UNIVERSITY OF TARTU

Faculty of Economics and Business Administration

Institute of Economics

Lauri Punga

THE CYCLICAL CONDUCT OF ESTONIAN FISCAL POLICY

Master's Thesis

Supervisor: Viktor Trasberg, knd

Tartu 2014

Recommended for defence   ....
<div align="center">(supervisor's signature)</div>

Accepted for defence "   " 2014

Head of Chair , Chair of Economic Theory   ....
<div align="center">(Head of Chair's name and signature)</div>

I have written the Master's thesis independently. All works and major viewpoints of the other authors, data from other sources of literature and elsewhere used for writing this thesis have been referenced.

....
<div align="center">(author's signature)</div>

TABLE OF CONTENTS

INTRODUCTION

In the aftermath of the global economic crisis, it is difficult to think of an area of research more relevant in today's economy than stabilization policy. It is not only a question of good economics, but also a highly sensitive political debate, and with real consequences for average citizens (either consumers or producers). The ultimate goal of stabilization policy is to moderate economic fluctuations with the tools of monetary and fiscal policy. With short-term interest rates lowered close to zero by many influential central banks, monetary policy has exhausted its traditional stimulative channel to affect the real economy. Due to the prolonged economic crisis, fiscal policy has returned to center stage as a macroeconomic tool. As it is a theme with strong Keynesian flavor, the skepticism towards activist fiscal policy remains widespread, especially in Europe.

Despite being the largest economic downturn since the Great Depression of 1929-1939, the recent economic crisis has provided three positive aspects associated with the topic of this thesis. Firstly, the prolonged recession has induced a new wave of research and publications regarding business cycles and the management of aggregate demand via monetary and fiscal policies. The list of references can easily be split into two sections – articles produced before and after the global economic and financial crisis (as the role of fiscal policy has been reconsidered). From this point forward, we refer to the latest economic crisis as the Great Recession.

Secondly, as a consequence of the deflationary processes due to the crisis, Estonia managed to fulfill the Maastricht criteria in order to join the euro area in 2011. Joining a monetary union has important implications for the conduct of fiscal policy. Thirdly, the economic contraction that started in 2008 provided a second trough to conclude the first full business cycle of modern Estonian economy. This provides the logical time frame for the empirical analysis.

The cyclical aspect in the conduct of national fiscal policy, as introduced in the title of the thesis, refers to the manner in which fiscal policy decisions influence, and are influenced, by the cyclical developments in the economy. The conduct of fiscal policy can either moderate the economic fluctuations through counter-cyclical policy or to amplify the economic fluctuations through pro-cyclical policy, depending on the fiscal policy stance and the position of the economy in the business cycle – the alternating sequence of expansion and contraction in economic activity. The term „counter-cyclical" refers to fiscal policy which is supposed to stabilize the business cycle (i.e. lean against the wind), meaning higher taxes, lower government spending, and therefore larger surpluses during expansions (and vice versa in recessions).

The objective of the thesis at hand is to *assess the cyclical conduct of Estonian fiscal policy over the recent business cycle*. We look to gain a better understanding of how fiscal policy in Estonia behaves in response to business cycles, i.e. what is the relationship between budgetary positions and the cyclical developments in the economy. In order to achieve that objective, the following research goals must be fulfilled:

- introduce the theoretical principles of managing business cycles with fiscal policy;
- discuss the institutional and countercyclical aspects of Estonian fiscal policy framework;
- review the empirical literature on measuring fiscal policy stance, including the methodology and main results;
- define the recent Estonian business cycle and analyze the performance of Estonian macroeconomic and budgetary variables during that period;
- provide an ex-post empirical analysis of the conduct of Estonian fiscal policy, including by constructing a regression model for analyzing the relationship between budgetary variables and output fluctuations;
- provide a conclusive, empirically-based assessment to the conduct of Estonian fiscal policy with related policy implications.

In short, the overriding goal is to provide a well-argumented answer to an important policy debate – has fiscal policy in Estonia been countercyclical or procyclical?

Taking into account the cyclical developments of the Estonian economy and data limitations, the analysis is focused on the period 1996-2012. This provides the longest available data series for the econometric analysis, and most importantly, includes the first full-scaled business cycle in modern Estonian economy.

Estonian macroeconomic policy performance is often criticized by academics and various economic organizations as being procyclical, but without providing the empirical analysis that led to such a result. Most commonly, procyclicality in Estonian fiscal policy is associated with only modest surpluses and the practice of positive supplementary budgets during the previous expansionary period, and with the austerity measures implemented during the recent economic crisis. Due to data shortcomings or a small sample size of economic indicators, Estonia is often missing from larger scale comparative country studies. This is similarly true for the analysis of various aspects of fiscal policy. Therefore, the following analysis attempts to provide an original contribution to a policy-relevant area of research.

In the empirical analysis, we look to provide an ex-post evaluation to the conduct of Estonian fiscal policy. The goal is not to analyze the overall performance of fiscal policy with all the aspects involved, but only its stabilization function – how has the Estonian government used fiscal policy in general, and discretionary fiscal policy specifically, to react to economic fluctuations? In our assessments, we follow the principle that in order for fiscal policy to contribute to short-term stabilization, it must be implemented in a countercyclical fashion. Therefore, as a rule, fiscal policy should not be procyclical. For that purpose, the predominant focus in the empirical literature on fiscal cyclicality has been on how fiscal variables co-move with the output cycle. More specifically, econometric analysis of fiscal policy tends to be done in the context of fiscal policy reaction functions (or „fiscal rules") that capture the behavior of fiscal policy as a response to cyclically changing macroeconomic conditions.

The rest of the thesis is structured as follows. Chapter 1 introduces the theoretical background necessary for the empirical analysis of Estonian fiscal policy. Section 1.1. reviews the theory of using fiscal policy as a stabilization tool over the business cycle. Section 1.2. provides a closer look at the institutional setting in which Estonian fiscal policy decisions have been made in the past (and also will be made in the near future).

Section 1.3. concludes the theoretical chapter of the thesis by discussing the appropriate methodologies and similar studies published in the fiscal policy literature.

The empirical chapter of the thesis starts with an analysis of the Estonian economic performance over the recent business cycle together with a narrative of government budgetary dynamics, as an assessment of the economic cycle and its impact on the budget is critical to the pursuit of countercyclical policies. Section 2.2. provides the empirical (and econometric) analysis in order to assess whether Estonian fiscal policy have behaved pro- or countercyclically over the recent business cycle. Section 2.3. discusses the results and draws policy implications. Complete data concerning Estonian macroeconomic performance and various budgetary indicators is provided in the appendices. The author is thankful to the Estonian Ministry of Finance for providing the data most critical to the analysis – various budgetary positions and the estimates for the output gap.

1. FISCAL POLICY OVER THE BUSINESS CYCLE

1.1. Stabilizing business cycles with fiscal policy

To start the analysis, we review the basic theory surrounding fiscal policy as a business cycle stabilization tool – its components, advantages, and disadvantages. As becomes evident, the stabilization role of fiscal policy is only one of the three larger functions assigned to fiscal policy, and therefore countries naturally differ in their policy conduct. In order to analyze the policy performance of a single country, we first need to understand the economic analysis behind the decision-making process.

A much-cited article by Lucas (2003: 1) proposed that macroeconomics had succeeded in solving its central problem of depression prevention and that the potential welfare gain from better long-run policies far exceeded the potential of improving short-term demand policies. However, the sheer scale of the recent global economic crisis (the so-called Great Recession) have once again moved aggregate demand policies to the forefront of policy debates.

Bénassy-Quéré et al (2010: 21) introduce the essential functions of fiscal policy based on the well-known Musgrave's three branches of government:

1) *Allocation of resources* covers public interventions aiming at affecting the quantity or the quality of the factors available for production and their sectoral or regional distribution;

2) *income redistribution* covers policies aiming at correcting the primary distribution of income between agents or regions;

3) *macroeconomic stabilization* covers policies aiming at bringing the economy closer to balance as a response to exogenous shocks that move the economy away from it (with the balance defined as full employment with price stability).

The three functions of national fiscal policy are therefore allocation, redistribution and stabilization. As explained by Bénassy-Quéré et al (2010: 21), redistribution has a different scope than either allocation or stabilization, since it addresses the distribution of income within society. The distinction between allocation and stabilization policies is illustrated in Figure 1, as they represent two different time periods while analyzing the economic output of a country.
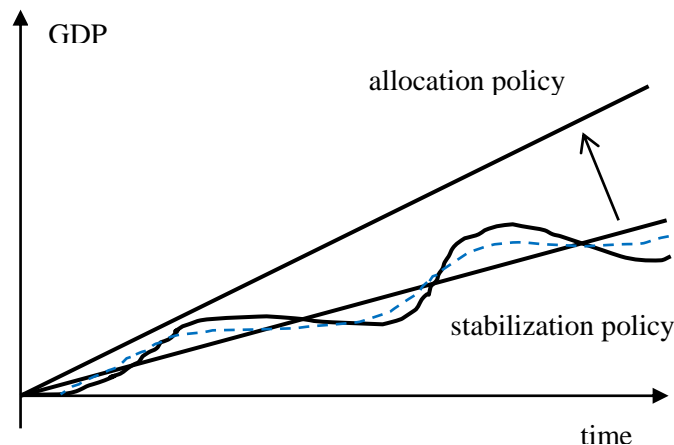

Figure 1. Stabilization versus allocation policies (Bénassy-Quéré 2010: 21).

In the figure above, the combination of the two ascending lines indicate the operation of allocation policy while the dashed wavy line indicates the operation of stabilization policy. The distinction between them directly refers to the distinction between long-term output growth and short-term fluctuations around the trend: allocation policies aim at increasing the maximum level of output (as indicated by the arrow) that can be reached without creating inflation – what is generally called *potential output* (i.e. potential GDP), while stabilization policies aim at minimizing the divergence between actual and potential output, known as the *output gap* (Bénassy-Quéré 2010: 21). The consensus view amongst economists is that potential output is primarily driven by supply-side factors while the short-run fluctuations in real GDP are primarily caused by aggregate demand shocks (Snowdon & Vane 2005: 703). The properties of Figure 1 also provides an alternative view of two distinct tasks for macroeconomic policy-makers. The objective of *growth* policy is to ensure that the economy sustains a high long-run growth rate of potential GDP, while the objective of *stabilization* policy is to keep actual GDP reasonably close to potential GDP in the short run (so to avoid excessively high unemployment or inflation).

The discussion now turns to the policy tools available for policy-makers. A textbook definition of stabilization policy is the active use of monetary and fiscal policy to influence the aggregate demand for goods and services, as the goal of stabilization policy is to minimize the social welfare loss from the volatility of output and inflation (Sorensen & Whitta-Jacobsen 2010: 584).

A closer look at the role of stabilization policy (together with a stylized business cycle) is provided in Figure 2. The wavy line indicates the performance of actual GDP over the business cycle (a business cycle is typically measured from trough-to-trough). During the expansion phase of a business cycle, growth in actual GDP can temporarily exceed the growth rate of economy's potential capacity to produce. During the recessionary phase, however, the growth rate of potential output can exceed the growth rate of actual GDP.

Figure 2. Stabilization policy over the business cycle (based on Langdana 2009: 49).

Once again, the dashed wavy line indicates the potential role for countercyclical stabilization policy – to avoid excessive and unsustainable growth (overheating) in the cyclical upturn and to dampen the below-potential (or even negative) growth performance during cyclical downturns. The opposite of countercyclical stabilization policy is procyclical policy. Under such circumstances, the policy-makers either provide further stimulus to the overheating process or induce additional economic distress during downturns. As a result, the economy is characterized by even greater short-term volatility around the trend.

As explained by Bénassy-Quéré et al (2010: 30), the motive for intervening in the name of stabilization policy is the search for efficiency and the consequential efficiency loss resulting from not reaching it. During an economic downturn, as the government works to employ idle resources, economic activity falls less than it would have in the absence of government intervention (Courtois 2009: 3).

Macroeconomists debate over what policies they can and should pursue to reduce short-run fluctuations in economic activity, as both fiscal and monetary policies affect aggregate demand. The traditional Keynesian view of aggregate demand implies that the amount of goods and services demanded in an economy equals the sum of private consumption, investment and government spending (AD = C + I + G). Expansionary fiscal policy aiming to boost demand and output in the economy can do so either directly, through greater government spending (G), or indirectly, through tax reductions that stimulate private consumption (C) and investment spending (I) (Walsh 2002: 26). The opposite is true for contractionary fiscal policy during periods of economic overheating. The debate in the empirical literature looks to answer the question whether government spending or tax changes are the most effective instruments in influencing aggregate demand through fiscal policy.

To conclude, countercyclical fiscal policy aims to boost economic activity by increasing aggregate demand during economic downturns, when insufficient demand has led to below-capacity production levels (and the roles are reversed during economic overheating). The purpose of stabilization policy is to engage more of the economy's existing productive capacity, therefore improving welfare and minimizing the inefficiency losses. The critical question for an active fiscal stabilization policy is the ability to adjust the intervention appropriately given the nature of shocks and the structure of the economy (Andersen 2005: 22).

As explained by Andersen (*Ibid*.: 22), if aggregate demand plays a role in determining output in the short run, then it follows that temporary variations in public spending or taxation can have important effects and can be used to stabilize the economy. However, it is much easier to establish a principle case for an active stabilization policy than to implement it in practice.

Governments have assumed a more active role in managing the economy as a response to global economic crisis. According to Coenen et al (2010: 6), the fiscal stimulus packages in euro area countries amounted to roughly 2 per cent of GDP in 2009-10 (not counting off-balance-sheet measures and the economic support coming from automatic fiscal stabilizers). In comparison, the fiscal stimulus measures adopted in the U.S. in 2009-10 were equivalent to roughly 5 per cent of the U.S. GDP (Cameron 2010: 1).

The fiscal policy-makers have two main policy instruments available to them to stabilize the business cycle – taxation and public spending (the so-called textbook „t" and „G"). The main categories on the revenue side include taxes on individuals, business taxes, consumption taxes and social security contributions. Similarly, spending measures can be separated into government consumption and investment, transfers to households, businesses, and sub-national governments.

Fiscal policy instruments can contribute to the stabilization of the economy in several ways. Stabilization can result from *discretionary* policy-making, when governments actively decide to adjust spending or taxes in response to changes in economic activity. Changes in government revenue and expenditure which occur without requiring new decisions by policy-makers and result from the impact of economic fluctuations on budgetary components are called *automatic* fiscal stabilizers. Automatic fiscal stabilization (e.g. automatic stabilizers) results from certain features of taxation and social transfers that are built into tax codes and social legislation. (Monthly Bulletin 04... 2013) For example, as output falls, tax revenues also fall and unemployment payments rise. Automatic stabilizers thus cause the nominal budgetary balance to fluctuate in similar pattern as growth – when GDP growth accelerates automatic stabilizers contribute to lower deficits or higher surpluses, and vice versa, when GDP growth decreases automatic stabilizers contribute to smaller surpluses or higher deficits.

In addition, automatic stabilization stems from the resilience of major spending components with regard to economic fluctuations, since these components are pre-committed in annual budgets or even in multi-annual expenditure rules (Monthly Bulletin 04... 2013). Since government spending is usually less volatile than other components of GDP (private consumption, investment or net exports), it contributes to output stability through a composition effect.

Debrun & Kapoor (2010: 71) introduce a third channel of how fiscal policy decisions can contribute to macroeconomic stability – structure of the tax and transfer system could be designed to maximize economic efficiency and market flexibility, thereby enhancing the resilience of the economy in the face of shocks. The underlying resilience of the economy to foreign (and domestic) shocks could be especially important to small and open economies. Overall, the less volatile the economy, the smaller the potential need for discretionary fiscal policy actions.

The traditional Keynesian fiscal stimulus is associated with the use of temporary tax cuts or temporary increases in government spending to increase aggregate demand during a recession. As explained by Seidman (2012: 5), during a severe recession, advocates of Keynesian stimulus place a higher priority on combating the recession than on balancing the budget or preventing an increase in government debt. In other words, it is customary to ignore issues of long-term fiscal balance when confronting the need for countercyclical fiscal policy (Auerbach 2009: 7). Along the same lines, Romer (2012: 15) distinguishes two types of fiscal policy-makers – fiscal hawks care about the long-run deficit and want immediate action to get it down, while fiscal doves care about unemployment and want to use fiscal stimulus to reduce it.

Automatic stabilizers operate more powerfully in some economies than in others. As built-in automatic stabilizers provide the first line of defence in an economic downturn, the need for further discretionary measures have to be weighted against the strength of country-specific automatic stabilizers. The extent of automatic stabilization depends on several factors: the size of the public sector, the cyclicality of the tax base, the design of the public social security system and the progressivity of taxes (Financial Stress... 2013). The higher the public spending-to-GDP ratio, the more the economy is effectively shielded from economic fluctuations. On the revenue side, fiscal stabilization increases with the progressivity of the tax system. (Monthly Bulletin 04... 2013)

Debrun & Kapoor (2010: 69) find that the moderating effect of automatic stabilizers have appeared to have weakened during the decade before the Great Recession and also, that automatic stabilizers do not seem to be effective in developing economies. Interestingly, there seems to be little systematic evidence that countries with leaner governments compensate for weaker automatic stabilizers by using more discretion in

fiscal policy decisions. This allows to conclude that automatic stabilizers tend to play a more consistently countercyclical role than discretionary fiscal policy and that the changes in discretionary fiscal policy must be either poorly timed or related to factors other than output stabilization. (The Effectiveness... 2013)

In light of the Great Recession, the variation in the amount of discretionary fiscal stimulus undertaken could also be explained by the severity of the crisis in each country and the fiscal health before the crisis (Romer 2012: 8). An economy's fiscal health is associated in literature with the „fiscal space" or „fiscal leeway" available for counter-cyclical discretionary fiscal measures to be potentially implemented during a recession.

The advantages of being able to let the automatic stabilizers operate (in contrast with discretionary measures) are well-known – they are not subject to time-lags or political decision-making processes and their economic impact adjusts automatically to the cycle (Monthly Bulletin 06... 2013). Automatic stabilizers respond in a timely, foreseeable and symmetrical manner over the economic cycle, moderating overheating in expansionary periods and supporting economic activity in recessionary periods. As long as economic fluctuations remain balanced, automatic stabilizers do not affect the underlying soundness of budgetary positions. (Monthly Bulletin 04... 2013)

Contrary to discretionary fiscal policy, automatic stabilizers are also not subject to the politically-charged problem of (eventually) reversing the announced stimulus measure. On a downside, sizeable automatic stabilizers can delay the adjustment of an economy (Monthly Bulletin 04... 2013).

The symmetrical manner of the operation of automatic stabilizers ensures that the fiscal impulse generated by the budget's automatic response to changing economic conditions is always countercyclical, by definition. Therefore, in order for the overall fiscal policy stance in an economy to be procyclical, the countercyclical impulse of automatic stabilizers must be dominated by even larger procyclical impulse generated by discretionary policy actions.

As mentioned above, automatic stabilizers play an immediate role during downturns as the first line of defence in moderating the economic fluctuations. However, the fiscal

variables that underpin the working of automatic stabilizers are not designed primarily for stabilization purposes. On the contrary, they are designed in the first instance to cater for economic equity or efficiency objectives, with automatic stabilization of business cycles arising as a side-benefit (Counter-cyclical... 2013). Adjusting the underlying fiscal variables for purely stabilization purposes would intervene with the allocative and redistributive branches of government policy.

Blanchard et al (2010: 15-16) suggest two different approaches in designing better automatic fiscal stabilizers. Firstly, in a more conventional manner, the macroeconomic effects of automatic stabilizers could be increased by increasing the size of the government or (to a lesser extent) to make taxes more progressive or to make social insurance programs more generous. Secondly, additional temporary tax policies and temporary transfers (i.e. items with larger multipliers) could be triggered by crossing a carefully selected threshold macro variable.

Before the Great Recession the policy consensus was to let fiscal policy achieve its countercyclical impact through the working of automatic stabilizers (as monetary policy was widely regarded as the primary tool for aggregate demand management). While automatic fiscal stabilizers are effective in dampening normal cyclical fluctuations, there are situations where active policy decisions might be needed – automatic stabilizers alone might not be sufficient to stabilize the economy (Monthly Bulletin 04... 2013). As explained by Auerbach et al (2010: 142), the recent increase in fiscal policy activism reflects both the severity of the recession and a revealed optimism with regard to the potential effectiveness of activist fiscal policy.

The size of automatic stabilizers present in an economy appears to be negatively correlated with the size of discretionary stimulus (Economic Report...2013). Furthermore, both discretionary policy actions and automatic stabilizers appear to be subject to decreasing returns, the more fiscal stability itself is impaired (Euro Area Fiscal... 2013).

On occasion, attempts to manage aggregate demand through discretionary fiscal policy end up being counterproductive. The problem of procyclicality arises when fiscal contractions take place in periods of low (or negative) growth and fiscal expansions

occur during economic booms. During such episodes, fiscal policy exacerbates economic fluctuations rather than moderates them. (Monthly Bulletin 04... 2013) Procyclical discretionary fiscal policies can potentially override the effect of automatic stabilizers (which are countercyclical by nature), therefore possibly contributing to economic instability.

