Fiscal Policy as a Determinant of Consumption Expenditure: The Estonian Case

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Abstract

The aim of the paper is to analyze and explain the impacts of fiscal policy on households’ consumption. Specifically we analyze the role of both discretionary and non-discretionary fiscal policy on consumption. The authors examine tax system in Estonia and distribution of income between households. In the paper the impact of different tax systems on consumption has been estimated. The analysis shows that the exchange of flat income tax to progressive income tax have a little effect on smoothing of households consumption, but can increase the burden on general government budget. It also reveals that the role of fiscal policy on private consumption has been limited. This study will rely on analysis of statistical data on households’ income and expenditures as well as on time-series analysis of aggregated data of GDP, consumption and income tax.

JEL Classification Numbers: E62, H20

Keywords: tax reform, tax policy, consumption expenditure of household, automatic stabilizers.

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1. The role of automatic fiscal stabilizers in the EMU

The European Commission uses structural budgets as inputs for budgetary analysis. According to the SGP (*Stability and Growth Pact, Amsterdam 1997*) these are the central indicators according to which the fiscal policies of member states are planned. Although they are not totally adequate, the structural budget estimates are still used. This is also natural since even if the separation of the cyclic components is not dependent upon the calculation method used, economic cycle is not directly measurable. Different international institutions use different methods to define GDP gap and this is why the results are not comparable.

According to different sources (see Bouthevillain *et al*. 2001; European Economy 2002; Valtioneuvoston Kanslia 2000), average cyclic sensitivity of budgets among EMU member states is 0.5. When the GDP gap grows by 1 percentage point, then there is a shift in budget balance by 0.5% of GDP. In southern member states the sensitivity is smaller. This group includes Greece, Spain, France, Portugal, Italy and Austria. The indicator is highest in Denmark, Sweden, the Netherlands and Finland. Budget revenues are more sensitive to economic cycles. The influence on expenditure is relatively small. This means, that economic conjuncture influences taxes more than government transfers and consumption (see European Central Bank (ECB) data in Table 1).

The size of the cyclic components distributes according to budget cyclic sensitivity and the present state of the economy. The results differ depending on the research method and that is why the results should be interpreted as an interval of where the actual figure potentially stands. In states that have larger automatic stabilizers, the effect of the budget cycle can be up to 3% of GDP. The EMU average is 0.5% of GDP.

One of the reasons why the cyclic components vary so much from each other is the difference in above mentioned sensitivity assessments. The other reason is that international organizations use different methods to assess their GDP gap. The OECD, IMF and European Commission (EC) use the production function1 while the European Central Bank uses the Hodrick-Prescott’s filter defined GDP trend2. The results of these two methods are out of step with each other.

Most research about the influence of automatic stabilizers upon the economy has been carried out on the basis of macroeconomic models. The results of research on the basis of such model simulations should be viewed with certain reservations, because these results are dependent on many specific factors characteristic only to that certain model. Two models, INTERLINK and NiGEM, not surprisingly give quite different results on the stabilizing effect of automatic stabilizers for EMU member states. NiGEM shows a significantly smaller effect than INTERLINK. The difference between the results is greatest in the case of Finland. There, INTERLINK shows eight times more effectiveness than NiGEM, while the average difference between the results is three times.

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1 The European Commission has used the production function to measure potential GDP since 2001. Previously they also used the HP filter.
2 Bouthevillain *et al*. 2001 have written about using the HP filter for the measuring of potential GDP.
Table 1. The cyclic sensitivity of budget revenues and expenditures in EMU member states (% of GDP when the GDP gap grows by 1 percentage point)

<table>
<thead>
<tr>
<th></th>
<th>BEL</th>
<th>GER</th>
<th>GRE</th>
<th>SPA</th>
<th>FRA</th>
<th>IRL</th>
<th>GBR</th>
<th>ITA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>0.56</td>
<td>0.45</td>
<td>0.38</td>
<td>0.40</td>
<td>0.53</td>
<td>0.42</td>
<td>0.65</td>
<td>0.48</td>
</tr>
<tr>
<td>Revenue</td>
<td>0.49</td>
<td>0.40</td>
<td>0.38</td>
<td>0.35</td>
<td>0.48</td>
<td>0.33</td>
<td>0.43</td>
<td>0.47</td>
</tr>
<tr>
<td>Expenditure</td>
<td>-0.07</td>
<td>-0.05</td>
<td>0.00</td>
<td>-0.05</td>
<td>-0.05</td>
<td>-0.09</td>
<td>-0.22</td>
<td>-0.01</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>LUX</th>
<th>NED</th>
<th>AUS</th>
<th>POR</th>
<th>FIN</th>
<th>DEN</th>
<th>SWE</th>
<th>EU15</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>0.33</td>
<td>0.69</td>
<td>0.47</td>
<td>0.50</td>
<td>0.55</td>
<td>0.67</td>
<td>0.75</td>
<td>0.53</td>
</tr>
<tr>
<td>Revenue</td>
<td>0.30</td>
<td>0.45</td>
<td>0.50</td>
<td>0.42</td>
<td>0.48</td>
<td>0.56</td>
<td>0.61</td>
<td>0.44</td>
</tr>
<tr>
<td>Expenditure</td>
<td>-0.03</td>
<td>-0.24</td>
<td>0.03</td>
<td>-0.08</td>
<td>-0.07</td>
<td>-0.11</td>
<td>-0.14</td>
<td>-0.09</td>
</tr>
</tbody>
</table>

Source: Bouthevillain et al. 2001 (ECB).

In EU states throughout the 1990s, according to INTERLINK (OECD) model simulations, automatic stabilizers have reduced cyclic fluctuations on average by 1/4 to 1/3. The size of the stabilizers varies state by state. In Finland and Denmark the fiscal stabilizers are the most effective. According to the model, if there were no stabilizers in those two countries, GDP volatility would be about twice what it has been (see Figure 1) (van den Noord 2000; Brunila et al. 2002).

Figure 1. Effectiveness of automatic stabilizers (van den Noord, 2000)

In the case of demand shocks, the pressure put on the budget is greater and therefore the stabilizing effect is also greater. On supply side shocks automatic stabilizers are rather ineffective — their effectiveness is three to four times lower. It should also be mentioned that when a shock has a long term effect on the real indicators, then a policy that is only based on automatic stabilizers is unreliable - there is no movement back to the equilibrium.

