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# Overreliance in Automatic Stabilizers?

## - Sweden's Fiscal Policy during the Financial Crisis

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## Abstract

What was the outcome of Sweden's fiscal policy between 2009 and 2012 and why was it different from forecasts? Research by the OECD during the financial crisis, used by the Swedish Government to illustrate their fiscal policy, suggested that Sweden would have the biggest stimulus of all OECD countries. However, Sweden's fiscal policy ended up rather modest. By examining the forecasted fiscal policy with the outcome I find that the Government systematically underestimated its income. By using a simple regression I find correlation between the forecast errors in GDP growth and forecast error in budget balance. Also, by looking at specific budget post I show that a big part of the miscalculations comes from overestimating the overall cost of the automatic stabilizers. The research shows that relying on automatic stabilizers as the biggest part of a country's fiscal policy is problematic as it is dependent on forecasts.

**Keywords:** Fiscal Policy, Automatic Stabilizers, Forecasts of Fiscal Policy, Sweden's Fiscal Policy.

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# 1 Introduction

Automatic Stabilizers are generally viewed as a favorable tool for fiscal policy since they are contracyclical and do not rely on active decisions to be implemented. However, the findings in this paper highlight some problems using automatic stabilizers as your main fiscal policy tool. This study shows that large forecast errors can lead to miscalculation of planned fiscal policy in countries with tight budgetary rules that rely heavily on automatic stabilizers.

Specifically, the focus is on Sweden's fiscal policy in the aftermath of the financial crisis between the years 2009 - 2012. Sweden is an interesting example. During the crisis years it was explicitly mentioned in the country's budgets that automatic stabilizers was an important part of the fiscal policy and that budgetary rules should be undershoot in order for them to work fully.

Early research in 2009 from The Organisation for Economic Co-operation and Development (OECD) forecasted that Sweden would, between 2008-2010, have the largest fiscal stimulus in terms of its impact on fiscal deficits of all developed countries (OECD 2009:108). This study was highlighted in the Swedish official budgets at the time to illustrate the size of the country's fiscal policy.

However, later research shows that Sweden's fiscal policy was modest during the crisis years (Aizenman & Pasricha 2013). These contradicting findings pose interesting questions and the aim of this paper is to investigate how Sweden intended to conduct its fiscal policy during the crisis years and compare it with the eventual result. My research questions are:

> *1. What were Sweden's Fiscal Policy intentions during the financial crisis and what was the outcome?*

> *2. If the outcome differed from the intentions, why were they different?*

I examine these questions by looking at the budgets and spring budgets of 2009 and 2010 and by comparing the forecasted fiscal balance for the years 2009 - 2012 with the outcome.

The result shows that Sweden planned to run a rather big budget deficit during 2009, 2010 and onwards, however, the outcome was much more modest. The main reason for this was because the country's earnings were systematically underestimated during 2009 and 2010.

The reason for why the Government underestimated the earning was that they overestimated the size of the downturn in terms of GDP growth and the size of output gap, which in turn overestimated the size of the automatic stabilizers. This is shown with simple linear regressions. To further check if the forecast errors derive from miscalculating the automatic stabilizers, I show that the Government overestimated expenditure and the fall in income of the actual budget post that compromise automatic stabilizers.

Consequently, the main reason for why the fiscal policy became smaller than planned was because the cost of the automatic stabilizers was overestimated. Automatic stabilizers primarily affect the income side of the budget which is harder to forecast than the expenditure side since it is more dependent on outside factors. This in turn makes it harder plan the size of fiscal policy if the largest part is automatic stabilizers and not discretionary fiscal policy.

# 2 Previous Research about Sweden's Fiscal Policy during the Financial Crisis

OECD conducted a study in 2009 in which they measured the fiscal policies of all its member states. They found that Sweden's automatic and discretionary fiscal policy cumulated over the period 2008-2010 as percent of 2008 GDP would be the biggest of all its member states. The reason for why Sweden would have the biggest fiscal stimulus was primarily because it had large automatic stabilizers. (OECD 2009:108).

The OECD uses an older study by Girouard and André (2005) for calculating the size of the automatic stabilizers. It is not explicitly mentioned in the report but the formula used is the following according to the Swedish Fiscal Policy Council:

$$Automatic\ stabilizers = Budget\ elasticity \times Output\ gap$$

The budget elasticity[1] for Sweden is taken from the Girouard and André study and is 0.55.

A later study from 2013 by Aizenman and Pasricha finds a different result. They also look at the OECD countries and measure the net fiscal stimulus between 2007 and 2009. They focus on the consolidated government expenditure in the national income identity (G in economics textbooks) and views increases in this parameter as net fiscal stimulus. This means that some of the automatic stabilizers such as unemployment benefits are excluded from their analysis. They defend this method by arguing that much of these benefits will not be spent since savings usually increase during recessions. They find that Sweden's fiscal policy was only modestly countercyclical during the crisis years.

Findings from the Swedish Fiscal Policy Council offer some suggestions about why there is a difference in result between above studies. They argue that the automatic stabilizers impact on fiscal savings is not as strong as suggest by the OECD. The budget elasticity of 0.55 from the OECD is viewed too high because local governments are since 2000 obligated to balance their budget and since unemployment benefits have been reduced. Because the Swedish Ministry

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[1] See part 6 for a more detailed explanation of the budget elasticity.

of Finance is using the OECD calculations the Council argues that they overestimated the deficits during the crisis years. They also argue that one reason for the lower deficit than forecasted was that unemployment was lower than predicted. (Swedish Fiscal Policy Council:2011).

The Swedish National Institute of Economic Research also finds that automatic stabilizers have become smaller than before. They found that the budget elasticity between 2007-2012 was 0,4 which was half what it had been in the years 1995-2006. They argue that this is because both taxes and unemployment benefits have been lowered. (2013:43)

My research has similar findings as the Swedish Fiscal Policy Council. I also find a systematic overestimation of the budget deficit. Furthermore, even though I do not focus on unemployment I find that the main reason for the fiscal policy forecast errors depend on forecast errors in GDP growth and the output gap.

# 3 Fiscal Policy – From Keynes to the Modern Multiplier Debate

Below is a short presentation of research about fiscal policy. Criticism as well as advantages of fiscal policy is discussed in order to show in what climate politicians make decisions. Therefore, some rather basic economic theories are highlighted together with current research about the issue.[2]

## 3.1 Keynes

John Maynard Keynes is the architect behind fiscal policy and the multiplier. According to Keynes prices, especially wages, does not automatically correct to create equilibrium in the short run. This leaves space for fiscal policy as the government can create aggregate demand by increasing its expenditures when the economy is below full potential. (Fregert & Jonung 2011:289). Theoretically, a government should, by using fiscal policy, be able to increase demand and get the economy back to equilibrium.

To do this the government would also need to have an understanding of the multiplier. It is called the multiplier since the stimulus that the government provides to the economy does not only give it a one-time boost. This is because of the circular flow of the economy: if the government increases its expenditures it will lead to higher income because people would be able to get higher salaries or companies can hire more workers. The higher income will in the next period lead to higher consumption which for a second time will lead to higher income as companies can increase salaries our increase workers to face the higher demand. This circular flow is repeated indefinitely but in every period the amount that contributes to the country's GDP is less because some of the increased income will be removed from the circular flow of the economy since it is being saved, spent on imports and taxed back to the government. Consequently, the size of the multiplier is depending on the people's marginal propensity to consume, taxes, and their marginal propensity to import  (ibid: 310).

