

There is no common answer to the question as to how the government's budgetary policy affects private consumption. However, it is possible to analyse how many people there are who can take a loan and save. To which extent do people take into consideration the anticipated growth or decline in taxes? To which extent have the needed prerequisites been met in Estonia? These and other are issues are to be tackled in the following article.

DOES GOVERNMENT CONSUMPTION AFFECT PRIVATE CONSUMPTION?

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So far economic theory has not provided a sufficient answer to the question whether and how government consumption should affect private consumption. If government expenditure is financed from today's taxes, disposable income is reduced and hence also private consumption might decrease. Since in the longer run the principal source of government revenue is tax collection, government expenditure has to equal the tax revenue. If the government finances the expenditure with loans, personal disposable income is not reduced. But in the future the government must either limit expenditure to repay the loans and/or raise taxes. Whether the consumers respond to the anticipated tax rise immediately or not depends on their model of behaviour, which economic theory is trying to depict by the consumption function.

There are two main consumption functions. According to the first, **the Keynesian approach, the consumption in the current period depends solely on the present-period disposable income** (gross income minus taxes plus different transfers). This hypothesis has two flaws. Firstly, the Keynesian consumption function is not in line with one important stylised fact of the economy according to which the fluctuation in consumption is significantly smaller than that of income, which means that the propensity to consume or the proportion of the income used for consumption changes from period to period. The second prerequisite is that private consumption propensity is the same, irrespective of the level of income.

The basis of the other consumption function is the permanent income hypothesis suggested by Milton Friedman in his book published in 1957². **According to the**

¹ This article is based on the research *Liquidity Constraints and Ricardian Equivalence*. The author of the article extends his gratitude to Hannes Kaadu who cooperated in writing the study.

² Friedman, M., 1957. *A Theory of Consumption Function*, Princeton University Press.

permanent income hypothesis, the consumer makes an effort to maximise the utility of consumption. Such a person wants to consume evenly during all periods, as this way the utility of consumption is the biggest, hence optimal. To calculate the optimum, the consumer divides the expected income into equal parts throughout lifetime. Consumption no longer depends on the income of the same period, but on the anticipated income and can increase/decrease only if expectations of future cash flows change. Necessary prerequisites are regarded to be a flaw of this consumption function. People have to plan income and expenditure for a longer period in the future and be capable of taking loans against the future income and save for the future.

Since an expenditure tax rise does not affect today's disposable income, according to the Keynesian consumption, it does not affect current consumption. However, an anticipated tax rise reduces the future disposable income (future wealth). If people plan their consumption, according to Friedman's hypothesis, it affects consumption already today, since the future income is reduced. **A situation in which people's consumption behaviour does not depend on whether the government raises taxes or finances expenditure through taking out loans is called the Ricardian equivalence³. If the Ricardian equivalence holds, growth in government expenditure does not boost gross economic consumption namely because people reduce consumption.** Besides the two prerequisites, which were necessary for the permanent income hypothesis, in case of the Ricardian equivalence it has to be assumed that taxes do not have a significant distorting effect and do not depend on the level of income⁴.

In Estonia, the Ricardian equivalence has not been extensively studied. Central government budgets have not always been balanced; budget implementation may differ from the plans regarding economic growth, inflation and revenue collection. Local municipalities are also allowed to take loans. Estonian capital markets are considered to be imperfect, which is typical of transition economies. Even though it applies to the first half of the 1990s, the same conclusion cannot be automatically drawn regarding the beginning of the new decade when excessive borrowing is an issue.

To which extent have the necessary prerequisites been met in Estonia? How many people are there who can take loans and save? How big is their share in total income and consumption? To which extent do people take into consideration an anticipated increase/decline in taxes? These and several other issues have been analysed in the second and third sections of the article. The second section provides longer insights into the theoretical

³ The modern author of the Ricardian equivalence is Robert J. Barro, but after his 1974 article (Are Government Bonds Net Wealth? *The Journal of Political Economy*. 82 (6), 1095–1117) was published, Jim Buchanan highlighted in his commentary that David Ricardo had in his 1817 book *The Principles of Political Economy and Taxation* presented a similar idea. Since the original author of the idea was Ricardo, the phenomenon has been named after him.

