

THE ROLE OF AUTOMATIC FISCAL STABILISERS IN ESTONIA AND THE EUROPEAN UNION¹

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■ Introduction ■

The currency board arrangement is characterised by a monetary policy framework that lacks means for implementing active monetary policy. Therefore, fiscal policy serves as the main tool for influencing domestic demand and stabilising the cyclical fluctuations of the economy. The stabilisation instruments of the fiscal policy can be divided into two groups:

- discretionary policy;
- automatic fiscal stabilisers (AFS) that function automatically when the government sector adjusts to the current economic conjuncture.

Fiscal policy analysis has risen to the agenda in connection with Estonia's wish to join the European Economic and Monetary Union (EMU) and the need to assess the ability of the government sector to maintain the budget balance (under the Maastricht Treaty budget deficit should not exceed 3% of the GDP²). The role of AFS is primarily seen as the course for the future, since the focus within EMU is on the functioning of AFS, while discretionary steps should be an exception rather than a traditional means of stabilisation. The current article gives a survey of the size of AFS in Estonia, ie the economic-cycle-related change of government sector fiscal balance in 1996–2001 and the variation of AFS' size over this period.

■ The Nature of Automatic Fiscal Stabilisers ■

The functioning of AFS means that the government sector budget reacts to changes in the economic activity, thus influencing the development of the private sector.

When economy is in the growth phase, relatively more taxes are being collected (the effective tax rate increases) and government transfers to households decrease. As a result, the growth of disposable income of households and consumption slows down, inhibiting economic growth. At the same time, the budget position of the public sector improves. In

¹ The article is based on a survey by Kattai, R., Kangur, A., Liiv, T., Randveer, M. (2003), 'Automatic Fiscal Stabilisers in Estonia: The Impact of Economic Fluctuations on General Government Budget Balance', Working Papers of Eesti Pank, No 11.

² The Stability and Growth Pact adopted in Amsterdam in June 1997 also prescribes fines for EMU members who exceed the 3% limit. The fixed proportion of the fine is equal to 0.2% of the annual GDP and the varying proportion depends on the size of the deficit. The upper limit of the fine is 0.5% of the annual GDP. Fine is not applied if the European Commission finds that the limit has been exceeded temporarily or if excessive deficit results from severe economic downturn of over 2% of the GDP (in some cases also 0.75–2%).

a reverse situation, ie during an economic downturn, tax burden is relatively smaller and government transfers to households increase, which curbs the fall of consumption and economic growth. When the GDP equals its potential volume, the actual fiscal balance is equal to structural balance, changing only as a result of discretionary policy. Changes in the balance of the budget caused by the economic cycle form the cyclical component of the budget, which characterises the size of automatic stabilisers. Thus, the size and variation of AFS gives a quantitative assessment of the extent of the impact of economic activity on budgetary position.

The main factors affecting the size of AFS are the size of the government sector, the structure of the tax system and the regulation of paying unemployment benefits.

As a rule, the larger share of the government sector in the GDP increases the cyclical component of the budget in relation to GDP. This is also amplified by the increase of the share of cyclically sensitive taxes and the growth of the progressiveness of the tax system. Changes in the budgetary position caused by the unemployment benefit depend on the sums paid per person and the share of benefits in the total expenditure of the budget, as well as the sensitivity of the unemployment rate to the cyclical fluctuations of the economy.

■ The Role of Automatic Fiscal Stabilisers ■ in the European Union

According to different sources (European Commission, European Central Bank (ECB), Organisation of Economic Cooperation and Development (OECD), International Monetary Fund), the average cyclical sensitivity of budgets in the EU member countries is approximately 0.5, ie when GDP gap increases by one percentage point there is a shift in the budget balance by 0.5% of the GDP. In southern EU Member States cyclical sensitivity is smaller. This group includes France, Greece, Italy, Portugal and Spain, but also Austria, Ireland and Luxembourg. The indicator is highest in Belgium, Denmark, Finland, the Netherlands, Sweden and United Kingdom. Budget revenues are more sensitive to business cycles. The impact on expenditure is relatively small, which means that market fluctuations have a bigger impact on taxes than government transfers and consumption. The above is confirmed by the ECB data in Table 1.

The size of AFS in the EU depends on the budget's cyclical sensitivity and the present state of the economy (GDP gap). Estimates on the size of AFS differ depending on research methods; and, therefore, the results should be interpreted as an interval where the actual figure potentially stands. Generally, the size of the cyclical component of the budget can amount to 3% of the GDP in countries with larger automatic stabilisers. The EMU average is about 0.5% of the GDP.