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[2] Research connected to the monetarist's and neo-classical's schools of economics are not presented here as both schools argue that fiscal policy is not effective. This might also be of value to show that fiscal policy is not an obvious policy tool use. However, since the Swedish Government, as I will later show, views fiscal policy as a useful tool I focus on the economic debate that does not completely disregard fiscal policy.

## 3.2 Crowding Out

One of the main arguments against fiscal policy is that it can crowd out private investment. Crowding out can be explain with the IS-LM Schedule. The IS curve is the equilibrium in the goods market and stands for *Investment-Savings*. The logic behind it is that GDP depends on the relationship between investment and interest rates. If interest rates are high fewer investments projects would take place since in instances where the investments had low expected returns it would be more beneficial to just keep the money in the bank and collect interest. Lowering interest rates, on the other hand, leads to more investment since saving money in the bank becomes less beneficial.

LM is the equilibrium in the money market and stands for *Liquidity preference – Money Supply*. The curve refers to the idea that GDP is dependent on the relationship between liquidity preference and interest rates. When the economy is doing well people are willing to sacrifice more, i.e. interest on savings, to hold money in order to make transactions. The opposite holds in a downturn when people are more willing to save even if the interest rate is low.

Consequently, the IS and the LM curve are two sides of the same coin. The IS curve is the demand for lending and the LM curve is the supply of lending and both depend on the interest rate and the current state of the economy.

Now, crowding out is the idea that fiscal policy will crowd out private investments because it leads to higher interest rates. The logic can be seen in the below IS-LM Schedule where G is fiscal multiplier. As seen in the schedule GDP does not increase the full amount of the multiplier because the increase in G leads to higher interest rates which in turn lead to fewer investments in the private sector. The size of the "crowding out" effect depends on the interest elasticity of investments which is the same as the angle of the IS curve and also on the interest elasticity of money demand which is the angle of the LM curve. (Froyen 2013:134-136)

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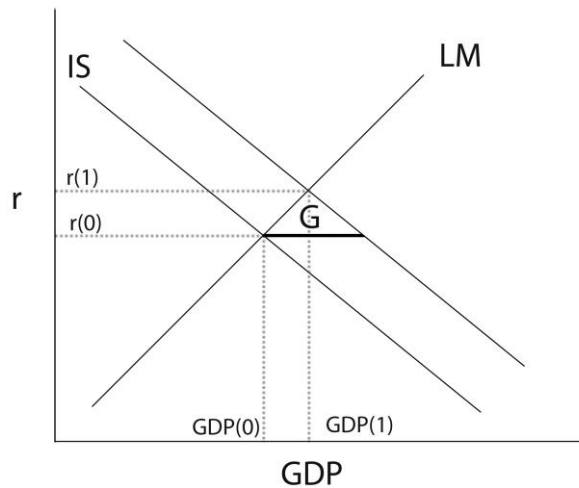
**Figure 1: IS-LM Schedule**

## 3.2.1 Crowding Out Exports: The Mundell – Fleming Model

In order to explain what would happen in an open economy the IS-LM curve was expanded by Robert Mundell and Marcus Fleming. They added the Foreign Exchange Market (FE in Figure 2) to the model. For a small open economy the FE curve is a horizontal line since it is not believed that a small economy can affect exchange rates. By adding this to the original IS-LM curve fiscal policy in a small open economy becomes completely useless at changing the GDP level. This is explained by the following logic, just as in figure 1 fiscal policy will, in the first phase, lead to higher exchange rate and the IS curve will shift (IS(2) in Figure 2). However, since the economy is open it will also lead to more expensive exports as the value of the currency appreciates. This in turn will lead to a decrease in net exports (NX in Figure 2) and equilibrium is fully reached first when GDP is back to its original level (GDP(0) in Figure 2). (Fregert & Jonung 2011:342)



**Figure 2: IS-LM-FE**

### *3.3 The Multiplier Debate*

Since the financial crisis and especially during the ongoing euro crisis a lot of papers have been written about the size of the multiplier.

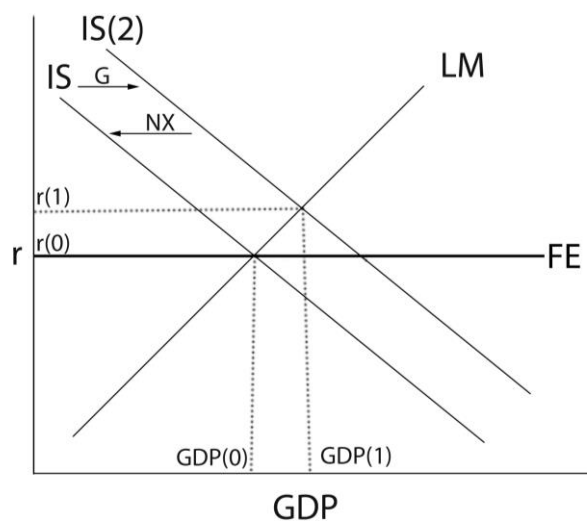Ilzetzki, Mendoza, and Végh conducted a large study on the issue where they compared quarterly data from 44 countries between the years 1960 to 2007 (the exact time frame varies depending on country). Their results are similar to the above mentioned theories as they show that countries which have a flexible exchange rate have a multiplier of zero. In a similar vein they also find that a country's openness to trade is an important determinate of the multiplier, countries with a high proportions of trade to GDP have generally smaller and negative (less than one) multipliers. They also find different results for developing and developed countries and that the size of the multiplier also depends on the debt level of a country, the higher the debt to GDP the lower the multiplier (Ilzetzki, Mendoza and Végh 2013).

However, there are a lot of different results in research about the size of the fiscal multiplier. An IMF staff position note by Spilimbergo, Symansky, and Schindler (2009) gives a good overview of different research on the multiplier. Their summary show that research, even about the same country, paints a very unclear picture of the size of multiplier as it ranges from negative to highly positive.

### 3.3.1 The Multiplier in a Liquidity Trap

The theoretical framework suggests that the effectiveness of fiscal policy depends on the state of the economy. As discussed above, the angle of LM curve affect the how much of the private investment that will be crowded out by increased government spending. In a depressed economy were expansive monetary policy has led to interest rates close to zero but people are still so pessimistic that they are not investing the economy is facing a so-called liquidity trap. This situation can also be illustrated with the IS-LM curve. In a liquidity trap increased government spending (G in Figure 3) will not lead to crowding out since it will not affect interest rates. Consequently, fiscal policy is more effective when an economy is in a liquidity trap. (Fregert & Jonung 2011:332).
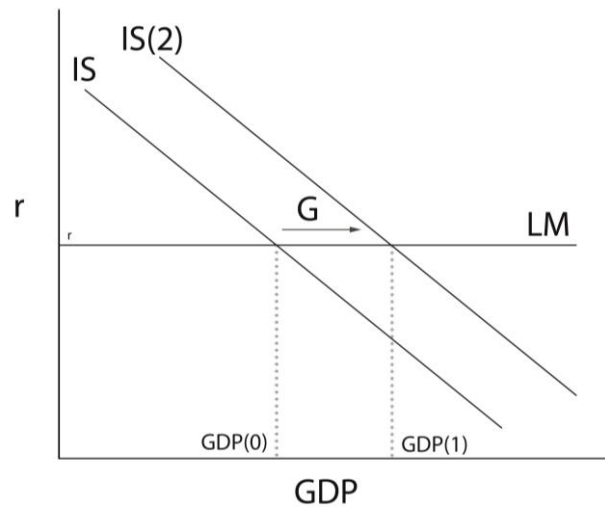
**Figure 3: Fiscal policy in a liquidity trap**

Empirical research about the multiplier during liquidity traps have also shown that the multiplier tend to be higher during such depressed times. For instance, Almunia, Benetrix, Eichengreen, and O'Rourke (2010) investigate the multiplier in 27 countries during the Great Depression in the 1930's and came to the conclusion that it was higher than one.

