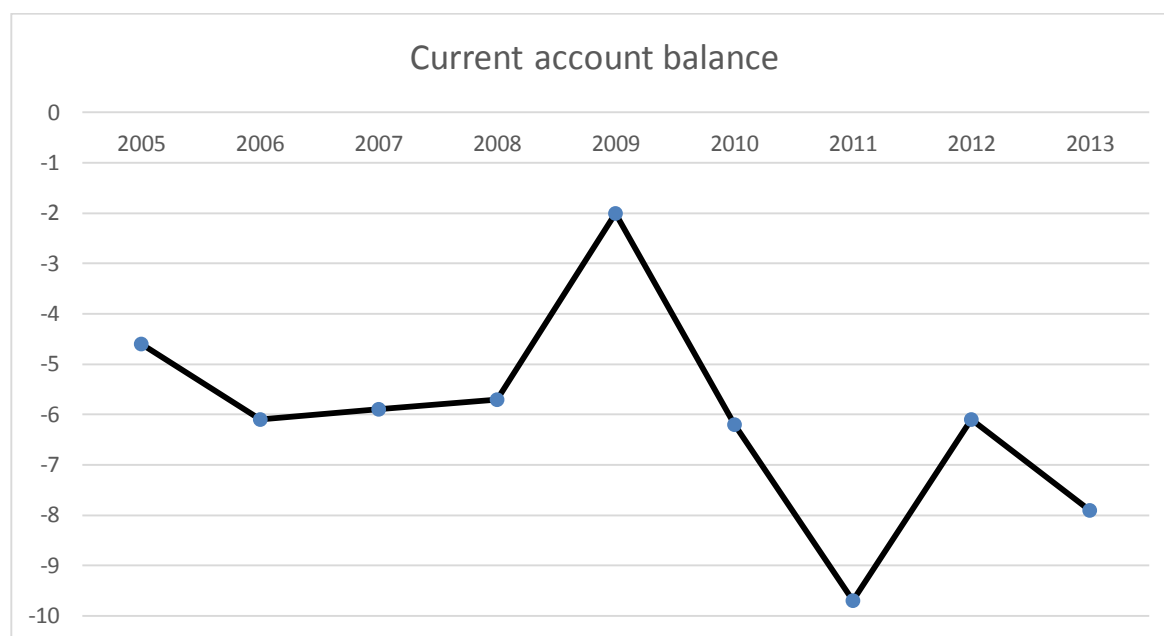
During the growth period of 2002-2007, the Turkish government's debt decreased rapidly: this figure was only 39.4% and 39.5% of GDP in 2007 and 2008. There are four main reasons behind the reduction in government debt; firstly, around this time the Turkish real GDP increased at an average of more than 5% per annum. Also, the Turkish government's primary deficit was extremely low (the primary balance is actually positive) before 2009, and there was an appreciation in local currency during this time; whilst, the cost of the debt reduced as a result of falling interest rates. During the crisis, the Turkish government's debt increased from 39.5% in 2008 to 46.1% in 2009, after the crisis, the Turkish government's debt decreased gradually to 32.6% in 2015. This low level government debt allowed more space for fiscal policies to be implemented in Turkey. The IMF suggests that "Turkey's government debt is sustainable even under different shock scenarios" (IMF, 2014, p.41).

Chapter 6. Summary and conclusions

This thesis has presented three research studies which all relate to post-crisis fiscal policies. All three research chapters in this thesis have tried to address a number of questions about fiscal policy, such as: the speed of fiscal policy adjustments in order to bring the level of external debt to a sustainable level; the variety of economic factors that influence the effectiveness of fiscal policy and the practical challenges of policy making in some individual countries. Detailed findings of each research chapter are discussed in the concluding sections of each relevant chapter. The purpose of this chapter is to summarise the key findings of these three research chapters.

First of all, Chapter 3 suggests that a small open economy is able to adjust gradually in order to bring that country's external debt back to a sustainable level within a certain amount of time as requested by foreign lenders. The simulation results in Chapter 3 highlight that small open economies will attempt to delay adjustments for as long as possible before implementing the adjusts gradually.

While Chapter 4 strongly supports the existence of a relationship between financial development, financial openness, the level of external debt, the exchange rate regime and the size of a government's consumption multiplier.

By analysing four case studies which focus on Greece, Latvia, Pakistan and Turkey (Chapter Five) it is evident that fiscal policy choices and their varying results are determined by several factors including: preceding economic conditions, monetary policy, the financial markets and political economy.

The findings presented in both Chapter 4 and Chapter 5 suggest that although different countries face the same problems (economic recession or fiscal crisis), one countries fiscal policy choice may be different to another countries fiscal policy choice because there are numerous economic factors that can affect the effectiveness of fiscal policy. Therefore, fiscal policies should be issued in a wide context with careful consideration for monetary policies, financial markets and the political economy.

There's an array of lessons that have been learnt from undertaking this thesis.

Firstly, the simulation results presented in Chapter 3 suggest that based upon welfare grounds, it is much more desirable to implement adjustments gradually so as to bring external debt to a sustainable level. Rapid adjustments are problematic even in broader models that take into account other aspects of the economy. For example, when a small open economy faces a limited foreign borrowing capacity, there may be a shifting trend from consuming tradable goods to non-tradable goods. This transfer will take time as labour skills need to be properly trained as well as the amount of capital required for this shift in consumer goods; therefore, gradual adjustments seem to be more reasonable.

There are several reasons to argue for rapid adjustment, one of them is the possibility of default. The simulation results from Chapter 3 (see 3.4.3) highlight that although there is an agreement between borrowers and lenders, the borrowers may decide to default especially if delaying is better for them (in terms of total forward-looking utility). Furthermore, gradual adjustment may lead to differing viewpoints between lenders and borrowers regarding the speed of adjustments, exchange rate and other institutional arrangements.

Policy-makers should also remember the saying that one size does not fit all. Policy choices vary across countries and time periods because its effectiveness depends on the economic situation of the specific country. Therefore, a policy should be ideally issued in a broad context with careful consideration for many aspects of the economy.

One lesson learnt whilst researching this thesis is that even in countries facing a public debt crisis, implementing a tight fiscal policy may be not the optimal choice especially if the fiscal multiplier is extremely high; in other words, a large fiscal multiplier means that a tight fiscal policy will be incredibly costly. Therefore, a tight fiscal policy may be less effective in terms of reducing the level of public debt.

There are several suggestions regarding future research which could be completed to extend the findings of this thesis.

In the model used in Chapter 3, the government only runs a simple budget balance; introducing government debt into the model will enhance the models usefulness when it comes to studying fiscal policies in countries with external debt difficulties. What's more,

the model in Chapter 3 may be extended to highlight several other major issues, such as the difficulty of switching resources.

Chapter 4 examines the relationship between several factors in relation to the size of the government consumption multiplier. However, there are still many factors which should be taken into consideration. Besides, Chapter 4 solely focuses on the size of a government's consumption multiplier, considering the size of a government's investment multiplier as well as a government's revenue multiplier would aid the research significantly and truly highlight the effectiveness of fiscal policies.

Although Chapter 5 analyses case studies of four countries which have different features, it would be better if the study covered a wide range of countries, and it would be great if more factors were taken into consideration as this would enable countries to determine their fiscal policy choice much more clearly.

Finally, both Chapter 4 and Chapter 5 could be extended so as to evaluate how political consensus and credibility affect fiscal choices and fiscal policy effectiveness. There definitely seems to be a gap in the literature.

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