⁴ Besides the Ricardian equivalence there is the crowding out effect, which is a connection between government loan growth and declining private consumption/investments. Government borrowing increases interest rates in a closed economy and thus also private customers have to pay higher interest. This decreases the number of useful investment projects and leads to reduced investments. Consumption declines as well because the products the purchase of which was planned to be financed through loans are more expensive.

aspects of the Ricardian equivalence, the essence of consumer and durable goods, liquidity constraints, long planning horizons, etc. The third section presents Estonian data by analysing the above-mentioned issues and providing an answer to the question whether Estonians act according to the Ricardian equivalence or not.

■ Theoretical Aspects of the Ricardian Equivalence ■

When explaining the Ricardian equivalence, Robert J. Barro claimed that people do not consider the bonds issued by the government as wealth, but perceive that repurchasing the bonds is only possible if the government raises taxes. The anticipated tax rise affects the disposable income of the people. Since income decreases, the optimal consumption is smaller.

For the Ricardian equivalence to apply, three prerequisites are needed:

1. **Perfect capital markets.** Liquidity constraints are mainly perceived in two ways⁵.
 - a) Different interest rates apply to household loans and savings.
 - b) The size of a loan is limited: households are not able to borrow in the amount equalling their future income.
2. **Long planning horizon.** Raising or lowering taxes must affect people's behaviour since their lifetime income changes. If the planning horizon is too short, people do not take into consideration that they would have to repay the government loan at all and thus there will be no need to save during the current period.
3. **No distorting effect of the taxes.** If taxes are lowered, it might make people want to work more since their income will increase, or it can lead to a reduced wish to work, if they try to maintain their previous income. This in turn prevents forecasting the anticipated effect of tax changes on people's wealth. If people opt for working more in the context of higher taxes, their income will not be reduced, consumption will be initially on the optimal level, and the increase in the deficit will not affect saving.

The Ricardian equivalence has been widely criticised because of these prerequisites. Taxes affect human behaviour, no man lives forever and not all people can take a loan or save. On the other hand, in the case of the Ricardian equivalence one must note the existence of traditional liquidity constraints, i.e. problems with borrowing and saving cannot always be interpreted as a limiting factor. If a person or his/her household consumes on an optimal level, it is irrelevant that the household cannot save or borrow when testing their liquidity constraints, since it is not possible to distinguish between people with and without liquidity constraints in the data.

It is obvious that liquidity constraints affect some households more than they affect others. According to the life cycle theory, the consumption of young people is

⁵ Hayashi, F., 1985. Tests for Liquidity Constraints: A Critical Survey. *NBER Working Paper*, 1720.

constrained. Their income has not yet risen to the lifetime average level. The unemployed and people with passive labour market status who return to the labour market later have incomes, which are temporarily lower than their lifetime average. The lack of permanent income reduces both the ability to save and borrow. Part of the working population might also witness liquidity constraints if the sustainability of their income is insecure (possible unemployment) or if it is impossible to take a loan in anticipation of increasing income. However, people with no permanent income from work and no plans to start working might have a higher average lifetime income than currently or than is expected.

According to the life cycle theory, pensioners fall into a separate group as well. Their income is lower than the lifetime average, while they cannot expect a rise in their income. If the permanent income hypothesis is effective, their earlier savings should enable to even out their consumption. Regarding pensioners, it must also be taken into consideration that it is important how the government decides to finance future budget deficit. If taxes are raised to cover expenditure, one has to distinguish between income and consumption taxation. Income taxation does not affect the amount of real disposable funds meant for consumption by the pensioners. Consumption taxation, however, reduces purchasing power, which is why immediate constraints on consumption become necessary. If the government decides to reduce expenditure in areas other than pensions, the current deficit will not affect the behaviour of people today.