## 3.3.2 The Multiplier in a *Global* Liquidity Trap: Lessons for Small Open Economies?

As discussed above the The Mundell – Fleming model shows us that expansive fiscal policy is useless in a small open economy since it would lead to currency appreciation which in turn would lead to crowding out of exports. However, in newer research, economists are arguing that this strict scenario does not always have to hold true, especially at the zero lower bound and in a liquidity trap.

Fujiwaray and Uedaz (2012) argues that small open economies can in fact benefit from fiscal policy in a global liquidity trap since interest rates are kept low which in turn prevents the exchange rate from appreciating. However, they also argue that results can be reversed depending on the intertemporal elasticity of substitution in consumption is lower than one.[3]

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[3] The Intertemporal elasticity of substitution is how consumption responds to the changes in the real interest rate.

Wieland (2012) comes to a similar conclusion and even goes so far to argue that the fiscal multiplier is higher in open economies in a liquidity trap than in closed economies.

## *3.4 No Consensus Predicament for Politicians*

As seen above, economists do not agree on the effectiveness of fiscal policy. Furthermore, as seen above, the usefulness of fiscal depends on a number of factors such as the level of openness of the economy, the size of the economy, the timing of the fiscal policy, and other issues depending on the theory you look at.

These uncertainties lead to problems with forecasting the effectiveness of fiscal policy. Research from IMF, by Blanchard and Leigh (2013), shows that forecasters systematically underestimated the fiscal multiplier during the financial crisis.

This imprecise theoretical groundwork arguably gives politicians a hard time deciding their policy actions. *The Swedish fiscal policy framework* from 2010 gives the Swedish Government's view on fiscal policy. They believe that the fiscal multiplier is lower than 1 and since Sweden is a small open economy with its own currency they believe that fiscal policy have limited effectiveness (2010:35).

# 4 Empirical considerations: Sweden's Fiscal Straitjacket

Apart from the theoretical framework the Swedish Government also has to take a number of budgetary rules into consideration when and if they decide to implement fiscal policy. The reason for these rules is to prevent that the debt to GDP level getting too high and also to prevent that fiscal policy destabilize the economy.

## 4.1 The Surplus Target

The so-called Surplus target states that general public sector net lending should be 1 percent of GDP on average during one business cycle. The Government should report twice a year on how they plan to fulfil the target to the Swedish Central Bank. One of the reasons for this rule, which is directly connected to fiscal policy, is to provide "Adequate margins for avoiding large deficits during economic downturns even in connection with an active contracyclical policy". (The Swedish fiscal policy framework, 2010:20). The Surplus target has never been violated since its enactment in 1997.

## 4.2 The Expenditure Ceiling

The Expenditure ceiling was also enacted in 1997 and stipulates that the Government, in the Budget Bill, shall propose a budget ceiling for the third year ahead. The ceiling is later decided by the Riksdag (the Swedish parliament). If it is forecasted that the ceiling will be broken measures must be taken by the Government to avoid it.

In order to leave room for fiscal policy the ceiling can be changed by the Riksdag. However, "[i]t has become the practice not to amend the expenditure ceiling" (The Swedish Fiscal Policy Framework, 2010:26) and at the few occasions that it has been amended it has always been lowered (ibid)

## 4.3 The Balanced Budget Requirements of Local Governments

Local governments are since the year 2000 obligated to balance their budgets. If a local government runs a deficit the general rule is that has to be corrected within 3 years. Furthermore, local governments should practice sound management which entails more than just balancing the budget. The "widespread goal" is that sound economic management means a surplus equivalent to 2 per cent of revenue from taxes and general state grants (ibid:30).

## 4.4 EU's Stability and Growth Pact

Being a member of the European Union Sweden is also obligated to abide by rules of the Union's Stability and Growth Pact. The most important aspect of this pact is that the budget deficit should not exceed 3 per cent of GDP any year and public debt should not exceed 60 per cent of GDP.

## 4.5 The Quest for Contracyclical Fiscal Policy

With these rather stringent rules in place the Swedish Government also has measures to prevent procyclical fiscal policy. As mentioned above, Sweden has, according to the OECD, some of the highest automatic stabilizers of all it members states. These tend to increase in economic downturns since more people become unemployed or partly unemployed and will depend more on the government. Consequently, the automatic stabilizers led to higher government spending during downturns and are therefore by its very nature contracyclical. However, if a country has budget rules these automatic stabilizer's effects might be dampened if the government chooses to rein in other spending in order to abide to the rules. To counter this phenomenon the Swedish Government can run deficits during downturn since the public sector net lending should be 1 percent of GDP on *average* during one business cycle and not every year. Also, as seen above, the expenditure ceiling can be altered to leave room for fiscal policy.

Furthermore, when forecast about the surplus target is incorrect the Government should take measures to change its current fiscal policy. As seen in the table below, taken from the Swedish fiscal policy framework from 2010, fiscal policy should not be procyclical and if it is it should be corrected at a high rate.

**Correcting surplus target deviations with allowance for the business cycle**

| Resource utilization | | Assessed surplus target compliance | | |
| --- | --- | --- | --- | --- |
| | | *Above the target* | *On target* | *Below the target* |
| *High* | | Balance-weakening measures when the economy slackens | No measures | Balance reinforcement at a high rate |
| *Nor-mal* | | Balance-weakening measures at a moderate rate | No measures | Balance reinforcement at a moderate rate |
| *Low* | | Balance-weakening measures at a high rate | No measures | Balance reinforcement as the economy recovers |

Table 1

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# 5 Definition of Automatic Stabilizers

When examining fiscal policy it is important to differentiate between discretionary fiscal policy and automatic stabilizers. Discretionary fiscal policy is active decisions by the government such as lowering taxes or building roads to create aggregate demand during downturns. In contrast, automatic stabilizers are instruments that stabilize a nation's economy without any active decisions.

Automatic stabilizers lower the impact changes in gross incomes have on disposable incomes, which in turn dampens the fluctuations in private consumption during economic swings. This can be seen in for instance progressive taxation since the fall in disposable income becomes less than the fall in income before taxes. Since automatic stabilizers reduce the swings in private consumption, which is part of aggregate demand, it becomes a stabilizing tool for the economy. (Fregert & Jonung 2011:313)

There are different ways of measuring automatic stabilizers, the manner in which the Swedish Government calculates the size of the automatic stabilizers is by measuring the automatic impact on the budget balance for changes in the output gap [4]. Mathematically speaking, the percentage change in the budget balance for every percentage change in the output gap. The ratio of change of the budget balance when the output gap change is called the budget elasticity.

