# THE DOMINANCE OF INDIRECT TAXES IN ESTONIAN STATE BUDGET

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**Abstract**

Recession has sharply erected the question of tax burden and the optimal proportion of different kinds of taxes among the incomes of the budget. Indirect taxes and consumption taxes, which proportion is different according to different methodologies, dominate in Estonian state budget. The buoyancy of a tax system based on taxes of that kind is especially weak during the recession. The purpose of Estonian government's economic policy during the highest peak of crisis was to keep the budget in balance. Instead of recovering economy the taxes were arisen and costs were reduced. The results of such a policy aren't still clear. Difficulties concerning the incomes of budget have arisen the necessity for lifting taxes, which is possible as the tax burden is low now. But a sharp question of the optimal level of taxes is going to be raised. A formula for indirect tax optimum according to Ramsey taxes and Slutski decomposition has been proposed in the article.

**Keywords:** Taxation, tax burden, Estonian state budget, Ramsey taxes, indirect tax optimum

**JEL Classification:** H270

## The problem

Everybody is familiar with the saying that death and taxes are the two most unpleasant as well as inescapable things. There are many goods that cannot be provided by the private sector but only by the state. Furthermore, with many goods provided by the private sector it is not possible to identify a consumer who would have to pay for them. It is the state that has to pay for these so-called public goods. According to Wagner's law the income elasticity of public expenditures is greater than 1, therefore the demand for state-financed services grows in proportion to the increase of income. That also means an increased demand for state budget revenues, mostly taxes. According to a popular opinion the state budget revenues should contain at least 90% taxes (loans not included).

Bigger state budget also means bigger taxes. Taxes in turn diminish the resources available to households and therefore welfare. So the question arises – which is bigger, the decrease in welfare of households and the state as a whole due to an increase of taxes, or the rise in welfare due to public goods and an increase in consumption? Naturally both these effects become evident through the behaviour of economic agents. Accordingly, with all taxes there is a question of their impact on the short- and long-term behaviour of economic agents.

In economic theory, this question can be approached from two viewpoints. First, it is possible to point out a set of principles, parameters and arguments, and construct models based on theoretical considerations, without taking into account particular numerical data. The other function of the theory is to provide a scientific set of analytical devices for the empirical data that would make giving practical suggestions possible. This part of the theory also needs to explain what kind of data from the millions of practical cases need to be gathered.

Not all of these interconnected problems can be discussed on these pages. We set out to consider two issues: first, to demonstrate the large proportion of indirect taxes in Estonian state budget, and second, to consider the problem of optimum in indirect taxing.

**Eliminating extranalities**

As a general rule, establishing or increasing taxes also raises prices. Accordingly, the reaction of households to taxes consists of the sum of two effects – income and substitution effect (the latter can be marginal, if the prices of all goods rise in proportion to the tax increase. But as the demand and supply elasticities of goods differ, this possibility is only theoretical and will therefore not be consider here). To achieve actual substitution effect the rise in prices needs to be compensated to the consumer. There are two possibilities for that – either to grant a specific amount of money to the consumer (household) based on the method introduced to the economic theory by Slutsky, or to try to compensate for the increase of prices to both the consumer and the supplier. If we choose the first option, Pareto effective situation is achievable (of course, in the absence of external effects and on the condition that indifference curve and isoquant are traditional) as a point of balance where the state incomes and expenditures for ensuring purchase power are even. The second option is of primarily theoretical interest as it would entail moving sums of money back and forth, and the final result would be marginal. We will not examine this option.

**Tax elasticity, buoyancy and incidence**

With any taxation system, three of its characteristics are of vital importance: elasticity, buoyancy and incidence. First of these shows the ability of a tax or of the system of all nationwide taxes to generate increased tax revenues in case of positive shifts in the object of taxation, primarily income or turnover. In practice, of course, tax elasticity depends on not only the type of tax, but also (if not primarily) on the structure of the system of collecting the particular tax. There are different approaches to buoyancy, but for the purposes of this study it is sufficient to regard it as a certain elasticity indicator in the situation where negative shifts are taking place in the object of taxation. The greater the buoyancy of a tax (and the whole system of taxation), the smaller the risk that in case of negative deviation in economy, primarily in the object of taxation, state income is significally reduced or the tax system even collapses.

The problem of the elasticity and buoyancy of tax systems was posed already in 1959 by R. A. Musgrave (Musgrave, 1959). Since then, all taxes connected with consumership and sale (sale tax, excises, VAT etc) have been regarded as elastic. With income tax, opinions vary – it has been regarded as both elastic and anelastic. Customs tax and duties are universally regarded as anelastic (Goode et al., 1984).

With buoyancy, the situation is more difficult. When it comes to analysis of buoyancy, authors either confine themselves to the analysis of elasticity in certain special cases (in the case of negative elasticity coefficient) or essentially forgot it. The reason for that is simple – during the past few decades there has been no opportunity to study national tax systems in a situation of clear economic depcession. The last bigger and more widespread depression took place in 1974–75 and even that was due to external factors (negative supply shock caused by oil prices), and therefore the analysis of the data from that period does not always produce „pure" results. Of course, it is not advisable to confine oneself to mere theoretical approaches or make conclusions based on 50-year-old data. In that sense the current depcession in Estonia and elsewhere is an interesting base material for future research. However, these analyses can be properly made only in a few years' time.