Consumption as buying and consumption as benefiting from a product are different things. Consumption smoothing applies to goods that are purchased and absorbed in the same

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period. Besides the above-mentioned perishables people also buy durable goods, which are paid for in one year while consumption thereof might last during several years in the future. Goods like cars, refrigerators, etc. fall under the first category. Moreover, level consumption does not apply to investment goods that can simultaneously be consumed and treated as investments. This includes real estate, art, precious metals, etc. Durable and investment goods are difficult to distinguish from regular goods. There are views⁶ in the business media that also holiday travel should fall under durable goods, since the memories

accumulated during travelling can make people happy even years later. Dental care can also be regarded as investment, since it secures less spending on teeth in the future and prevents other ailments.

The share of investment goods is important not only in private consumption, but also in the structure of government expenditure. If investments are made so that future generations can have a better life, e.g. there is more nature preservation, it cannot be regarded just current consumption. Besides, the debt might be useful for future generations who can enjoy cleaner nature. Spending that has been targeted at the preservation of the nation can also turn out to be an investment, since consumption can be maximised only if there

⁶ Hayashi, F., 1985. Tests for Liquidity Constraints: A Critical Survey. *NBER Working Paper*, 1720.

are many generations to come. **Therefore it is impossible to find a single definition to consumption, one can only apply consumer spending as the closest approximation in order to evaluate actual consumption.**

■ Ricardian Equivalence in Estonia ■

Since the budget is put together for the period of one year, it is natural that quarterly revenues may differ from expenditure. In the first quarter, revenue collection is below average while in the fourth quarter more revenue from taxation is collected; meanwhile the last spendings of the fiscal year are made at that time too. Such cyclical nature is not relevant in the context of the Ricardian equivalence. In reality, annual budgets are not balanced either. Figure 1 shows how quarterly budgets have evolved. The important thing is that the seasonally adjusted budget should be balanced. If seasonal adjustment or the levelling filter is applied, the budget indicated deficits from the second half of 1998 up to the beginning of 2002.

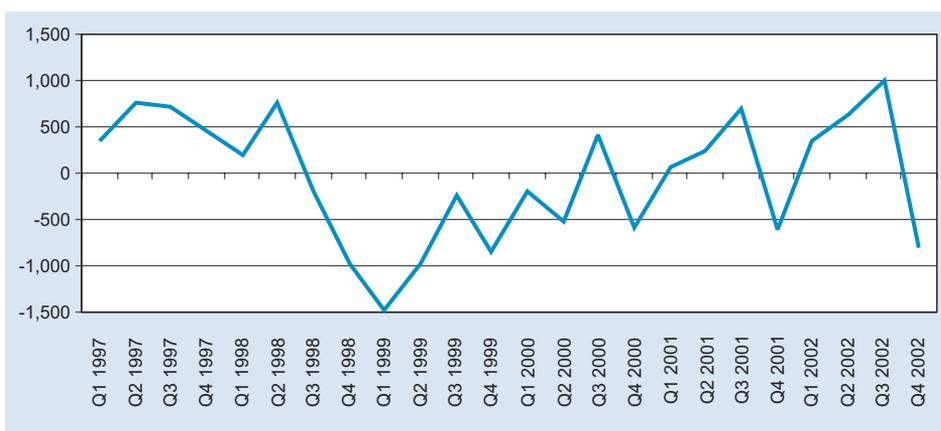


Figure 1. Government expenditure and revenues by quarters (EEK m)

Source: Statistical Office

The way Estonian households adjust their consumption actually largely depends on how the surplus and deficit are explained to the public. Prior to the 1998 crisis the Government of the Republic of Estonia transferred part of earlier revenues into the stabilisation reserve fund, which is meant for consumption during periods of recession. However, the rise from depression and budget deficit was fast - the companies recovered from the crisis and the government adopted a negative budget. A clear signal was given that budget deficit was not welcome. Meanwhile the surplus in the following years has been explained with the spending needs in the near future, e.g. the launch of the pension reform. Therefore government budget surplus should not raise expectations of a future fall in taxes.