*Automatic stabilizers = Budget elasticity x Output gap*

To illustrate, this relationship can be expressed in a graph where the budget balance as percentage of GDP is a function of the output gap.

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[4] The output gap is the difference between real and potential GDP.
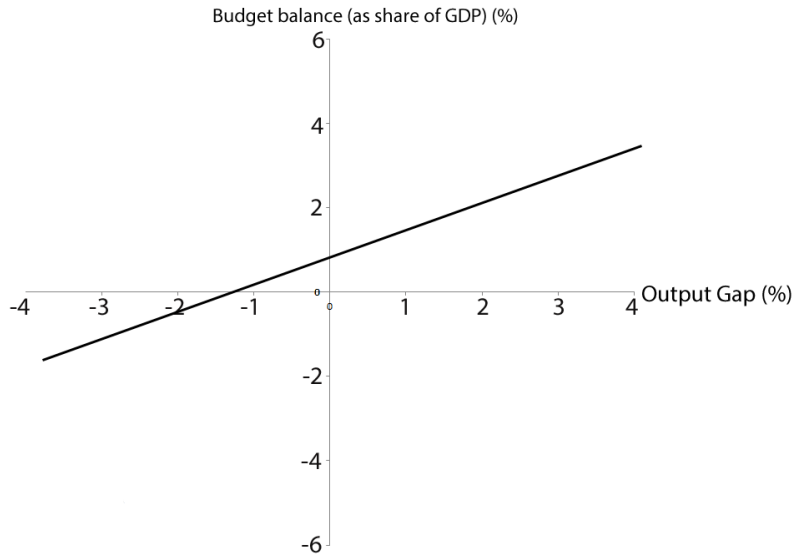
**Figure 4: Budget Balance as a Function of the Output Gap**

The angle of the line is the budget elasticity. If the proportion of the automatic stabilizers changes with for instance higher taxes the curve rotates. In the graph below the budget elasticity has increased through bigger automatic stabilizers.



**Figure 5: Increase in the Proportion of Automatic Stabilizers**

If on the other hand the Government decided to implement discretionary fiscal policy it does not change the angle of the curve but instead shifts the curve. In the example below a government decided on expansionary fiscal policy which, all else equal, shifts the curve down.

Budget balance (as share of GDP) (%)

Output Gap (%)

**Figure 6: Increased Discretionary Fiscal Policy**

These relationships can be expressed with the following calculation.

$$\Delta Budget\ Balance$$
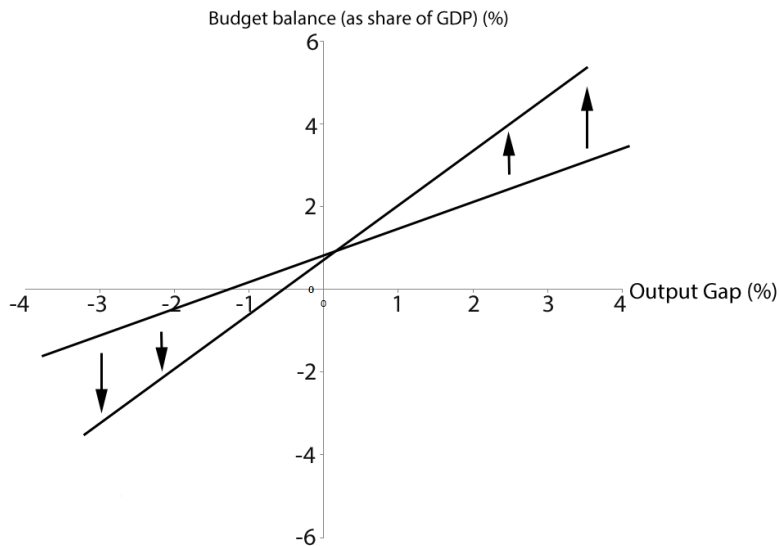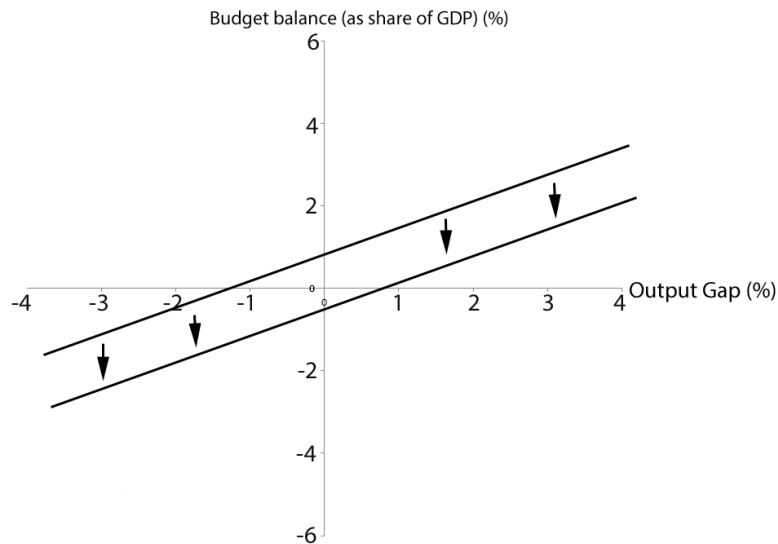$$= \Delta budget\ balance\ dependent\ on\ automatic\ stabilizers + discretionary\ fiscal\ policy$$
$$= Budget\ elasticity\ \times\ \Delta Output\ gap + discretionary\ fiscal\ policy$$

In other words, the budget balance is effected both by the output gap, since it triggers automatic stabilizers, and discretionary fiscal actions by a government. The output gap is dependent on autonomous changes in demand, discretionary fiscal policy and the multiplier. Furthermore, the proportion of the automatic stabilizers is calculated by the budget elasticity which is subject to change depending on changes in taxes and unemployment benefits.

In this essay I discuss both the overall size of the automatic stabilizers (budget elasticity ×output gap) and the proportion of the automatic stabilizers (budget elasticity). However, I only discuss the proportion of the automatic stabilizers indirectly with the help of other research.

To clarify, when conducting fiscal policy in a country with budgetary rules a government not only need to consider the discretionary part but also the automatic stabilizers. When calculating the overall cost of the automatic stabilizers a government needs to forecast the output gap as well as the proportion of the automatic stabilizers (i.e. the budget elasticity).

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# 6 Data

The data being used in this paper is primarily taken from the Swedish budget bills during the crisis years. I use forecasted numbers for the years 2009-2012 from the 2009 Spring Budget (published 2009-04-08), 2010 Budget Bill (published 2009-09-10) and the 2010 Spring Budget (published 2010-04-08). That 2012 is the last year I examine is because the data for later years is not complete.

The reasoning for using the 2009 Spring Budget as the first data source and not earlier budgets is that this is the first budget were the financial crisis is factored into the forecasts. Forecast error previous to the 2009 spring budget stems largely from the Government not predicting the financial crisis while forecasts in subsequent budgets incorporate the financial crisis.

That the 2010 spring budget is the last data source becomes natural since later budgets already calculated the actual fiscal policy outcomes for the crisis years. That there are so few data points is a problem and reflecting the issue of researching fiscal policy and the multiplier since it is anticipated to have different results at different times (see part 3). I try to negate the issues of few data points by using data from all the 3 budgets when conducting simple linear regressions and when examining if forecast errors were systematic.