The questions of tax incidence have received more attention. The spreading on tax burden between demandant and supplier, but also between different social strata of varying income, is the key question of not only taxation, but of all macroeconomics and economic policy. By how much does the income of a certain social stratum decrease in real life and how much does the demand drop as a consequence? If the supplier becomes the tax bearer, then by how much do the prices rise? How much does that in turn reduce demand? It is a wide-spread view that indirect taxes, which dominate in developing countries and make up a particularly large percentage in Estonia, are regressive towards income. Unfortunately the latest in-depth statistical studies in that field date back to more than 30 years ago, when the tax systems of newly independent developing countries were actively researched. As those countries quickly changed the structure of their taxes, there are almost no studies about countries with a tax system analogous to that of Estonia today. Even of Eastern European countries only Latvia has a tax structure similar to Estonia.

**Optimal tax rates**

As mentioned earlier, the decrease in state budget revenues has raised the question of a possible increase of tax burden in Estonia already in 2009. Next, we will try to construct a model to determine the optimum of the dominant indirect taxes.

In an attempt to maintain comprehensiveness, we will base our model on two common views on model-construction in taxation theory. First, the state revenues from taxes come as lump-sum taxes straight from households, and second, any transaction between the consumer and the supplier increases state revenues. There are no external forces, the indifference curve and isoquant are standard. In the absence of any other taxes such premise leads to Pareto optimum in the point where

the increase in state revenues and the purchasing power redistribution curve meets with the lump-sum taxes curve. Adding any other taxes directs us away from that point. Essentially we are trying to find a solution that would bring about an increase in state revenues by increasing consumption taxes, while reducing the welfare of households as little as possible. If we expect taxes to be used for an increase in social welfare, we can claim that when the left side of equation (1) exceeds the right side, the total social welfare has increased.

To put it in the form of an equation: we are trying to choose the tax vector t in such a way as to maximize social welfare V(q). If we designate the total revenue of subjects from indirect taxes with R(t), we arrive at:

$R(t) = t \bullet X(q) \geq \vec{R}$, (1)

where X(q) is the vector of aggregated demand and $\vec{R}$ is the required tax revenue.

With taxes imposed, a quantity q is supplied for price t, but the consumer pays the price (p+t). We designate the household welfare corresponding to quantity q with v(q) and the household demand with x(q) and arrive at equation (1). Again, V(q) is the rise of social welfare caused by an increase in taxes.

The problem posed is easily solved if we use Ramsey's rule of optimal taxes and Lagrange's widespread method of determining maximum. We maximize V + λ R, where λ is the Lagrange multiplier, which in this case does not indicate the marginal utility of some particular good supplied by the private sector, but of the social welfare arising from the increase in state revenues.

We can write:

$$\frac{\partial V}{\partial t_i} + \lambda \frac{\partial R}{\partial t_i} = 0. \qquad (2)$$

If we make the substitution

$$\partial V / \partial t_i = -\sum_h \beta^h x_i^h \text{ and } \partial R / \partial t_i = X_i + t \cdot \partial X / \partial t_i$$

and use Slutsky's compensated demand curve of demand derivative, we get:

$$\frac{\sum_k t_k \sum_h s_{ik}^h}{X_i} = -\sigma_i$$

$$\sigma_i = 1 - \sum_h \frac{x_i^h}{X_i} \frac{b^h}{\bar{b}} \qquad (3,4)$$

$S_{ik}^h$ is the derivative of Slutsky's compensated demand curve on household h (the utility level preceding the tax increase has been maintained) and $\sigma_i$ is negative because there is a covariance, $b^h$, of the social marginal utility of the net income of

household h (where the „net“ means there is an adjusment to the social marginal utility, $\beta^h$, for the marginal propensity to spend on taxes out of extra income, and b is the average of $b^h$) and the consumption of good i by houshold h, ($x^h_i$). Thus, $\sigma_i$ is higher the more good is consumed by those who have a low social marginal utility of income.

As the above equations (1) and (2) take into account the most important aspects of the interconnection of taxes and social welfare, it can be successfully used to describe the social aspect of the efficiency of indirect taxes. However, these equations as well as those suggested earlier (Ahmed; Stern, 1989) are practicable only on the condition that we succeed in mathematically describing the function of the social welfare of households, from which we can then find the derivative. As a rule, the task of describing the function of the welfare of households is often difficult to solve with adequate accuracy, i.e the same kind of problems arise as in the case of using Hicks's method to subtract the substitution and income effect.

**The structure of taxes in Estonia**

Certainly, there are more theoretical conceptions about the optimal tax structure and optimal tax burden (Neberry, 2007). But the tax structures of all states differ from every optimal model. Some main principles of Estonian tax structure are observed in following.

In the initial stage of its tranition period, Estonia (like most other Eastern European countries) was in a unique position – it essentially lacked a taxation system, a vital instrument of economic policy, which now needed to be constructed. In a perfect world, that would have meant building a system based on contemporary economic theory. Unfortunately Eastern European countries lacked pertinent knowledge, both in regard to taxation theory and the economic situation (an accurate description of the development phase and the processes).

Estonia has been advertised as a state of low tax burden. But the attitude isn't supported by the data of Eurostat. Table 1 demonstrates the general tax burden of EU. The table has been compiled the way that it could demonstrate the highest and lowest tax burdens and the states of greatest change in tax burdens and the states of tax burden most similar to Estonia.

The data of table 1 demonstrate that factually Estonia isn't a state of the lowest tax burden, but it's one of the average ones (it's the 15th among 27). But Estonia is a state of EU 5 members, where the tax burden has arisen in 2000-2010. If one would consider the fact that Malta and Cyprus were factually off-shore states before EU in 2004 and that they had to increase their tax burden for EU, so Estonia remains actually the state of highest tax burden in EU. The reason can be seen in the tax structure of Estonia.