Balassone & Kumar (2007: 20) suggest that despite the debate on the feasibility and effectiveness of fiscal policy in stabilizing output fluctuations, as a rule, fiscal policy should not be procyclical. However, procyclical fiscal policies may be warranted due to financial sustainability concerns. There is also empirical evidence that fiscal poliy is often procyclical during cyclical upturns. (*Ibid*.: 20)

Balassone & Kumar (2007: 24-27) distinguish and discuss three causes of procyclical fiscal policy: difficulties in assessing the economic cycle, political economy factors, and financial constraints and market access. Firstly, fiscal policy could end up being procyclical because of an inaccurate assessment of the economic cycle (even if the original intention was to engage in countercyclical fiscal policy). There may be difficulties in estimating the underlying or potential growth rate of the economy, in assessment of the size of the output gap, and substantial lags in the availability of the data (which are later on compounded by the lags in implementing the policy itself). (*Ibid*.: 24)

Secondly, procyclical fiscal policy could be explained by the vote-seeking behavior of policy-makers, emphasizing the dynamics of spending pressures arising in good times. Avoiding the unpopular decision of cutting exuberant spending in good times may exacerbate the debt situation and lead to procyclical contractionary policies in the next economic downturn. (*Ibid*.: 25)

Thirdly, procyclicality could be caused by financial market constraints as external funding weakens during the recessionary periods (when it is needed the most). The decision of implementing strongly contractionary fiscal policies could therefore be a reaction to the loss of investors' confidence. (*Ibid*.: 27)

Whatever the underlying reason for procyclicality, by boosting activity in upturns and failing to sustain it or even injecting a contractionary impulse in downturns, procyclical policy increases the amplitude of the economic cycle. Excessive economic volatility has adverse effects on welfare, savings and investment, and economic growth. (Balassone & Kumar 2007: 28) Procyclical fiscal policy exacerbates economic fluctuations.

Before the Great Recession, monetary policy seemed to have a comparative advantage over fiscal policy in achieving countercyclical goals (Taylor 2000: 27) and also, monetary policy was strong enough to do the job – fiscal policy was simply not necessary (DeLong & Tyson 2013: 3). The consensus view was that fiscal policy should only be used should monetary policy hit the zero lower bound. However, Romer (2011: 2-6) draws the following four policy lessons from the recent crisis: (1) we need fiscal tools for short-term stabilization, (2) we have even stronger evidence that fiscal policy is effective, (3) fiscal space is valuable, and (4) political economy considerations are phenomenally important.

To determine the size of the output response to the fiscal stimulus, e.g. the effectiveness of fiscal policy, one must estimate the so-called fiscal multiplier. The Keynesian multiplier is the ratio of the increase in real output to the increase in government spending or tax cut that generates it (Seidman 2012: 14). To maximize the effect of fiscal policy intervention, policy measures should be tailored to those actions that are likely to provide the largest multipliers. Hemming et al (2002: 35), based on an extensive review of fiscal policy literature, provide a list of situations when fiscal multipliers tend to be positive and possibly quite large:

- There is excess capacity, the economy is either closed or it is open and exchange rate is fixed, and households have limited time horizons or are liquidity constrained;
- increased government spending does not substitute for private spending, it enhances the productivity of labor and capital, and lower taxes increase labor supply and/or investment;
- government debt is low and the government does not face financing constraints;
- there is an accompanying monetary expansion with limited inflationary consequences.

According to Alesina & Giavazzi (2013: 16), there is a vague sense amongst researchers that multipliers greater than one call for aggressive countercyclical policy, while multipliers smaller than one call for the opposite.

Recent developments in the world economy offer ambiguous evidence for the size of fiscal multipliers. Firstly, a case can be made for lower multipliers for tax cuts, as the propensity of households and businesses to save has likely increased in the current conjuncture (The Effectiveness... 2013). Furthermore, Eggertsson (2009: 30) finds that the effect of tax cuts and government spending is fundamentally different at zero nominal interest rates than under normal circumstances (for example, the multiplier of goverment spending becomes almost eight times larger). Therefore, the estimates of multipliers for different fiscal policy instruments provided by previous empirical studies do not necessarily apply to circumstances when the zero bound is binding. The empirical literature therefore concludes that the impact of a fiscal stimulus on output is very much state-dependent and that there is no such thing as „the" multiplier (as there is a lot of heterogeneity across fiscal multiplier estimates).

There seems to be significant support for the limited use of fiscal stimulus for stabilization purposes under appropriate circumstances (Kopcke et al 2005: 20). But what are the appropriate circumstances? Even if fiscal policy measures have a positive multiplier effect, to be useful they must be implemented at the right time and supported by favourable macroeconomic conditions (Danninger et al 2008: 72).

Hemming et al (2002: 37) propose a following list of key questions for policy-makers contemplating the proper fiscal policy response to an economic downturn:
- What is the source of a downturn in economic activity?
- How responsive are interest rates, the exchange rate, and prices to a fiscal expansion?
- Are accompanying policies supportive?
- Is a fiscal expansion likely to be permanent and is government debt sustainable?
- What is the composition of a fiscal expansion or contraction?
- What influences the behavior of households and firms?

There are two main types of critique of discretionary fiscal policy: skepticism that discretionary fiscal policy can be delivered efficiently owing to political constraints, and doubts that it can be effective for economic reasons. Also, there is a view that fiscal policy could be most effective when monetary policy is least effective, such as when nominal interest rates are close to zero or the monetary mechanism is impaired. (Financial Stress... 2013).

A classic case where monetary policy is constrained not to react cyclically is the case of a country with a fixed exchange rate and high capital mobility (see Table 1), a country such as Estonia. Under such circumstances, fiscal policy would have a cyclical role because monetary policy could not be used (Taylor 2000: 30).

Table 1. Short-term effectiveness of fiscal policy in an open economy

	High capital mobility	Low capital mobility
Floating exchange rates	Ineffective or not very effective	Effective
Fixed exchange rates	Effective	Not very effective

Source: Bénassy-Quéré et al 2010: 187

A common theme in the literature on the effectiveness of fiscal policy is the „TTT-criteria" that must be fulfilled in order for a discretionary fiscal policy measure to be successful (e.g. policy must be timely, temporary, and targeted). Bouthevillain et al (2009: 16) review the criteria in a following manner:

1) *Timely*. Is the measure effective by the time a stimulus to the economy is needed the most? In this respect the time lags involved in decision-making, implementation and impact on the economy are important.
2) *Temporary*. Does the measure create an expansive fiscal impulse only for as long as the production potential is underutilized?
3) *Targeted*. Does the measure have a relatively strong multiplier effect?

Timeliness is regarded as the least controversial criterion during prolonged economic downturns such as the Great Recession, as the political decision-making process appears to be more rapid during a period of acute crisis and because the downturn is expected to last a number of years (The Effectiveness...2013).

In addition to the „TTT-criteria", several other factors must be taken into account when contemplating the optimal composition of a fiscal stimulus measures, such as (Euro Area... 2013):

- the initial fiscal position and the existing tax and spending structures;
- the expected depth and duration of the economic downturn, and the potential trade-off between short-term stabilisation objectives (demand side) and longer-term growth-enhancing tools (supply side);
- the expected size of the fiscal multipliers of various instruments and the time needed for the measures to feed through to demand and output;
- the institutional characteristics that facilitate implementation;
- the need to minimise distortions in market mechanisms.

The room for fiscal policy to react to a downturn is constrained by budget deficits and debt at the outset, with public debt that is accumulated during a period of economic slack having a lower economic cost than debt accumulated when resources are fully employed (Kopcke et al 2005: 16).

Since both monetary and fiscal policy affect aggregate demand, the prevailing policy mix becomes an important policy consideration. Bouthevillain et al (2009: 11) conclude that the output response of a fiscal stimulus is considerably higher in the case of monetary accommodation, i.e. when their impact on aggregate demand is cumulative and not offsetting. For instance, the euro area countries that chose to (or were forced to) implement procyclical austerity measures due to concerns about long-term fiscal sustainability were characterized by unbalanced policy mixes, as the common monetary policy induced expansionary impulses while national discretionary fiscal policies induced contractionary impulses.

1.2. Estonian fiscal policy framework

In theory, macroeconomic policy-makers have three potential tools in their disposal for short-term demand management (i.e. responding to cyclical developments in the economy) – fiscal policy, monetary policy, and exchange-rate policy. A country's decision regarding the set-up of monetary and exchange-rate policies are closely related through the „trilemma" of international finance, which in essence means that a country can only select up to two options of the following three – international capital mobility, independent monetary policy, and stability in the currency exchange rate (Mankiw 2013). Since adopting a currency board arrangement (a very strict form of fixed exchange rate regime) in 1992, Estonia opted for capital mobility and stability in the exchange rate, with the price of losing monetary policy as a tool for short-term demand management.

With Estonian kroon fixed to Deutsche mark and monetary policy concentrating on price stability, the only device left to Estonian policy-makers for dealing with macroeconomic shocks was fiscal policy (i.e. budget and tax policy). From stabilization policy's point of view, the macroeconomic framework did not change in 2011 with the successful entry into the euro area, as the national currency was now fixed to sixteen other countries and monetary policy decisions were ruled by European Central Bank in Frankfurt, Germany.

The adoption of a common (one-size-fits-all) monetary policy in the context of the EMU has eliminated the possibility to use monetary policy for the stabilization of country-specific shocks, which can be regarded as the main cost of forming a monetary union. How large this cost actually is depends on what alternative mechanisms are available to ensure economic adjustment to asymmetric shocks or to symmetric shocks with asymmetric effects. The only remaining instrument in the hands of national authorities and capable to stabilize local macroeconomic conditions is fiscal policy. (Beetsma et al 2001: 60) In short, monetary policy (with its short-term interest rate channel) has never been an option for responding to recessions or overheating in the Estonian economy.

Therefore, it is essential to analyze what role (if any) have Estonian fiscal authorities subjected to fiscal policy as a tool for stabilizing excessive economic volatility. Since adopting a currency board arrangement in 1992, Estonia is known for its conservative fiscal policy with a clearly-stated goal of annually balanced general government nominal budgets (so-called „balanced or better rule"). Due to upcoming large structural changes in the economy at the time, the rule of balancing the nominal budget annually was preferred to the rule of balancing the budget over the business cycle (Updated ... 2004: 7). Furthermore, annually balanced nominal budgets would serve to keep the public debt to a minimum and safeguard the long-term sustainability of public finances (*Ibid.*: 22)

Annually balanced budget rules, while being effective in controlling the level of public debt, have been criticized for lacking solid economic foundations, for increasing volatility of revenues and output, for creating procyclical bias in fiscal policy, and for being inefficient and discouraging a medium-term perspective (Fatas 2005: 5). For example, the excessively strict (ex ante) nominal balance rule cannot accommodate shocks to the economy without discretionary expenditure increases or cuts, while it is also destabilizing as it overrides the impact of automatic stabilizers (OECD 2009: 59). While regarded as being „automatic", letting the automatic stabilizers operate in full is a policy decision in its own right.

The evolution of constraining fiscal policy seems to consist of three stages (OECD 2009: 60): (1) prevalence of the balanced budget rules (with exceptions to a „golden rule" which allows deficits only for public investment purposes); (2) adherence to Keynesian demand management policies and accommodating fiscal stance (i.e. maintaining a balanced budget over the business cycle); (3) an increased emphasis on supplementing cyclically balanced budgets with expenditure and debt rules to achieve sustainability. In the first stage, annually balanced budget rules were implemented by countries wishing to install fiscal responsibility, but eventually they proved to be too rigid and were replaced by more flexible arrangements. In fact, before Estonia joined OECD in late 2010, annually balanced budget rules in nominal terms at the national level did not exist in OECD countries (*Ibid.:* 59).

Why would Estonia adhere to a fiscal rule which reduces the flexibility of fiscal policy in a macroeconomic policy environment where fiscal policy is the only tool available for influencing the cyclical behavior of the economy? The decision to balance the nominal budget position annually (instead of over the economic cycle) was based on the following arguments (Updated .... 2008: 30):

- uncertainty in the assessments of potential output and its developments, which may lead to an incorrect assessment of the cyclically-adjusted budgetary position;
- in a small open economy, national fiscal policy effectiveness may be reduced due to macroeconomic developments imposed by the external environment;
- due to high volatility of Estonian macroeconomic indicators it is advisable to maintain strict fiscal policy in order to avoid exceeding the Maastricht deficit criterion (in the case of unfavourable developments);
- markets would not favour deficit planning when growth remains below potential, which may potentially lead to greater negative than positive effects on aggregate demand.

It would be worthwhile to analyze the officially-defined objectives of Estonian fiscal policy, as proposed in State Budget Strategies, to elaborate more on the countercyclical role assigned to fiscal policy. For instance, the Strategy for 2003-2006 (Riigi eelarve ... 2002: 100) recognizes fiscal policy as the only tool under currency board arrangement for influencing the economy while assigning special emphasis on *balanced* budget policy. The main objective of fiscal policy introduced in the Strategy of 2004-2007 is to provide the necessary pre-conditions for stable economic growth through prudential governance of the state (Riigi eelarve ... 2003: 13). In the most recent strategy documents, for example (State Budget ... 2013: 37), the objective of the Government's fiscal policy is „to support macroeconomic stability via the flexibility and efficiency of markets and to manage the risks that threaten the balanced development of the economy", while making „budget policy decisions that support maximum macroeconomic stability, manage the risks that threaten the balanced development of the economy, and improve the economy's growth potential and increase employment". It seems that Estonian fiscal authorities have previously proposed that the occurence of

budgetary balance itself is the source of economic stability (that is required for economic growth). There has been no apparent mention of using countercyclical (discretionary) fiscal policy to moderate economic fluctuations.

The issue of medium-term perspective and the sole focus on nominal budget measures was addressed when Estonia became a member of the European Union in 2004, with now having to adhere to the requirements of the Maastricht Treaty and the Stability and Growth Pact. Estonia's budgetary policy medium-term objective (MTO) was initially set to achieving a structural budget balance, but switched to achieving a structural surplus in 2007 (Updated ... 2007: 31). Achieving a structural surplus in medium-term has been the officially stated objective ever since and will continue to be so in the near future (State Budget ... 2013: 37).

In the EMU policy coordination framework, the European Central Bank (ECB) is responsible for the single monetary policy, while other economic policies are carried out by governments respecting the rules and procedures laid down in the Maastricht Treaty and the Stability and Growth Pact (SGP). As the ECB's primary objective is to maintain price stability in the euro area as a whole, the maintenance of economic stability at the national level falls to fiscal and structural policies. (Brunila 2002: 2) This is similar to a policy assignment described by Taylor (2000: 30), where a monetary policy focuses entirely and publicly on reacting to inflation (creating a reputation as inflation fighters), while fiscal policy focuses on the countercyclical job of keeping real GDP close to potential GDP.

As explained by Brunila (2002: 2), the fiscal framework of EMU seeks to combine discipline and flexibility through two requirements: (1) budgetary position should be „close to balance or in surplus" over the medium turn as required by the SPG, and (2) the general government deficit should remain below 3% of GDP (except in the event of exceptional circumstances) as required by the Maastricht Treaty. In theory, the „close to balance" requirement should ensure the necessary room for manoeuvre for cyclical stabilization subject to the 3% of GDP deficit ceiling. In 2009, in truly exceptional circumstances, all euro area countries were granted permission to increase budget deficits to enable the implementation of stimulus packages (Midthjell 2011: 35).

According to the principles of SPG, if Member States achieve their medium-term objective (MTO) of budgetary positions close to balance or in surplus, they can also achieve the stabilization objective by letting automatic stabilizers operate freely and fully (Monthly Bulletin 04... 2013). The more sensitive the budget is to cyclical conditions, the more ambitious should the surplus objective be.

The EU fiscal framework has been designed to let the automatic stabilisers operate freely as shown in Figure 3. Over the business cycle, the underlying budgetary position should be in balance, as reflected by an unchanged cyclically-adjusted balance (CAB). The nominal budget balances should then automatically show a surplus position in good times, when the output gap is positive and a nominal deficit when the output gap is negative. (Quarterly... 2004: 31) To conclude, the spirit of the SGP is to let the automatic stabilisers play freely around a budgetary position of close-to-balance or in surplus over the cycle and a rather constant cyclically-adjusted primary balance (Quarterly... 2004: 32).

Figure 3. The EU fiscal framework over the cycle (Quarterly... 2004: 30).

While constructed to indicate the fiscal framework in the European Union, the figure above provides the underlying principles of countercyclical fiscal policy in general. Periods of negative output gaps are associated with nominal deficits, while periods of positive output gaps are associated with nominal surpluses, with the overall goal of being in balance over the economic cycle (i.e. cyclically balanced). Such a simple theoretical construction should be kept in mind when analyzing actual budget

developments of a chosen country. In the Estonian context, it is also a source of discussion for future proposals on fiscal policy's main objective.

In theory, achieving their MTO should provide Member States with enough room for budgetary manoeuvre to avoid procyclical fiscal policies in economic downturns. However, the SGP is not efficient in eliminating the procyclical bias in discretionary fiscal policy-making altogether, since it only focuses on the budgetary discipline during downturns rather than during upswings (Brunila 2002: 10). As noted succinctly by Alesina & Giavazzi (2013: 6), the surpluses are almost never large enough during expansions.

While indeed being successful in keeping the governments' indebtedness to minimal level, Estonian fiscal policy has been labelled procyclical during the expansionary years and also more recently during the Great Recession. Several reports have indicated the procyclical bias in Estonian fiscal policy, for example OECD (2009), OECD (2011), OECD (2012) and IMF (2013). The literature therefore seems to suggest that Estonian fiscal policy, historically subjected to an annually balanced nominal budget rule, has not succeeded in its countercyclical role. Constraining fiscal policy may impose large costs in terms of lack of flexibility when dealing with business cycle fluctuations. In the upcoming chapters of the thesis, we first look to identify the appropriate measures to be used for assessing the cyclical stance of fiscal policy, and secondly, provide our own empirical assessment to the conduct of Estonian fiscal policy.

1.3. Measuring fiscal policy stance

As introduced in the previous section, fiscal policy can contribute to the stabilization of the economy through the operation of automatic stabilizers and through discretionary fiscal policy decisions. To get a sense of the fiscal authorities' intentions regarding fiscal policy, a closer look at the dynamics of nominal budget balances is needed (a closer look at Estonia's nominal budget balances is therefore provided in chapter 2). Figure 4 presents an excellent overview of all the components underlying the potential causes of deteriorating or improving budgetary positions as the economy fluctuates.
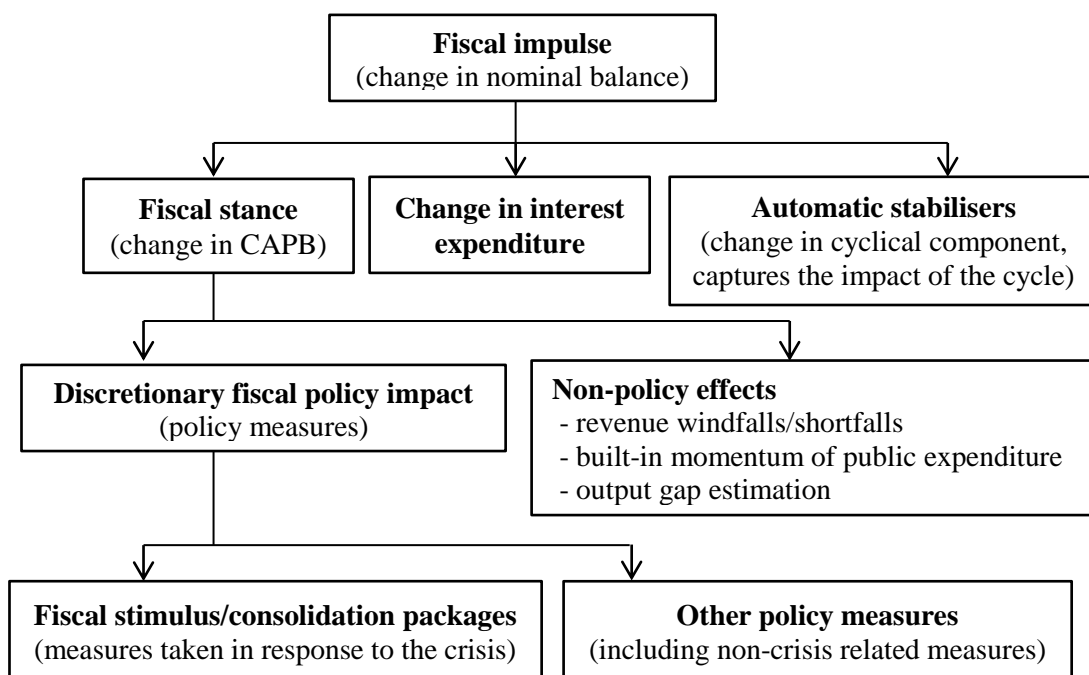
```
                    ┌─────────────────────────────────┐
                    │         Fiscal impulse          │
                    │  (change in nominal balance)    │
                    └─────────────────────────────────┘
         ┌──────────────────┬──────────────────────────┐
         ▼                  ▼                           ▼
┌──────────────────┐ ┌──────────────────┐ ┌───────────────────────────────┐
│  Fiscal stance   │ │ Change in interest│ │    Automatic stabilisers      │
│ (change in CAPB) │ │   expenditure    │ │ (change in cyclical component,│
│                  │ │                  │ │  captures the impact of cycle)│
└──────────────────┘ └──────────────────┘ └───────────────────────────────┘
         │                                             │
         ▼                                             ▼
┌──────────────────────────────────┐ ┌───────────────────────────────────┐
│ Discretionary fiscal policy impact│ │ Non-policy effects                │
│      (policy measures)           │ │ - revenue windfalls/shortfalls    │
│                                  │ │ - built-in momentum of public     │
│                                  │ │   expenditure                     │
│                                  │ │ - output gap estimation           │
└──────────────────────────────────┘ └───────────────────────────────────┘
         │                                │
         ▼                                ▼
┌──────────────────────────────────┐ ┌───────────────────────────────────┐
│Fiscal stimulus/consolidation pkgs│ │     Other policy measures         │
│(measures taken in response to    │ │ (including non-crisis related     │
│          the crisis)             │ │         measures)                 │
└──────────────────────────────────┘ └───────────────────────────────────┘
```

Figure 4. Overview of the fiscal impulse and its components (Euro Area ... 2010: 23).