Another issue is that the forecasts for 2009 should naturally also be more accurate than later forecasts since all the data sources are from 2009 and later. This means that the Government already should have been able factor in real outcomes from part of the year into their forecasts. However, this is again a problem of earlier forecast not factoring in the financial crisis and is therefore not relevant for understanding the Governments reasoning during the crisis.

The data is presented below. All forecasted data is taken from the budgets while most of the outcomes are taken from The Swedish National Institute of Economic Research. The outcomes for the output gap are taken from later budgets as well as the outcomes for the budget post concerning income taxes and unemployment benefits. To save space, the data concerning specific budget posts can be found in appendix 1.

| Table 2: The Data | 17 | | | |
|---|---|---|---|---|
| **Spring Budget 2009 (forecast)** | **2009** | **2010** | **2011** | **2012** |
| Income | 1 578 | 1 592 | 1 640 | 1 705 |
| Expenditure | 1 659 | 1 708 | 1 738 | 1 772 |
| Fiscal Balance | -81 | -116 | -98 | -67 |
| Fiscal Balance (% of GDP) | -2,7 | -3,8 | -3,1 | -2 |
| GDP | -4,2 | 0,2 | 2,4 | 4 |
| Output gap | -7,2 | -8,7 | -7,9 | -6,2 |
| **2010 Budget (forecast)** | **2009** | **2010** | **2011** | **2012** |
| Income | 1 593 | 1 605 | 1 657 | 1 727 |
| Expenditure | 1 660 | 1 711 | 1 724 | 1 763 |
| Fiscal Balance | -68 | -107 | -67 | -36 |
| Fiscal Balance (% of GDP) | -2,1 | -3,5 | -2,1 | -0,9 |
| GDP | -5,2 | 0,6 | 3,1 | 3,8 |
| Output gap | -6,4 | -6,5 | -5,0 | -3,0 |
| **Spring Budget 2010 (forecast)** | **2009** | **2010** | **2011** | **2012** |
| Income | 1 593 | 1 605 | 1 657 | 1 727 |
| Expenditure | 1 637 | 1 689 | 1 724 | 1 754 |
| Fiscal Balance | -25 | -67 | -32 | 14 |
| Fiscal Balance (% of GDP) | -0,8 | -2,1 | -1 | 0,4 |
| GDP | -4,9 | 2,5 | 3,9 | 3,5 |
| Output Gap | -5.3 | -4.4 | -2.9 | -1.9 |
| **Outcome** | **2009** | **2010** | **2011** | **2012** |
| Income | 1607 | 1 680 | 1 735 | 1 767 |
| Expenditure | 1643 | 1 686 | 1 731 | 1 789 |
| Fiscal Balance | -37 | -6,7 | 5 | -22 |
| Fiscal Balance (% of GDP) | -0,9 | 0 | 0 | -0,5 |
| GDP | -5,1 | 5,7 | 3,9 | 0,7 |
| Output gap | -5,7[5] | -3,9[6] | -0.9[7] | -2.7[8] |

[5] Budgetpropositionen för 2011 (2010)
[6] Budgetpropositionen för 2012 (2011)
[7] Budgetpropositionen för 2013 (2012)
[8] Budgetpropositionen för 2014 (2013)

# 7 Identification Strategy

There is an obvious problem of causation with using budget balance as the measure for fiscal policy. Mathematically speaking, if the multiplier is high enough a fiscal expansion could remove the fiscal deficit. Moreover, fiscal deficit or fiscal surplus can be created by external factors such slumps or booms in exports.

However, as I examine *forecasting* it is useful to determine fiscal policy with the help of the budget balance. This is because Sweden has a tight fiscal straight jacket (see part 4) which makes the size of the expansive fiscal policy dependent on the budget situation. Furthermore, the Swedish Government themselves uses the fiscal balance variable to determine if their fiscal policy is pro- or countercyclical.

Seeing that the Governments decisions for fiscal policy depends on the budget balance the Governments *forecasted* budget balance becomes an important gauge of its intentions for fiscal policy. Furthermore, by comparing the forecast with the outcome I can examine problems with the Government's predictions.

However, the method also has its limitations. It cannot for instance see the exact reasons for why the forecasts differed from the results. Perhaps the errors come from having the wrong fiscal multiplier or perhaps it comes from external factors. This problem is negated as I also examine forecast errors on specific budget post such as unemployment benefits and income taxes to see if the forecast error derives from failure in predicting automatic stabilizers.

## 7.1 Fiscal Savings instead of Structural Fiscal Savings

There is also the question about using fiscal savings and not structural fiscal savings since the latter is generally used as a tool for identifying a countries fiscal stance. The reasoning for why I use real fiscal savings and not structural fiscal saving as a measurement for fiscal policy is threefold.

Firstly, no matter where fiscal policy derives from, automatic or discretionary, it still contributes to the budget balance and to the fiscal multiplier. Logically, the Government should be more concerned with the real fiscal balance.

Secondly, the manner in which the structural fiscal savings is calculated is subject to criticism by the Swedish Fiscal Policy Council. The structural fiscal savings is calculated by the Swedish Ministry of Finance in the following way:

*Structural fiscal savings = Actual net lending – Automatic stabilizers –*
*Extraordinary tax revenue – One-off effects*

The Automatic Stabilizers are, in turn, calculated like this:

*Automatic stabilizers = Budget elasticity × Output gap*

The output gap is a measure of the difference between real and potential GDP. A negative output gap means a recession and a positive one means an economic boom. The number the Ministry of the Finance use for the budget elasticity is taken from the OECD and is 0.55. (Report of the Swedish Fiscal Policy Council 2011)

However, these numbers; the output gap and the automatic stabilizers, are criticized. The output gap is very hard to forecast, especially during large economic fluctuations. For instance, the Ministry of Finance's forecast for the 2009 output gap has varied with an interval of 5.5 % (ibid 53).

As for the automatic stabilizers, the budget elasticity that the Ministry of Finance uses is too high according to the Fiscal Policy Council since local governments are required to balance their budgets in Sweden. By assuming that the local government will indeed balance their budgets even during downturns and calculating their size of the entire Government's budget the council comes to the conclusion that the budget elasticity can be as low as 0.32 or at least 20 percent lower than the number that the Ministry of Finance uses (ibid 58-59).

Thirdly, no matter if you use the above calculations from the Fiscal Policy Council or the calculations from the Ministry of Finance the automatic stabilizers were calculated to be the biggest share of fiscal policy in Sweden during the financial crisis. Even if the Fiscal Policy Councils more conservative number for the budget elasticity would be used the automatic stabilizers would still be a biggest part of the fiscal policy.

It is important to remember that these numbers were forecasts and in the end the automatic stabilizers become smaller than predicted. However, the Government explicitly mentioned that automatic stabilizers where an important part of the fiscal policy at the time and should therefore be considered when examining Sweden's Fiscal Policy.