The taxes are divided into three according to the object by Eurostat: consumption taxes, labour taxes and capital taxes. The following figures show the tax revenues of

these three possibilities of taxes in 2010. Estonia is generally among the average ones in EU by the tax burden; the tax burden is as an average of EU, but the role of consumption taxes puts it on the second place and the role of capital taxes on the last place.

**Table 1.** Tax burden of some EU states in 2000 and 2010

| State | 2000 | 2010 | Change | Rank |
|---|---|---|---|---|
| • CY | 29,9 | 35,7 | +5,8 | 13 |
| • MT | 27,9 | 33,3 | +5,4 | 17 |
| • EE | 31,0 | 34,2 | +3,2 | 15 |
| • IT | 41,5 | 42,3 | +0,8 | 5 |
| • PT | 31,1 | 31,5 | +0,5 | 20 |
| • DK | 49,4 | 47,6 | -1,8 | 1 |
| • SE | 51,5 | 45,8 | -5,8 | 2 |
| • BE | 45,1 | 43,1 | -1,2 | 3 |
| • FR | 44,2 | 42,5 | -1,8 | 4 |
| • FI | 47.2 | 42,1 | -5,1 | 6 |
| • UK | 36,7 | 35,6 | -1,1 | 14 |
| • CZ | 33,8 | 33,8 | 0 | 16 |
| • LV | 29,7 | 27,3 | -2,4 | 2 |
| • RO | 30,2 | 27,2 | -3,0 | 26 |
| • LT | 29,9 | 27,1 | -2,9 | 27 |
| • SK | 34,1 | 28,1 | -6,0 | 23 |

Source: by the author on basis of the following data:
http://ec.europa.eu/taxation_customs/resources/documents/
taxation/gen_info/economic_analysis/tax_structures/index_en.htm

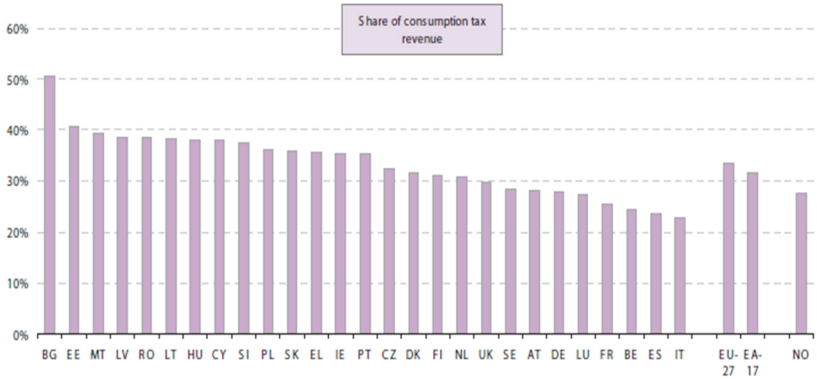


**Figure 1.** The role of consumption taxes in the budgets of EU members in 2010 (Taxation. http://epp.eurostat.ec.europa.eu/portal/page?- pageid/136748).


**Figure 2.** The role of labour taxes in the budgets of EU members in 2010 (Taxation. http://epp.eurostat.ec.europa.eu/portal/page?- pageid/136748).

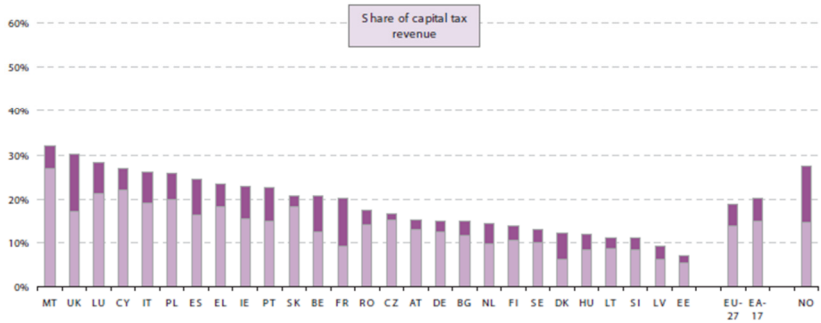


**Figure 3.** The role of capital taxes in the budgets of EU members in 2010 (Taxation. http://epp.eurostat.ec.europa.eu/portal/page?- pageid/136748).

The economic crisis has brought attention to the issue of tax structure. Table 2 presents taxes in Estonian state budget from 2005, i.e after Estonia joined the EU. It is difficult to assess what is the percentage of indirect taxes in Estonian state budget. Indirect taxes clearly include VAT, excises and the customs tax. However, also the gambling tax has some features characteristic to indirect taxes, as it is not imposed on the revenues from economic activities but rather as a preventive lump-sum tax, i.e before launching the slot machine etc. The tax sum is transfered by the manager of the gambling business in some way (e.g by raising drink prices) to the actual bearer – the gambler, i.e consumer. Accordingly this tax also has the incidence characteristic of indirect taxes and therefore it is more accurate to regard it as an indirect tax (at least when it is established in such a way as in Estonia).

As far as we know, there is no other country that has social benefits tax in the form that it exists in Estonia. The tax is paid by the employer, but it is calculated based on the amount of money paid to the employee. That tax is meant only for pensions and healthcare, i.e it functions largely as retirement and health insurance. Clearly, the defining criterium here is whether the emplyee's salary would increase by the amount that makes up the social benefits tax if that tax was abolished. If yes, the social benefits tax has enough characteristic features to regard it as an indirect tax; if not, the features of direct taxes probably prevail (the social benefits tax is the employer's expenditure). As this question is impossible to answer properly, authors classify it arbitrarily, depending on their views, as either a direct or indirect tax. Eurostat has taken a „diplomatic" position and classifies that Estonian social tax as a labour tax, regarding it therefore as primarily a resource tax (Taxation. http://epp.eurostat.ec.europa.eu/portal/page?- pageid/136748 ), but that is not entirely accurate as the income from social benefits tax is allocated for certain social expenditures.