Several studies have shown, that the prescribed 3% limit allows sufficient room for automatic stabilizers to work without risking the stated boundaries assuming that the structural budget is balanced or adequately overbalanced (Artis et al., 2000; Barrell et al. 2001; Dalsgaard et al. 1999; Dury et al, 2000). Artis and Buti (2001) indicate that Belgium, Denmark, Spain, Ireland, Luxembourg, the Netherlands, Portugal and the United Kingdom should keep their structural deficit between 0% and 1% of GDP. Germany, Greece, France, Italy and Austria could have a deficit that is even larger than 1%. Budgets in Finland and Sweden are relatively cycle sensitive, and so in these countries the structural budget should be overbalanced. Similarly, Barrel, Hurst and Pina (2002), claim that only Austria should keep their structural budget in balance in order to prevent automatic stabilisers increasing the deficit in excess of 3%, most EMU states may experience a deficiency as large as 1 % of GDP.
2. The size and variation of automatic stabilizers in Estonia

2.1 The overview of the tax system in Estonia

Since regaining independence, Estonia has pursued a balanced fiscal policy, which was supported by the tax reform in 1991. In recent history of Estonia there had been 4 changes in the tax system (see Box 1). The tax reforms that started in 1991 fulfilled mainly the fiscal function. Its main aim was to create the necessary income base for the budgets of the central government and local governments and to balance the budget. The following two stages of tax reform in 1994 and 2000 were clearly of stimulating character.

**Box 1. Tax reforms in Estonia**

<table>
<thead>
<tr>
<th>Year</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1991</td>
<td>The tax reform introduced personal income tax with progressive bands with rates ranging from 16 per cent to 33 per cent.</td>
</tr>
<tr>
<td>1992</td>
<td>A value added tax of 10 per cent was raised to 18 per cent, corporate income tax to 35 per cent and personal income tax to 50 per cent (for incomes above ten minimum wages). Payroll taxes have been introduced at a rate of 33 per cent to finance social insurance (20 per cent) and health insurance (13 per cent).</td>
</tr>
<tr>
<td>1994</td>
<td>The personal and corporate income taxes were reduced and as a result of that a flat 26 per cent income tax was introduced.</td>
</tr>
<tr>
<td>2000</td>
<td>To strengthen the economic environment Estonia introduced a new corporate income tax. According to this act the accumulated profits is exempt from income tax.</td>
</tr>
</tbody>
</table>

Tax receipts made up 33.7 per cent of GDP in 2001, of which direct taxes accounted for 21.1 per cent and indirect taxes for 12.6 per cent. The Estonian average tax burden, defined as the tax-to-GDP ratio, appears to be slightly lower as the EU area tax burden, but is higher than in most OECD countries (Joumard 2001).

2.2 Methodology

To determine the size of automatic fiscal stabilizers and the structural balance we have used the widely accepted two-step method. The first stage of this method is to identify the cyclic sensitivity of all budget components (revenue and expenditure components) – their elasticity to influencing macro indicator, in this case the GDP gap. The second stage is to calculate budget’s cyclical component and structural balance based on elasticity estimates and the GDP gap.

About 90% of the Estonian government’s gross revenue comes from taxes. The remaining income sources are considerably smaller and considered to be a residual. Based on this the government sector budget revenue ($R_i$) comes from personal income tax ($PITAX_i$), corporate income tax ($CITAX_i$), social tax ($SOCTAX_i$), excises ($EXCTAX_i$), value added tax ($VATTAX_i$) and other income ($\varepsilon_i$):

$$R_i = PITAX_i + CITAX_i + SOCTAX_i + EXCTAX_i + VATTAX_i + \varepsilon_i$$  (1)

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3 See for example Bouthevillain et al. 2001.
Government sector expenditures \((E)\) are as follows: government sector transfers to households \((TRANS)\), purchased goods and services \((PURS)\) and other expenditures \((\delta)\):

\[
E = TRANS_t + PURS_t + \delta_t
\]  

(2)

Government sector revenue and expenditure consists of structural (accordingly \(R_{s,t}\) and \(E_{s,t}\)) and cyclic elements \((R_{c,t} \text{ and } E_{c,t})\). The actual budget balance \((B_t)\) is the sum of the structural \((B_{s,t})\) and cyclic balance \((B_{c,t})\) (Hagemann 1999):

\[
B_t = (R_{s,t} - E_{s,t}) + (R_{c,t} - E_{c,t}) = B_{s,t} + B_{c,t}
\]  

(3)

Structural balance is represented as follows:

\[
B_{s,t} = B_t - B_{c,t} = B_t - \sum_j B^{j}_{c,t}
\]  

(4)

where \(B^{j}_{c,t}\) is the cyclic part of the budget’s \(j\)-component, dependent on macro indicator gap \(v^{j}_{c,t}\) and the elasticity of the budget’s \(j\)-component \(e^{j}_{B/v^{j}_{c,t}}\)

\[
B^{j}_{c,t} = B^{j}_{t} \times e^{j}_{B/v^{j}_{c,t}} \times v^{j}_{c,t}
\]  

(5)

The only drawback of the two-step method is a possible overrating of the elasticity, mainly because it does not take into account mutual impact of the fiscal position and domestic demand. Also some steps on the expenditure side (for example changes in the health system) can be pro-cyclic and shifts in economic structure can falsify the revenue. An alternative would be to use the SVAR (Structural Vector Auto-Regression) method to calculate structural budget balance. SVAR analysis also provides an estimation of the influence of discretionary political steps on the budget, and the corresponding component will be separated from the revenue/expenditure time-series (see for example Höppner 2002). Many factors render this method unreliable in our context. One of those is the shortness of the data series but also the modest size of our economy and our position in the transition phase all limit the use of SVAR. (The main deficiency of the SVAR method is that it is useless in cases of structural fluctuations. Rather small changes in assumptions cause a remarkable change of revenue).

When determining the elasticity of the budgetary components we use regression analysis. In order to find credible elasticity estimates, we have to clear the time-series data of the influence of changing taxation policies. It means we have to find an estimate of what the inflow (income) would have been like if the changes had not been put into practice (the structural element would have grown along its potential long term trajectory). To eliminate the influence of the taxation policy we have two options: a) in regression the time-series used is modified in advance; and, b) along with the actual taxation time-series a dummy variable is also added to the regression. It is assumed that these would characterize the effects of certain taxation policies. The first method is more transparent, more reliable, easier to understand, but not always applicable with different taxes.