# 8 Method

In this study I use basic text-book economics as my method. The forecast errors are calculated by subtracting the forecast with the real outcome.

$$Forecast\ error = forecast - real\ outcome$$

In order to investigate if there were systematic forecasting errors the average forecasting error is being used. These are calculated by taking the sum of forecast error and dividing it by the number of observation.

$$Average\ error = \frac{\sum forecast\ error}{number\ of\ observation}$$

(Fregert & Jonung 2011:396-397)

To examine the reason for the forecast error a simple linear regression is used. I use forecasting error in GDP growth as the independent variable (x) and forecasting error in budget balance as the dependent variable (y).

$$Budget\ balance\ forecast\ error\ =\ \beta_1 +\ \beta_2 * GDP\ growth\ forecasting\ error +\ \varepsilon$$

Since the Government uses output gap to forecast automatic stabilizers I also make a similar linear regression but exchange forecasting error in GDP growth with forecasting error in output gap.

$$Budget\ balance\ forecast\ error\ =\ \beta_1 +\ \beta_2 * output\ gap\ forecast\ error +\ \varepsilon$$

I also examine if the forecast errors primarily derives from failures in forecasting automatic stabilizers. Here I use the following calculation:

*(Forecasted income tax– Forecasted expenditure for unemployment benefits) – (income tax– expenditure for unemployment benefits)= Approximation of forecast error of automatic stabilizers*

Furthermore, in order to investigate the manner the Government measures the automatic stabilizers I also add value added tax to the calculations.

*(Forecasted income for tax for work + forecasted income for value added tax – forecasted expenditure for unemployment benefits) – (income for Tax for work + income for value added tax–expenditure for unemployment benefits) = Approximation of forecast error of governments definition of automatic stabilizers*

# 9 Results

In this section I present the findings. The mathematical findings are presented together with the language in the budget bills in order to understand the intentions of the Government.

Examining the Swedish budget bills during the crisis years you find a distinct shift from previous forecast in the Spring Budget of 2009. This is the first budget where the Government plans for expansionary fiscal policy and a budget deficit of several percentage points of GDP . In this budget it is argued that the current situation is hard to forecast, however, "[a]gainst the background of the deep recession it is important to avoid that fiscal policy becomes pro-cyclical. It is therefore justified to undershoot the surplus target in order for the budgets' automatic stabilizers to work fully." (Spring Budget 2009:50 (own translation)).

Similar language is used both the in the 2010 Budget Bill and the 2010 Spring Budget. There it was argued that it was justifiable to fall short of the surplus goal in order to maintain demand. This shows that the Government believed that the state can create demand by using expansionary fiscal policy in the same vein as Keynes argued for. Furthermore, they emphasized that this was the correct time for fiscal policy since monetary policy was already very expansive and the interest rate was close to zero, a line of reasoning which is comparable with the theoretical framework on liquidity traps (see part 3) (2010 Budget bill 2009:40). Consequently, the reasons that the Government planned to run deficits was not because they could not balance the budget but rather because they wanted to create demand.

Concerning the discretionary fiscal policy the Government outlined in the 2010 budget bill that they would invest 48 billion kronor (1.6 percent of GDP) in 2009 and 35 billion kronor (1.1 percent of GDP) in 2010 to combat the economic downturn. For instance, local governments were given a one-time increase in support of 10 billion kronor since they are especially sensitive to downturns because their budgets need to be balanced (ibid: 41-42).

However, the Government believed that automatic stabilizers would be the lion's share of the stimulus. In the Spring Budget 2009, the 2010 Budget and on the Financial Ministers own blog they published data from an OECD study, which showed that Sweden would have the biggest stimulus cumulated over the period 2008-2010 as a per cent of 2008 GDP and that the

automatic stabilizers would be more than 3 times the size of the discretionary fiscal policy (see Figure 7 and 8 below). They emphasized "[i]n Sweden a large part of the stabilizing fiscal policy, which in other countries requires active decisions, are made with automatic stabilizers" (2010: 41(own translation))
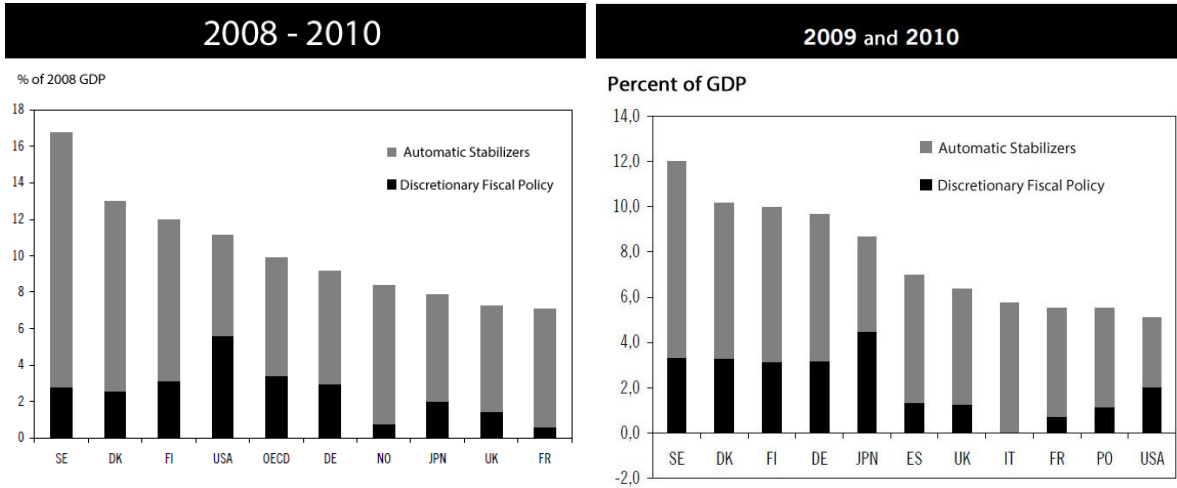


**Figure 7 and 8: Size and Composition of the Fiscal Policy from the Spring Budget 2009 and the 2010 Budget**

The actual forecasted numbers from the budget can be seen in table 3 below of the forecasted fiscal balance in the budgets.

| Table 3: Forecasted Fiscal Balance (% of GDP) | | | |
|---|---|---|---|
| Year | Spring Budget 2009 | Budget 2010 | Spring Budget 2010 |
| **2009** | -2,7 | -2,1 | -0,8 |
| **2010** | -3,8 | -3,5 | -2,1 |
| **2011** | -3,1 | -2,1 | -1 |
| **2012** | -2 | -0,9 | 0,4 |