The majority of studies on the impact of automatic stabilisers on economy are based on the simulation of macroeconomic models. **According to the OECD's INTERLINK model, in the EU automatic stabilisers reduced the cyclical GDP fluctuations by an average of 25% in the 1990s.** The efficiency of the stabilisers in smoothing the business cycle varies remarkably across countries. AFS are most efficient in Denmark and Finland – in the absence of stabilisers GDP fluctuation would be two times bigger in those two

**Table 1. Cyclical sensitivity of budgets in the EU member countries
(% of GDP, when GDP gap increases by one percentage point)**

	Belgium	Germany	Greece	Spain	France	Ireland	Great Britain	Italy
Total	0.56	0.45	0.38	0.40	0.53	0.42	0.65	0.48
Revenue	0.49	0.40	0.38	0.35	0.48	0.33	0.43	0.47
Expenditure	-0.07	-0.05	0.00	-0.05	-0.05	-0.09	-0.22	-0.01
	Luxembourg	Netherlands	Austria	Portugal	Finland	Denmark	Sweden	EU 15
Total	0.33	0.69	0.47	0.50	0.55	0.67	0.75	0.53
Revenue	0.30	0.45	0.50	0.42	0.48	0.56	0.61	0.44
Expenditure	-0.03	-0.24	0.03	-0.08	-0.07	-0.11	-0.14	-0.09

Source: Bouthevillain, C., Cour-Thimann, P., van der Dool, G., de Cos, P.H., Langenus, G., Mohr, M., Momigliano, S., Tujula, M. *Cyclically Adjusted Budget Balances: an Alternative Approach*. European Central Bank, Working Paper No 77 September 2001.

countries. Studies estimating the impact of automatic stabilisers³ have also found that in case of demand side shocks the impact on the budget is considerably bigger, thus, the balancing effect of stabilisers is also bigger in the event of demand side shocks. In case of supply side shocks, automatic stabilisers are relatively inefficient since their impact is three-four times smaller.

AFS increase the volatility of the government sector budget revenue and expenditure and in certain situations this can make it difficult to balance the budget and meet the Maastricht criteria on budget deficit. Several studies have shown, however, that the 3% limit prescribed in the Maastricht Treaty is sufficient to allow automatic stabilisers to work without risking the infringement of the limit, assuming that the structural budget is balanced or moderately in surplus⁴. Artis and Buti⁵ have indicated that Belgium, Denmark, Ireland, Luxembourg, Portugal, Spain, the Netherlands and United Kingdom should keep their structural deficit between 0 and 1% of GDP. Austria, France, Germany, Greece and Italy could even afford a deficit slightly larger than 1%. Budgets in Finland and Sweden are more relatively cycle sensitive, therefore, these countries should keep their structural budgets in a surplus. However, Barrel, Hurst and Pina⁶ claim that only Austria should keep its structural budget balanced, to prevent automatic stabilisers increasing the deficit above 3%, while most EMU countries may experience a deficit of up to 1% of GDP.

³ See for example 'European Economy. Public Finances in EMU – 2001', Directorate General for Economic and Financial Affairs, No 3/2001; Meyermans, E. (2002), 'Automatic Fiscal Stabilisers in the Euro Area: Simulations with the NIME model', Fourth Workshop on Public Finance, Banca d'Italia, Perugia, 21–23 March.

⁴ For example, Artis, M.J., Buti, M. (2001), 'Close to Balance or In Surplus – A Policy Marker's Guide to the Implementation of the Stability and Growth Pact', Journal of Common Market Studies, 38 (4); Barrel, R., Dury, K. (2001), 'Will the SGP Ever Be Breached?', in 'The Stability and Growth Pact – The Architecture Of Fiscal Policy in EMU', Palgrave; Dalsgaard, T., de Serres, A. (1999), 'Estimating Prudent Budgetary Margins for 11 EU Countries: A Simulated SVAR Model Approach', OECD Economics Department Working Papers, No 216; Dury, K., Pina, A. (2000), 'European Fiscal Policy After EMU: Simulating the Operation of the Stability Pact', EUI Working Papers, ECO.

⁵ Artis, M. J. and Buti, M. (2001), 'Close to Balance or In Surplus – A Policy Marker's Guide to the Implementation of the Stability and Growth Pact', Journal of Common Market Studies, 38 (4).

⁶ Barrel, R., Hurst, I. and Pina, A. (2002), 'Fiscal Targets, Automatic Stabilisers and Their Effects on Output', National Institute of Economic and Social Research, London.