It is probably reasonable to bring out the percentage of indirect taxes in different versions, with social benefits tax included and not. In the first case, the percentage of indirect taxes has made up 75.3–87.8% of state budget revenues ever since Estonia joined the EU; in the latter case the percentage has been 41.1–53.6%. If we take the first approach, we arrive at what is clearly the biggest percentage of indirect taxes among EU member states; even with the second approach the result is well above EU average.

When trying to determine the percentage of consumption taxes in Estonian state budget, we likewise have to face the question of how to classify some taxes that are different from those in other countries. Again we are talking mainly about social benefits tax. In the form that it exists in Estonia, it has been regarded as a tax on using one of the goods – labour – and hence as a resource tax. That, however, raises the question of whether it is a consumption tax. It is not the purpose of this study to discuss whether the multifunctional tax established during the transition period when there was no economicic-theoretical knowledge available belongs to this or that category. Therefore – although the author does not share the opinion that the social benefits tax as it exists in Estonia is a consumption tax – also the percentage of consumption taxes has been given in two versions in Table 2 – with social benefits tax included and not. It is clear that consumption taxes include VAT and excises. But does the customs tax on alcohol, furniture, meat etc count as a consumption tax? More likely yes – without consumption there is no tax. It is also certain that customs increase the prices and limit consumption – nobody will import if there is no demand. Gambling tax, as it exists in Estonia, should probably be classified as a consumption tax as well. Factor payments for the local governments can also be counted in, but these are not reflected in the state budget and will therefore not be considered here.

As seen from the figures presented in Table 2, a peculiar situation has taken shape in Estonia – if we take the above considerations (which are, admittedly, debatable) into account when classifying taxes, the percentage and amount of indirect and consumption taxes in the state budget coincide.

Regardless of how exactly we classify these taxes, we have to acknowledge that their proportion in the state budget is big. The figures in Table 2 and 3 also demonstrate the marginal role of environment taxes (which make up part of the „other taxes") in Estonian state budget.

**Table 2.** Income from taxes in Estonian state budget 2005–2012 (2005-2010 miljon kroons; 2011-2012 euros)

| | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 |
|---|---|---|---|---|---|---|---|
| Total taxes | 55208 | 67718 | 70396 | 63780 | 63299 | 4342 | 4775 |
| Personal income tax | 3846 | 4786 | 4328 | 2419 | 3000 | 227 | 266 |
| Corporate income tax | 3123 | 4083 | 4166 | 4010 | 3032 | 201 | 252 |
| VAT | 18645 | 22304 | 20548 | 18809 | 19531 | 1343 | 1494 |
| Excises | 7030 | 8195 | 8971 | 9818 | 10425 | 717 | 776 |
| excise on tobacco | 1208 | 1529 | 2519 | 2088 | 1794 | 145 | 158 |
| excise on alcohol | 2089 | 2314 | 2434 | 2590 | 2585 | 179 | 195 |
| excise on fuel | 3728 | 4353 | 4697 | 4870 | 4870 | 361 | 390 |
| excise on packaging | 3 | … | 1 | 1 | 1 | 1 | 1 |
| Gambling tax | 354 | 467 | 484 | 278 | 323 | 19 | 20 |
| Customs tax | 401 | 549 | 508 | 307 | 373 | 29 | 29 |
| Social benefits tax | 21764 | 27268 | 31299 | 28084 | 26562 | 1801 | 1933 |
| Other taxes | 45 | 66 | 92 | 55 | 62 | 5 | 15 |

Source: the author's calculations based on the Ministry of Finance homepage, http://www. fin.ee/.

It only takes basic calculation of percentage to demonstrate the growing dominance of social benefits tax in Estonian state budget – from 34.2% in 2004 to 44.4% in 2008. The economic crisis that started in 2008 will, however, in connection to the substantial rise in unemployment freeze the salaries to be paid in 2009. That in turn will lead to a drop in the income from social benefits tax. The halting of an increase in household incomes – or even their decrease – will, considering the big loan

burden of households, lead to a decrease of VAT and excises. That has already put enormous pressure on the 2009 state budget – it is clear that the absolute sum will be significantly smaller than in 2008. The revenues of a budget based on consumption taxes will probably have good elasticity during periods when incomes and consumption are quickly rising, but the buoyancy of such a system is weak. All prognoses, without exception, predict a substantial decrease in the rate of inflation (which has been high, ca 10% during the past few years) or even a decrease in prices (Estonian Ministry of Finance ...). Given the 44.4% social benefits tax and 29.2% VAT in the 2008 state budget, that adds further pressure on the 2009 budget.