The table shows rather big forecasted deficits which was also in line with the language of the budgets at the time. However, the outcome became quite different. As seen in figure 9 below the fiscal balance was not as negative as predicted. In 2009 the budget deficit was much smaller than predicted, in 2010 the budget was almost balanced, and in 2011 Sweden had a small budget surplus.
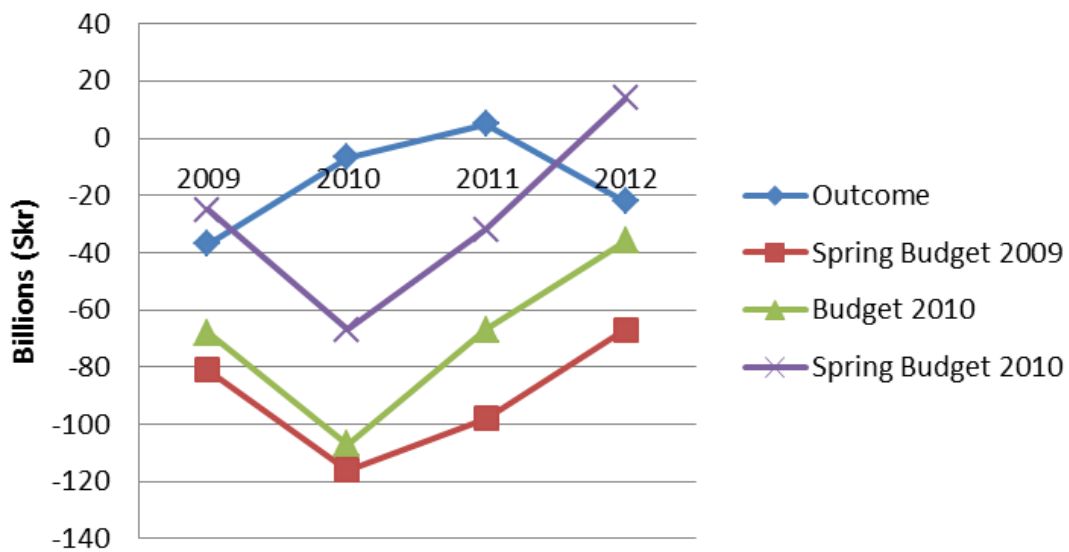
# Fiscal Balance Vs Forecast

Figure 9: Fiscal Balance compared to Forecasted

Figure 9 show that the forecasts in the Spring Budget 2009 and the 2010 Budget Bill both overestimated the size of the deficit for all 4 years. Calculating the forecast error and average forecast error (table 4 below) confirms that size of the fiscal policy was systematically overestimated during the crisis years. The error becomes smaller the closer the forecast is to the forecasted year but is on all instances except for two overestimating the deficit.

| Table 4: Forecast Error of Fiscal Balance (Billions Skr) | | | |
|---|---|---|---|
| Year | Spring Budget 2009 | 2010 Budget | Spring Budget 2010 | Average Error |
| 2009 | -44 | -31 | 12 | -21 |
| 2010 | -109,3 | -100,3 | -60,3 | -89,97 |
| 2011 | -103 | -72 | -37 | -70,67 |
| 2012 | -45 | -14 | 36 | -7,67 |

But why were these big and systematic errors made? By looking at the forecasted government income and expenditure it is apparent that the largest forecast errors come from underestimating the Government's income during the crisis years (Figure 10). Government expenditure was on the other hand closer to forecasts (Figure 11).
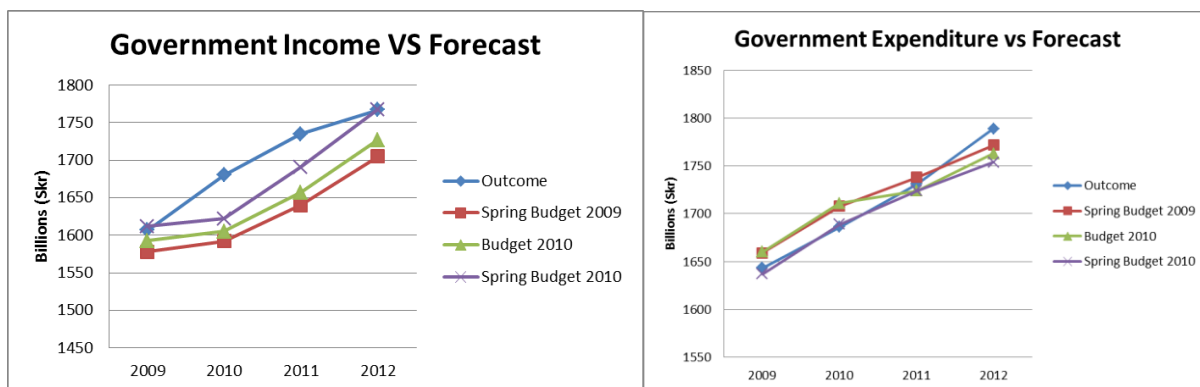
25

**Figure 10 and 11**

Calculating the forecast error and the average error also illustrates this. The Government systematically underestimated the income while the forecast error for expenditure is not as big (see table 5 and table 6 below).

| Table 5: Forecast Error Government Income (Billions Skr) | | | | | Table 6: Forecast Error Government Expenditure (Billions Skr) | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Year | Spring Budget 2009 | Budget 2010 | Spring Budget 2010 | Average Error | Year | Spring Budget 2009 | Budget 2010 | Spring Budget 2010 | Average Error |
| 2009 | -29 | -14 | 5 | -12,7 | 2009 | 16 | 17 | -6 | 9 |
| 2010 | -88 | -75 | -58 | -73,7 | 2010 | 22 | 25 | 3 | 16,7 |
| 2011 | -95 | -78 | -44 | -72,3 | 2011 | 7 | -7 | -7 | -2,3 |
| 2012 | -62 | -40 | 1 | -33,7 | 2012 | -17 | -26 | -35 | -26 |

Now, why did the Government fail in forecasting their income to such a high degree that the fiscal policy that was supposed to create demand ended up being rather modest? One reason could have been that they also overestimated the severity of the downturn. If they accounted for a much deeper recession they would believe that they had lower income and less money to spend because automatic stabilizers would be triggered to a larger degree. To see if the forecast error in budget balance can be explained by the forecast error in GDP growth I use a simple linear regression:

$$Budget\ balance\ forecast\ error\ =\ \beta_1 +\ \beta_2 * GDP\ growth\ forecasting\ error +\ \varepsilon$$

At the 95 % confidence level I find a significant correlation between the forecast errors in GDP growth and forecast error in budget balance (see table 7 below). The estimate of $\beta_2$ is 0.387 which implies that for every percentage point higher GDP growth than forecasted the budget deficit was 0.387 % lower than forecasted.

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| Table 7: Budget balance forecast error dependent on GDP growth forecasting error | | | | |
|---|---|---|---|---|
| Equation: $Budget\ balance\ forecast\ error\ =\ \beta_1 + \beta_2 * GDP\ growth\ forecasting\ error + \varepsilon$ (Results at the 95% confidence level) | | | | |
| | $\beta_1$ | $\beta_2$ | $R^2$ | p-value |
| All 3 Budgets (12 observations) | -1,435 | 0,387 | 0,643 | 0,002 |

I get similar results if I exchange GDP growth forecast error with output gap forecast errors.

| Table 8: Budget balance forecast error dependent on Output gap forecasting error | | | | |
|---|---|---|---|---|
| Equation: $Budget\ balance\ forecast\ error\ =\ \beta_1 + \beta_2 * output\ gap\ forecast\ error + \varepsilon$ (Results at the 95% confidence level) | | | | |
| | $\beta_1$ | $\beta_2$ | $R^2$ | p-value |
| All 3 Budgets (12 observations) | -0,610 | 0,472 | 0,601 | 0,003 |

This result is in itself not surprising, higher GDP growth and smaller output gap should logically lead to higher state income and lower deficit all else equal. 2010 was the year with the biggest forecast error were made and it was a hard year to forecast for all forecasters and the Ministry of Finance errors are not significantly worse than other institutions (Konjunkturläget Mars 2001: 136). The Government was aware that they overestimated the fall in income during these years; in the 2010 Budget Bill and the 2010 Spring Budget the Government also mentions that they have more room for reforms because of the improved situation.