■ The Size and Variability of Automatic Stabilisers ■ in Estonia

Estimating GDP Gap

The size of AFS is usually determined by the so-called two-step method. First, GDP gap is measured. The second stage is to identify the cyclical sensitivity of all budget components (revenue and expenditure components) to the GDP gap. Finally, the structural budget and the budget's cyclical component are calculated on the basis of the GDP gap and sensitivity estimates. The study this article is based on uses the same method.

In order to determine the GDP gap it is necessary to estimate potential GDP. There are two alternatives for calculating potential GDP:

- using the HP filter⁷;
- using the production function.

As there is no consensus in literature on which method is more adequate, we have based our calculations on estimates obtained by both methods, in order to determine the interval for the actual structural budget balance.

The smoothing parameters 40, 100, 400 and 1600 are used to give HP filter-based estimates of potential GDP⁸. The production function used here is the Cobb-Douglas function⁹, which gives additional two estimates. The first method assumes that the government and agricultural sector operate on the potential level (see GDP gap (PF 1) in Figure 1), the second method

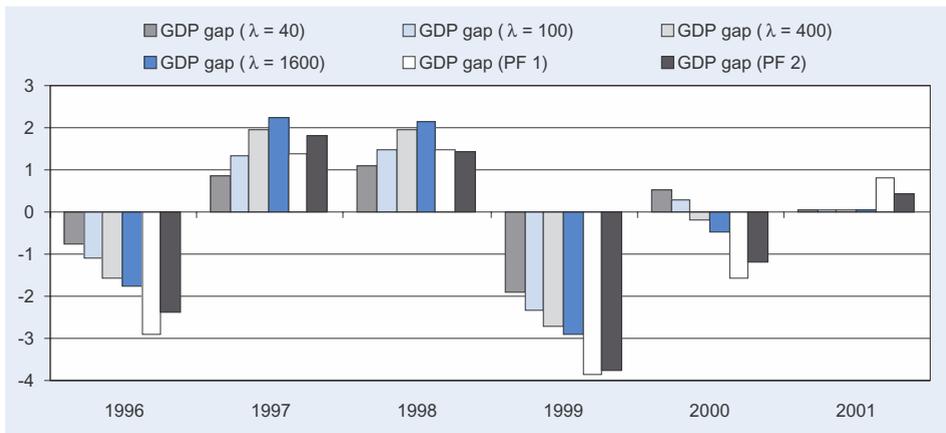


Figure 1. Estimates of GDP gap based on HP filter and production function

⁷ Hodrick-Prescott filter.

⁸ To determine the trend, quarterly data have been used, for which the smoothing parameter (λ) value is set at 1600. However, usually this does not meet the requirement that potential GDP estimate contain information on structural shifts in economy. Therefore, smaller values of the smoothing parameter have been used as well.

⁹ The method used in OECD studies has been applied (see, for example, Giorno, C., Richardson, P., Roseveare, D., van den Noord, P. (1995), 'Estimating Potential Output, Output Gaps and Structural Budget Balances', OECD, Economics Department Working Papers, No 152, Paris).

assumes this only for the government sector (see GDP gap (PF 2) in Figure 1). GDP gap estimates from the two production functions are relatively similar and their dynamics and magnitudes of changes are broadly in line with the assumed actual situation.

The variation of the GDP gap is noticeable according to all estimates. Comparing the gaps obtained with the production function and the HP filter, we can suppose that the smoothing parameters 40 and 100 are too small, meaning that the cyclical component is underestimated and the trend is overestimated (the so-called compression effect). The rest of the estimates differ from one another on an annual basis by about one percentage point, which can be considered a relatively small variation. Since we cannot favour one estimate to the other, all derived GDP gaps are used in calculating structural balance (except for gaps obtained with the smoothing parameters of 40 and 100). This allows us to determine the interval for the actual structural budget balance.

Cyclical Sensitivity of Budget

The most important part of the Estonian government sector budget is tax revenue, accounting for about 90% of the total revenue. The remaining 10% is non-tax revenue. Cyclical sensitivity of gross revenue is the ratio of the sum of personal income tax, corporate income tax, social tax, excises, VAT and non-tax revenue sensitivities to the GDP gap. The cyclical sensitivity of government sector expenditure depends on the sensitivity of government transfers to households, purchase of goods and services and other expenditure.