As becomes evident, movements in the nominal budget balance can be divided into three potential sources – changes in the cyclically-adjusted primary balance, changes in interest expenditures on government debt, and the operation of automatic stabilizers. If we also include interest payments to the *fiscal stance*, we arrive at a cyclically-adjusted balance (CAB in short), which is the predominant measure used in the following empirical analysis. In the Estonian example, the ratio of interest payments to GDP have remained rather constant (around 0,2%) over the time period under review. Fiscal stance itself consists of discretionary fiscal policy measures and non-policy effects, such as revenue windfalls during rapid expansion periods. Finally, the discretionary fiscal policy impact can be divided into fiscal stimulus or consolidation measures implemented in direct response to the economic situation and discretionary decisions that are implemented unrelated to the macroeconomic conditions. (*Ibid.:* 22)

Movements in nominal budget balances can be misleading by giving an impression of expansionary or contractionary fiscal policy, even if the changes are driven by cyclical factors. The automatic component of the changes in the budget balances are commonly estimated by multiplying the output gap by the sensitivity of the budget balance to the cycle (Quarterly... 2004: 30). This automatic component is equivalent to the working of the automatic stabilizers.

To indicate the economy's position in the business cycle, the concept of potential output is required (rather than concentrating on the growth rates or real levels of production). Measures of potential GDP were initially devised to guide the short-term decisions about monetary and fiscal policy and therefore seen as a tool to help policymakers manage aggregate demand (Monthly Bulletin 07... 2013). Although output gap as a macroeconomic indicator is less-known to an average citizen, it is an important measure in policy circles. The size of the gap between actual and potential output (usually expressed as a ratio to potential GDP) ought to be relevant to policymakers in order to maintain steady economic growth and stability in the macroeconomic environment.

However, the concept of potential output has its own limitations, which can create difficulties for the policy-makers responsible for managing aggregate demand close to its potential level. The potential level of production is a moving target that is subject to frequent data revisions and can potentially be estimated by using different techniques (this applies to Estonian case as well). This complicates the process of estimating the size of the potential output and therefore the size of the output gap in real time, which in order makes it difficult to conduct cyclically appropriate fiscal policy.

In Estonia, the sensitivity of the budget balance to cyclical developments in the economy is estimated at 0,3 (this is the numerical value applied in their calculations by the Estonian Ministry of Finance). Compared to other countries in the European Union, this is one of the lowest values – the average budgetary sensitivity for the euro area as a whole is around 0,5 (Larch & Turrini 2009: 9). In other words, Estonian budget balances are not very sensitive to changes in economic conditions.

Empirically, we achieve the Estonian cyclically-adjusted budget (CAB) measure by subtracting the effect of automatic stabilizers from the nominal budget balance:

CAB = nominal budget balance – 0,3*output gap

As a result, we have filtered the impact of cyclical movements on fiscal variables and reached the so-called underlying fiscal balance. Therefore, all the movements in the cyclically-adjusted balances can be interpreted as changes in discretionary fiscal policy.

Cyclically-adjusted balances measure what the nominal balance would have been if the output had been at its potential level (i.e. if the output gap would have been zero) (State Budget ... 2006: 17). Only when the economy is producing close to potential should the nominal and cyclically-adjusted balances indicate a similar value. If we were to also subtract the interest payments on government debt from the cyclically-adjusted balance, the end result would be the cyclically-adjusted primary balance.

The stronger the effect of automatic stabilizers, the more closely should nominal balances follow the movement of the output gap (holding discretionary policy constant). The prediction of an optimizing theory of fiscal policy would be that the nominal (or unadjusted) fiscal deficit should behave countercyclically and the cyclically-adjusted budget deficit should behave acyclically over the business cycle (see also Figure 4 on page 28). However, if the nominal balances are not varying with the fluctuations in GDP, then the cyclically-adjusted fiscal balances must be behaving procyclically. (Lane 1998: 6)

A simple empirical exercise (common to the fiscal policy literature) to provide a quick assessment to the discretionary fiscal policy stance (whether counter- or procyclical) is to look at changes in the cyclically-adjusted budget balances (either CAB or CAPB) together with the prevailing output gap. As such, during periods of negative output gaps, a negative change in the budget position is associated with countercyclical discretionary fiscal policy, while a positive change is associated with procyclical discretionary fiscal policy (the exact opposite is true in conditions of positive output gap). The same methodology has been used by Estonian authorities in several successive (2005-2008, 2010) publications of the Convergence Programmes, see for example (Updated ... 2010: 43). In the empirical analysis to follow, we will apply the same methodology for a longer time period and with the latest data on budgetary positions and output gaps.

A more sophisticated approach which has become common practice in the empirical literature is to analyze the determinants of fiscal policy through the estimation of so-called „fiscal rules", which summarize the behavior of fiscal authorities. The sole purpose of such analytical exercises is to identify a limited set of macroeconomic determinants that explain developments in various measures of fiscal policy.

(Quarterly...2004: 34) In essence, it looks to add more explanatory variables to the right-hand side of the core relationship between budgetary positions and the cyclical fluctuations of the economy.

Similar and/or identical methodologies (compared to the methodology used in section 2.2.) have been proposed in a number of studies. For example, the baseline specification used in the upcoming econometric analysis is identical to the models used in cross-country studies by Balassone & Kumar (2007), Fatas & Mihov (2009), and Benetrix & Lane (2012). Furthermore, for robustness purposes, we also include the *change* in the various budget balances as an alternative dependent variable, inspired by Fatas & Mihov (2011). The analysis carried out by European Commission (Quarterly Report... 2004) applies the standard specification, but includes the output gap variable with a one-year lag (however, the lagged variable turns out to be statistically nonsignificant). Lastly, similar to the following analysis here, Lane (1998) addresses the issue based on a single country and a similarly small sample size (with only 15 observations).

The objective of the above-mentioned articles are all similar – to determine whether the conduct of fiscal policy in a specific country or a group of countries have been counter- or procyclical. Also, all of the empirical literature above interpret the coefficients on the output gap in a similar way (when using various budget balances as dependent variables) – a positive coefficient estimate is a sign of countercyclical fiscal policy while a negative coefficient estimate is a sign of procyclical fiscal policy.

As explained by Fatas & Mihov (2011: 36), when proposing the fiscal rule to be estimated, the focus is to reach a simple reaction function to capture the cyclicality of fiscal policy, instead of trying to identify all of the macroeconomic variables affecting the dependent variable. Hence, we can conclude that the (dynamic and autoregressive) multiple regression model is used as the predominant and appropriate econometric tool to analyze the issue of cyclicality in the conduct of fiscal policy.

What type of results can be expected when studying the Estonian fiscal policy behavior? Unfortunately, none of the previously mentioned articles have included Estonian indicators in their studies. Therefore, we have no benchmark estimates for Estonian

fiscal policy behavior. However, we can draw some wider conclusions from the empirical literature for comparative purposes.

For instance, Balassone & Kumar (2007: 20) provide further proof for the assessment that in developing countries, the sensitivity of the fiscal balance to economic cycle is generally low, while in industrial countries, the movements in the ratio of overall fiscal balance to GDP are seen to be mildly countercyclical. The authors find that in industrial countries, when using nominal balance as the dependent variable, the coefficient for β equals 0,3 (in addition, all of the explanatory variables are statistically significant). For developing countries, however, the coefficient for β equals 0,07 and is statistically nonsignificant – indicating that there is no clear pattern in the behavior of nominal balances over the cycle. (*Ibid.:* 23)

When turning to cyclically-adjusted budget balances (which should indicate the behavior of discretionary fiscal policy measures), Fatas & Mihov (2009: 8) observe that many of the coefficients on the output gap are not statistically significant and conclude that fiscal policy tends to be less countercyclical in the empirical literature than what normative models suggest. Therefore, it is probable for the coefficient estimates on the output gap to be statistically nonsignificant, either when using nominal or cyclically-adjusted budget balances.

More recently, Fatas & Mihov (2011: 36) find that the nominal budget balance moves in a countercyclical manner with the coefficient β in the range of 0,3-0,5 (depending on the country), and when using cyclically-adjusted balance as the dependent variable (i.e. excluding automatic stabilizers) the coefficient falls to the range of 0,09-0,2. The authors note that the difference between the two coefficients can be interpreted as the size of the automatic stabilizers, with automatic stabilizers on average larger in size than discretionary changes in policy (*Ibid.*: 37). Finally, Fatas & Mihov (*Ibid.*: 54) draw three important conclusions: (1) for most countries, automatic changes in the budget balance play a stronger role in stabilizing output than discretionary fiscal policy; (2) countries with less responsive automatic stabilizers tend to use countercyclical discretionary fiscal policy more aggressively; (3) for all countries discretionary policy has become more aggressive in recent decades.

In conclusion, when discussing fiscal policy and its potential stance, the starting point would be to evaluate the behavior of nominal budget balances. This provides us with the first look at how budgetary positions co-move with economic fluctuations. For policy to be countercyclical, one would expect to see surpluses during expansionary periods and deficits during downturns. However, as the dynamics of nominal balances include both automatic and discretionary components, it may not reveal the true intentions of fiscal authorities related to the business cycle. For that purpose we can evaluate the developments of cyclically-adjusted balances compared to the prevailing output gap. Furthermore, the two-variable relationship between budgetary positions and output gap serves as the basis for constructing a so-called fiscal rule, to be estimated econometrically. The upcoming empirical chapter of the thesis will look to address these methodologies in their order of discussion, to reach a comprehensive assessment of the Estonian fiscal policy stance over the recent economic cycle.

2. EMPIRICAL ANALYSIS OF ESTONIAN FISCAL POLICY

2.1. Cyclical fluctuations in Estonian economy

As a volatile economy, it is essential that macroeconomic policy in Estonia is conducted with a view towards contributing to stability. Following analysis provides a narrative of Estonian macroeconomic performance over the period 1996-2012 to give a sense of the position of the economy in the business cycle, which is an essential input in conducting countercyclical fiscal policy. Understanding the developments in the economy provides the background to evaluate the appropriate stance of the fiscal policy in Estonia.

To introduce the cyclical properties of the economy, figure 5 presents the annual growth of Estonian quarterly real GDP since the year 1996 (compared with the cyclical developments in the euro area as a whole). It is important to focus on the quarterly measure, since this is the unofficial indicator used to define whether the economy is in a recession or not. According to the simple rule of thumb, the economy is said to be in a recession if it experiences *two* consecutive quarters of negative GDP growth.
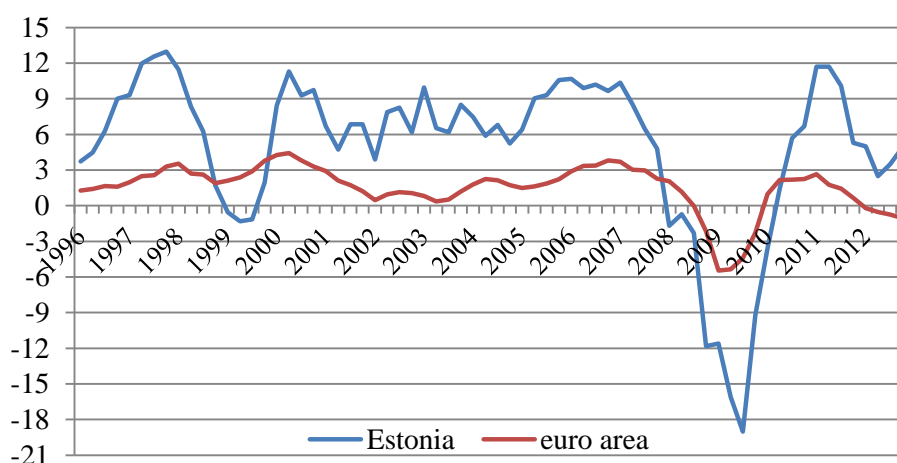

Figure 5. Annual growth in quarterly real GDP 1996-2012, % (Statistics Estonia, eurostat).

33

Following this principle, Estonia has had two recessionary periods since regaining independence (detailed data in Appendix 2). As a result of the Russian crisis before the turn of the century, Estonian quarterly GDP growth started to decrease by the end of 1998 and starting in 1999, Estonian economy experienced three consecutive quarters of negative growth (although modest in absolute value). The second recessionary period was caused by a combination of domestic overheating and the impact of the global financial and economic crisis, as the quarterly GDP growth indicated consecutive negative values from the beginning of 2008 up to the first quarter of 2010.

Not taking into account the transitional recession years before 1996, the modern Estonian economy has experienced only one full-scaled business cycle. Since the business cycles are usually measured from trough to trough, we could apply the second quarter of 1999 and the third quarter of 2009 as milestone quarters (as the quarters with the most negative growth rates). These two troughs are separated by 40 quarters of economic activity (including 33 quarters of uninterrupted economic growth), making the first Estonian business cycle last approximately 10 years.

Turning to the volumes of real GDP (see Figure 6), the expansion period in the Estonian economy becomes even more impressive. The real production capacity of the Estonian economy more than doubled in size between 1996 and 2007 and the economy has returned to a new growth path since 2009. The average annual growth rate of real GDP for the full time period of 1996-2012 is accordingly 5 per cent.
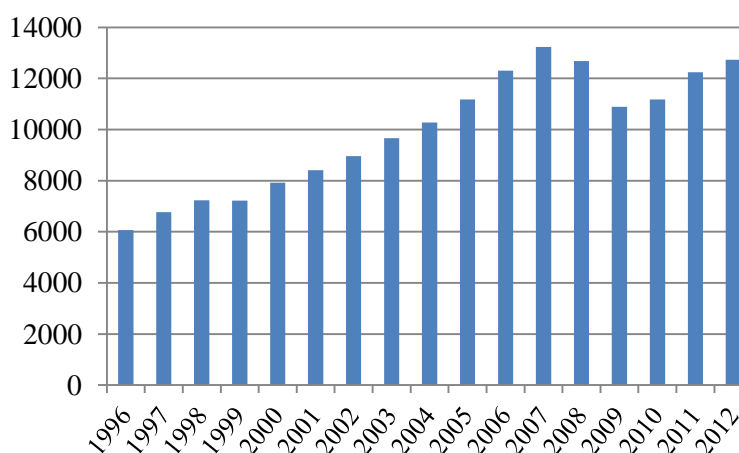

Figure 6. Real GDP 1996-2012, mln € (Statistics Estonia).

Looking at annual GDP volumes, the effects of the three negative growth quarters in 1999 is barely noticeable. On the other hand, the Great Recession of 2008-2009 had a significant impact on the economy's growth performance, undoing several years of economic progress. The second year of the crisis, 2009, sent the economy's production levels back in time to 2004. Although the Estonian nominal GDP has surpassed the pre-crisis levels by 2012, in real terms, however, the economy's realized productive capacity has still not reached the record-level of 2007. If the Estonian economy reaches the 2007 production levels in real terms in 2013, this would make it six years in total – which is more than enough time to potentially consider and conduct timely discretionary fiscal policy measures.

Figure 7 provides the output gap data for Estonia, together with the unemployment rate. The output gap from this point forward is defined in the conventional manner - actual output minus potential output, divided by potential output (and expressed in percentages). There is usually a very strong negative correlation between the two variables – the output gap measured on the left scale, and the unemployment rate measured on the right scale – since periods of negative output gap (below-potential production) are associated with higher unemployment rates and periods of positive output gap (above-potential production) are associated with lower unemployment rates. The correlation between the two variables is in fact -0,9 for the 1996-2012 time period in the Estonian example.
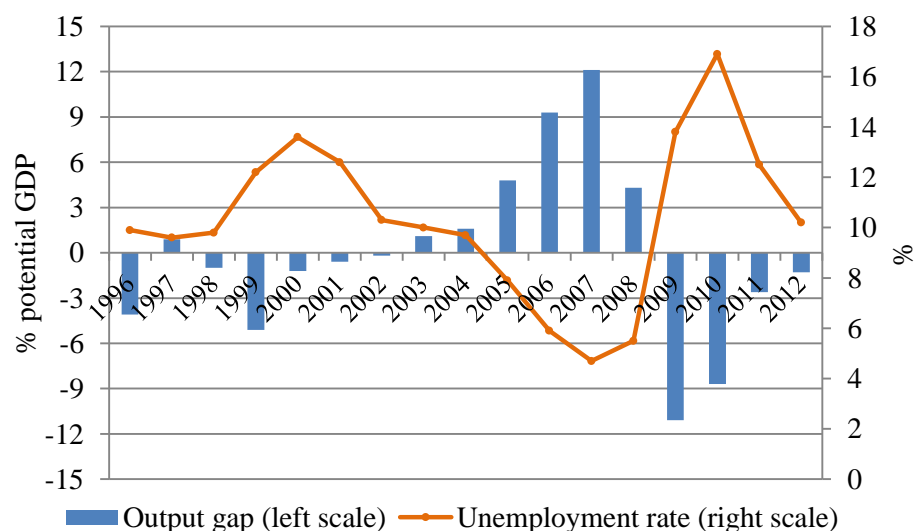

Figure 7. Output gap and the unemployment rate 1996-2012 (Ministry of Finance).

The main question under review here is how good have the Estonian policy-makers been in stabilizing the economy; i.e. matching the potential and real levels of GDP (a situation where the output gap is zero). The initial answer based on the figure would have to be „not very", at least in the second half of the time period. The potential output and the output measured in real terms have differed significantly, citing the failure and and the need for stabilization policy. In only two years, the Estonian economy moved from one extreme to another, as the positive output gap of 12,1% in 2007 quickly transformed into a negative output gap of -11,1% in 2009. The cost of the excess volatility becomes obvious when looking at the changes in the unemployment rate. In only three years, the unemployment rate increased from 4,7% to 16,9%.

The process of estimating potential output involves a high degree of uncertainty. Table 2 provides the Estonian output gaps estimated by four different institutions. For example, Eesti Pank's estimates indicate a clearly less volatile behavior of actual output around potential (both the overheating and the downturn periods indicate less deviation from the balance). In the purposes of assessing the fiscal stance, it would be important that at least the signs of the output gap do not differ on a yearly basis. But on some occasions it does indeed happen (e.g. 2005, 2011, 2012). Due to a longer data sample and the fact that the institution itself is responsible for the policy in question, the analysis proceeds with the data provided by the Estonian Ministry of Finance.

Table 2. Sample of estimates for Estonian output gap 2005-2012, % potential GDP

Data source	2005	2006	2007	2008	2009	2010	2011	2012
Ministry of Finance	4,8	9,3	12,1	4,3	-11,1	-8,7	-2,6	-1,3
Eesti Pank	-0,2	2,3	5,9	3	-8,2	-4,7	0	-0,6
IMF	-	-	-	6,3	-9,4	-7,6	-1,6	-0,7
AMECO	5,5	9,3	12	4,6	-9,4	-6	0,5	1,4

Source: Ministry of Finance, Eesti Pank, IMF, AMECO

The dynamics of Estonian economic growth and nominal budget balances in the period of 1996-2012 can be separated into three distinct phases. The first phase lasted from 1996 to 2001 and therefore consists of the pre-crisis years, the Russian crisis, and the period immediately after the crisis. This can be thought of as the first trough of the business cycle. Starting from 2002 up to 2007, Estonian economy experienced fast and eventually unsustainable growth in total production and consumption, wages, and living

standards. This is the boom period between the two troughs. Finally, the period of 2008-2012 includes the bursting of domestic imbalances and the lead-up to the Great Recession, the Great Recession of 2008-2009, and the subsequent years of the prolonged downturn. This concludes the business cycle by providing the second trough.