Taking into account the Estonian government sector’s gross revenue, the most influential discretionary policy that has affected inflow (income) has been the raising of the tax-free income for income tax.\(^4\) The removal (elimination) of income tax from

\(^4\) From 1996 till 1999 the tax-free income was 500 EEK a month, in 2000 it was 800 EEK a month, since 2001 it has been 1000 EEK a month.
corporations’ accumulated profits was a radical step but it did not greatly affect government revenue. Regardless of this, both time-series need rectifying to facilitate elasticity evaluation. To evaluate the elasticity of personal income tax, the data used was levelled beforehand. With corporate income tax the dummy variable was added to the evaluation equation (further particulars of the methods used are given later).

2.3 Determining the elasticity of the budget components

2.3.1 Personal income tax

The revenue from personal income tax rose from 4.5 billion in 1996 to 7 billion in 2001. During this period personal income tax made up about 23% of the government sector’s taxation revenue. Incoming tax payments to the government sector can be shown as follows:

\[ PITAX_i = L_i \times (\bar{w}_i - TF_i) \times RATE_i - \phi \]  

(6)

where \( L \) is the number of employed, \( \bar{w} \) is the average gross wage during the period, \( TF \) is the tax-free income, \( RATE \) is the tax rate and \( \phi \) is other permissible deductions. On this basis the raising of the tax-free minimum (\( \Delta TF^+ \)) and the subsequent change to received income tax (\( \Delta PITAX^- \)) can be represented as follows (presuming that the number of employed and the tax rate are constant and the division of wealth in the given period does not change):

\[ \Delta PITAX_i = -L_i \times \Delta TF_i \times RATE_i \]  

(7)

The influence of raising the tax-free income in equation (7) was limited by fixing it to the year 2000. Because the value of the calculated elasticity depends on whether the value was fixed at the beginning or the end of the period, then it is better to select the middle. The resulting figure for the period in question equals 800 EEK. So if the taxation policy had been as it was in 2000, then from 1996 till 1999 inflow would have been 12% lower (15% at the beginning of the period, 8% at the end). In 2001, on average, the tax inflow would have been 5% higher.

In Estonia flat personal income tax has been implemented. In most cases the lack of progressive taxation means that this tax does not work as an automatic fiscal stabilizer. But here we have to take into account the influence of the personal tax-free income on the applicable size of the revenue. The theory says that the higher the personal tax-free income, the greater the proportion of people’s salaries used on goods and savings. When one’s gross wage is equal to or lower than the tax-free income one could consume/save one’s entire wage. On the other hand an increase in wages will also increase the taxed portion and growth of the effective tax rate. When we add the fact that revenues are dependent on economic growth, we can intuitively state that with a growing economy household revenues also grow, a greater proportional part is taxed and usable revenues do not grow as fast as gross income.

To determine the elasticity of government sector expenditure and taxation inflow we need to know the specific tax or expenditure’s functional connection to GDP. Because these connections are indirect we need to know through which factors GDP shows its influence.

Personal income tax is a function of the average gross wage (\( \bar{w} \)), employment (\( L \)), the tax-free income (\( TF \)), permissible deductions (\( \phi \)) and the tax rate (\( RATE \)):

\[ PITAX_i = f(\bar{w}_i, L_i, RATE_i, TF_i, \phi) \]  

(8)
On the basis of employment and average gross wage a payroll fund $\bar{w}$ is formed that associates functionally with the level of GDP:

$$\bar{w} = g(GDP)$$  \hspace{1cm} (9)

From this we find that personal income tax received by the government sector is dependent on GDP:

$$PITAX_t = f(g(GDP_t), RATE_t, TF_t, \varphi)$$  \hspace{1cm} (10)

We evaluate tax elasticity towards GDP while the remaining personal income tax factors are presumed to be constant. Using the previously levelled income tax time-series elasticity will be estimated using following logarithmic function (11):

$$\log(PITAX_t) = \alpha_0 \times \log(GDP_t) + \alpha_1 + \epsilon_t$$  \hspace{1cm} (11)

where parameter $\alpha_0$ characterizes tax elasticity towards GDP, $\alpha_1$ is a constant and $\epsilon_t$ is the residual.

Using the same functional form another elasticity estimate is also given. The basis is GDP in factor costs (see equation 12). This basically means that net product taxes are excluded from GDP. This step is justified because the latter does not directly affect taxation base.

$$\log(PITAX_{t, FC}) = \alpha_0 \times \log(GDP_{t, FC}) + \alpha_1 + \epsilon_t$$  \hspace{1cm} (12)

Using the first method the elasticity of personal income tax is 1.11, implying that when the GDP grows by 1%, the revenue from income taxes also grows by 1.11%. Using the second method, the elasticity is 1.09.

### 2.3.2 Social tax

The greatest tax revenues for the government come from social tax. On average this amounts to about 34-35% of all incoming\(^5\). Incoming social taxes grew from 7 billion to 12 billion between 1996 and 2001. The system concerning social taxes has remained stable. Changes to social policies have been relatively small and need not be separated from the data. The amount of incoming social tax is directly dependent on average gross wage and employment (on the salaries fund). As mentioned above, the salaries fund is a function of GDP. This also means that social taxes are functions of both GDP and the tax rate. The elasticity of social tax is determined according to salary and employment sensitivity in relation to GDP.

$$SOCTAX_t = f(g(GDP_t), RATE_t)$$  \hspace{1cm} (13)

When determining the elasticity equations (11) and (12) were used analogically. Because there are several abnormal observations, additional dummy variables were added to the equation which describes the deflection mentioned before. Both the equations give basically the same result, in the first case the value of $\alpha_0$ is 0.95, and in the second 0.94.

### 2.3.3 Excises

Income from excises goes directly into the general government budget. Their volume grew from 1.7 billion in 1996 to 3.5 billion in 2001. Excises account for about 10% of

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\(^5\) From 2000 social tax was included in the state budget.
government sector tax income. The regulations concerning excises have changed a great deal during this period. Describing the changes is problematic, mainly because of the number of changes and because they usually have a seasonal structure. In further analysis we have to assume that changing these taxes has had a little or no affect on their inflow to the general government budget.