Personal income tax accounted for an average of 23% of the total tax revenue in 1996–2001. In Estonia, proportional personal income tax has been implemented and usually the absence of progressive taxation reduces the impact of the tax as an automatic stabiliser. This is partly compensated by the tax-exempt minimum, which makes the Estonian personal income tax slightly progressive. The sensitivity of the personal income tax to the GDP gap is estimated at about 0.08. In other words, a shift in the GDP gap by one percentage point causes a change of 0.08% of the GDP in personal income tax revenues.

Social tax is the largest source of government revenues, accounting for about 34–35% of total tax revenue. Thus, the social tax also has the greatest impact on the cyclical sensitivity of total revenue. Since the sum of incoming social tax depends directly on the average gross wages and employment (ie the wage fund), the cyclical sensitivity is determined by the sensitivity of the average gross wages and employment to the GDP gap. According to calculations, the sensitivity of the social tax is about 0.12, ie one percentage point shift in the GDP gap changes the social tax revenue by 0.12% of the GDP.

Excises accounted for approximately 10% of the government sector tax revenues in the period analysed. Preliminary conclusions on the cyclical fluctuations of excise tax receipts can be drawn from the structure of excise taxes. Excise taxes were collected

from alcohol (about 30% of total), tobacco products (about 20%), motor fuel (about 45%) and motor vehicles (about 4%). Receipt of tobacco and alcohol excises is presumably relatively insensitive to cyclical fluctuations. Changes in the economic situation probably have the greatest impact on fuel excise, which is the main component of excise sensitivity. According to calculations, the cyclical sensitivity of excises is approximately 0.04.

Value added tax income makes up 26% of the government sector tax revenues. It depends on the size of the tax applied on a particular group of goods. The cyclical sensitivity of VAT depends on the cyclical sensitivity of the demand of the particular group of goods taxed with VAT. The cyclical sensitivity of VAT is estimated at 0.1.

Revenue from **corporate income tax** has been divided into two sub-periods. The dividing line is 1 January 2000 when tax was abolished on retained profits. As a result, corporate income tax makes up just 2% of the total tax revenue. Presumably, the receipt of corporate income tax should depend on the GDP, since profits depend on the economic situation, although intra-business factors also play a major role. Since the year 2000, corporate income tax revenue mainly depends on the behaviour of the company, ie the decision on when and how much dividends to pay. Therefore, we were unable to determine the cyclical sensitivity of the corporate income tax.

Neither could any definite correlation be determined between the business cycle and intake of **non-tax revenue**.

On the expenditure side, transfers to households could serve as automatic stabilisers, accounting for slightly over 25% of the total government sector expenditures. About 70% of the transfers are made up of pensions, 13% are child allowances and 7% are sickness benefits, which so far have not been directly linked to fluctuations of the business cycle in Estonia (or are linked very indirectly). Unemployment benefits and subsistence allowances, which are directly influenced by cyclical fluctuations, account for just 5% of transfers and slightly over 1% of the government expenditures. This means that cyclical fluctuations should have but a marginal impact on transfers to households.

Reaction of Estonia's Fiscal Position to Cyclical Fluctuations of the Economy

Since we have presumed that expenditures do not directly depend on the GDP gap, the size of AFS is formed on the basis of the cyclical sensitivity of revenues only, which we calculated to be 0.35. When calculating AFS, the cyclical sensitivity of revenue has been combined from the GDP gap estimates based on the HP filter and the production function. As it turns out, the **cyclical component of the budget is generally below 1% of the GDP.** AFS peaked in 1999 when the GDP gap was estimated at -3.9% (according to the production function result PF 1), but even then the cyclical component of the budget amounted to just -1.3% of the GDP (see Table 2).

Table 2. Cyclical component of Estonia's government sector budget between 1996–2001 (% of GDP)

	GDP gap				Cyclical component			
	$\lambda = 400$	$\lambda = 1600$	PF 1	PF 2	$\lambda = 400$	$\lambda = 1600$	PF 1	PF 2
1996	-1.59	-1.76	-2.90	-2.40	-0.54	-0.60	-0.99	-0.80
1997	1.96	2.26	1.40	1.80	0.67	0.77	0.46	0.61
1998	1.95	2.17	1.50	1.40	0.66	0.74	0.49	0.49
1999	-2.72	-2.92	-3.90	-3.70	-0.92	-0.99	-1.31	-1.27
2000	-0.18	-0.46	-1.60	-1.20	-0.06	-0.16	-0.53	-0.40
2001	0.07	0.07	0.80	0.40	0.02	0.02	0.27	0.15