In order to better understand the motives behind fiscal policy decisions, we provide a brief narrative of nominal budget dynamics during the selected time period (for graphical presentation, see Figure 10 on page 46). Before 1997, the main objective of Estonian fiscal policy was to find the sources of revenues to secure the functioning of the re-established Estonian government. The overall nominal budget position was of second importance, although jurisdiction was set in place to avoid excessive growth in government debt. (Eelarve... 2013) In 1997, as fiscal policy succeeded in achieving a budget surplus, Stabilization Reserve Fund was founded. The initial purpose of the Reserve was to manage domestic demand by investing the surplus (accumulated in the reserves) abroad and to create investor-confidence in Estonian economic policy. By the end of 2012, the market value of the assets in the Stabilization Reserve Fund are estimated at 347 million euros (or 2% as a ratio to nominal GDP). The funds in the Reserve can be used as a fiscal policy tool for managing macroeconomic risks and for investing in long-term investments and structural changes in the economy. For example, 3,5 million euros of the Reserve money were used in 2009 to ease the risks in domestic economy caused by the Great Recession. (Riigi rahavoo... 2013)

The payments into the Stabilization Reserve continued in the first half of 1998. However, as the deteriorating situation in world economy (particularly in Russia) started to affect the Estonian economy, the planned budget surplus of 1998 eventually became a budget deficit in the size of -0,3% of GDP. Instead of adding to the newly-created reserve, bigger government deficits were avoided by drawing money from the reserve. Due to overly optimistic economic outlook (including pre-planned increases in public sector wages) at the time, the government budget of 1999 turned out to be overly expansionary compared to the prevailing economic conditions, leading to a deficit of -3,6% (Estonian ... 1999). Therefore, additional cost-cutting budgets were implemented twice in 1999. In hindsight, this above-the-norm increase in budget expenditures could be interpreted as (accidental) countercyclical discretionary fiscal policy (increasing

government spending in times of economic hardship). Because the financing gap was funded from the reserves, the government debt ratio did not increase significantly.

The budget year of 2000 signified the efforts of the Estonian government to return to the principle of balanced budgets as the growth of government expenditures were restricted to a minimal level (Estonian ... 2000). As the economy returned to a positive growth path, the measured budget deficit at the end of the year was only -0,5%. Based on the assumption of 5% annual real GDP growth, the strategy for the upcoming years was to keep the nominal budget balanced and to ease the overall tax burden of the economy. In 2001, the government achieved the first surplus (0,3%) since the start of the Russian crisis due to higher effectiveness of the administration of indirect taxes and due to better tax receipts in a more healthy economy (Estonian Economy and Monetary Policy 6 ... 2001). Because of the ongoing uncertainty in the world economy, the government was cautioned to avoid overly optimistic prognosis for 2002-2003 and not to neglect the potential need for additional spending withdrawals. Also, the funding of the reserves would prove to be more difficult in the future (as the privatization process was close to completion) and the rapid increase of government debt would adversely affect the country ratings and potentially lead to a completely new economic policy environment. (Estonian Economy and Monetary Policy 9 ... 2001)

2002 proved to be the turning point in Estonian economy (at least in government budget balances) as the negative prognosis scenarious of previous years never materialized. In 2002, for the second year in a row, the nominal budget balance indicated a small surplus (of 0,4%) and allowed for two additional positive budgets during the year. For 2003, the goal was set to achieve a slight surplus instead of a maximum level of expenditure growth (the surplus turned out to be 1,8% of GDP) (Estonian ... 2003). Again, due to faster-than-expected growth in revenues, the government pushed through an additional expenditure-increasing budget. It must be emphasized that the Estonian government accepted a supplementary positive budget for each of the years in the period of 2002-2007 (and even twice in 2002).

The budget surpluses of 2004 and 2005 (both 1,6%) were comparable with the surplus accumulated in 2003, but concerns were raised whether the surpluses were big enough considering the increasing growth rate of the economy (Estonian Economy and

Monetary Policy 3 ... 2006). From this perspective, the fiscal policy stance was rather loose. As the economy continued to grow, the budget surplus achieved a record level of 2,4% in 2006 and in the initial process of planning the budget for 2007, a goal of achieving at least 0,5% of surplus were set (the biggest surplus goal of the recent history) (Estonian Economy and Monetary Policy 9 ... 2006). Although indicating a tighter fiscal policy than before, it was perceived as only a modest goal regarding the state of the economy. Eventually, the government budget would be in surplus (for the sixth year in a row) by 2,4% in 2007. Contrary to previous years, the surplus was not attained due to unexpectedly high tax receipts, but because of the decision to increase the size of the reserves and to postpone a number of investment projects at local goverment levels (Estonian ... 2007). The period of rapid GDP growth and budget surpluses resulted in the record-low level of public debt (3,7% of GDP in 2007). The level of government debt accumulated before 2008 would turn out to play a significant role in response to upcoming events globally.

In similar fashion to previous years, the budget of 2008 was initially planned to be in surplus. However, as became clear in the beginning of the year, the end result would be the opposite. Tightening of monetary policy and a decrease in foreign demand led to a negative additional budget during the year (Estonian ... 2008). Coincidentally, pensions and transfer payments to families were pre-set to increase in 2008 and therefore acted as an increase in the size of automatic stabilizers (a good policy in the countercyclical sense). Also, in an effort to increase the budget revenues, the decrease of income tax was put on a halt for a year (a bad policy in the countercyclical sense). The decrease of income tax was supposed to presume in 2010 if the economy recovers, but it has not happened even in 2013.

The overriding objective of Estonian fiscal policy during the recession was not to exceed the deficit limit of -3% set by the Maastricht criteria in order to join the eurozone. Despite the large-scale economic contraction, Estonia's nominal budget deficit was -2,9% in 2008 and therefore Estonia managed to fulfill the budget criteria (in addition to all of the other requirements). In 2009, Estonia accepted another additional negative budget during the year and as an austerity measure, decided to pause the state

contributions into a specific pension fund. (Estonian Economy and Monetary Policy 1 ... 2009) The years of excessively loose fiscal policy were followed by years of austerity.

The austerity measures were mainly designed to cut the expenditure side of the budget and to a lesser extent to increase the revenue side of the budget. In addition, several one-off measures were implemented to cope with the deterioration of fiscal balances. (Estonian Economy and Monetary Policy 2 ... 2009) Due to their temporary and short-term effects, these measures are not taken into account when estimating structural budget balances. The deficit by the end of 2009 was still -2,0% of GDP, but showed a remarkable turn to surplus already in 2010 (0,2%). Before 2009, the budget deficits were usually financed by the accumulated surpluses held in the Stabilization Reserve Fund. In order to sustain some liquidity in the reserves, the ratio of public debt was allowed to increase in 2009.

In 2011, in its first year of membership, Estonia was the only country in the eurozone to achieve a surplus (1,2%) in general governments' nominal balance (Estonian ... 2012). After two years of austerity, the growth in government expenditures resumed in 2011. The effects of the one-off measures have disappeared on the revenue side, but increased on the expenditure side of the budget by 2012 (leading to a small budget deficit of -0,2%). For example, the sale of CO_2 quotas increased the budget position by one percentage point both in 2010 and 2011, but the investments associated with the quotas deteriorated the budget balances of 2012 and 2013 by 1,1 and 0,4 percentage points respectively (State Budget ... 2013: 45). The public debt has increased close to double-digits in 2012 due to loan payments into European Financial Stability Facility (but most importantly, not because of deficit-spending).

Having provided the narrative of government's nominal budget developments, the analysis now turns to a more isolated view towards specific fiscal indicators with countercyclical policy principles in mind. Table 3 indicates the main sources of tax revenue in Estonian general government budgets – the income tax, value-added tax (VAT) rates, and the social tax. Bottom row of the table provides the overall tax burden in the economy (total tax revenue including social contributions as a share of GDP). The selected time frame captures all of the most important changes in Estonian tax structure leading up to and also during the crisis. In other words, there has not been any major

changes before 2004 (except for the reduced VAT rate of 5% introduced in 2000) and after 2009 for the purposes of our analysis of fiscal policy. Also, various excises were raised on multiple occasions in 2009 and 2010, adding to the procyclical nature of increasing taxes during an economic downturn. (Updated ... 2010: 37-38).

Table 3. Changes in Estonian main tax rates, 2004-2009

Main tax rates	2004	2005	2006	2007	2008	2009
Income tax	26	24	23	22	21	21
VAT (standard)	18	18	18	18	18	18/20
VAT (reduced)	5	5	5	5	5	9
Social tax	33	33	33	33	33	33
Tax burden (% GDP)	30,6	30,6	30,7	31,4	31,7	35,7

Source: Ministry of Finance

As can be seen from Table 3, the boom years of 2005-2007 were accompanied by consecutive decreases in income tax rates and stable VAT and social taxes. In 2009, the first impact year of the crisis, the reduced form of VAT was raised from 5% to 9% in the beginning of the year and the standard rate of VAT raised from 18% to 20% in the middle of the year. Contrary to textbook stabilization policy, the expansionary phase of the cycle was therefore accompanied by a decrease in tax rates and the recessionary phase accompanied by an increase in tax rates. However, it must be emphasized that none of the aforementioned changes in tax rates were planned and realized based on the stabilization motive of fiscal policy. This type of procyclical behavior, whether as a conscious decision or as an inevitable by-product of a tax reform, nevertheless adds to the volatility of the economy. The overall tax burden increased significantly in 2009, mostly due to a collapse in nominal GDP (less due to lower tax revenues collected). By the end of 2012, the overall tax burden in Estonia was measured at 32,9% of GDP.

As introduced in the theory chapter, most of the procyclicality in government fiscal policies usually originate from the expenditure side, as policy-makers mistakenly perceive all improvements in output as fully permanent and hence opt to expand government spending in line with the rate of growth of the overall economy. Therefore, it is with respect to government expenditure that the differences between optimal and non-optimal fiscal policy can be the starkest (Lane 1998: 7).

Figure 8 presents the annual growth in Estonian government budget's revenue and expenditure items. First of all, the economic downturn caused by the Russian crisis quickly deteriorated the growth rate of government revenues, but did not lead to an immediate cost-cutting behavior by the policy-makers (government expenditures still continued to grow, but with a slower pace than before). The expansion period between the two crises (2001-2007) are accompanied by fast and balanced growth in government revenues and expenditures. Contrary to the Russian crisis, the policy response to the Great Recession included actual cuts in the government expenditures, as indicated by the negative values of expenditure growth in 2009 and 2010. Furthermore, 2010 is the only year in Estonia's recent history when the government revenues have actually decreased compared to the previous year.
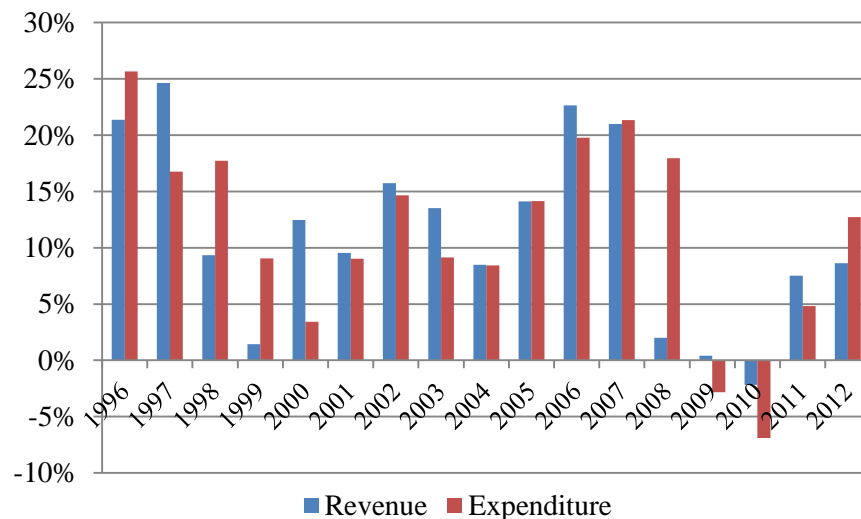

Figure 8. Annual growth in government revenues and expenditures 1996-2012, % (Statistics Estonia).

The dynamics in Figure 8 raise three separate policy conundrums. Firstly, did the over-excessive expenditure growth in 1998 and in 2008 act as expansionary fiscal policy (fiscal stimulus) in the subsequent crisis? Secondly, was the growth in the size of the government budgets too fast in the period of 2005-2007? Thirdly, were the policy decisions made during the recessions (after the severity of the crisis had become obvious) countercyclical?

Table 4 compares the magnitude and the longevity of the two downturns. What stands out from Table 4 is the differing scales and policy responses of the crises. The crisis of 2008-2009 is clearly more intense and prolonged, as the negative output gap has not yet been eliminated or the pre-crisis level of real GDP achieved to this day. At the same time, the nominal budget deficit never surpassed the 3 per cent threshold value (as it did in the 1998-99 crisis), the budgetary position returned to balance in just two years time, and the ratio of public debt grew only 3 percentage points.

Table 4. Comparing two recessions

Economic indicator	Crisis of 1998-1999	Crisis of 2008-2009
Consecutive quarters of negative GDP growth	3	9
Lowest annual GDP growth	-0,3% (1999)	-14,1% (2009)
Lowest annual nominal budget balance	-3,6% (1999)	-2,9% (2008)
Cumulative output lost (before closing the output gap)	8,1%	23,7%*
Public debt (before and after the crisis years)	6,2% → 5,1%	3,7% → 6,7%
Unemployment rate (before and after the crisis years)	9,6% → 13,6%	4,7% → 16,9%
CPI inflation (before and after the crisis years)	11,2% → 4,0%	6,6% → 3,0%
Return to balanced or better nominal budget	2001 (in 3 years)	2010 (in 2 years)
Return to pre-crisis level of real GDP	2000 (in 2 years)	2013 (in 5 years)*
Annual growth in government expenditure (including a year after)	17,7% → 9,1% → 3,4%	17,9% → -2,8% → -6,9%

*assuming that in 2013 the output gap closes and real GDP surpasses the pre-crisis level

Source: Statistics Estonia, author's calculations

While the expenditure side of the budget continued to grow during the first recessionary period (albeit with a smaller rate), the crisis of 2008-09 is characterized by two consecutive years of expenditure cuts. Did the rigid adherence to the 3 per cent threshold value and the as-soon-as-possible return to a balanced budget worsen the economic situation? There seems to be a trade-off between letting the budgetary indicators deteriorate as the economic situation worsens instead of letting the real economic indicators (GDP, unemployment) deteriorate as the economic situation worsens (while keeping the budgetary indicators as constant as possible).

An important feature of the Estonian expenditure side of the budget is that most of the expenditure items are pre-determined by law or due to other considerations, which make the short-term changes in the levels of expenditure very difficult to achieve. These so-called fixed expenditures account for 71% of total expenditures in 2012 and their share is expected to increase in the upcoming years (reaching 77% in 2017), making the expenditure side of the budget even more rigid. (Riigi eelarvestrateegia 2014... 2013) Despite exhibiting increasing rigidity for short-term changes, a larger share of fixed expenditures actually contribute to higher stabilization through the composition effect.

The financial crisis of 2008 that originated from United States quickly turned into a global economic crisis and for a lot of countries, also a crisis of debt. The enormous debt burden could well be the most prolonging consequence of the recession. Figure 9 provides the illustration of debt dynamics in Estonia – government sector debt presented on the left scale and private debt presented by the scale on the right (both indicators are measured as a ratio to GDP).
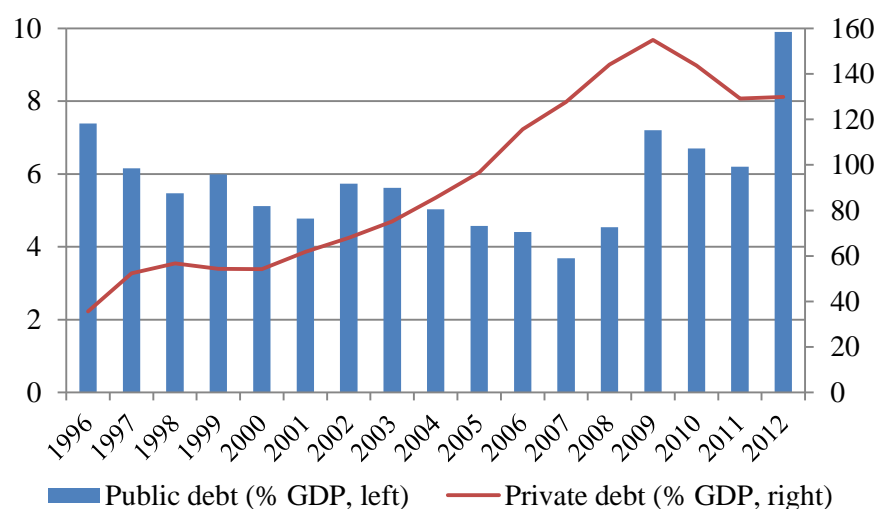

Figure 9. Public and private debt 1996-2012, % GDP (Statistics Estonia).

First of all, Estonia has by far the lowest ratio of public debt in the European Union and since joining the euro-area in 2011, comfortably satisfies the numerical Maastricht criteria of 60%. The Great Recession raised the Estonian government debt ratio from only 3,7% in 2007 to 6,7% in 2010. As a comparison, public debt during the same time period grew from 25,1% to 92,2% in Ireland, from 28,5% to 93,0% in Iceland and from 9,0% to 44,5% in Latvia (countries similar to Estonia in terms of relative size and

openness) (Eurostat ... 2013). In 2012, the Estonian public debt is measured around 10% of GDP, and almost all of the increase in debt ratio compared to the previous year is due to contributions to European Financial Stability Facility and therefore not due to country-specific deterioration of public finances. A similar value of public debt is forecasted to prevail in near-term future.

Overall, Estonia has managed to escape from the sudden collapse of aggregate demand and trade volumes without risking the health of public sector finances and without the economic crisis turning into a full-blown sovereign debt crisis. However, a totally different dynamic can be evidenced with regards to private sector debt (e.g. the liabilities held by non-financial corporations, households, and non-profit institutions serving households). The ratio of private debt in Estonia continuously grew from 2000 to 2009, from 54,1% to a record-level of 154,9%, indicating the fast growth during the loan-financed consumption-based boom years. In recent years, the ratio has stabilized around 130%.

2.2. Measuring Estonian fiscal policy stance

2.2.1. Analysis of Estonian budgetary positions

The goal of the following analysis is to provide empirical evidence for the assessment of fiscal policy stance in Estonia. Figure 10 below presents the behavior of Estonian cyclically-adjusted balances over the business cycle and in comparison with the previously introduced nominal balances (data in Appendix 3). Up until 2004, there is a clear tendency for co-movement between the nominal balance and the output gap (indicating countercyclical fiscal policy). Nominal balances deteriorated when the economy was producing below potential and achieved a surplus when the economy was producing above potential capacity. The cyclically-adjusted balances indicate weaker co-movement with the output gap (i.e. more acyclical behavior) than the nominal balances, which provides further evidence for the countercyclical conduct of fiscal policy until 2005.
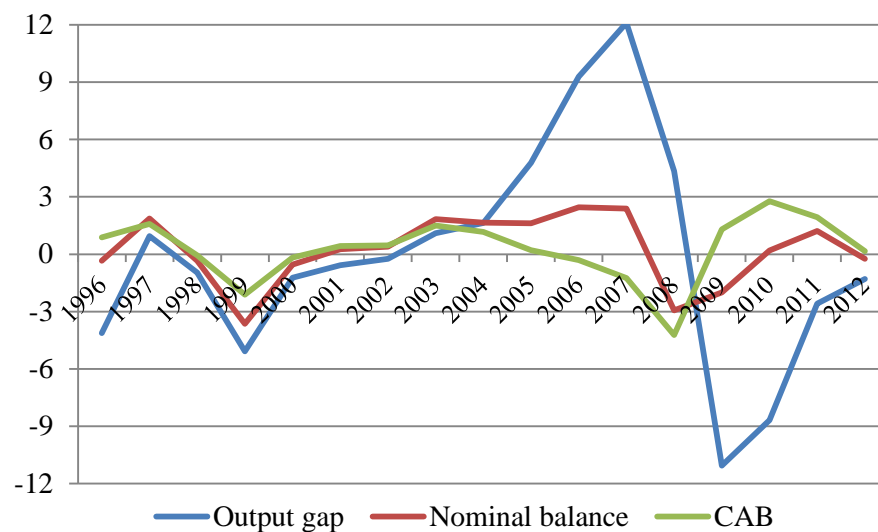
Figure 10. Nominal and cyclically-adjusted balance (CAB) reacting to output gap 1996-2012, % GDP, % potential GDP (Ministry of Finance).

Starting from 2005, the nominal budget surpluses never surpassed 2,5% of GDP as the positive output gaps grew increasingly larger in size. During the most acute overheating period (2005-2007), the average value of the general governments' nominal surplus was 2,1 percent of GDP despite an average real GDP growth of 8,8% and an average positive output gap of 8,7%. In hindsight, the first policy mistake was not being able to achieve significantly higher nominal budget surpluses in the 2005-2007 period.