**Table 3.** Indirect taxes in Estonian state budget 2005–2012 (2005-2010 million kroons, 2011-2012 million euros)

| | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 |
|---|---|---|---|---|---|---|---|
| Total taxes | 55208 | 67718 | 70396 | 63708 | 63299 | 4342 | 4775 |
| Indirect taxes (social benefits tax included) | 48217 | 58816 | 61856 | 57019 | 56923 | 3892 | 4239 |
| Percentage of indirect taxes (%, social benefits tax included) | 87.3 | 86.9 | 87.8 | 89,5 | 89,9 | 89,6 | 88,8 |
| Indirect taxes (social benefits tax not included) | 29572 | 31548 | 30557 | 29213 | 30351 | 2091 | 2306 |
| Percentage of indirect taxes (%, social benefits tax not included) | 53.6 | 46.6 | 43.4 | 45.8 | 47,9 | 48,1 | 48,3 |
| Consumption taxes, social benefits tax included | 48217 | 58816 | 61856 | 57019 | 56891 | 3885 | 4232 |
| Percentage of consumption taxes (%, social benefits tax included) | 87.3 | 86.9 | 87.8 | 89,5 | 89,9 | 89,6 | 88,7 |
| Consumption taxes, social benefits tax not included | 29572 | 31548 | 30557 | 29213 | 30329 | 2074 | 2299 |
| Percentage of consumption taxes (%, social benefits tax not included) | 53.6 | 46.6 | 43.4 | 45,8 | 47,9 | 48,1 | 48,1 |

Source: the author's calculations based on the data from Table 2. (Of „other taxes" 50% have been taken to be indirect.)

**Economic Crisis and State Budget**

All European states were hit by economic depression in 2008–2010. But its range and course have been very different in each case. As the crisis began in the financial sector, so the states where income from the financial sector formed the greatest part of GDP suffered first of all. Due to urgent and powerful measures taken by these states the situation was stabilized at this point. In some Eastern European states the economic depression turned into a severe crisis which could be compared with the Great Depression of 1929–1932, especially Estonia, Latvia and Lithuani (Table 4). There are several reasons for this, some objective and some subjective. Discussion of all these reasons is beyond the scope of this paper.

In this situation Estonian government did not base it's actions on the previously mentioned taxation theory that would have presumed the underlining of compensated demand curve and the adaption of taxes and the budget accordingly. The government denied the existance of the crisis and afterwards hoped on the self-correcting impact of the market forces. However, when it became clear that a budget built on the dominance of consuption taxes, which was a great income during the economic boom (tabel 3), was in a difficult situation when the crisis emerged, then the whole situation was not given an evaluation based on analysis, but the aim was set to ensure the stability of some financial indicators (mainly the balance of the budget). In the hope to ensure the balance of the budget the situation was set to be changed by random measures of which the macroeconomic results weren't (and aren't) analysed.

The data of tables 2, 3 and 4 expressively demonstrate an essential decrease of inland revenues of Estonia in 2008-2010. It's seen that the decrease was especially enormous in Estonia, wherein the role of consumption taxes is high. It was proofed that taxes from estate (real-estate tax, death tax) and income tax are more stable sources of budget than the consumption taxes.

It's widespread to enliven economy during an economic crisis through additional direction of money into entrepreneurship (decrease of taxes, loans from state or loans with state support etc.). The other possibility is the activation of consumption. Usually, the social welfares, subsidies for unemployment etc. are increased for it. The method helps to lessen social stresses in addition to the stimulation of demands.

Another way was chosen in Estonia. The purpose was to keep the balance of budget at any cost in order to fulfil the criteria of "euro uniting". There are two ways to stabilize the budget.

**Table 4.** Dynamics of tax funds, wages, unemployment and GDP in 2007-2012 (per cents in comparison with the same quarter of the last year)

| Period | **2007** | | | | **2008** | | | |
|---|---|---|---|---|---|---|---|---|
| | I | II | III | IV | I | II | III | IV |
| GDP | 9,8 | 7,6 | 6,4 | 4,5 | 0.4 | -1.4 | -3.3 | -9.9 |
| Tax revenues | 27.6 | 28,4 | 18,6 | 18,2 | 10,2 | 5,7 | 7,1 | -2.8 |
| Average wage | 20,1 | 21,2 | 12,9 | 20,2 | 19,5 | 15,2 | 14,4 | 6,9 |
| Unemployment (%) | 4 | 3,9 | 4,1 | 4,1 | 4,2 | 4,0 | 6,2 | 7,6 |
| Period | **2009** | | | | **2010** | | | |
| | I | II | III | IV | I | I I | III | IV |
| GDP | -15.1 | -16.5 | -15.6 | -9,7 | -2,4 | 1,7 | 3,1 | 6,2 |
| Tax revenues | -10.1 | -12.1 | -13.6 | -10,9 | 5,7 | -2,2 | -1,0 | 2,2 |
| Average wage | -1.5 | -4.4 | -5.9 | -4,9 | -2,3 | -1,7 | -0,7 | 3,9 |
| Unemployment (%) | 11,4 | 13,5 | 14,4 | 15,5 | 19,8 | 18,6 | 15,5 | 13,6 |
| Period | **2011** | | | | **2012** | | | |
| | I | II | III | IV | I | II | III | IV |
| GDP | 11,4 | 12,7 | 9,8 | 4,0 | 3,4 | 3,5 | 3,4 | 3,7 |
| Tax revenues | 1,6 | 9,8 | 5,9 | 3,7 | 11,2 | 11,0 | 11,6 | 10,6 |
| Average wage | 4,4 | 4,2 | 6,5 | 3,9 | 4,1 | 4,2 | 4,3 | 5,9 |
| Unemployment (%) | 11,4 | 12,7 | 9,8 | 10,4 | 10,9 | 10,1 | 10,0 | 9,9 |

Source: Homepage of Ministry of Finance. http://www.ee/index.php?id = 233; Eurostat….

1. Increase of taxes. A classic measure against crisis is the lowering of taxes instead of increasing them. The increase of taxes as a measure against crisis according to our data has never been used nor have we found any corresponding literature which might recommend such action. Seemingly, this was a case of dominantly political approach in the wish of gaining good results in the upcoming elections. Once realised that the economic indicators were poor, it became a priority to try to meet the requirements of joining the euro zone and success was hoped to come due to ephasising this.