Concerning cyclic fluctuations, preliminary conclusions can be made based on the structure of excises. Structurally speaking, excise income comes from alcohol (~32% of total excises), from tobacco (~18%), from fuel (~45%), from cars (~4%), and from packaging (~0.05%) (such structure has remained relatively stable during the period mentioned). Tobacco and alcohol excises are not very sensitive to cyclic fluctuations (presumably). The consumption of fuel is dependent on economic activity and is the main component that determines the cyclic sensitivity of total excises. The inflow of taxes depends on demand for these taxed goods while GDP is changing \( h(GDP_t) \), and on the tax rate for the specific goods \( F_i \).

\[
EXCTAX_i = f(h(GDP_t), F_{i,t})
\]  

Again there are two ways to determine the elasticity, the first possibility is in relation to GDP, and the second is on GDP based on factor costs. Depending on the method and the dummy variables used the excise sensitivity is either 0.98 or 0.80.

### 2.3.4 Value-added tax

While in 1996, the inflow to government budget from VAT was 5 billion EEK, in 2001 it had risen to 8.5 billion EEK, making up 26% of budget income from taxes. During this period there were changes made to the list of goods that attract VAT, also there were changes to the tax rates, but the influence on incoming taxes was relatively small and there is no need to eliminate the factors resulting from discretionary policies to correct the elasticity evaluation. The inflow coming from VAT is dependent on the tax rate of the goods group \( i \). The cyclic sensitivity of the tally depends on the elasticity of demand in relation to GDP \( l(GDP_t) \).

\[
VATTAX_i = f(l(GDP_t), RATE_{i,t})
\]

The elasticity of VAT is calculated in a similar way as in the case of social tax and excises. The values are accordingly 0.87 and 0.82.

### 2.3.5 Corporate income tax

Budgetary revenue has to be divided into two periods. The line between them is January 1, 2000. Starting from that day no tax was required to be paid on accumulated profits. Since then budget income from corporate income tax has decreased to only 2% of government sector tax revenues. In 1998 tax revenues coming from corporate income tax were at their highest, about 2 billion EEK. By the year 2001, this income had decreased to 0.7 billion EEK.

It is hard to point out the function of corporate income tax. Intuitively it should be dependent on GDP (profit is dependent on the present state of the economy), but it also depends on intra-company factors. In 2000 inflow was primarily dependent on firm’s decisions on when to pay dividends and how much to pay. Because of this, measuring tax elasticity is complicated. Before the loss of taxes paid from accumulated profits the inflow was dependent on GDP and on the tax rate. Since the policy changed
any connection to GDP growth has substantially diminished. When presenting this functionally we have to distinguish two different periods – up to the end 1999 and after that:

\[
CITAX_t = f(\eta(GDP_t), RATE_t) \quad \text{if } t < 2000
\]

\[
CITAX_t = f(\mu(GDP_t), RATE_t) \quad \text{if } t \geq 2000
\]

In practice the influence of taxation policies can be eliminated by adding a dummy variable \((D_{j-1,t})\) into the equation. This is done to exclude the effects of discretionary policies while estimating the elasticity. Whether the dummy variables describe the re-designing of tax structures correctly or not is impossible to control, because with corporate income tax it is not possible to employ similar methods to eliminate the influence of discretionary fiscal policy as was done with personal income tax. Considering the shortness of this time-series the best alternative is to use dummy variables:

\[
\log(CITAX_t) = \alpha_0 \times \log(GDP_t) + \alpha_1 + D_j + D_{j-1,t} + \varepsilon_t, \quad j = 1...n
\]

where \(n\) indicates how many stable taxation policy periods there have been during the time in question. For example, from 1996 to 2001 there were two different policies on the payment of company income tax. This means that \(n=2\) and one dummy variable is added to the equation (which equals 1 till the end of 1999 and 0 since the beginning of the year 2000). As with previous regressions, dummy variables \((D_j)\) are used to describe abnormal observations (conventionally higher or lower inflow). Depending on the equation used as well as on GDP, the evaluation of corporate income tax elasticity is either 1.51 or 1.58.

### 2.3.6 Government sector expenditure

Transfers to households constitute a little over a quarter of all government sector expenditure. About 70% of transfers are pensions, 13% are child support and 7% are illness compensations. All these are not dependent on economic cycles (or the connection is remote and minimal). Unemployment compensation and living allowances added together make up about 5% of all transfers. That is the reason why it can be concluded here that cyclic fluctuations should only influence household transfers marginally.

Half of all government sector expenditures are on goods and services. Out of this 40% are wages and 60% on other goods and services. Government spending should follow conservative principles, therefore independence can be assumed in regard to variations of gross domestic product. Since in the case of government expenditure and transfers it can be assumed that elasticity equals 0; this has not been measured separately.\(^6\)

### 2.3.7 Estonian government sector budget cyclic sensitivity

As we can see from the above, estimates of the elasticity of all taxes is approximately the same no matter which method we use. The most sensitive is corporate income tax.

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\(^6\) According to European Commission opinion the government sector expenditure in Germany, Greece, Spain, Italy and in Austria is non-elastic towards cyclic fluctuations too (European Economy 2002).
As expected, the sensitivity of personal income tax is greater than 1. At the same time the result is low enough and shows that the tax-free income has a low stabilizing effect. The elasticity of the remaining taxes is less than 1.

The standard error on all evaluations of elasticity is relatively small, between 0.03 – 0.05. The standard error of corporate income tax is substantially greater, in the first case 0.6, and in the second 0.4. Taking into account the minor role corporate income tax plays in tax proceeds, the error is marginal while calculating the budget’s structural balance (see Table 2).