The cyclically-adjusted balance, i.e. the balance that would prevail if we would neglect the cyclical overheating of the economy, was actually in deficit both in 2006 (-0,3%) and in 2007 (-1,2%). It would have been appropriate to target both larger nominal surpluses and cyclical surpluses in order to provide a buffer against the occurence of negative shocks to the macroeconomy.

Structural (or structurally-adjusted) balances can be viewed as an augmentation of cyclically-adjusted balances, as they adjust for a broader range of factors (nonstructural elements beyond the economic cycle); removing one-off, or temporary, revenue or expenditure items; which do not affect the underlying fiscal position. Figure 11 introduces the behavior of Estonian structural balances compared to nominal and cyclically-adjusted balances. One can detect three separate data lines only since 2004, as this indicates the beginning of the accounting of one-off measures in Estonia.
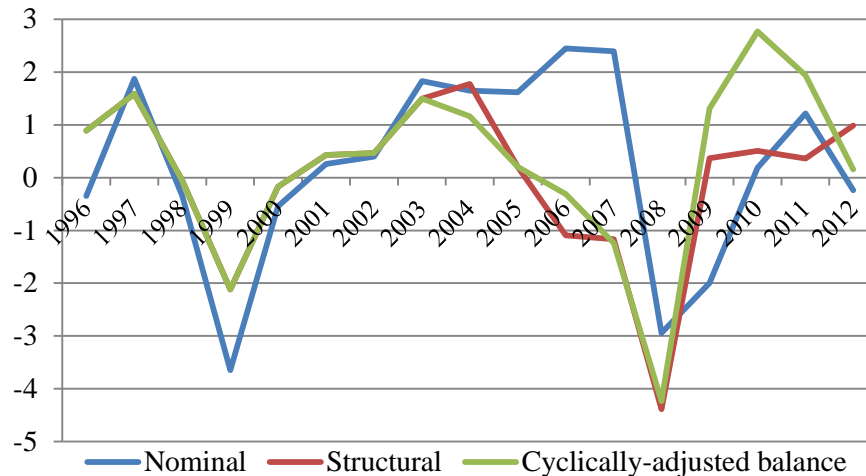
46

Figure 11. Estonian fiscal balances, % GDP 1996-2012 (Ministry of Finance).

The structural budget balances indicate similar values as the cyclically-adjusted balances up to 2008. From then on, the structural budget position does not indicate surpluses of similar size compared to the cyclically-adjusted surpluses in 2009, 2010, and 2011. Therefore, some of the measures responsible for the impressive cyclically-adjusted surpluses must have been temporary or one-off in nature.

The discussion of one-off measures are important in the context of the policy response to the crisis. However, the empirical literature suggests not to exclude crisis-related discretionary fiscal measures from the reported structural balances, as including them in fiscal balances would provide a more accurate measure of the authorities' policy intentions. Whether all of the one-off measures in the Estonian example are crisis-related or not is debatable. With that (and also data constraints) in mind, the rest of the analysis in this chapter focuses on the changes in cyclically-adjusted instead of structurally-adjusted balances as an indicator of fiscal policy.

In order to assess the intended contribution of discretionary fiscal policy to aggregate demand, the preferred measure becomes the *change* in the cyclically-adjusted budget component from year to year, as distinct from the absolute figures. In theory, this would provide the intent of the fiscal policy at the time (whether the aim was to loosen or tighten the policy stance).

Figure 12 presents the data describing Estonian fiscal policy intentions. The positive values in Figure 12 indicate a tightening in discretionary fiscal policy, while the negative values indicate a loosening in discretionary fiscal policy. We can also characterize the stances based on their strength (see Table 5). For example, the policy stance in 1998 and 1999 can be interpreted as being very loose, as the changes in cyclically-adjusted balances compared to the previous years are greater than 1,5 percentage points. The most extreme observations come from 2008 and 2009, as the very loose fiscal policy stance is followed by never-before-seen fiscal tightening.
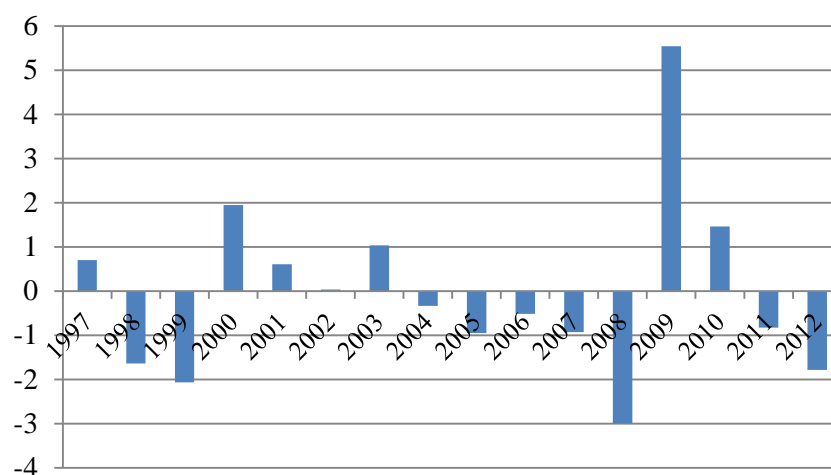

Figure 12. Change in cyclically-adjusted balance 1997-2012, pp (author's calculations).

Table 5. Fiscal stance criteria

Fiscal stance	Change in CAB (pp)
Very loose	less than minus 1,5
Loose	between minus 0,5 and minus 1,5
Neutral	between minus 0,5 and 0,5
Tight	between 0,5 and 1,5
Very tight	more than 1,5

Source: based on Hemming et al 2002: 30

To sum up, changes in the cyclically-adjusted balances are used as a proxy for the intended fiscal stance net of automatic stabilizers. However, the intended discretionary fiscal stance and the end result of the policy impulse do not necessarily coincide in the real economy. For example, the automatic stabilizers could work in the opposite direction and with greater strength (therefore dominate the discretionary component).

Having analyzed the strength of the fiscal impulse, the next logical step would be to include the cyclical position of the economy. This would enable us to assess whether the policy directions were countercyclical or procyclical in relation to the output gap, intended or unintended to strengthen or weaken the stabilizing effect of the automatic stabilizers. Figure 13 examines the fiscal stance (approximated by the changes in the cyclically-adjusted balance) in relation to the cyclical conditions in the economy (approximated by the size of the output gap). To run a countercyclical fiscal policy, the bars in Figure 13 should move in the same direction on a yearly basis.
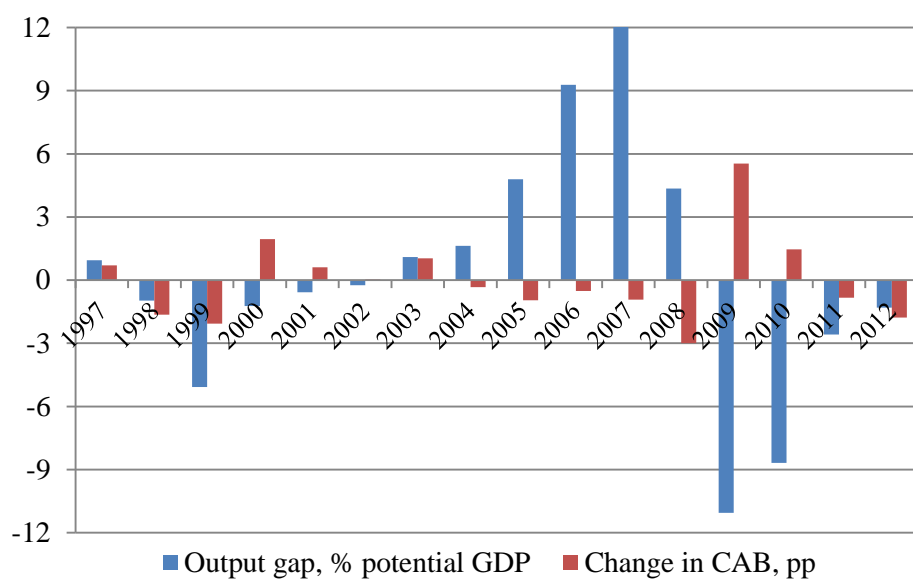

Figure 13. Output gap and change in cyclically-adjusted balance 1997-2012 (Ministry of Finance, author's calculations).

Almost all of the countercyclical fiscal policy years (except for 2003) are located either in the beginning or the end of the sample period. The fiscal loosening of 1998 and 1999 coincides with the Russian crisis and the negative output gaps in Estonia – therefore, the policy response to the recession is clearly countercyclical in nature, allowing for the budget to accommodate the negative shock affecting the economy. After the most acute years of the crisis, the fiscal policy stance tightened in 2000. This is an interesting turn of events that could justify the use of expansionary discretionary fiscal policy in an economic downturn. Instead of tightening the policy stance in the midst of the recession, the necessary adjustments could be made in the following years (as the economy has returned to growth or closed the negative output gap).

Starting in 2004, instead of moving in the same direction, the output gap and the change in cyclically-adjusted balances start to move in the opposite directions (as the prevailing policy stance deteriorates increasingly compared to the optimal countercyclical stance). Decreases in CAB and positive output gaps of 2004-2008 turn into increases in CAB and negative output gaps of 2009-2010, with all of the years indicating less-than-optimal fiscal policy. Estonian fiscal policy stance returns to countercyclical ways in 2011 and 2012 as the negative output gap is closing together with a loosened fiscal policy stance compared to the previous crisis years.

The data presented in Figure 13 can be applied to find evidence for the hypotheses that discretionary fiscal policy is usually more countercyclical in downturns and that the problem of procyclicality is more characteristic to expansion years. For that purpose, we concentrate first on the years of negative output gaps and then on the years of positive output gaps. With regards to the first hypothesis, the Estonian example does not provide a conclusive answer – fiscal policy is indeed countercyclical in response to the Russian crisis of 1998-1999, but not during the Great Recession of 2008-2009. In response to the second hypothesis, the years of the largest positive output gaps (2004-2008) in Estonia indeed indicate a slightly procyclical fiscal policy stance. If we apply the data in Figure 13 on a scatter diagram, the result would look like Figure 14 below.
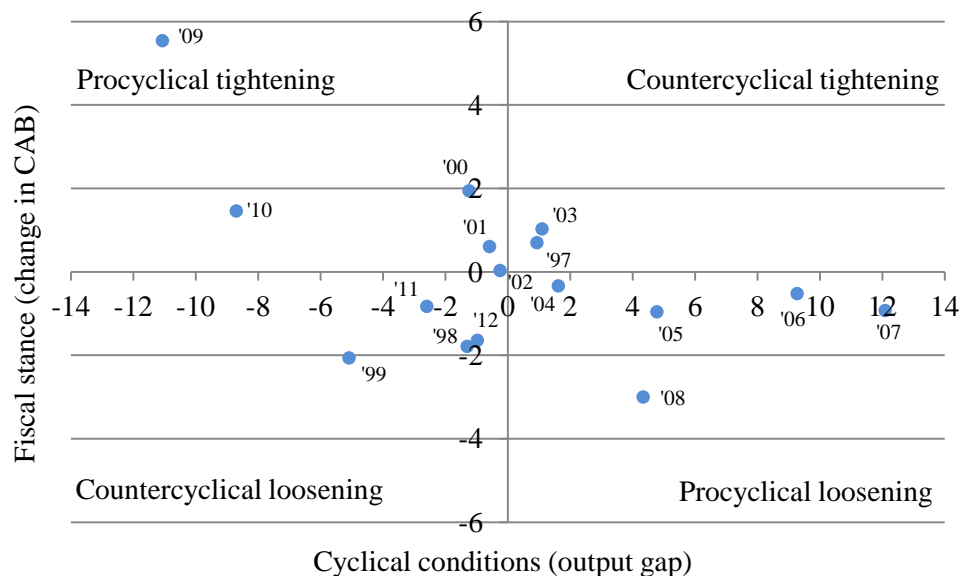

Figure 14. Fiscal policy stance 1997-2012 (author's calculations).

We have once again plotted the change in cyclically-adjusted balance (rather than the level) on the vertical axis against the output gap on the horizontal axis. Each data point located in one of the four labeled quadrants represents one year in the 1997-2012 period. An increase in CAB could result in either procyclical tightening (if the output gap is negative) or countercyclical tightening (if the output gap is positive). Similarly, a decrease in CAB could result in either procyclical loosening (if the output gap is positive) or countercyclical loosening (if the output gap is negative). Data points located close to the axis should be treated as neutral (for example, the year 2002). For the overall fiscal policy stance to be countercyclical in nature, most of the data points should be located in either the first or the third quadrant (labeled either „countercyclical tightening" or „countercyclical loosening"). This is however not the case for Estonia.

As evidenced in Figure 14, the policy impulse to the crisis years of 1998-1999 was countercyclical loosening as the CAB deteriorated in conditions of negative output gap, followed by procyclical tightening in 2000 (continuing mildly in 2001). The fiscal policy impulse for the boom period of 2004-2007 must be emphasized – while there was an almost constant decrease in the CAB, the output gap grew significantly larger with each year. Therefore, the optimal change in CAB could not have been of similar size each year. On the contrary, for the policy stance to be countercyclical tightening rather than procyclical loosening, positive changes in CAB (either smaller deficits or bigger surpluses) were required in hindsight. The year 2008 is an interesting case. On one hand, there was a significant negative change in the CAB (from a deficit of -1,2% in 2007 to a deficit of -4,2% in 2008) while the economy was still producing at above-potential level. On the other hand, 2008 ended up being the first recessionary year, as the real GDP decreased by 4,2% compared to the previous year (of above-potential growth). After 2008 comes a complete overhaul in Estonian fiscal policy stance (and not necessarily for the better, since we are moving from one procyclical quadrant to another). Starting from the upper-left corner in Figure 14, 2009 and 2010 are clear examples of procyclical tightening; i.e. cutting the budget in years of below-potential growth. In the Estonian context, these are the so-called austerity years following the Great Recession. Finally, 2011 and 2012 indicate a looser fiscal stance compared to the previous austerity period. Together with the negative output gap, the policy stance in the last two years can be labelled as countercyclical loosening.

Overall, the fiscal policy impulse is procyclical on nine occasions, neutral on one occasion, and countercyclical only on six occasions (out of sixteen observations in total). A countercyclical policy record of six from sixteen cannot be interpreted as fiscal policy behaving in an optimal manner. In conclusion, neglecting the size of the impulse and the type of the output gap, fiscal policy impulses in Estonia during the 1997-2012 period have been more often procyclical rather than countercyclical.

As introduced in previous theory chapters, stabilization policy (at least in theory) consists of both fiscal and monetary policy tools. Therefore fiscal and monetary policy stances (i.e. the policy mix) in the real economy can either accommodate each other (when both policy impulses are either expansionary or contractionary), or influence the macroeconomic environment in the opposite directions (when one of the impulses is contractionary and the other expansionary). Sometimes both stabilization tools are required to increase the strength of the policy stance, on other occasions one policy looks to offset the impulses of the other. Figure 15 illustrates the Estonian policy-mix for the period 1997-2012, by plotting the fiscal stance on the vertical axis and the monetary stance (approximated by the change in the real short-term interest rates) on the horizontal axis.
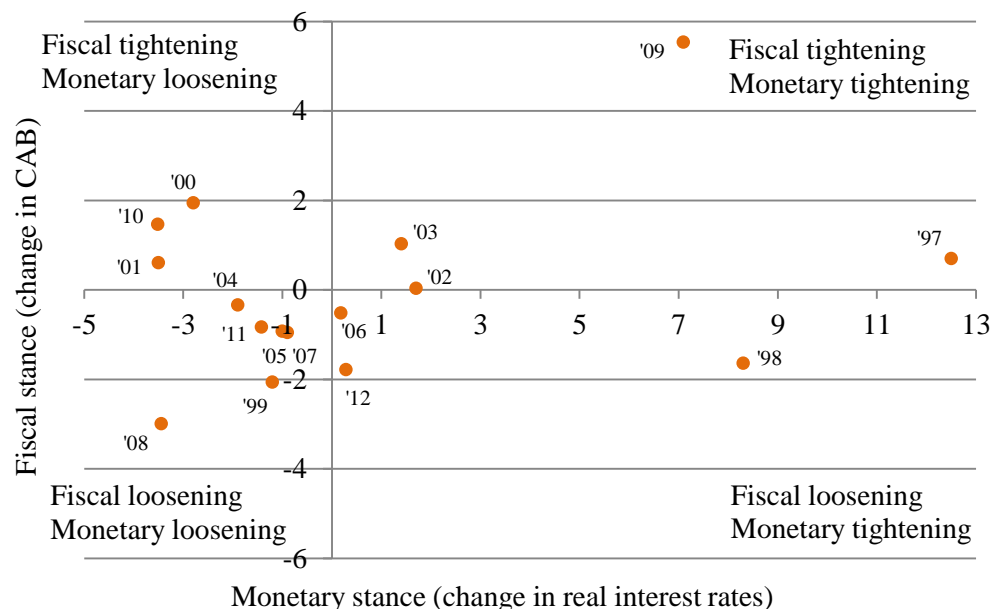

Figure 15. Policy mix in Estonia 1997-2012 (author's calculations).

The short-term nominal interest rates used in the analysis are the annual averages of 3 month Talibor (for 1996-2005) and the 3 month Euribor (for 2006-2012). Real interest rates are calculated by adjusting the nominal rates with Estonian annual CPI inflation. A positive change in CAB is associated with fiscal tightening while a positive change in real interest rates is associated with monetary tightening (and vice versa in both cases). Good examples of monetary tightening include the years 1997-1998 and 2009.

First of all, we can analyze the years when fiscal policy impulses in Estonia were accommodated by similar monetary policy impulses. Most of the years under review fall under this category. The fiscally loose boom years of 2004, 2005 and 2007 coincide with monetary loosening, thereby exacerbating the cyclical developments of the economy. 2008 is the most extreme example of fiscal and monetary loosening, followed by an even more extreme example of fiscal and monetary tightening in 2009. In 2010, the continuing monetary loosening in eurozone was accompanied by a domestic fiscal tightening in the Estonian example.

Since 2011, the monetary impulses originate from one-size-fits-all monetary policy decisions taken by the ECB. This could potentially create asymmetric policy stances due to different cyclical conditions of the member states' economies and due to different inflation performances. Because of disparities in inflation rates across the eurozone, the nominal interest rates decided by the ECB could lead to very different outcomes in real terms (interest rates corrected by Consumer Price Index) nationally. In other words, from 2011 onwards Estonian fiscal policy decisions must be made taking monetary policy as given.

While the previous scatter diagram described both fiscal and monetary policy stances, it omitted the cyclical developments of the Estonian economy. Table 6 provides the fiscal and monetary stances familiar from the scatter diagrams together with the stance of the overall policy mix (combining the direction and strength of the impulses). More importantly, the fifth column includes the type of output gap prevailing at the time (whether negative or positive), while the last column presents the policy stance that should prevail under such cyclical conditions and according to the countercyclical stabilization policy principles.

The criteria used for determining the fiscal policy stance was introduced in Table 5 on page 48, and monetary policy stances are categorized in similar fashion. Neglecting the size of the output gap, the overall policy mix in Estonia has been predominantly tight or mixed before 2004 and predominantly loose after 2004.

Table 6. Comparing the actual and optimal policy stance, 1997-2012

Period	Fiscal stance	Monetary stance	Policy mix	Output gap	Countercyclical policy
1997	tight	very tight	tight	positive	tight
1998	very loose	very tight	mixed	negative	loose
1999	very loose	loose	loose	negative	loose
2000	very tight	very loose	mixed	negative	loose
2001	tight	very loose	mixed	negative	loose
2002	neutral	very tight	tight	close to zero	neutral
2003	tight	tight	tight	positive	tight
2004	neutral	very loose	loose	positive	tight
2005	loose	loose	loose	positive	tight
2006	loose	neutral	loose	positive	tight
2007	loose	loose	loose	positive	tight
2008	very loose	very loose	very loose	positive	tight
2009	very tight	very tight	very tight	negative	loose
2010	tight	very loose	mixed	negative	loose
2011	loose	loose	loose	negative	loose
2012	very loose	neutral	loose	negative	loose

Source: Ministry of Finance, author's interpretations

The main policy conclusions can be drawn when comparing the fiscal stance and the overall policy mix with the last column, which should indicate the deviation of actual policy from the optimal policy. Based on fiscal policy alone, the policy stances coincide in only seven years out of sixteen. Fiscal policy tightened in the aftermath of the Russian crisis in 2000 and 2001 and again in 2009 and 2010. Due to negative output gaps prevailing at the time, the optimal policy decision would have been to loosen the policy. From 2005 to 2008, under fiscally loose and above-potential GDP conditions, the optimal policy suggests tightening of policy stance. Based on the overall policy mix (which includes the monetary impulses and hence the inflation performance), the results coincide in five years out of sixteen in total. Here, we must be more careful with the interpretations, since we now have three underlying variables generating the policy stance. Also, the monetary and fiscal policy interactions can be more complex in nature.