2. Cutting down budget expences during the crisis instead of increasing them. State budgets have found themselves in an especially severe situation. The contents of state budgets have had to be pared and negative supplementary budgets made. That

is, the contents of state budgets have to be pared within the year. But a cutting of that kind reduces consumption. As consumption taxes form the main part of the Estonian state budget, so a budget cutback of any description means a cutback in incomes in the next period.

Both were used in Estonia: the taxes were increased and the national reliefs were limited. Table 4 provides an overview of the most important taxes in Estonia during 2008-2009. Also, the income tax incentives were decreased (it isn't given in table 4).

The influence of the cuts in the budget on the further tax revenues has been observed previously (Raju, 2011); the influence of negative additional budgets has been demonstrated. According to the calculations of the author 3 negative additional budgets of 2008 and 2009, which total amount was 12.4 billion kroons, decreased the incomes in budgets of future periods not less than in 7 billion kroons (Raju, 2011). If we also consider the fact that if the cuttings had not been made, the unemployment rate would have risen more slowly and the unemployment benefits, income supports and other similar payments would have been lower, we start to question whether the cuttings were really economically justified. Thus, Estonia has acted contrariwise to common practice. The political purpose – the criteria for EU incorporation – was followed and euro was taken as a currency – but the crisis was intensified and the departure from it was extended. The average crisis of EU was 4-5 quarters, but it was 11 quarters in Estonia and the decrease of GDP was higher in Estonia than in EU (-24.3%). The system of indirect dominant taxes, the increase of tasxes and the connection of the length of the crisis and GDP decrease has to be observed in order to bring out the strength of the connection.

**Table 4.** Rates of the main taxes in Estonia in 2008 and 2009 (per cent)

| **Taxes** | **2008** | **2009** |
|---|---|---|
| Social benefits tax | 33 | 33 |
| Income tax | 21 | 21 |
| VAT | 18 | 20 |
| Percentage of excise tax in retail sales | 12,9 | 17 |
| Unemployment insurance tax (employer) | 0,30 | 1,25 |
| Unemployment insurance tax (employee) | 0,60 | 2,5 |

Source: Homepage of Ministry of Finance. http://www.ee/index.php?id = 233.

**Summary**

The following can be concluded from the above:

1. If we discount Malta and Cyprus as practically off-shore before EU, the tax burden of Estonia in 2000-2010 has been the highest in EU.

2. The structure of the revenues of the Estonian state budget differs considerably from that of other EU member states. The percentage of environment taxes is negligible, while the peculiarly structured social benefits tax, which constitutes the greatest and increasing source of revenue of the state budget, is difficult to classify as either a direct, indirect or labour tax. Due to the huge proportion of consumption taxes the buoyancy of Estonian tax system is weak. The results of 2008 -2010 demonstrate clearly that during periods of economic recession the state budget is very vulnerable.

3. The shortfall of income to the state budget in 2008 and especially at the beginning of 2009 has forced the government to make cutbacks up to 10% and has acutely raised the issue of increasing the tax burden. However, the question of optimal tax burden has to be raised. Based on Slutsky's principle of compensated demand curve and Ramsey's optimal tax theory we can take the optimal level of indirect taxes (which are dominant in Estonia) to be the point where the household welfare reduction curve and the social welfare increase curve intersect.

4. Whichever approach we take to defining indirect and direct taxing, it is clear that indirect taxes prevail in the income of the Estonian state budget. The social benefits tax makes up a particularly big – and growing – proportion. Different approaches lead to the same conclusion: the percentage of consumption and indirect taxes in the state budget is equal, i.e. indirect taxes have been imposed on consumption.

5.The purpose of economic politics different from other EU states – not to fight economic crisis but assuredly to passage to euro on 1. January 2011 – caused a different taxation and loan policy from other EU states in the years of crisis.

6. The way Estonian Government has chosen to balance the budget – a continuous cut of the expenses- forms a dead circle as the cur of the expenses, particularly the wages, is going to decrease the incomes of the next period. According to the most modest calculations, which haven't taken into consideration the decrease of the demand due to macroeconomic influence, the state budget of Estonia lost 2.2 billion kroons in 2008 and 10.5 billion kroons in 2009 due to the cuts of budget.

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# KAUDSETE MAKSUDE DOMINANT EESTI RIIGIEELARVE TULUDES

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Eesti riigieelarve väga halb täituvus kriisiperioodil tõstis teravalt päevakorda küsimuse oprtimaalsest maksukoormusest ja maksude srtuktuurist. Käesoleva kirjutise raames vaadeldakse tarbimismaksude suurt osakaalu Eesti riigieelarve laekumistes ja kaudsete maksude optimaalse taseme probleeme.

Eesti maksukoormus on alates Eesti astumisest EL olnud vahemikus 33,7-36,3%, mis oli aastaid madalam EL keskmisest, kuid nüüd on ligikaudu keskmine (2010 vastavalt 34,2% ja 35,8% ), seda nii Eesti maksukoormuse tõusu kui EL keskmise maksukoormuse alanemise tõttu