Table 2. Budget revenue and expenditure elasticity in relation to GDP (%)

<table>
<thead>
<tr>
<th>Component</th>
<th>Elasticity</th>
<th>Share in general governments tax proceeds</th>
<th>Total elasticity (weighted average)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1. method GDP</td>
<td>2. method GDP FC*</td>
<td>1. method GDP</td>
</tr>
<tr>
<td>Revenue</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Personal income tax</td>
<td>1.11 (se 0.039)</td>
<td>1.09 (se 0.035)</td>
<td>0.23</td>
</tr>
<tr>
<td>Social tax</td>
<td>0.95 (se 0.038)</td>
<td>0.94 (se 0.036)</td>
<td>0.34</td>
</tr>
<tr>
<td>Corporate income tax</td>
<td>1.51 (se 0.62)</td>
<td>1.58 (se 0.402)</td>
<td>0.044</td>
</tr>
<tr>
<td>VAT</td>
<td>0.87 (se 0.047)</td>
<td>0.82 (se 0.047)</td>
<td>0.28</td>
</tr>
<tr>
<td>Excises</td>
<td>0.98 (se 0.096)</td>
<td>0.80 (se 0.002)</td>
<td>0.13</td>
</tr>
<tr>
<td>Expenditure</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Transfers to households</td>
<td>0</td>
<td>0</td>
<td>-</td>
</tr>
<tr>
<td>Government sector purchases</td>
<td>0</td>
<td>0</td>
<td>-</td>
</tr>
</tbody>
</table>

*elasticity evaluated based on GDP production factor expenditure

The average elasticity of tax proceeds is about 1%, using the first method it is 1.016, and using the second method it is 0.973 (the difference is only 0.04 %). Growth of GDP by 1% means that the inflow of tax proceeds will also grow by about 1%. Furthermore, government sector revenues are about 40% of GDP, so growth of the GDP gap by 1 percentage point should produce growth in tax proceeds of about 0.4% of GDP. Using this indicator in regard to the economic cycle, we are at the same level as EMU countries with a less sensitive fiscal position (the EMU average is 0.5).7

Because of the low budget sensitivity in relation to GDP the threat of exceeding the SGP 3% deficit limit is low, this is true even if the structural deficit reaches 1% of GDP (then the GDP gap should exceed 5% and the criteria would be in danger).

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* Estonia’s government sector is small in comparison with EMU member states. Government expenditure in relation to GDP has continuously decreased. In 1996 it was about 42%, in 2001 38%. In comparison with EMU member states the government sectors are smaller only in Ireland and in Spain (accordingly 31% and 37 % of GDP) (Economic Forecasts Spring 2002).
3. Estonia’s potential GDP and GDP gap

Having found the elasticity of the revenue components, the next step in finding a structural balance is to estimate the GDP gap. As mentioned in the second section, in the context of EMU states, the correct GDP gap is most important determinant of the size of the cyclical component of the budget and that is why its measurement in the current context is critical.

Determining the GDP gap is based on an evaluation of the potential GDP. As mentioned before there are two main options to estimate the potential output, both of which are used in this article.

3.1 Measuring the GDP gap using the Hodrick-Prescott filter

The main argument for using the HP filter is that with this method there is no need to assess the production inputs. Because we lack reliable data on capital stock, a suitable approximation must be found for the factors used in the production function, which as a result reduces the reliability of the estimate of the potential GDP. Following these considerations, the HP filter is used for estimating the potential GDP. The positive characteristics of the filter are its simplicity and transparency.

The estimate of the GDP gap is determined by the value of the HP filter’s smoothing parameter $\lambda$, the selection of which is subjective. In this case four different values of $\lambda$ have been used: 40, 100, 400, and 1600. Because there have been many structural shifts in the Estonian economy, it is best to use the value as small as possible, mainly because then the structural changes are taken into account while generating the trend.8

There is no approved way to check the results; the only possibility would be to see how, while increasing and reducing the value of the $\lambda$, the estimate of the GDP gap changes.

Changing the smoothing parameter from 40 to 1600 substantially influences the estimate of the GDP gap; the value of the GDP gap depending on the parameter is on average 1 percentage point. The adequacy of the parameters (the extent to which the estimate of the gap is accurate) can be determined when we have the gap values calculated also on the basis of production functions.

3.2 Measuring the GDP gap using production functions

Smoothing of time-series is a simple and often used method in estimating the potential output level. Nevertheless, from the point of view of macro-economic analysis it is too mechanical – it does not take into account the structural peculiarities of the economy and the limits imposed by production and other endogenous factors. Keeping the above-mentioned in mind, from the point of view of economic theory the most favourable way of estimating the non-inflationary level of output is through an analysis of the production function. What follows in this chapter draws directly on the methodology of OECD (see for example Giorno et al. 1995).

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8 Usually the value of $\lambda$ in cases of quarterly data is 1600, which means that the trend approaches a linear function. In most cases this does not meet the requirement that the estimate of the potential GDP should also reflect the structural shifts in the economy.
The method used here is based on estimation of simple two-factor Cobb-Douglas production function for business sector using the average functional distribution of factor incomes. The obtained error term is smoothed and, as a result, provides an estimate of trend total factor productivity. The potential output of the business sector is then calibrated using the same functional structure of the production function together with obtained estimate of total factor productivity, actual capital stock and previously calibrated estimate of full employment. The latter consists of an employment adjustment according to the gap between actual unemployment and the estimated NAWRU. This is the main difficulty with production function analysis, because estimating the level of full employment is extremely difficult in every state, while in the case of Estonia the problems are intensified due to structural shifts and shortness of the time series.

In detail the method mentioned above follows next steps. Estimated private sector production function takes the following form:

\[ \ln Y = \ln A + \alpha \ln L + (1 - \alpha) \ln K + \ln G \]  

or,

\[ y = a + \alpha l + (1 - \alpha)k + g \]  

where \( Y \) is the private sector value added in constant prices, \( L \) is the actual employment level of private sector, \( K \) is actual capital stock of the private sector, \( G \) is total factor productivity, and \( \alpha \) is the labour share (the functional distribution of factor incomes).

Low case letters in formula (19) denote the natural logarithms of respective variables. Given the value of \( \alpha \) – which according to the period’s average labour share is 0.6 – the residual \( e \) is estimated and smoothed using the Hodrick-Prescott filter. The obtained time series has been used as an estimate of total factor productivity (\( g^* \)). In estimating the production function it is extremely important to constructing the time series of capital stock that has been done using the perpetual inventory method. The estimate of the end-point of the capital stock draws on the comparison of international research findings in developed and developing countries. Accumulating data on fixed capital formation from the Summers-Heston database, it is possible to show that the capital-output ratio in developed countries is more than twice the respective ratio in developing countries. Taking into account that the capital-output ratio in industrial countries can be a maximum of over 3, in Estonia’s case the indicator can be a maximum of 1.5, which has been used in this article. The capital stock of the business sector is then constructed in retrospect according to the above-mentioned perpetual inventory method. Leaving aside the problems originating from the identification of constant amortization rate, net investments derived from the national accounts have been used in capital accumulation.