2.2.2. Regression analysis of Estonian fiscal policy rule

To study the behavior of fiscal policy over the business cycle, a regression model is constructed to be estimated by OLS method using „Stata 11" data analysis software. Data for the output gap and all the fiscal balances is provided by the Ministry of Finance, while government debt levels, revenue and expenditure items are collected from the database of Statistics Estonia. Most of the data is reproduced in the appendices. It is important to emphasize that the following analysis focuses on the ex-post measures of the fiscal variables and of the output cycle (so they do not indicate the data available for policy-makers in real time). This must be taken into account when analyzing the deviations from optimal policy discovered in the regression analysis.

With the benefit of hindsight, we can gather valuable policy lessons for the future, but at the same time, must be careful in criticizing the policy decisions made in the past under potentially different circumstances. In addition, there is great uncertainty with regards to estimating a country's potential output and hence the output gap. This uncertainty is even higher for an economy experiencing structural changes and a rapid catching-up phase.

All the regressions run in the analysis will be descriptive and cannot be interpreted in terms of causality. In the relationship under consideration, the causality works both ways: fiscal policy reacts to the business cycle and the business cycle is affected by fiscal policy. We include annual panel data for the time period of 1996-2012. All of the years are treated similarly, whether expansions or recessions. Since the regression analysis also requires lagged variables, the time series shortens by one year and therefore the final number of observations is 16.

The sample is quite small by normal standards for regression analysis, but not atypical in empirical literature for similar studies and somewhat inevitable in the case of Estonia. Nevertheless, due to a small sample size, all the numerical results must be interpreted with caution.

Assuming that fiscal policy reacts to the output gap, we can summarize the behavior of fiscal policy from an econometric point of view by using a fiscal policy rule such as:

$$FISCAL_t = \alpha + \beta CYCLE_t + \gamma DEBT_{t-1} + \delta FISCAL_{t-1} + \varepsilon_t$$

where *FISCAL* is the fiscal variable of interest (as a measure of fiscal policy) and *CYCLE* is the variable that captures the state of the economy (as a measure of the business cycle). In essence, we are analyzing how the fiscal variable reacts to the business cycle. We use three different measures of government's budgetary balance to analyze the behavior of fiscal policy and select the output gap as an indicator of cyclicality. All of the fiscal variables are measured as a ratio to GDP while the output gap is a ratio to potential GDP.

In line with similar empirical work, we run the regressions including one-year lagged dependent variables such as *DEBT* (gross government debt as a ratio to GDP) for sustainability concerns and *FISCAL* to account for the persistence in fiscal balances. This follows the idea that national fiscal authorities are motivated by objectives of output stabilization (so that budget balances should respond positively to output gaps) and debt stabilization (so that a positive response of budget balances to the existing stock of public debt is expected) (Quarterly...2004: 34). As evidenced during the latest economic crisis, unsustainable debt dynamics can reduce the fiscal space for the conduct of countercyclical fiscal policy.

In setting up the regression model, following Fatas & Mihov (2009: 17), we think of fiscal policy as a combination of three elements: automatic stabilizers, endogenous discretionary fiscal policy, and exogenous discretionary fiscal policy. Automatic stabilizers help „stabilize" the business cycle and are „automatically" triggered by the tax code and by spending rules. Endogenous discretionary fiscal policy includes changes in policy taken in response to changing economic conditions, while exogenous discretionary fiscal policy includes changes in policy not related to economic conditions (for example, changes in fiscal policy driven by political or institutional constraints).

As explained in the theory chapter, if fiscal policy is measured as the nominal or primary budget balance (i.e. without any cyclical adjustment of the balances), then the coefficient β captures both the operation of automatic stabilizers and the discretionary changes in fiscal policy. If instead we select one of the cyclically-adjusted measures of the budget balance (either CAB, CAPB or structural balance) as a fiscal policy indicator, then the coefficient β captures only the discretionary response of fiscal policy to the business cycle. In the context of using fiscal policy as a countercyclical demand management tool, the latter is the subject of great interest (since the size of automatic stabilizers is a by-product of the prevailing tax and spending structure). Finally, any change that is not directly related to the state of the economy or the level of debt will be part of the residual ε, which can be identified with exogenous discretionary fiscal policy.

The behavior of the budget balances can be either countercyclical, acyclical or procyclical depending on the value of coefficient β, which captures the responsiveness of the fiscal variable in relation to the business cycle. This is the core relationship for the purposes of our analysis. If the coefficient is significantly negative (β<0) the policy stance is procyclical, and if the coefficient is significantly positive (β>0) we can assess the policy stance to be countercyclical (see Table 7). In case the coefficient turns out to be nonsignificantly different from zero (β=0), the cyclical stance is said to be acyclical. Once again, optimal fiscal policy is widely regarded to be countercyclical in nature.

Table 7. Assessing the cyclical stance of a budget balance

Cyclical stance	Coefficient β value
procyclical	negative
acyclical	zero
countercyclical	positive

Source: Benetrix & Lane 2012: 6

According to Fatas & Mihov (2009: 21), we should see the coefficients on the output gap to be significant as long as the government engages often (and in the same direction) in fiscal policy decisions that are discretionary and related to the cycle. The fact that coefficients are non-significant could be an indication that we do not observe

such behavior very often or that the behavior is not consistent with the countercyclical fiscal policy principles (i.e. different policy responses in episodes of similar cyclical conditions). The coefficient on debt is expected to be positive in all specifications.

In the following pages, table 8 provides the results of the regression analysis for six different specifications for the full sample of sixteen observations (1997-2012). Tables 9 and 10 present the regression results of the two sub-samples in identical manner. Columns numbered 1, 3, and 5 apply the level of the fiscal indicator as the dependent variable, while columns numbered 2, 4, and 6 apply the yearly changes of the same indicator as the dependent variable. All of the explanatory variables are described by their coefficient estimates, statistical significance (*, **, ***), and standard errors (in parentheses). Also included is the value of R^2, which measures how much of the total variance in the fiscal indicator is explained by the selected explanatory variables. However, achieving a high value for R^2 (a high goodness of fit) is not the overriding objective of the following regression analysis. For robustness purposes, we look at three different budget balance measures, while separately including both their annual levels and changes (Δ) in the balance, totalling six different specifications of the so-called fiscal rule. In addition, we split the full sample of 16 observations into two equally-sized sub-samples to distinguish the behavior of fiscal policy before and after 2004 (inspired by the dynamics of budgetary balances illustrated in Figure 11). We now turn to the detailed analysis of the various specifications and data periods.

Table 8 presents the regression analysis of fiscal cyclicality for the period 1997-2012. In the first column, the coefficient estimate on the output gap variable is highly statistically significant with a value of 0,285. This can be interpreted as indicating *weakly* countercyclical behavior, as previous empirical literature based on cross-country studies have provided a range of 0,3-0,5 for such a specification. The lagged debt variable have proved to be statistically significant, and with a positive coefficient as expected. The lagged dependent variable proves not to be statistically significant in the initial specification, but turns out to be highly statistically significant when applying the change in the nominal balance as the dependent variable. Therefore, in column 2, all of the variables included in the model are statistically significant.

Table 8. Regression analysis of fiscal cyclicality 1997-2012

Variables	(1) NOM/GDP	(2) ΔNOM/GDP	(3) CAB/GDP	(4) ΔCAB/GDP	(5) CAPB/GDP	(6) ΔCAPB/GDP
Output gap	0,285*** (0,091)	0,284*** (0,091)	-0,057 (0,080)	-0,057 (0,080)	-0,051 (0,078)	-0,050 (0,078)
Lagged debt/GDP	0,952** (0,370)	0,950** (0,371)	0,921 (0,526)	0,920 (0,526)	0,986* (0,521)	0,985* (0,520)
Lagged dependent variable	-0,173 (0,277)	-1,171*** (0,277)	0,030 (0,299)	-0,970*** (0,299)	-0,013 (0,296)	-1,011*** (0,296)
Constant	-5,012** (2,087)	-5,000** (2,088)	-4,889 (2,889)	-4,881 (2,889)	-5,018* (2,810)	-5,014* (2,804)
R-squared	0,566	0,688	0,471	0,623	0,489	0,638

Notes: Standard errors in parentheses. ***significant at 1%; **significant at 5%; *significant at 10%.These models are (OLS) estimated with data for the period 1997-2012 (n=16). NOM/GDP is nominal balance scaled by GDP. CAB/GDP is cyclically-adjusted balance scaled by GDP. CAPB/GDP is cyclically-adjusted primary balance scaled by GDP. Columns numbered (2), (4), and (6) use annual change in budget balance (rather than the level) as the dependent variable. Lagged explanatory variables are used with one-year lags. Detailed information on the diagnostic tests is presented in the appendices.

Cyclically-adjusted balances can be used as approximations to indicate the behavior of discretionary fiscal policy (as the automatic stabilizers are netted out). As suggested earlier, the coefficients on output gap when using the cyclically-adjusted balances as dependent variables do not indicate any counter- or procyclical behavior for the 1997-2012 time period. The β-coefficients are close to zero in value and statistically nonsignificant, referring to acyclical behavior. As the interest payments on public debt as a ratio to GDP have stayed rather constant in the period under review, we do not indicate any significant differences between models using CAB versus CAPB. Neither of these budget measures indicate a statistically meaningful behavior in relation to the economic cycle. Based on the regression analysis, discretionary fiscal policy has not intervened in a regular and systematic manner either to moderate or to exacerbate the cyclical developments.

This must be the conclusion for the time period as a whole, but would the conclusion be different if we separate the full sample into two sub-samples? In table 9, we present the results after re-running the same regression models for the time period 1997-2004. Based on nominal budget variables, the results suggest much stronger (0,85 > 0,29) countercyclical fiscal policy behavior compared to the full sample. Estonia did experience considerable deficits during the Russian crisis and increasing surpluses as the economy recovered.

Table 9. Regression analysis of fiscal cyclicality 1997-2004

Variables	(1) NOM/GDP	(2) ΔNOM/GDP	(3) CAB/GDP	(4) ΔCAB/GDP	(5) CAPB/GDP	(6) ΔCAPB/GDP
Output gap	0,851*** (0,058)	0,850*** (0,058)	0,550*** (0,059)	0,549*** (0,059)	0,521*** (0,050)	0,522*** (0,050)
Lagged debt/GDP	0,151 (0,148)	0,150 (0,148)	0,153 (0,147)	0,153 (0,147)	0,208 (0,129)	0,208 (0,129)
Lagged dependent variable	-0,018 (0,070)	-1,015*** (0,070)	-0,018 (0,104)	-1,018*** (0,104)	0,046 (0,090)	-0,954*** (0,090)
Constant	-0,214 (0,871)	-0,211 (0,869)	-0,222 (0,862)	-0,222 (0,862)	-0,321 (0,751)	-0,321 (0,751)
R-squared	0,985	0,989	0,964	0,972	0,972	0,978

Notes: Standard errors in parentheses. ***significant at 1%; **significant at 5%; *significant at 10%. These models are (OLS) estimated with data for the period 1997-2004 (n=8).

More importantly, discretionary fiscal policy measures also indicate countercyclical behavior, as evidenced by highly statistically significant positive β-coefficients (with values above 0,5). The response to the Russian crisis (delaying the cuts in expenditure) could explain the result of countercyclical discretionary fiscal policy. The model itself has however suffered, with lagged debt variables and constants now statistically nonsignificant in all of the specifications. Overall, the conduct of fiscal policy (both with and without automatic stabilizers) during 1997-2004 can be labelled countercyclical.

Finally, in table 10, we present the results of regression analysis for the second sub-sample consisting the years 2005-2012. The selected time period includes the domestic overheating of Estonian economy, the Great Recession, and its policy response.

Table 10. Regression analysis of fiscal cyclicality 2005-2012

Variables	(1) NOM/GDP	(2) ΔNOM/GDP	(3) CAB/GDP	(4) ΔCAB/GDP	(5) CAPB/GDP	(6) ΔCAPB/GDP
Output gap	0,512*** (0,101)	0,511*** (0,102)	0,104 (0,150)	0,103 (0,150)	0,097 (0,153)	0,097 (0,153)
Lagged debt/GDP	1,252** (0,295)	1,249** (0,297)	2,834* (1,341)	2,829* (1,342)	2,757 (1,371)	2,750 (1,367)
Lagged dependent variable	-1.251** (0,389)	-2,248*** (0,391)	-0,905 (0,661)	-1,904** (0,661)	-0,883 (0,680)	-1,880** (0,677)
Constant	-6,003** (1,595)	-5,986** (1,603)	-14,818* (7,096)	-14,788* (7,103)	-14,082 (7,142)	-14,048 (7,118)
R-squared	0,902	0,927	0,797	0,860	0,787	0,855

Notes: Standard errors in parentheses. ***significant at 1%; **significant at 5%; *significant at 10%. These models are (OLS) estimated with data for the period 2005-2012 (n=8).

Compared to the first sub-sample, nominal budget balances now indicate clearly weaker countercyclicality than during the first eight years (0,51 compared to 0,85). Such a result can be anticipated when looking at the behavior of nominal balances over the developments in output gap (see Figure 10 on page 46) – the first eight years indicate a stronger co-movement in the two variables, while the last eight years were known for less-than-ideal budget surpluses during the expansionary phase and relatively small budget deficits compared to the scale of the economic crisis (in other words, greater volatility in nominal balance would have been expected). Meanwhile, all of the explanatory variables are statistically significant in nominal specifications. Contrary to the first sub-sample and similar to the full sample, discretionary fiscal policy can be labelled acyclical in the period of 2005-2012.

We conclude the regression analysis with presenting the results (see Table 11) of the main econometric relationship under review – the reaction of various fiscal balances (as a proxy for fiscal policy) to developments in the output gap (as a proxy for cyclical developments in the economy). Table 11 presents the coefficient estimates on the output gap (which are expected to be positive in order to indicate countercyclical behavior) for all of the three time periods, while using the levels-specification of nominal, cyclically-adjusted, and cyclically-adjusted primary balances.

Table 11. Cyclicality of Estonian budget balances

	nominal/GDP	CAB/GDP	CAPB/GDP
coefficient β (1997-2012)	0,285***	-0,057	-0,051
coefficient β (1997-2004)	0,851***	0,550***	0,521***
coefficient β (2005-2012)	0,512***	0,104	0,097

Source: author's calculations

Starting with nominal balance as the fiscal policy indicator, all of the coefficients on output gap variable are positive and highly statistically significant. These results provide evidence of *countercyclical* behavior in nominal balances, which include both the operation of automatic stabilizers and the discretionary component of fiscal policy decisions. Therefore, improving negative or increasing positive output gaps are associated with nominal budget developments towards smaller deficits or higher surpluses, and vice versa. Automatic stabilizers are known to be countercyclical by default. When concentrating only on the discretionary component of fiscal policy (either CAB or CAPB), the results indicate *acyclical* behavior over the full sample period – the coefficient estimates on the output gap are statistically nonsignificant. However, in addition to automatic stabilizers, *countercyclical* discretionary fiscal policy can be detected during the 1997-2004 period.

To conclude the regression analysis, contrary to the widely-held belief, we found no econometric evidence of procyclicality in Estonian fiscal policy over the time period 1997-2012, even when separating the full sample into two sub-samples (hoping to capture the procyclical behavior from the second sub-sample). Neither the nominal nor cyclically-adjusted budget balances provide any evidence of procyclicality.

Although the regression analysis do not capture any evidence of procyclical behavior, it does not mean that Estonian fiscal policy has behaved in an optimal manner – it is only weakly countercyclical for the full sample period (when including the operation of automatic stabilizers), with discretionary fiscal policy indicating countercyclicality only in the first sub-sample. Although the point estimates should be treated with caution due to a small sample size, we can identify the dynamics in the output gap coeffient estimates – the countercyclical effect is much stronger in the first sub-sample than in the second sub-sample (or in the full sample period). This concludes the econometric analysis of Estonian fiscal policy performance.

Overall, the proposed „fiscal rule" in its current specification has provided satisfactory results, with all of the variables proving at some point the importance of belonging in the model, and therefore, significantly affecting the behavior of Estonian budget balances. The addition of changes in the budget balances as dependent variables have provided further robustness to the results. The model itself is readily applicable when more data points become available in the future. For the most part, the results have had logical explanations from the narrative and statistical analysis provided earlier. Only the absence of procyclicality in the second sub-sample is somewhat of a surprise result. Therefore, it is important that such an econometric exercise is only one (and not the only) input when deciding on the verdict of counter- or procyclicality in fiscal policy. Also, it may be difficult to reach a uniform conclusion for the full sample period, when the sample itself consists of smaller sub-samples indicating differing policy stances. A more close-up approach may be required. Table 12 below looks to provide a condensed version of the empirical fiscal policy assessment process.

Table 12. Results of the empirical analysis

Method of assessment	*1996-2004*	*2005-2012*
graphical analysis & narrative of nominal budget balances (overall stance)	countercyclical	weakly countercyclical and procyclical
method used by Ministry of Finance (discretionary stance)	mostly countercyclical	mostly procyclical
regression analysis (overall & discretionary stance)	countercyclical overall, countercyclical discretionary	weakly countercyclical overall, acyclical discretionary

Source: author's calculations

2.3. Discussion and policy implications

Having provided the empirical analysis of cyclicality in both the Estonian economy and budgetary positions, we can now turn to the overall discussion regarding the cyclical conduct of fiscal policy in Estonia and contemplate policy changes that would look to improve the prevailing situation.

Establishing the inherent volatility in the Estonian macroeconomic indicators, and therefore, the need for countercyclical stabilization policy, is a much easier exercise compared to reaching an unanimous conclusion on Estonian fiscal policy stance. First of all, whenever discussing a fiscal policy stance of a certain country, it is important to distinguish between overall and discretionary fiscal policy stance – any policy assessment would have to specify whether automatic stabilizers are included in the analysis or not – and to include what type of methodology has been used for the assessment. In addition, in lack of a systematic approach to moderating business cycles, larger data samples may be required to separate into smaller sub-samples to reach any statistically significant conclusions.

The overall stance of Estonian fiscal policy conduct tends to indicate a movement from good to worse – policy was clearly countercyclical around the Russian crisis, weakly countercylical during the expansionary period, and briefly procyclical as a response to the Great Recession. The occurence of less countercyclical or even procyclical policy elements was caused by similar reasons as discussed in the theory – Estonian fiscal policy stance has been often reassessed due to data revisions, larger surpluses during the expansionary period would have been very difficult to achieve due to political spending pressures, and the consolidation measures implemented during the latest recession had also a confidence aspect to it (in addition to fulfilling the Maastricht criteria).

Empirical literature on fiscal policy suggests that the more developed the country, the more countercyclical fiscal policy tends to be. The main econometric result of the analysis of Estonian fiscal policy suggests that the policy conduct here has been only weakly countercyclical (when including both automatic stabilizers and discretionary measures). The reasons behind such insufficiently counter-cyclical policy could be found in the fiscal framework and policy objectives prevailing at the time. As suggested

in theory, annually balanced nominal budget rules are prone to inflexibility and procyclical bias.

As mentioned in the theory chapter, the costs of losing an independent monetary policy can be reduced by a more active countercyclical fiscal policy. Furthermore, empirical literature have provided evidence that countries with weak automatic stabilizers (such as Estonia) tend to use discretionary fiscal policy more actively. In our analysis of Estonian fiscal policy, however, we noted that the countercyclical role of fiscal policy has been mostly overlooked by fiscal authorities and that countercyclical discretionary measures have not compensated for the modest effect of automatic stabilizers. With regards to the discretionary policy component, the econometric analysis suggests countercyclical behavior only in the 1997-2004 period.

However, the literature suggests that discretionary fiscal policy can be a viable tool for short-term demand management in open economies with fixed exchange rates and high capital mobility. Future policy efforts should therefore look to increase the countercyclical behavior of fiscal policy in relation to the economic cycle, with discretionary policy measures (under right circumstances) being a valuable tool in an already limited stabilization toolkit. Furthermore, changes in the tax rates could be assessed in terms of their cyclical appropriateness. From a purely stabilization standpoint, Estonian income tax rate was decreased during the expansionary period and value added tax rates increased during the recession, implicating procyclical behavior.

Developments in the fiscal policy framework seem to be lately changing for the better regarding the countercyclical role that fiscal policy can play. The same policy documents that have referred to the procyclical bias in Estonian fiscal policy, have also discussed several solutions and policy proposals for increasing the countercyclical role of fiscal policy. As a recent development, there seems to be more focus on the structural budgetary position and its objectives, in parallel to nominal budget positions. The movement from strict annually balanced nominal budget rules to a more flexible, balanced over the cycle framework, is associated in theory with a larger role assigned to the stabilization function of fiscal policy, and hopefully helps to avoid the underlying procyclical bias in the previous fiscal policy framework.