To examine if this big forecast error was made because they overestimated the size of the automatic stabilizers and not some other external factor I further check what the errors derives from. Automatic stabilizers compromise a number of posts in the budget; on the income side they compromise primarily income taxes since they are progressive. On the cost side the automatic stabilizers are the unemployment benefits and welfare benefits.

By taking the forecasted tax for work and subtracting it with the forecasted budget post that incorporates unemployment benefits[9] we get a general idea if the forecast error of fiscal policy depends on miscalculations of the automatic stabilizers.

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[9] Expenditure post: 14 "Arbetsmarknad och arbetsliv"

| Table 9: Approximation of Forecast error of Automatic Stabilizers (billions of Skr) | | | | |
|---|---|---|---|---|
| Year | Spring Budget 2009 | 2010 Budget | Spring budget 2010 | Average Error |
| 2009 | -12,4 | -3,5 | (No data) | -8,0 |
| 2010 | -32,8 | -29,2 | -12,0 | -24,6 |
| 2011 | -50,2 | -44,6 | -17,8 | -37,5 |
| 2012 | -49,4 | -47,1 | -8,2 | -34,9 |

As can be seen in table 9 the Government systematically overestimated the size of the automatic stabilizers. The forecast error is not as big as the forecast error for the budget balance but still substantial. Furthermore, the manner in which the Government calculates automatic stabilizers also incorporates value added tax. If we make a similar calculation but also add value added tax to the calculations we get the following numbers:

| Table 10: Approximation of Forecast error of Governments definition of Automatic Stabilizers (billions of Skr) | | | | |
|---|---|---|---|---|
| Year | Spring Budget 2009 | 2010 Budget | Spring budget 2010 | Average Error |
| 2009 | -24,9 | -12,1 | (No data) | -18,5 |
| 2010 | -65,8 | -58,1 | -26,5 | -50,1 |
| 2011 | -83,5 | -72,6 | -30,2 | -62,1 |
| 2012 | -70,9 | -62,1 | -5,3 | -46,1 |

Adding value added tax to the calculations shows an even higher forecast error with the broader definition of automatic stabilizers. It seems like a big explanatory factor for the forecast error in planned fiscal policy was that the Government overestimated the size of the automatic stabilizers.

In the end, the outcome of the fiscal policy was not determined by a will to create demand but rather a consequence of failing to forecast the Government's income. This was because the Government explicitly viewed automatic stabilizers as an important fiscal policy tool to stabilize the economy and since the overall size of the automatic stabilizers is dependent on the state of the economy fiscal policy becomes dependent on forecasts of GDP growth.

# 10 Concluding Remarks

The findings in this paper, that forecast error in GDP growth and the output gap led to forecast error on the size of the fiscal policy are not surprising, however, they do have some important policy implications. Automatic stabilizers are viewed to be a good fiscal policy tool just because they are automatic and do not have to rely on active decisions. However, this study shows that relying on automatic stabilizers as you primary fiscal policy tool puts a heavy burden on forecasting. This is because the automatic stabilizers are primarily dependent on the income side of the country's budget together with the budget elasticity. Predicting the income side of the budget is dependent on GDP growth which is especially hard to forecast during big shocks to the economy. Furthermore, predicting the budget elasticity can also be problematic as previous research has already shown that the OECD numbers for budget elasticity of 0.55 (i.e. the proportion of the automatic stabilizers) that the Swedish Government was using was too high.

Using automatic stabilizers for fiscal policy are in itself not bad. It has several big advantages it is contra-cyclical, instantaneous, and does not dependent on, sometimes slow, decision making. However, miscalculating the automatic stabilizers can also have negative effects on discretionary fiscal policy. Because of fiscal straitjackets and problems of forecasting automatic stabilizers it is easy to see a scenario where the discretionary fiscal policy becomes less expansive because a government tries to avoid violating budgetary rules if a big downturn is forecasted. In the budgets of the crisis years of 2009 and 2010 the Swedish Government was ready to exceed the Surplus target with several percentage points of GDP, however, because of large forecast errors the size of the fiscal policy became much smaller.

An issue that muddles the findings in this paper is the question of how vital the Government viewed fiscal policy. Since the economy was trending better than predicted perhaps the Government did not believed that the forecasted fiscal policy was needed. Furthermore, the theoretical debate on the effectiveness on fiscal policy is far from over and for small open economies, such as Sweden, it is even more unclear. And even though the language of the budgets showed a belief in fiscal policy the primary part was automatic and not discretionary. The Swedish Fiscal Policy Framework from 2010 also showed that the Government had rather low expectations on the size of the multiplier which they viewed to range between 0

and 1. If the Government does not believe in the usefulness of fiscal policy emphasizing the automatic stabilizers can be a way to have it both ways as the Government was seen as having the biggest fiscal policy within all OECD member states without actually having a big discretionary stimulus. However, at the same time you cannot fault the Government for using OECD numbers or for having overly pessimistic forecasts since all forecasters overestimated the slump at the time.

To conclude, this study falls in line with the recommendations of the fiscal policy council that the Government should revise the way they forecast automatic stabilizers. Furthermore, policy makers in countries with fiscal straitjackets should be aware of the dangers of using automatic stabilizers as their primarily fiscal policy tool as they are heavily dependent on forecasts.

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# Appendix 1: Data for Calculating Forecast Error for Automatic Stabilizers

| Income (Automatic Stabilizers) | | | | |
|---|---|---|---|---|
| **Municipality Income Tax** | | | | |
| Year | Spring budget 2009 | 2010 budget | Spring budget 2010 | Outcome |
| **2009** | 507,1 | 510,8 | 510,1 | 511,1 |
| **2010** | 510,4 | 513,9 | 520,7 | 522,9 |
| **2011** | 520,7 | 525,2 | 537,6 | 538,2 |
| **2012** | 537 | 542 | 559,7 | 562,7 (forecast) |
| **Government Income Tax** | | | | |
| Year | Spring budget 2009 | 2010 budget | Spring budget 2010 | Outcome |
| **2009** | 41,1 | 41,2 | 40,7 | 40,1 |
| **2010** | 41,6 | 42,1 | 42,4 | 42,5 |
| **2011** | 42,3 | 43,2 | 43,7 | 44,6 |
| **2012** | 43,6 | 44,5 | 45,4 | 44,4 (forecast) |
| **Value Added Tax** | | | | |
| Year | Spring budget 2009 | 2010 budget | Spring budget 2010 | Outcome |
| **2009** | 289 | 292,9 | 302,6 | |
| **2010** | 291,3 | 295,4 | 309,8 | 301,5 |
| **2011** | 299,2 | 304,5 | 320,1 | 324,3 |
| **2012** | 310,1 | 316,6 | 334,5 | 332,5 (forecast) |
| Expenditure (Automatic Stabilizers) | | | | |
| **Work related transfers (Expenditure post: 14)** | | | | |
| Year | Spring budget 2009 | 2010 budget | Spring budget 2010 | Outcome |
| **2009** | 70 051 | 64 950 | (no data) | 60 620 |
| **2010** | 87 908 | 88 358 | 78 240 | 68 556 |
| **2011** | 93 647 | 93 524 | 79 567 | 63 285 |
| **2012** | 89 579 | 93 083 | 72 855 | 66 633 (forecast) |

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