The next step is to find the estimate for the private sector full or potential employment (\( L^* \)). The following formula is used for this purpose:

\[ L^* = LFS^* (1 - NAWRU) - LG \]  

where \( LFS^* \) is the smoothed workforce (found as the product of working-age population and the trend of the participation rate), \( NAWRU \) is the non-accelerating wage rate of unemployment, and \( LG \) is employment in the government sector.

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9 Non-Accelerating Wage Rate of Unemployment
10 During the analysis other \( K/Y \) ratios were also experimented with, which, however, didn’t gave so reliable results.
The estimate for NAWRU is derived from an equation used by the OECD that assumes the change in wage inflation to be proportional to the gap between actual unemployment and NAWRU:

$$\Delta^2 (\ln W) = -a(U - \text{NAWRU}) \quad a > 0$$

(21)

where $W$ and $U$ are wage and unemployment levels. Assuming that NAWRU is constant between two discretionary consecutive time periods, the estimate of $a$ is given by:

$$a = -\frac{\Delta^2 (\ln W)}{\Delta U},$$

(22)

which allows to express NAWRU with the following formula:

$$\text{NAWRU} = U - \frac{\Delta U}{\Delta^2 (\ln W)} \cdot \Delta^2 (\ln W)$$

(23)

Obtained time series has been smoothed and is then used in the calculations of the potential employment of business sector. Inserting the estimates of full employment ($l^*$) and total factor productivity ($g^*$) to the initial production function and assuming that the capital stock is at its potential level, we can find the potential output of the business sector ($y^*$):

$$y^* = a l^* + (1 - a) k + g^*$$

(24)

The potential output of the economy can be found by adding the government sector’s value added to the business sector’s potential output. In the figure below two GDP gaps estimated with production function approach are compared with those obtained with HP smoothing. The first estimate treats government and agricultural sector as exogenous (operating at their potential level) (see GDP gap PF1 on Figure 2).

The second estimate only takes the government sector as exogenous (see GDP gap PF2 on Figure 2). The two GDP gaps estimated using the production function method are relatively similar, their dynamics and magnitudes of changes are logical when confronted with actual data.

The variation of the GDP gaps across all estimates is rather noticeable. In comparing the gaps obtained with the HP filter with those based on production function approach we can assume that the smoothing parameters 40 and 100 are too small, meaning that the cyclical component has been underestimated and that the trend has been overvalued (so called compression effect).

The remaining estimates differ from each other on an annual basis by about 1.5 percentage points that can be considered as reasonably small variation, caused by differences in methods. Since we lack criteria of favouring one estimate to another, all derived GDP gaps are used in calculations of structural balance (excluding the gaps $\lambda = 40$ and $\lambda = 100$). This allows determining the interval for the actual structural budget balance.

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11 As Giorno et al. 1995 mentions, the obtained short-term estimate for NAWRU follows the actual unemployment dynamics and can differ from the long-term NAWRU that would have been calculated based on constant unemployment rate (see for example Kearney et al. 2002).

12 In other words, the presumption was that the government operates at its potential level; in some studies the same assumption also goes for the agricultural sector.

13 As mentioned in section two, estimates of the cyclical components of budget in EMU member states differ depending on the method used by over 2% of GDP.
4. Calculating the structural balance

The basis for calculating structural balance was given previously by equations 4 and 5. Since the only macro indicator in use is the GDP gap, the cyclical components of tax revenues in simplified form can be expressed as follows:

\[ \text{TAX}_{c,j}^{t} = \text{TAX}_{j}^{t} \times \varepsilon_{\text{TAX}_{j}} \times \text{GDP}_{c,j}^{t} \]  \hspace{1cm} (25)

where \( \text{TAX}_{c,j}^{t} \) is cyclical component of \( j \)-th tax, \( \text{TAX}_{j}^{t} \) is actual value of \( j \)-th tax in period \( t \), \( \varepsilon_{\text{TAX}_{j}} \) is \( j \)-th tax’s elasticity with respect to GDP and \( \text{GDP}_{c,j}^{t} \) is cyclical component of GDP – GDP gap.

Taxes can be divided into two groups according to their natural macroeconomic base: the first and largest group has nominal base (VAT, income tax, etc.), the second category includes taxes with a real base (excises) – these are taxes that are imposed on physical quantity of goods. Taking into account the unity of estimates and leaving aside possible price effects, the current article follows standard approach in using a nominal base on all taxes.14

The GDP gap, on the other hand, is calculated from real quantities, indicating that in formula (26) both nominal and real quantities are used. In some cases while estimating the tax elasticity ‘nominal’ taxes are regressed on real GDP, but in this case it is hard to capture the economic intuition of the results. It’s more appropriate as well as simple to assume that the elasticity estimated on real or nominal macroeconomic base variables do not differ from each other.15

In calculating the structural budget, the tax elasticity estimated on the basis of GDP at market prices are combined with HP estimates of GDP gap, and the tax elasticity estimated on the basis of GDP at factor costs are combined with production function estimates of GDP gap. Since both are almost equal, the result will only be affected by the estimates of GDP gap. Therefore it is not necessary to present all eight different combinations of gaps and elasticity; we present here four main estimates of structural budget balance.

The cyclical component is the difference between the actual and the structural values. Because, as previously shown, expenditure components do not depend on GDP fluctuations, the cyclical sensitivity of budget forms on the basis of cyclical sensitivity of revenues. It appears that the difference between the structural and actual budget

\[ \text{Figure 2. Estimates of GDP gaps based on HP filter and production functions} \]

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14 See for example Bouthevillain 2001.
15 See for example Bouthevillain 2001.
balance hasn’t exceeded 1.35% of GDP in any sample year. Even in 1999, when according to PF 1 GDP gap reached -3.9%, the cyclical component of the budget was found to be only -1.35% of GDP (see Table 3).

**Table 3. The cyclical components of general government budget (% of GDP)**

<table>
<thead>
<tr>
<th>GDP gap</th>
<th>Revenue</th>
<th>Expenditure</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>λ=400</td>
<td>λ=1600</td>
</tr>
<tr>
<td>1996</td>
<td>-1.59</td>
<td>-1.76</td>
</tr>
<tr>
<td>1997</td>
<td>1.96</td>
<td>2.26</td>
</tr>
<tr>
<td>1998</td>
<td>1.95</td>
<td>2.17</td>
</tr>
<tr>
<td>1999</td>
<td>-2.72</td>
<td>-2.92</td>
</tr>
<tr>
<td>2000</td>
<td>-0.18</td>
<td>-0.46</td>
</tr>
<tr>
<td>2001</td>
<td>-0.07</td>
<td>0.07</td>
</tr>
</tbody>
</table>

The variation of the cyclical component of the revenues depending on the research method can be regarded as relatively small; the difference between minimum and maximum values is, on average, 0.35 % of GDP.