Majanduskriisi tingimustes aktualiseerus maksude struktuuri küsimus. Tabelis 1 on toodud Eesti riigieelarvesse laekunud maksud alates 2005 aastast, s. o. Eesti EL astumisest. On selge, et kaudsete maksude alla lähevad neist VAT, aktsiisid ja tollimaks. Kuid kaudsete maksude tunnuseid on ka hasartmängumaksul. Sellisel kujul, kui on Eestis kehtestatud sotsiaalmaks, teda meile teadaolevatel andmetel kuskil mujal ei eksisteeri. Maksu tasub tööandja; kuid selle välja arvutamise aluseks on töövõtjale makstav summa. Kuna pole selge, kas sellisel kujul on sotsiaalmaks otsene või kaudne maks, siis liigitavad autorid teda meelevaldselt. Eurostat liigitab Eesti selle maksu tööjõumaksude (labor tax) hulka, lugedes teda seega ressursimaksuks. (Taxation. http://epp.eurostat.ec.europa.eu/portal/page?-pageid/136748), kuid ka see pole päris täpne, kuna sotsiaalmaksu laekumised on ette ära suunatud kindlateks sotsiaalkuludeks.'Ilmselt on mõttekas välja tuua kaudsete maksude osakaal kahes eri variandis, koos sotsiaalmaksuga ja ilma selleta. Esimesel juhul on kaudsete maksude osakaal pärast Eesti astumist EL kõikunud vahemikus 75,3 - 87,8% riigieelarve tuludest, teisel juhul vahemikus 41,1 - 53,6%. Esimese metoodika järgi on tegu selgelt suurima kaudsete maksude osakaaluga EL liikmesmaade hulgas; ka teise metoodikaga saadud tulemus ületab selgelt EL keskmist.

Tarbimismaksude osakaalu leidmisel kerkib jälle küsimus sotsiaalmaksust.. Kindlasti kuuluvad tarbimismaksude hulka VAT ja aktsiisid. Ka tollimaks alkoholilt, mööblilt, lihalt jne on pigem tarbimismaks. Ilmselt on õige tarbimismaksude hulka liigitada Eestis kehtestatud kujul ka hasartmängumaks. Sellise käsitluse juures kerkib huvitav paradoks- kaudsed maksud ja tarbimismaksud langevad kokku. Mitte soovides diskuteerida sellise käsitluse põhjendatuse üle, konstateerime, et mistahes lähenemise korral tarbimismaksudele on nende osakaal Eesti riigieelarve tuludes suur.

Arvud näitavad ka sotsiaalmaksu kasvavat dominanti Eesti riigieelarve laekumistes 34,2%lt 2004a. 44,4%ni 2008a. 2008 aastal alanud majanduskriis aga külmutas seoses tööpuuduse suure kasvuga 2009a. palgana välja makstavad summad, mis viis sotsiaalmaksu laekumiste vähenemiseni. Majapidamiste tulude kasvu lõppemine -

tihti isegi vähenemine - viisid majapidamiste suure laenukoormuse olukorras aga käibemaksu ja aktsiiside laekumise vähenemisele. See viis Eesti 2008-2010 aasta riigieelarved suure löögi alla. lmselt on tarbimismaksudele rajatud eelarve tuludel suur elastsus perioodidel, kus sissetulekud ja tarbimine suurenevad kiiresti, aga sellisel süsteemil on nõrk ujuvus (buoyancy).

Probleemi lahendamiseks kärpis valitsus kulusid ja tõstis kriisi haripunktil makse. Sellele vaatamata vähenesid Eesti riigieelarve maksutulud kriisiaastail kokku pea 11% Maksukoormuse kasv 31.4%lt 34,2%ni aastail 2000-2010 on oluliselt aktualiseerinud küsimust optimaalsest maksude tasemest. Püüame alljärgnevalt konstrueerida mudelit Eestis dominantsete kaudsete maksude optimumi leidmiseks.

**Tabel 1.** Maksude laekumine Eesti riigieelarvesse 2005-2010 (2005-2010 miljonit krooni, 2011-2012 miljonit eurot)

| | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 |
|---|---|---|---|---|---|---|---|---|
| Maksud kokku | 53831 | 55208 | 67718 | 70396 | 63780 | 63299 | 4342 | 4775 |
| Isiku tulumaks | 10911 | 3846 | 4786 | 4328 | 2419 | 3000 | 227 | 266 |
| Ettevõtte tulumaks | 2365 | 3123 | 4083 | 4166 | 4010 | 3032 | 201 | 252 |
| Käibemaks | 14021 | 18645 | 22304 | 20548 | 18809 | 19531 | 1343 | 1494 |
| Aktsiisid | 6424 | 7030 | 8195 | 8971 | 9818 | 10425 | 717 | 776 |
| s.h. tubakaaktsiis | 1205 | 1208 | 1529 | 2519 | 2088 | 1794 | 145 | 158 |
| alkoholiaktsiis | 1838 | 2089 | 2314 | 2434 | 2590 | 2585 | 179 | 195 |
| kütiseaktsiis | 3363 | 3728 | 4353 | 4697 | 4870 | 4870 | 361 | 390 |
| Hasartmängumaks | 292 | 354 | 467 | 484 | 278 | 323 | 19 | 20 |
| Tollimaks | 347 | 401 | 549 | 508 | 307 | 373 | 29 | 29 |
| Sotsiaalmaks | 18392 | 21764 | 27268 | 31299 | 28084 | 26562 | 1801 | 1933 |
| Muud maksud | 1079 | 45 | 66 | 92 | 554 | 62 | 5 | 15 |

Allikas. Autori arvutused Rahandusministeeriumi koduleheküIje alusel. http://www. fin.ee/

Mudeli konstrueerimisel lähtume välismõjude puudumisest, isokvandi ja samakasulikkuse kõvera klassikalisest kujust ning Pareto-optimumi saabumisele punktis, kus valitsusele laekuva tulu kasv ja ostjõu ümberjaotuse kõver kohtub paušaalmaksude omaga. Seega me sisuliselt otsime varianti, mille puhul valitsuse sissetulekute laekumise kasv ja sellest tulenev sotsiaalne heaolu ei oleks väiksemad majapidamiste kaotusest. Teiste sõnadega, kui võrrandi (1) vasak pool ületab parema, siis on ühiskonna kogu sotsiaalne heaolu kasvanud.