A structurally balanced budget objective allows room for manoeuvre for cyclical stabilization (subject to the 3% deficit ceiling). Another policy initiative discussed in the fiscal policy literature, also in the Estonian context, is to set up a Fiscal Council that looks to enhance the countercyclical role of fiscal policy by constantly assessing the cyclical position of the economy and providing input to the budget preparation process. This would help to overcome at least one of the reasons why Estonian authorities opted for annually balanced nominal budget rules before the recent business cycle. Regarding the bias of overspending during expansionary periods, multi-year expenditure ceilings could be introduced.

To conclude, Estonia is inherently a very volatile economy, and the policy choices made so far have not looked to stabilize these cyclical developments in a discretionary manner. Estonian policy-makers have not been able to use monetary policy for stabilization purposes since entering a currency board arrangement. Although Estonia was not a member of the euro area in 2008-09, it acted as it already were. As the Estonian macroeconomic policy framework moved from a currency board to a monetary union in 2011, the already limited toolkit for aggregate demand management grew even more restricted – the conduct of fiscal policy is now subject to annual deficit and debt thresholds.

The undeniable fact is that due to the nature of the Estonian economy it will be susceptible to excessive volatility also in the future and that the first full-scaled business cycle will be followed by others (including the periods of aggregate demand shortfall). The probability of asymmetrical shocks will grow as more countries enter the monetary union and the one-size-fits-all monetary policy of ECB may not be fitting to the macroeconomic conditions prevailing in Estonia. The question therefore becomes how to increase the ability of fiscal policy to smooth cyclical fluctuations in output and employment over the course of business cycles (without negatively affecting the underlying potential growth rate of the economy)?

Estonian economy is in a unique position compared to the average euro area country. Together with the lowest ratio of public debt, one of the weakest automatic stabilizers, and a highly volatile economic performance, there seems to be the required space and the obvious need for (discretionary) countercyclical fiscal policy principles. However,

stabilization can be challenging in small and open economies, as every policy mistake comes with a great cost (ill-targeted stimulus may leak abroad, limited fiscal space complicates the response to cyclicality). As such, the first option would be to make the economy inherently more resilient (and less susceptible) to external shocks. A more realistic option would be to have better policies ready to be implemented in case of excessive and welfare-reducing economic fluctuations. Is there scope to heighten the effectiveness of automatic stabilizers? Is it possible to attach trigger mechanisms to public spending and tax instruments (triggered by stabilization needs)? Will the stabilization aspect of discretionary fiscal policy grow in importance compared to the allocation and distribution aspects?

CONCLUSION

Stabilization policy aims to eliminate the short-term gap between actual and potential output in the economy over the business cycle. In addition to the working of automatic stabilizers (which has only a modest effect in Estonia), fiscal policy-makers have the discretionary tools of taxation and government spending to implement countercyclical fiscal measures. The stabilizing role of fiscal policy has experienced a recent revival in policy discussions across the world, as the Great Recession has left a deep and prolonged effect on the economies. In most European countries, monetary policy has either exhausted its traditional channels or was not an autonomous policy tool in the first place.

As governments have assumed a more active role in managing the economy, it is important to understand the issues involved in successful aggregate-demand management (for instance, in order to prevent the common problem of procyclicality). The effectiveness of short-term demand-management policies, measured by a fiscal multiplier, depends mainly on the underlying properties of an economy and the nature of the shock hitting the economy. In theory, fiscal policy can be effective in an open economy with fixed exchange rates and high capital mobility − in a country such as Estonia.

In addition to being a potentially effective policy option in theory, fiscal policy in Estonia has historically been the only tool available for stabilizing excessive economic volatility, whether under currency board arrangement or in a monetary union. However, instead of placing an increased importance to the stabilization function of fiscal policy, Estonian policy-makers have opted for conservative fiscal policy with „balanced or better rule" for nominal budget positions. While achieving low levels of government debt and possible confidence effects, it reduces the flexibility of (discretionary) fiscal

policy in accommodating shocks to the economy. Meanwhile, Estonian economy is characterized by very volatile output and employment.

An assessment of the economic cycle and its impact on the budget is critical to the pursuit of countercyclical policies. In order to describe the fiscal policy stance in modern Estonia, the author has concluded a statistical and an econometric analysis of the budgetary processes during the economy's first full business cycle. The data on output gap and budgetary variables is provided by the Estonian Ministry of Finance, while the regression model is built based on the empirical literature of similar studies.

From 1996 up to 2004, Estonian fiscal policy was overall conducted in a countercyclical manner. As a response to the Russian crisis, the nominal budget indicated a sharp deficit and public expenditures continued to grow, signalling a very loose fiscal stance. Starting in 2005, the size of the budgetary surpluses did not increase accordingly to the strong economic performance, indicating less countercyclical behavior. The fiscally loose boom years also coincided with monetary loosening. In order to be able to conduct countercyclical fiscal policies during downturns, a fiscal buffer must be created during the previous expansionary phase. In response to the Great Recession, and with a view towards fulfilling the Maastricht criteria, the policy-makers implemented austerity and one-off measures, signalling a very tight and procyclical fiscal stance.

The regression analysis looked to provide an econometric analysis of the issue of cyclicality in Estonian fiscal policy. Various fiscal variables were regressed against output gap and the lagged values of public debt and the selected fiscal variable itself. In such specification, fiscal outcomes are determined by objectives of output stabilization and debt stabilization.

The main results can be summarized as follows. Contrary to the widely-held belief, we found no econometric evidence of procyclicality in Estonian fiscal policy over the time period 1997-2012. With nominal balance as the fiscal policy indicator, the coefficients on output gap variable are positive and highly statistically significant, providing evidence of countercyclical behavior in nominal balances (which include both the operation of automatic stabilizers and the discretionary component of fiscal policy decisions).

When concentrating only on the discretionary component of fiscal policy the results indicate acyclical behavior over the full sample period – the coefficient estimates on the output gap are statistically nonsignificant. However, countercyclical discretionary fiscal policy can be detected during the 1997-2004 period.

To conclude, Estonia is inherently a very volatile economy, and the policy choices made so far have not looked to stabilize these cyclical developments in an optimal manner. Future policy efforts should therefore look to increase the countercyclical behavior of fiscal policy in relation to the economic cycle, with discretionary policy measures (under right circumstances) being a valuable tool in an already limited stabilization toolkit. Recent developments in the fiscal policy framework seem to offer positive encouragement, as an increased role is assigned to structural budgetary objectives and the setting up of a Fiscal Council and multi-year expenditure rules are being discussed in policy circles.

REFERENCES

1. **Alesina, A., Giavazzi, F.** Introduction. – Fiscal Policy after the Financial Crisis. Edited by A. Alesina & F. Giavazzi. Chicago: The University of Chicago Press, 2013, pp. 1-18.

2. AMECO – The Annual Macroeconomic Database. [http://ec.europa.eu/economy_finance/ameco/user/serie/SelectSerie.cfm]. 29.11.2013

3. **Andersen, T. M.** Is there a Role for an Active Fiscal Stabilization Policy? – CESifo Economic Studies, 2005, Vol. 51, No. 4, pp. 511-547.

4. **Auerbach, A. J., Gale, W. G., Harris, B. H.** Activist Fiscal Policy. – Journal of Economic Perspectives, 2010, Vol. 24, No. 4, pp. 141-164.

5. **Auerbach, A.** US Fiscal Policy in Recession: What's Next? – CESifo Forum, 2009, Vol. 10, No. 2, pp. 3-8.

6. **Balassone, F., Kumar, M. S.** Cyclicality of Fiscal Policy. – Promoting Fiscal Discipline. Edited by M. S. Kumar & T. Ter-Minassian. Washington D.C.: IMF, 2007, pp. 19-35.

7. **Beetsma, R., Debrun, X., Klaassen, F.** Is Fiscal Policy Coordination in EMU Desirable? – Swedish Economic Policy Review, 2001, Vol. 8, pp 57-98.

8. **Bénassy-Quéré, A., Cœuré, B., Jacquet, P., Pisani-Ferry, J.** Economic Policy: Theory and Practice. New York: Oxford University Press, 2010, 709 p.

9. **Bénétrix, A. S., Lane, P. R.** Fiscal Cyclicality and EMU. 2012, 28 p. [http://www.tcd.ie/iiis/documents/discussion/pdfs/iiisdp403.pdf]. 08.10.2013

10. **Bénétrix, A. S., Lane, P. R.** The Cyclical Conduct of Irish Fiscal Policy. 2011, 20 p. [http://www.tcd.ie/iiis/documents/discussion/pdfs/iiisdp374.pdf]. 08.10.2013

11. **Blanchard, O., Dell'Ariccia, G., Mauro, P.** Rethinking Macroeconomic Policy. 2010, 18 p. [http://www.imf.org/external/pubs/ft/spn/2010/spn1003.pdf]. 23.11.2013

12. **Bouthevillain, C., Caruana, J., Checherita, C., Cunha, J., Gordo, E., Haroutunian, S., Hubic, A., Langenus, G., Manzke, B., Pérez, J. J., Tommasino, P.** Pros and Cons of Various Fiscal Measures to Stimulate the Economy. – Banque centrale du Luxembourg Working Paper, 2009, No. 40, 30 p. [http://www.bcl.lu/fr/publications/cahiers_etudes/40/]. 28.11.2013

13. **Brunila, A.** Fiscal Policy: Co-ordination, Discipline and Stabilisation. 2002, 18 p.
[http://ec.europa.eu/dgs/policy_advisers/archives/experts_groups/docs/brunila.pdf]. 28.11.2013

14. **Calmfors, L., Corsetti, G., Flemming, J., Honkapohja, S., Kay, J., Leibfritz, W., Saint-Paul, G., Sinn, H-W., Vives, X.** Fiscal Policy and Macroeconomic Stabilization in the Euro Area: Possible Reforms of the Stability and Growth Pact and National Decision-Making Processes. – EEAG Report on the European Economy, 2003, No. 05, pp. 46-75.

15. **Cameron, D. R.** Fiscal Responses to the Economic Contraction of 2008-09. 2010, 17 p. [http://www.princeton.edu/piirs/research/research-clusters/politics-economic-crisis/Fiscal-Responses-to-the-Economic-Contraction.pdf]. 28.11.2013

16. **Coenen, G., Kilponen, J., Trabandt, M.** When Does Fiscal Stimulus Work? – ECB Research Bulletin, 2010, No. 10, pp. 6-10. [http://www.ecb.europa.eu/pub/pdf/other/researchbulletin10en.pdf]. 28.11.2013

17. Counter-cyclical Economic Policy. OECD Economic Outlook. 2010, pp. 309-330. [http://www.oecd.org/eco/outlook/45276589.pdf]. 28.11.2013

18. **Courtois, R.** What We Do and Don't Know about Discretionary Fiscal Policy. – Economic Brief, 2009, No. 09-04. [http://www.richmondfed.org/publications/research/economic_brief/2009/pdf/eb_09-04.pdf]. 28.11.2013

19. **Danninger, S., Kumhof, M., Laxton, D.** When Does Fiscal Stimulus Work? – IMF World Economic Outlook. 2008, pp. 70-75. [http://www.imf.org/external/pubs/ft/weo/2008/01/]. 28.11.2013

20. **Debrun, X., Kapoor, R.** Fiscal Policy and Macroeconomic Stability: New Evidence and Policy Implications. – Revista de Economia y Estadistica, 2010, Vol. 48, No. 2, pp. 69-101.

21. **DeLong, J. B., Tyson, L. D.** Discretionary Fiscal Policy as a Stabilization Tool: What Do We Think Now That We Did Not Think in 2007? 2013, 31 p. [http://www.imf.org/external/np/seminars/eng/2013/fiscal/pdf/tyson.pdf]. 28.11.2013

22. Economic Report of the President. The Council of Economic Advisers. 2010, 458 p. [http://www.presidency.ucsb.edu/economic_reports/2010.pdf]. 28.11.2013

23. Eelarvepoliitika ja majanduse stabiliseerimisreserv. Taustinfo. [http://www.eestipank.ee/sites/default/files/publication/et/RPU/1998/taust2.html]. 07.12.2013

24. **Eggertsson, G. B.** What Fiscal Policy is Effective at Zero Interest Rates? – Federal Reserve Bank of New York Staff Reports, 2009, No. 402, pp. 1-34. [http://www.newyorkfed.org/research/staff_reports/sr402.html]. 28.11.2013

25. Estonian Economy and Monetary Policy 1/2009. Eesti Pank, 2009. [http://www.eestipank.ee/en/publication/estonian-economy-and-monetary-policy/2009/estonian-economy-and-monetary-policy-12009]. 23.11.2013

26. Estonian Economy and Monetary Policy 1/2013. Eesti Pank, 2013. [http://www.eestipank.ee/en/publication/estonian-economy-and-monetary-policy/2013/estonian-economy-and-monetary-policy-12013]. 26.11.2013

27. Estonian Economy and Monetary Policy 2/1999. Eesti Pank, 1999. [http://www.eestipank.ee/en/publication/estonian-economy-and-monetary-policy/1999/estonian-economy-and-monetary-policy-21999]. 23.11.2013

28. Estonian Economy and Monetary Policy 2/2008. Eesti Pank, 2008. [http://www.eestipank.ee/en/publication/estonian-economy-and-monetary-policy/2008/estonian-economy-and-monetary-policy-22008]. 23.11.2013

29. Estonian Economy and Monetary Policy 2/2009. Eesti Pank, 2009. [http://www.eestipank.ee/en/publication/estonian-economy-and-monetary-policy/2009/estonian-economy-and-monetary-policy-22009]. 23.11.2013

30. Estonian Economy and Monetary Policy 2/2012. Eesti Pank, 2012. [http://www.eestipank.ee/en/publications/series/estonian-economy-and-monetary-policy]. 23.11.2013

31. Estonian Economy and Monetary Policy 3/2006. Eesti Pank, 2006. [http://www.eestipank.ee/en/publication/estonian-economy-and-monetary-policy/2006/estonian-economy-and-monetary-policy-32006]. 23.11.2013

32. Estonian Economy and Monetary Policy 3/2007. Eesti Pank, 2007. [http://www.eestipank.ee/en/publication/estonian-economy-and-monetary-policy/2007/estonian-economy-and-monetary-policy-32007]. 23.11.2013

33. Estonian Economy and Monetary Policy 6/2001. Eesti Pank, 2001. [http://www.eestipank.ee/en/publication/estonian-economy-and-monetary-policy/2001/estonian-economy-and-monetary-policy-62001]. 23.11.2013

34. Estonian Economy and Monetary Policy 9/2000. Eesti Pank, 2000. [http://www.eestipank.ee/en/publication/estonian-economy-and-monetary-policy/2000/estonian-economy-and-monetary-policy-92000]. 23.11.2013

35. Estonian Economy and Monetary Policy 9/2001. Eesti Pank, 2001. [http://www.eestipank.ee/en/publication/estonian-economy-and-monetary-policy/2001/estonian-economy-and-monetary-policy-92001]. 23.11.2013

36. Estonian Economy and Monetary Policy 9/2006. Eesti Pank, 2006. [http://www.eestipank.ee/en/publication/estonian-economy-and-monetary-policy/2006/estonian-economy-and-monetary-policy-92006]. 23.11.2013

37. Euro Area Fiscal Policies and the Crisis. ECB Occasional Paper. 2010, No 109, 79 p. [http://www.ecb.europa.eu/pub/pdf/scpops/ecbocp109.pdf]. 23.11.2013

38. European Economy. Public Finances in EMU - 2005. European Commission. 2005, No. 3, 422 p. [http://ec.europa.eu/economy_finance/publications/publication_summary427_en.htm]. 10.10.2013

39. Eurostat. Statistics Database. [http://epp.eurostat.ec.europa.eu/portal/page/portal/eurostat/home/]. 29.11.2013

40. **Fatás, A.** Is There a Case for Sophisticated Balanced-budget Rules? 2005, 19 p. [http://search.oecd.org/officialdocuments/displaydocumentpdf/?doclanguage=en&cote=ECO/WKP%282005%2953]. 28.11.2013

41. **Fatás, A., Mihov, I.** Fiscal Policy as a Stabilization Tool. 2011, 99 p. [http://faculty.insead.edu/fatas/Fiscal_Stabilization.pdf]. 08.10.2013

42. **Fatás, A., Mihov, I.** The Euro and Fiscal Policy. 2009, 53 p. [http://www.nber.org/papers/w14722]. 08.10.2013

43. Financial Stress, Downturns, and Recoveries. IMF World Economic Outlook. 2008, 301 p. [http://www.imf.org/external/pubs/ft/weo/2008/02/pdf/text.pdf]. 23.11.2013

44. **Hemming, R., Kell, M., Mahfouz, S.** The Effectiveness of Fiscal Policy in Stimulating Economic Activity – A Review of the Literature. 2002, 52 p. [http://www.imf.org/external/pubs/cat/longres.cfm?sk=16198.0]. 23.11.2013

45. IMF Country Report No. 13/114. Republic of Estonia: 2013 Article IV Consultation. 2013, 56 p. [http://www.imf.org/external/pubs/ft/scr/2013/cr13114.pdf]. 29.11.2013

46. **Kopcke, R. W., Tootell, G. M. B., Triest, R. K.** Introduction: The Macroeconomics of Fiscal Policy. – The Macroeconomics of Fiscal Policy. Edited by R. W. Kopcke, G. M. B. Tootell, R. K. Triest. Cambridge: MIT Press, 2005, pp. 3-21.

47. **Lane, P. R.** On the Cyclicality of Irish Fiscal Policy. – The Economic and Social Review, 1998, Vol. 29, No. 1, pp. 1-16.

48. **Lane, P. R.** On the Cyclicality of Irish Fiscal Policy. – The Economic and Social Review, 1998, Vol. 29, No. 1, pp. 1-16.

49. **Langdana, F. K.** Macroeconomic Policy: Demystifying Monetary and Fiscal Policy. New York: Springer, 2009, 286 p.

50. **Larch, M., Turrini,** A. The Cyclically-adjusted Budget Balance in EU Fiscal Policy Making: A Love at First Sight Turned Into a Mature Relationship. – European Commission Economic Papers, 2009, Vol. 374, pp. 1-44.

51. **Lucas, R. E.** Macroeconomic Priorities. – American Economic Review, 2003, Vol. 93, No. 1, pp. 1-14.

52. **Mankiw, N. G.** The Trilemma of International Finance. - The New York Times. 2010.[http://www.nytimes.com/2010/07/11/business/economy/11view.html?_r= 0]. 28.11.2013

53. **Midthjell, N. L.** Fiscal Policy and Financial Crises – What are the Actual Effects of Fiscal Policy? – Norges Bank Economic Bulletin, 2011, Vol. 82, pp. 24-38. [http://www.norges-bank.no/en/about/published/publications/economic-bulletin/2011/midthjell/]. 28.11.2013

54. Monthly Bulletin 04/2002. European Central Bank. [http://www.ecb.europa.eu/pub/pdf/mobu/mb200204en.pdf]. 23.11.2013

55. Monthly Bulletin 06/2008. European Central Bank. [http://www.ecb.europa.eu/pub/pdf/mobu/mb200806en.pdf]. 23.11.2013

56. Monthly Bulletin 07/2009. European Central Bank. [http://www.ecb.europa.eu/pub/pdf/mobu/mb200907en.pdf]. 23.11.2013

57. OECD Economic Surveys: Estonia. April 2009. 2009, 146 p. [http://www.oecd.org/eco/surveys/economicsurveyofestonia2009.htm]. 28.11.2013

58. OECD Economic Surveys: Estonia. April 2011. 2011, 139 p. [http://www.arengufond.ee/upload/Editor/ettevotlus/OECD_Raport%20Eesti%2 0kohta_2011.PDF]. 28.11.2013

59. OECD Economic Surveys: Estonia. October 2012 Overview. 2012, 40 p. [http://www.oecd.org/eco/surveys/Estonia%20overview.pdf]. 28.11.2013

60. Options for Responding to Short-Term Economic Weakness. CBO Paper. 2008, 27 p. [http://www.cbo.gov/sites/default/files/cbofiles/ftpdocs/89xx/doc8916/01-15-econ_stimulus.pdf] 28.11.2013

61. Quarterly Report on the Euro Area. European Commission. 2004, Vol. 3, 42 p. [http://ec.europa.eu/economy_finance/publications/publication1668_en.pdf]. 08.10.2013

62. Rahapoliitika ja Majandus 9/2003. Eesti Pank, 2003. [http://www.eestipank.ee/publikatsioon/rahapoliitika-ja-majandus/2003/rahapoliitika-ja-majandus-92003]. 23.11.2013

63. Riigi eelarvestrateegia 2003-2006. Rahandusministeerium. 2002, 152 p. [http://www.fin.ee/riigi-eelarvestrateegia]. 28.11.2013

64. Riigi eelarvestrateegia 2004-2007. Rahandusministeerium. 2003, 159 p. [http://www.fin.ee/riigi-eelarvestrateegia]. 28.11.2013

65. Riigi rahavoo juhtimine ja finantsreservid. Rahandusministeerium. [http://www.fin.ee/riigi-rahavoo-juhtimine-ja-finantsreservid]. 07.12.2013

66. **Romer, C. D.** Fiscal Policy in the Crisis: Lessons and Policy Implications. 2012, 28 p. [http://elsa.berkeley.edu/~cromer/Lessons%20for%20Fiscal%20Policy.pdf]. 28.11.2013

67. **Romer, D.** What Have We Learned about Fiscal Policy from the Crisis? 2011, 12 p. [http://www.imf.org/external/np/seminars/eng/2011/res/pdf/DR3presentation.pdf]. 28.11.2013

68. **Seidman, L.** Keynesian Fiscal Stimulus: What Have We Learned from the Great Recession? – Business Economics, 2012, Vol. 47, pp. 273-284.