The debt burden of the government sector is nearly 6% of GDP. Central government debt has decreased more than twice, compared to 8% of GDP in 1995 (see Figure 2). In 2002 central government debt stood at slightly more than 3% of GDP. Meanwhile the debt burden of local municipalities has soared. The starting level of 1% of GDP in 1995 has risen to 3%. While at the beginning of the period three fourths of the debt was financed by foreign loans, by now the share of foreign loans has fallen to less than a third. During that period the government has not issued bonds on the domestic market, therefore it has not been possible for the citizens to treat government debt as wealth. Nevertheless, an expected growth or decline in taxes should affect the behaviour of people.

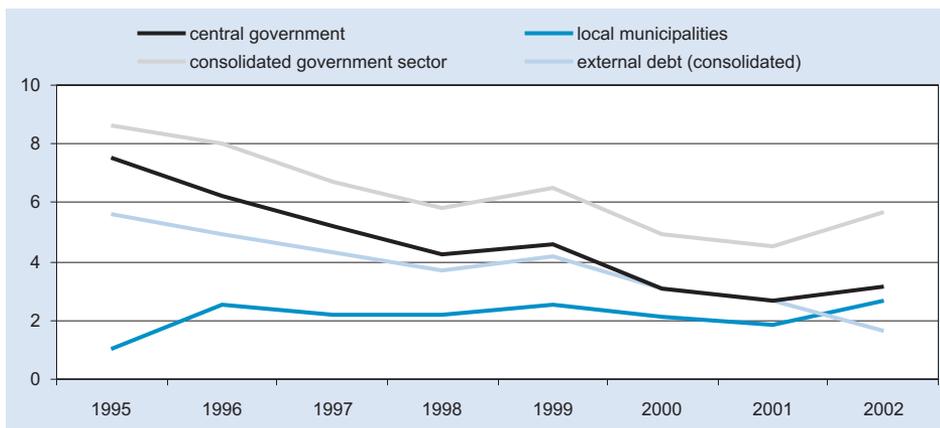


Figure 2. General government debt (% of GDP)

Source: Ministry of Finance

During the period under review private consumption has grown in line with the rise in income (Figure 3). The correlation coefficient of these figures, which shows how closely changes within are related, is 0.99. **This shows that growing income is associated with**

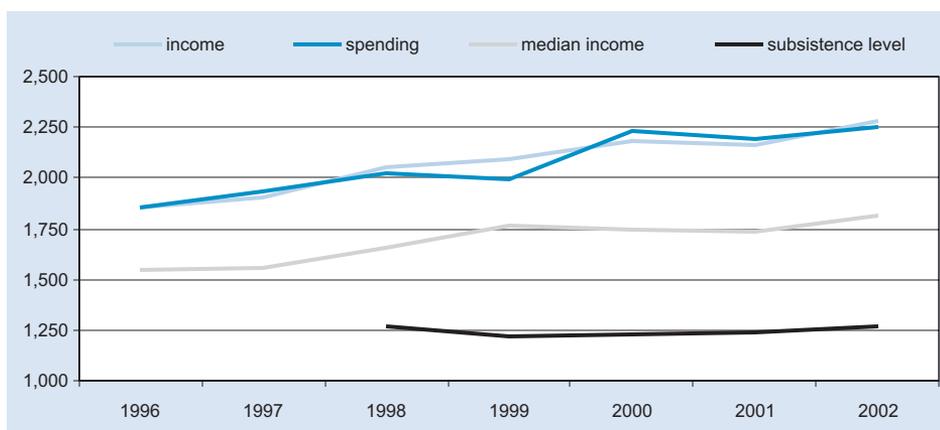


Figure 3. Income and spending in Estonia at the year 2000 prices (EEK per month)

Source: Statistical Office

higher spending. Such development trends seem to indicate significant liquidity constraints, since people have consumed all their income practically during the entire period. If people could have anticipated a growth in income, they would have been able to take loans against it and the spending would not have had to change during the period.