![Figure 3. GDP gap, the actual and structural budget balance in case of different smoothing parameters and production functions (%, % of GDP)](image)

Difference between actual and structural budget balance is formed according to whether the GDP gap is positive or negative and whether discretionary steps have caused a structural budget deficit or surplus.

In a growth-phase the functioning of automatic fiscal stabilizers improves the actual fiscal position when compared to the structural balance. When the structural budget is in deficit, then the current positive GDP gap reduces the actual budget deficit (see Figure 3, 1998). In case of structural budget surplus the actual budget surplus turns out even greater (1997). Conversely, in an economic downturn the actual budget position worsens when compared to the structural position (1996, 1999 and 2000).
From Figure 3 it can be concluded that the operation of the automatic stabilizers has made Estonia’s government sector budgetary position more volatile (resulting directly from the nature of the stabilizers). This has been intensified by discretionary counter-cyclical steps of fiscal policy. The standard deviation of the actual budget balance in 1996-2001 was 2.4% of GDP, the standard deviation of the structural balance was at the same time 1.7% of GDP. In 1997, when the actual surplus was 2.7% of GDP, the structural surplus, depending on the method used, was between 1.84 and 1.99% of GDP. In 1999, when there was a remarkable deficit and government sector expenditure exceeded revenue by 4.6% of GDP, the structural deficit between 3.2 and 3.65% of GDP was remarkably smaller.

Following the dynamics of the structural budget, we can clearly identify the tendencies in fiscal policy, i.e. whether the discretionary fiscal policy supports or hinders total demand. We should note that the structural balance itself (as shown in Figure 3) is a cumulative measure, expressing the whole effect of policies. It is more sensible to analyze fiscal policy tendencies by comparing current policy decisions with previous periods. On this reason the difference of structural budget balance is used for identifying the effects of discretionary fiscal policy. Differences in structural budget for different estimates of GDP gap are shown in Figure 4.

![Figure 4. Differences in the structural budget balance compared to previous years (% of GDP) and the growth rate of actual GDP](image)

As we can see, in 1998 and 1999, the annual difference of structural balance was negative, inferring that, in comparison to previous years, the government had directed more resources to the economy and carried out expansive fiscal policies. Conversely, in 1997, 2000 and 2001 the fiscal policy was restrictive in nature. Comparing these results with the dynamics of GDP gaps we can conclude that during the sample period Estonian fiscal policy has been mainly counter-cyclical and directed at smoothing cyclical fluctuations in an economy.
5. The impact of fiscal policy on consumption

5.1. The distribution of income

Economic situation of households is best characterized by monthly disposable income per household member which, as known, depends on a large part of personal income tax. In 2001 the monthly average disposable income per household member was 2289 EEK. (Household Living Niveau 2001).

![Figure 5. Share of population and disposable income in total disposable income by different deciles in Estonia (% 2001)](image)

In years 1996-2001 the disposable income increased 1.62 times. In 2001 the disposable income per household member in the first income deciles was nearly 14 times lower than the income per household member in tenth deciles (see Figure 5).

Since the household in the first income deciles is bigger than in the others, 13% persons have to manage with the income, which is accounted for only 26.5% of Estonian average income per household member. The income of households belonging to the seventh deciles was nearest to the average disposable income. The strongest influence on the difference of income between the first and tenth deciles was caused by difference (21.3 times) in income from wage labour.

Transfers, due to their stable character compared with other kinds of income have an equalizing influence on the distribution of income. The average income from transfers per household member was 1.8 times bigger in the highest income level compared to the lowest income level (Household Living Niveau 2001). Usually the first income groups gain from the redistribution of the income, and those in the highest income groups lose. Even after redistribution income differences remain large as the difference in transfers is relatively small. The main reason for the small difference is that on transfer payments are little differentiated by incomes and other conditions. In 2001 the fifth deciles received 2.9 times higher disposable income than the first deciles, but the tenth deciles received 11 times higher income than the first deciles. Such situation arises from the Estonian social security system, which is, on the one hand, simple, but on the other hand, sticky. A large part of transfer payments do not depend on the actual economic situation of the household (Kerem and Sults 2002).
As consumption expenditure depends on income, the tendencies of their change are quite similar. The growth rate of income as well as the growth rate of expenditure decreased by 11% in 1999 compared with 1998 (considering the real purchasing power 9% in 1998), but increased again by 15% in 2000 compared with 1999 (the real purchasing power was 11%). In 2001 it decreased again by 13% (the real purchasing power was 14%). The latest was caused by a smaller growth of income and higher rates in repaying loans which are considered as savings (Household Living Niveau 2001). In recent years the active loan policy of credit institutions has changed the consumption behaviour of households advancing the habit to live on credit.

5.2 The empirical estimation of consumption

The permanent income hypothesis (PIH) relates current consumption to a measure of disposable income. The PIH assumes that the household’s objective is to smooth consumption path by dividing its lifetime resources equally among each period of life. Therefore we can say that permanent income hypothesis is closely related to life-cycle theory, and together they have served as a foundation for most expectations research on consumption in macroeconomics. In practice the theories differ primarily in the types of equations used to express the basic idea of forward-looking consumers.

In any given year actual income may different from permanent income. The difference between them is transitory income, which can be positive or negative. However, the central assumption of the PIH is that consumption is proportional to permanent income and is quite unrelated to transitory income (any unforeseen increment in income does not result in unplanned consumption). The permanent income hypothesis that the individual’s consumption $C_i$ is proportional to his permanent income $Y_i^P$ can be written in the form of an equation

$$C_i = cY_i^P$$

(26)

c being MPC estimator.

The empirical definition of $Y_i^P$ is that it is the normal or expected income of the consumer. The precise line to be drawn between permanent and transitory components is best left to the data themselves, to be whatever seems to correspond to consumer behaviour. Thus empirically, permanent income must be whatever quantity that in practice the consumer regards as determining his planned consumption. The transitory component of income is to be regarded as that which arises from accidental or chance occurrences, while permanent and transitory consumption may be interpreted as planned and “unplanned” consumption respectively.