69. **Snowdon, B., Vane, H. R.** Modern Macroeconomics: Its Origins, Development and Current State. Cheltenham: Edward Elgar Publishing, 2005, 807 p.

70. **Sorensen, P. B., Whitta-Jacobsen, H. J.** Introducing Advanced Macroeconomics: Growth and Business Cycles. Berkshire: McGraw-Hill Education, 2010, 820 p.

71. **Spilimbergo, A., Symansky, S., Blanchard, O., Cottarelli, C.** Fiscal Policy for the Crisis. 2008, 37 p. [http://www.imf.org/external/pubs/ft/spn/2008/spn0801.pdf]. 23.11.2013

72. State Budget Strategy 2007-2010. Ministry of Finance of the Republic of Estonia. 2006, 138 p. [http://www.fin.ee/budgeting]. 08.10.2013

73. State Budget Strategy 2014-2017. Ministry of Finance of the Republic of Estonia. 2013, 111 p. [http://www.fin.ee/budgeting]. 08.10.2013

74. Statistics Estonia. [http://www.stat.ee/national-accounts]. 06.12.2013

75. **Taylor, J. B.** Reassessing Discretionary Fiscal Policy. – Journal of Economic Perspectives, 2000, Vol. 14, No. 3, pp. 21-36.

76. The Effectiveness and Scope of Fiscal Stimulus. – OECD Economic Outlook. Interim Report. 2009, pp. 105-150. [http://www.oecd.org/economy/outlook/42421337.pdf]. 23.11.2013

77. Updated Convergence Programme 2005. Republic of Estonia. 2005, 89 p. [http://ec.europa.eu/economy_finance/economic_governance/sgp/pdf/20_scps/2005-06/01_programme/ee_2005-12-01_cp_et.pdf]. 08.10.2013

78. Updated Convergence Programme 2006. Republic of Estonia. 2006, 88 p. [http://ec.europa.eu/economy_finance/economic_governance/sgp/pdf/20_scps/2006-07/01_programme/2007-01-03_ee_sp_et.pdf]. 08.10.2013

79. Updated Convergence Programme 2007. Republic of Estonia. 2007, 82 p. [http://ec.europa.eu/economy_finance/economic_governance/sgp/pdf/20_scps/2007-08/01_programme/2007-11-29_ee_cp_et.pdf]. 08.10.2013

80. Updated Convergence Programme 2008. Republic of Estonia. 2008, 93 p. [http://ec.europa.eu/economy_finance/economic_governance/sgp/pdf/20_scps/2008-09/01_programme/ee_2008-12-04_cp_et.pdf]. 08.10.2013

81. Updated Convergence Programme 2010. Republic of Estonia. 2010, 86 p. [http://ec.europa.eu/economy_finance/economic_governance/sgp/pdf/20_scps/2009-10/01_programme/ee_2010-01-29_cp_et.pdf]. 08.10.2013

82. **Walsh, C. E.** The Role of Fiscal Policy. – FRBSF Economic Letter. 2002, Vol. 26, pp. 25-29. [http://www.frbsf.org/economic-research/publications/economic-letter/2002/september/the-role-of-fiscal-policy/]. 28.11.2013

APPENDICES

Appendix 1. Macroeconomic indicators 1996-2012, %

Period	Output gap, % potential GDP	Real GDP growth, %	Public debt, % GDP	Unemployment rate, %	CPI inflation, %
1996	-4,1	5,7	7,4	9,9	23,1
1997	0,9	11,7	6,2	9,6	11,2
1998	-1,0	6,7	5,5	9,8	8,2
1999	-5,1	-0,3	6,0	12,2	3,3
2000	-1,2	10,0	5,1	13,6	4
2001	-0,6	6,3	4,8	12,6	5,8
2002	-0,2	6,6	5,7	10,3	3,6
2003	1,1	7,8	5,6	10,0	1,3
2004	1,6	6,3	5,0	9,7	3,0
2005	4,8	8,9	4,6	7,9	4,1
2006	9,3	10,1	4,4	5,9	4,4
2007	12,1	7,5	3,7	4,7	6,6
2008	4,3	-4,2	4,5	5,5	10,4
2009	-11,1	-14,1	7,2	13,8	-0,1
2010	-8,7	2,6	6,7	16,9	3,0
2011	-2,6	9,6	6,2	12,5	5,0
2012	-1,3	3,9	9,9	10,2	3,9

Source: Ministry of Finance, Statistics Estonia

Appendix 2. Annual real growth in quarterly GDP 1996-2012, %

1996Q1	3,7	2002Q1	3,9	2008Q1	-1,7
1996Q2	4,5	2002Q2	7,9	2008Q2	-0,7
1996Q3	6,3	2002Q3	8,3	2008Q3	-2,3
1996Q4	9,0	2002Q4	6,2	2008Q4	-11,8
1997Q1	9,3	2003Q1	10,0	2009Q1	-11,6
1997Q2	12,0	2003Q2	6,5	2009Q2	-16,1
1997Q3	12,6	2003Q3	6,2	2009Q3	-19,0
1997Q4	13,0	2003Q4	8,5	2009Q4	-9,2
1998Q1	11,5	2004Q1	7,5	2010Q1	-3,6
1998Q2	8,3	2004Q2	5,9	2010Q2	1,4
1998Q3	6,3	2004Q3	6,8	2010Q3	5,7
1998Q4	1,7	2004Q4	5,2	2010Q4	6,7
1999Q1	-0,6	2005Q1	6,4	2011Q1	11,7
1999Q2	-1,3	2005Q2	9,1	2011Q2	11,7
1999Q3	-1,2	2005Q3	9,3	2011Q3	10,1
1999Q4	2,0	2005Q4	10,6	2011Q4	5,3
2000Q1	8,5	2006Q1	10,7	2012Q1	5,0
2000Q2	11,3	2006Q2	9,9	2012Q2	2,5
2000Q3	9,3	2006Q3	10,2	2012Q3	3,5
2000Q4	9,7	2006Q4	9,7	2012Q4	4,9
2001Q1	6,7	2007Q1	10,4	2013Q1	1,3
2001Q2	4,7	2007Q2	8,6	2013Q2	1,0
2001Q3	6,9	2007Q3	6,5	2013Q3	...
2001Q4	6,8	2007Q4	4,8	2013Q4	...

Source: Statistics Estonia

Appendix 3. General government fiscal balances 1996-2012, % GDP

Period	Nominal balance	Interest payments	Primary balance	Cyclical budget component	Cyclically-adjusted balance (CAB)	Cyclically-adjusted primary balance (CAPB)	One-off measures	Structural balance
1996	-0,4	0,3	0,0	-1,2	0,9	1,2	-	0,9
1997	1,9	0,3	2,1	0,3	1,6	1,9	-	1,6
1998	-0,3	0,5	0,2	-0,3	-0,1	0,5	-	-0,1
1999	-3,6	0,3	-3,4	-1,5	-2,1	-1,8	-	-2,1
2000	-0,5	0,2	-0,3	-0,4	-0,2	0,0	-	-0,2
2001	0,3	0,1	0,4	-0,2	0,4	0,6	-	0,4
2002	0,4	0,2	0,6	-0,1	0,5	0,7	-	0,5
2003	1,8	0,2	2,9	0,3	1,5	1,7	-	1,5
2004	1,6	0,2	1,9	0,5	1,2	1,4	-0,6	1,8
2005	1,6	0,2	1,8	1,4	0,2	0,4	0,0	0,2
2006	2,4	0,2	2,6	2,8	-0,3	-0,1	0,8	-1,1
2007	2,4	0,2	2,6	3,6	-1,2	-1,1	-0,1	-1,2
2008	-2,9	0,2	-2,7	1,3	-4,2	-4,0	0,2	-4,4
2009	-2,0	0,2	-1,8	-3,3	1,3	1,5	0,9	0,4
2010	0,2	0,1	0,3	-2,6	2,8	2,9	2,3	0,5
2011	1,2	0,1	1,4	-0,7	1,9	2,1	1,6	0,4
2012	-0,2	0,2	-0,1	-0,4	0,2	0,3	-0,8	1,0

Source: Ministry of Finance

Appendix 4. Diagnostic tests for regression analysis

We present the results of diagnostic tests while applying nominal budget balance as the dependent variable in the regression model. Specifications based on cyclically-adjusted dependent variables were similarly tested, without any major shortcomings, and will not be reported here. Starting with correlation analysis of the selected variables, there is a statistically significant positive correlation between the nominal budget balance and the output gap (0,56) and a statistically significant negative correlation between output gap and the level of debt (-0,64). As evidenced by the regression analysis, the coefficient estimate of the output gap (when using nominal budget balance as the dependent variable) remains positive in all specifications, so that the correlation is also economically meaningful. None of the variables are as strongly correlated (in excess of 0,9) to cause concerns of multicollinearity. VIF (variance-inflating factor) and tolerance tests are not suggested for regressions with small sample sizes (for informational purposes mean VIF equals 1,88).

Furthermore, Breusch-Pagan test indicates no evidence of heteroskedasticity (Prob > chi2 = 0,1045). As the Durbin-Watson d-statistic is not applicable if the model contains lagged values of the dependent variable (it is biased toward a finding of no autocorrelation), we use Durbin's h-test (Prob > F 0,1252) and Breusch-Godfrey test (Prob > F 0,1010) for autocorrelation. It is critical for autoregressive models (i.e. models where the lagged dependent variable is used as an explanatory variable) not to exhibit autocorrelation. In both cases, we cannot reject the null hypothesis of no serial correlation. Ramsey's RESET test (Prob > F 0,1455) suggests that there are no omitted variables in the model. Jarque-Bera test indicates normality in the residuals (Prob > chi2 = 0,1736); however, the test may not lead to valid results in the case of small samples. To conclude, the standard diagnostic tests indicate no shortcomings in the regression model.

Also, for comparative purposes or due to data problems, the macroeconomic indicator chosen for CYCLE in the empirical literature is occasionally the real GDP growth or the unemployment rate (instead of output gap). The author did run the regression models with GDP growth and unemployment as the variables for CYCLE, but with non-superior results.

RESÜMEE

EESTI EELARVEPOLIITIKA KÄITUMINE MAJANDUSTSÜKLIS

Lauri Punga

Käesoleva magistritöö eesmärgiks on hinnata Eesti eelarvepoliitika käitumist viimase majandustsükli raames. Uurimisaluseks ajaperioodiks on valitud aastad 1996-2012. Hinnangu andmisel lähtub autor eelarvepoliitika vastutsüklilisest rollist majandustsükli stabiliseerimisel nii tõusu- kui langusperioodidel. Kui eelarvepoliitilised meetmed (s.t. valitsuse kulutused ja maksupoliitika) leevendavad lühiajalisi kõikumisi majanduses, on tegemist vastutsüklilise eelarvepoliitikaga. Vastupidisel juhul, kui eelarvepoliitika on majandustsüklit võimendava toimega, saab poliitikat pidada protsükliliseks. Magistritöö eesmärgi täitmiseks on oluline alljärgnevate uurimisülesannete tõstatamine ja edukas täideviimine:

- tutvustada teoreetilisi printsiipe majandustsükli juhtimisest eelarvepoliitikaga;
- arutleda Eesti eelarvepoliitilise raamistiku ülesehituse ja selle vastutsükliliste omaduste üle;
- anda ülevaade eelarvepoliitika toime hindamisega seonduvast empiirilisest kirjandusest, sealhulgas metoodikast ja peamistest tulemustest;
- defineerida Eesti viimane majandustsükkel ning selle raames analüüsida Eesti majanduse põhinäitajate ja eelarvepositsioonide arengut;
- teostada ex-post empiiriline analüüs Eesti eelarvepoliitika käitumisest, seejuures koostades regressioonimudeli eelarvepositsioonide ja kogutoodangu kõikumiste vahelise seose analüüsiks;
- anda empiirilisele analüüsile tuginev terviklik hinnang Eesti eelarvepoliitika käitumisele koos seonduvate järeldustega poliitikamuudatusteks.

Esmahinnangu andmiseks eelarvepoliitika tsüklilisele toimele piisab valitsussektori nominaalse eelarvepositsiooni analüüsist majandustsükli ulatuses. Majanduse tsüklilist käitumist, selle ülekuumenemise ja languseliseid perioode iseloomustab SKP lõhe suurus, mis esitab protsentuaalsel kujul lahknevuse majanduse reaalse ja potentsiaalse kogutoodangu vahel. Käesolevas töös on lähtutud Eesti Rahandusministeeriumi kõige hilisematest hinnangutest SKP lõhede (ja ühtlasi tsükliliselt tasandatud eelarvepositsioonide) suurustele.

Nominaalsed eelarvepositsioonid peaksid eelarvepoliitika vastutsüklilise toime olemasolul liikuma sarnases rütmis SKP lõhe arenguga – positiivsete SKP lõhedega kaasneksid nominaalsed eelarveülejäägid ning negatiivsete SKP lõhede korral nominaalsed eelarvepuudujäägid. Eesti puhul selgub analüüsist (vaata joonis 10 leheküljel 46), et vaatlusaluse ajaperioodi esimesel poolel on muutujatevaheline seos võrdlemisi tugev (s.t. poliitika on vastutsükliline). 2005. aastast alates hakkab seos nõrgenema, kuna nominaalsed eelarveülejäägid ei suurene piisavalt võrreldes positiivsete SKP lõhede arengutega, misjärel majanduskriisi aastaid iseloomustab esiteks võrdlemisi väike eelarvepuudujääk ning seejärel eelarveülejäägi saavutamine ulatusliku negatiivse SKP lõhe tingimustes. Seega, nominaalse eelarvepositsiooni analüüs pakub ilminguid, et Eesti eelarvepoliitika on olnud selgelt vastutsükliline vaatlusaluse ajaperioodi esimesel poolel, aga mitte enam teisel poolel. Ühtlasi välistab see järelduse, et eelarvepoliitika on olnud terve ajaperioodi ulatuses sarnaselt käituv.

Nominaalse eelarvepositsiooni puuduseks antud kontekstis on asjaolu, et see sisaldab nii eelarvekomponentide automaatset reageeringut majanduse kõikumistele (nn. automaatseid stabilisaatoreid) kui ka valitsuse suvakohaseid (*discretionary*) eelarvepoliitilisi meetmeid. Kui automaatsed stabilisaatorid on juba loomu poolest vastutsüklilise toimega, siis eelarvepoliitika suvakohaste meetmete mõju võib olla nii vastu- kui ka protsükliline (kui süstemaatiline seos eelarvepositsiooni ja majanduse tsüklilisuse vahel täiesti puudub, on tegemist atsüklilisusega). Eelarvepoliitika suvakohaste meetmete toime hindamiseks kasutatakse empiirilises kirjanduses tsükliliselt tasandatud eelarvepositsioone (näiteks CAB ja CAPB), millest on maha arvatud automaatsete stabilisaatorite toime. Sellisel moel peaksid kajastuma eelarvepoliitika teostajate konkreetsed kavatsused majanduse lühiajalisel juhtimisel.

Võrreldes tsükliliselt tasandatud eelarvepositsioone (või täpsemalt muutusi nendes) taaskordselt SKP lõhe arengutega, saame anda esmase hinnangu Eesti eelarvepoliitika suvakohaste meetmete toimele (vaata jooniseid 13 ja 14). Sarnast metoodikat on aastate jooksul oma väljaannetes rakendanud ka Eesti Rahandusministeerium, kuid pidevate andmete revideerimisega on kaasnenud ka sagedased ümberhinnangud eelarvepoliitika toimele. Eesti suvakohast eelarvepoliitikat iseloomustab selle metoodika kohaselt näiteks tugev vastutsüklilisus aastatel 1998-1999 (Vene kriisi perioodil) ning tugev protsüklilisus aastatel 2009-2010 (nn. Suure retsessiooni perioodil). Eesti majanduse ülekuumenemise perioodil (eelkõige 2005-2007) on suvakohane eelarvepoliitika käitunud pigem neutraalselt, s.t. majanduse ülekuumenemist pole ei leevendatud ega süvendatud.

Eelarvepoliitika käitumise ökonomeetriliseks analüüsiks on empiirilises kirjanduses laialt levinud nn. eelarvereeglite koostamine, mis hõlmavad endas mitmese regressioonimudeli püstitamist eelarvepoliitika (teostajate) käitumise selgitamiseks. Selle asemel, et võrrelda eelarvepositsioone pelgalt SKP lõhede suurustega, kaasatakse regressioonimudelisse selgitavate muutujatena lisaks SKP lõhele üldjuhul ka valitsuse võlakoormus ning viitajaga sõltuv muutuja. Sõltuva muutuja valik tehakse eelarvepositsioonide seast, seega on võimalik eelarvereeglit esitada mitmetes spetsifikatsioonides. Eelkõige huvitab meid seos eelarvemuutuja ning SKP lõhe vahel – kui SKP lõhe hinnatav koefitsient on positiivne, saab eelarvepoliitikat tõlgendada vastutsükliliseks (ning negatiivse koefitsiendi korral protsükliliseks).

Eesti eelarvepoliitika ökonomeetriline analüüs tuvastas nõrgalt vastutsüklilise käitumise kogu ajaperioodi ulatuses, hõlmates nii automaatseid stabilisaatoreid kui ka suvakohast eelarvepoliitikat. Seejuures on vastutsüklilisuse toime tugevus selgelt vähenenud, kui jaotada valim omakorda kaheks võrdseks ajaperioodiks. Selline tulemus on kooskõlas varasemalt käsitletud nominaalse eelarvepositsiooni (graafilise) analüüsiga. Keskendudes vaid suvakohasele eelarvepoliitika komponendile, ei saa eelarvepoliitika käitumist kogu ajaperioodi ulatuses enam vastutsükliliseks hinnata – suvakohane eelarvepoliitika viitab atsüklilisusele. Seega võib väita, et eelarvepoliitika vastutsüklilisus on peamiselt tulenenud automaatsete stabilisaatorite toimest majandustsüklite leevendamisel. Vastutsüklilist suvakohast eelarvepoliitikat võib siiski

kohata perioodil 1997-2004, mille hulka kuulus eelarvepoliitika reageering Vene kriisile.

Kokkuvõtteks võib öelda, et kuigi Eesti eelarvepoliitikat on iseloomustanud mõningad protsüklilised komponendid (positiivsed lisaeelarved, protsüklilised maksumuudatused, kärped negatiivse SKP lõhe tingimustes), ei ole protsükliline eelarvepoliitika olnud piisavalt süsteemne, et seda oleks võimalik tuvastada magistritöös püstitatud ökonomeetrilise eelarvereegliga. Seega on põhjendatud Eesti eelarvepoliitika käitumise analüüsi teostamine lühemate ajaperioodide lõikes ning erinevaid metoodikaid rakendades. Asjaolu, et ökonomeetriline analüüs on tuvastanud nõrgalt vastutsüklilise eelarvepoliitika, ei anna siiski põhjust pidada Eesti (suvakohase) eelarvepoliitika käitumist majandustsüklite stabiliseerimisel optimaalseks.

Senine eelarvepoliitiline raamistik on eelistanud ranget nominaalse tasakaalu reeglit, mis aga oma olemuselt ei võimalda eelarvepoliitikal majanduse kõikumistele vastutsükliliselt toimida. Eestit iseloomustab lisaks madal automaatsete stabilisaatorite toime ning vähene kogemus suvakohase eelarvepoliitika vastutsüklilisel kasutamisel. Samuti on muudatused peamistes maksumäärades langenud ebasobilikesse majandustsükli faasidesse stabilisatsiooni eesmärgist lähtudes. Viimaste arengutega seonduvalt on näiteks hakatud rohkem tähelepanu pöörama eelarve struktuursele eesmärgile, mis omakorda võimaldab nominaalsel eelarvepositsioonil kõikuda vastavalt majanduse tsüklilisusele.

Non-exclusive licence to reproduce thesis and make thesis public

I, Lauri Punga (date of birth: 25.07.1987),

1. herewith grant the University of Tartu a free permit (non-exclusive licence) to:

1.1. reproduce, for the purpose of preservation and making available to the public, including for addition to the DSpace digital archives until expiry of the term of validity of the copyright, and

1.2. make available to the public via the web environment of the University of Tartu, including via the DSpace digital archives until expiry of the term of validity of the copyright,

"The Cyclical Conduct of Estonian Fiscal Policy",

supervised by Viktor Trasberg,

2. I am aware of the fact that the author retains these rights.

3. I certify that granting the non-exclusive licence does not infringe the intellectual property rights or rights arising from the Personal Data Protection Act.

Tartu, **14.01.2014**