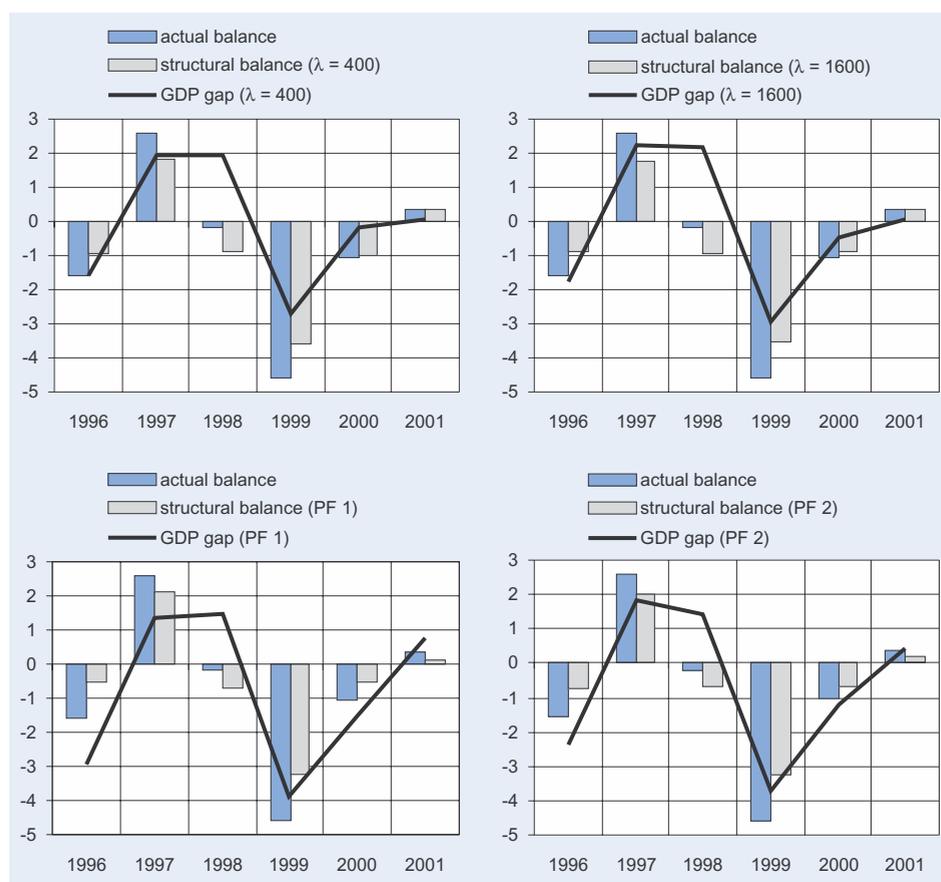


Figure 2. GDP gap (%), actual and structural budget balance in case of different smoothing parameters and production functions (% of GDP)

The variation of the cyclical component of revenues can be regarded as relatively small, depending on the research method, since the average annual difference between the maximum and minimum values is 0.35 percentage points of the GDP. Therefore, the estimates of structural balance are fairly similar, too. The difference between the actual

and structural budget balance depends on whether the GDP gap is positive or negative and whether discretionary steps have caused a structural budget deficit or surplus. **In a growth phase, automatic stabilisers improve the actual fiscal position as compared to structural balance.** When the structural balance is in deficit, the current positive GDP gap reduces the actual budget deficit (see Figure 2; 1998). In case of structural budget surplus the actual surplus of the budget turns out even larger (1997). **In an economic downturn phase, the actual budget position worsens as compared to the structural position** (1996, 1999 and 2000).

It can be concluded from Figure 2 that the functioning of automatic fiscal stabilisers has made Estonia's government sector budgetary position more volatile, ie the deviation of the actual budget balance is bigger than that of the structural balance. This, in turn, has been intensified by discretionary counter-cyclical steps – in the period of economic boom fiscal policy has been restrictive in nature (change in the structural balance has been positive from the previous year), whereas expansive fiscal policies have been used during economic downturn, thus supporting the functioning of AFS.

In 1997, when the actual surplus of the government sector budget was 2.7% of the GDP, the structural surplus, depending on the method used, was estimated at 1.8–2% of GDP. In 1999, when there was a considerable budget deficit and government sector expenditure exceeded revenue by 4.6% of the GDP, the structural deficit was much smaller: -3.2 to -3.6% of the GDP.

■ Conclusions ■

To sum up we can say that due to the low cyclical sensitivity of the Estonian budget there is only a limited danger of a sharp deterioration of the fiscal position in case of adverse economic shocks. Even when the structural deficit amounts to 1% of the GDP, the GDP gap would have to exceed 5% to push the actual budget deficit over the reference value prescribed by the Maastricht Treaty.