Since the transitory income $Y^T_i$ is not directly observable we start with assumption that permanent income depends on current and past disposable income. As we have to consider errors in measurements, $Y^P_i$ is measured with error equal to $Y^T_i$.

Normally the current, not the current permanent income, is measured. The adaptive expectations formulation of permanent income expresses the unobservable permanent income in terms of directly observable actual income. Expectations about the future are assumed to be modified in the light of recent experience.

For aggregate time series data, current permanent income may be estimated by a distributed lag formula with geometrically declining weights.
\[ Y_t^P = \lambda Y_t + \lambda (1 - \lambda)Y_{t-1} + \lambda (1 - \lambda)^2 Y_{t-2} + \ldots \]  \hfill (27)

where \(0 < \lambda < 1\). The parameter \(\lambda\) represents the speed with which permanent income is altered when actual and permanent incomes differ. Consumers will give most weight to their current income in assessing their permanent income and successively declining weights to whatever income has been in the past. The formulation stresses the “expected” nature of the permanent income.

In Estonia the lack of statistical data and very short time period make the empirical analysis of the determinants of consumption behaviour difficult. An attempt to illustrate the aggregate consumption under the permanent income hypothesis is made. Quarterly data of actual aggregate disposable income and consumption are used (Bank of Estonia, Statistical Office of Estonia). Aggregate disposable income includes income from wage labour, transfers and mixed income and operating surplus (Randveer 2003).

The current disposable income \(Y_t\) and the two-quarter lagged disposable income \(Y_{t-2}\) are chosen as regressors. There is no significant correlation between them.

\[ Y_t^P = \lambda Y_t + (1 - \lambda)Y_{t-2} \]  \hfill (28)

This implies that it takes two quarters to adjust the permanent income.

The MPC estimator \(c\) in the consumption function

\[ C_t = cY^P = c(\lambda Y_t + (1 - \lambda)Y_{t-2}) \]  \hfill (29)

is calculated using OLS.

The closest fit was provided when \(\lambda\) was chosen equal to 0.46.

\[ C_t = 0.96 \left( 0.46Y_t + 0.54Y_{t-2} \right) \]  \hfill (30)

The value obtained for MPC estimator \(c = 0.96 \pm 0.12\) at the 0.95 confidence level agrees with the observed APC for the period calculated on the basis of data from household’s statistics. (see Figure 6).

![Figure 6. Estonian aggregate consumption function (millions of EEK)](image)

According to the model hypothesis, the economy-wide consumption behaviour tends to take half a year for full adjustment of the permanent income and therefore the consumption. Skipping the first lag and waiting for the increase in the second one is due to the fact that the disposable income is alternatively increasing and decreasing.
5.3 The impact of the tax reform

A return to the progressive personal income tax (1991-1994, see Box 1) was proposed this in 2003. Some conclusions about the impact of the change of tax system on consumption expenditure are made using the aggregate consumption function.

On the personal level it means a raise in disposable income for 70% of individuals. Approximately 1% will have severe reduction of their income. For the rest income will slightly increase. On average the individual yearly raise would be 6 per cent. In lower-income households the share of income from wage labour in the disposable income of households is quite small. The considerable additional income from wage labour is insignificant for these households. Thus the smoothing capacity of the increase of disposable income will be weak.

On the aggregate level the effect of the change on the disposable income is above the error level of our model. Averagely 65% of the disposable income consists of the income from wage labour. It causes an increase in aggregate disposable income approximately 1470 millions EEK. As the decrease in the transfers is not considered, the forecast effect of the change in the personal income tax system on the aggregate consumption is a rough estimate. Theoretically when the tax system will be changed and is valid for half a year at least then one may expect a slight raise in disposable income and consumption.

As mentioned above, the personal income tax rate is 26 per cent flat in Estonia. Due to the flat income tax, taxes automatically don’t respond to the shocks to the economy. As calculated above the elasticity of the personal income tax in Estonia is slightly greater than 1. But its value is low enough to have a weak stabilizing effect. Nevertheless, the effectiveness of an automatic stabilizer depends not only on how much of an increase in disposable income it produces, but also how large a private response in consumption this increase in disposable income generates. This response, in turn, will depend on how the increase in disposable income is distributed, for households with different income levels will differ in the extent to which they spend increases in current disposable income (Auerbach and Feenberg 2000).

At the aggregate level the change of the flat personal income tax to the progressive one means an additional automatic stabilizer in the economy. The tax system will be more harmonized with the system in EU which is an important step in the integration process. On the other hand, government revenue will decrease becoming an additional threat to the balanced budget principle along with the EU requirements.

The dynamics in distribution of aggregate disposable income over the years 1999-2001 was investigated. Using the distribution of total disposable income in deciles the approximate quadratic distribution functions were constructed. Thus linear probability density functions were obtained.

The dynamics over the years show slight changes toward the uniform distribution (see Figure 7). Especially in 2001 the probability to fall to higher deciles has increased whereas the probability to be in lower deciles has gradually decreased over these years.
Conclusions

The paper indicated that fiscal policy has not been an important determinant of private consumption in Estonia. On one hand the Estonian government has thus far followed a balanced budget approach. Therefore the government has not used discretionary fiscal policy to smooth the fluctuations in economic activity.

On the other hand the role of non-discretionary fiscal policy has also been limited. The results of our research show that the role of automatic stabilisers is quite unimportant in Estonia. Budgetary sensitivity has been approximately 0.4 during 1996-2001 – increase in output gap by 1 percentage point causes change in budget balance by 0.4 percent of GDP. According to that maximum value of budget’s reaction has been only 1.3 percent of GDP (while the output gap was 3.9 percent). A positive implication of this result is that Estonia has good chances to hold budgetary balance within requested ceilings. If output gap reaches 5 percent, structural deficit may still be even 1 percent of GDP without actual balance exceeding 3 percent boundary.

The empirical estimation of private consumption in Estonia indicates that disposable income is the main determinant of household’s consumption. The role of other factors has been insignificant. In principle it shows that fiscal policy could have an important influence on private consumption. But in reality the impact is rather low. This in turn is caused by (1) the openness of the Estonian economy; (2) flat tax system, and (3) low unemployment benefits. Also simulation of possible changes in income tax shows that its impact on the distribution of income is limited.

References