Asjale valemi kuju andes võib väita, et me püüame valida maksuvektori t nii, et maksimeerida sotsiaalset heaolu V(q) tähistades subjektide kogutulu kaudsetest maksudest R(t), saame

$$R(t) = t \bullet X(q) \geq \vec{R}, \qquad (1)$$

kus X(q) on kogunõudluse vector ja $\vec{R}$ on vajalik maksutulu.Kui nüüd lugeda, et pärast maksude kehtestamist kogust q pakutakse hinnaga t, tarbija aga maksab tema eest hinna (p+t) siis tähistades kogusele q vastava majapidamise heaolu on v(q) ning majapidamise nõudluse x(q) saamegi valemi (1). Rõhutame veelkord, et V(q) on sotsiaalse heaolu kasv maksude kasvust.

Püstitatud ülesanne laheneb lihtsalt kui kasutada Ramsey reeglit optimaalsete maksude kohta ja majandusteaduses levinud Lagrange maksimumi leidmise võtet. Seega me maksimeerime V + λR kus λ on Lagrange kordaja, mis antud juhul tähistab mitte mõne konkreetse erasektori poolt pakutava kauba, vaid valitsuse tulude kasvust tuleneva sotsiaalse heaolu piirkasulikkust. Seega võime kirjutada

$$\frac{\partial V}{\partial t_i} + \lambda \frac{\partial R}{\partial t_i} = 0. \qquad (2)$$

Kui nüüd asendada

$$\partial V / \partial t_i = -\sum_h \beta^h x_i^h \quad \text{ja} \quad \partial R / \partial t_i = X_i + t \cdot \partial X / \partial t_i$$

ning kasutada Slutsky kompenseeritud nõudluskõverat ja leida tuletis, saame:

$$\frac{\sum_k t_k \sum_h s_{ik}^h}{X_i} = -\sigma_i$$

$$\sigma_i = 1 - \sum_h \frac{x_i^h}{X_i} \frac{b^h}{\bar{b}}$$

Kus $S_{ik}^h$ on Slutsky kompenseeritud nõudluskõvera tuletis majapidamisele h (on säilitatud maksude tõstmise eelne kasulikkusetase) ja $\sigma_i$ on negatiivne, kuna majapidamise netotulude sotsiaalse piirkasulikkuse $b^h$ (kus „neto" tähendab kohanemist sotsiaalse piirkasulikkusega $\beta^h$ marginaalse kalduvuse tõttu tasuda maksud lisasissetulekutest; ning b on keskmine $b^h$) ja hüvise i tarbimise vahel majapidamise h poolt ($x^h_i$) valitseb kovariantsus. Niisiis, $\sigma_i$ on seda kõrgem, mida rohkem hüvist tarbivad need, kelle sissetuleku sotsiaalne piirkasulikkus on madal.

Kuna eeltoodud valemid (1) ja (2) võtavad arvesse maksude ja sotsiaalse heaolu vastandliku seose kõige olulisemaid aspekte, on kaudsete maksude efektiivsuse sotsiaalne aspekt sellega küllaltki hästi kirjeldatav. Kuid nii siintoodud kui ka spetsialistide poolt varem pakutud valemid (Ahmed; Stern, 1989) on praktikas kasutatavad vaid eeldusel, et meil õnnestub matemaatiliselt kirjeldada majapidamiste sotsiaalse heaolu funktsioon; millest siis on võimalik leida tuletis. Praktikas osutub

selle funktsiooni piisava täpsusega leidmine keeruliseks, s.t. kerkivad needsamad raskused mis Hicksi võtte kasutamisel asendus- ja sissetulekuefekti lahutamisel.

**Järeldused**

1. Kaudsete ja tarbimismaksude osakaalu leidmine kogu maksukoormuses on keeruline, kuna maailmas puudub tunnustatud metoodika. Ka on mitmetel Eestis kasutatavatel maksudel korraga nii kaudsete kui otseste maksude tunnuseid. Samuti ei ole selge, mida ikkagi lugeda tarbimismaksuks.

2. Mistahes metoodika kasutamisel kaudsete ja otseste maksude määratlemisel jäävad Eesti riigieelarve laekumistes domineerima kaudsed maksud.

3. Eesti riigieelarve tulude struktuur erineb oluliselt EL enamiku liikmesriikide omast. Riigieelarve suurim ja kasvava osakaaluga tuluallikas on omapärase ülesehitusega sotsiaalmaks, mis on raskesti liigitatav nii otseste, kaudsete kui tööjõumaksude alla. Väga suure tarbimismaksude osakaalu tõttu on Eesti maksusüsteemi ujuvus nõrk. Majanduslanguse perioodil oli Eesti riigieelarve kergesti haavatav. Vaatamata maksukoormuse tõusule 31,4%lt 34,2%le aastail 2008-2010 vähenesid riigieelarve maksutulud pea 11%.

4. Riigieelarve väga halb täitumine 2008 ja eriti 2009 aastal, mis sundis valitsust tegema kuni 10% ulatuvaid eelarvekärpeid ja tõstma makse, on teravalt tõstatanud küsimuse optimaalsest maksukoormusest Eestis. Lähtudes Slutski kompenseeritud nõudluskõvera põhimõttest ja Ramsey maksude optimumi teooriast võib kaudsete maksude optimaalse tasemena vaadelda punkti, kus majapidamiste heaolu vähenemise kõver ja ühiskonna sotsiaalse heaolu kasvu kõver maksude tõstmisest lõikuvad. Praktikas on seda punkti väga raske leida.