As a counterargument, one can indicate a possibility that arising from the conservative nature of income growth expectations, the increase in the income of future periods is estimated as being equal to the income received at the current period, which is why such expectations are reviewed every year and adjusted according to the level of income received in each respective year. This is the situation in which the public estimates future income with a negative shift from year to year. This corresponds to the model of an irrationally behaving person, whose expectations of the future are not accurate (the growth in anticipated income does not on average equal the actual increase in income).

The interval under study includes an episode when consumption did not follow growth in income. It was the period immediately after the Russian crisis in August 1998. The economy witnessed several critical changes and many industrial sectors lost their former export markets in the east. The confidence of households regarding their future diminished, and even though real income increased, real consumption shrank in 1999. In 2000 economic environment improved to the extent that the positive saving of the year before turned negative. **Such behaviour proves that the part of consumption in income is not fixed and that households can save.**

The situation described above is very important regarding the Ricardian equivalence, since in 1999 private savings were positive while the government budget had a deficit. It is a typical Ricardian equivalence situation, where government budget deficit boosts expectations of rising taxes, which is why rationally behaving consumers save in anticipation of future reduced income. Even though the behaviour was in line with Ricardo's theory, it is not certain whether it was a causal connection or if private savings and government budget deficit were caused by a third factor. Because of automatic stabilisers government budget has a deficit at the time of negative economic growth. At the same time, unfavourable economic environment increases people's insecurity regarding the future and reduces their future income expectations, making them save. This is a phenomenon known from economic literature, which coincides with the Ricardian equivalence. On the basis of data it is **difficult to distinguish whether people saved because of government budget deficit or whether these savings were caused by prudence**⁷.

At the same time, unfavourable economic environment increases people's insecurity regarding the future and reduces their future income expectations, making them save.

⁷ Carroll, C. D., 2001. A Theory of the Consumption Function, with and without Liquidity Constraints. *NBER Working Paper*, 8387.

While studying **possible liquidity constraints in Estonia**, one has to look at the ability to save, which in turn depends on the minimum level of subsistence and the distribution of income. Figure 3 shows that median income is significantly lower than the arithmetical average income. Table 1 presents income per income deciles. The difference in income between the lowest and the highest deciles is more than 11 times. The poorest 24.4% of the population earn 9.1% of the gross income. These are people who live on income that is smaller than the minimum level of subsistence (the sum of minimal food basket and other spending). Meanwhile the richest 8.5% of the people earn 25% of the total income. Hence it is possible that even if the poorest 25% have liquidity constraints, these do not reflect in the total consumption indicators. **Consequently, it would not be accurate to claim that the people in Estonia as a whole are without liquidity constraints; however, the dynamics of total consumption might largely behave with minimal constraints.**

Table 1. Distribution of income and people per household deciles in 2002

Income decile	Income per household member (EEK)	Share of people in total population (%)	Share of income in gross national income (%)
I	651.8	11.9	3.1
II	1,193.1	12.5	6.0
III	1,515.2	9.9	6.0
IV	1,717.1	8.6	6.0
V	1,897.7	8.8	6.7
VI	2,128.4	9.6	8.2
VII	2,493.2	10.1	10.1
VIII	3,064.0	10.2	12.6
IX	4,104.9	9.9	16.3
X	7,295.3	8.5	25.0

Source: Statistical Office, Household Living Niveau, 2002

On the other hand, one might say that since many of the poor are pensioners and those who have lost work and are not planning to return, **it is not accurate to claim that these are people with liquidity constraints, since their anticipated income is not significantly larger than the current level.**

A major part of the income of Estonian people comes from government transfers (see Table 2). Meanwhile the weight of thereof has not declined, neither has the weight of earnings from paid employment grown in the income. Benefits (pension, child allowance, and other transfers) are important above all to households with low income, accounting for 49% of the total income in the fifth decile. The respective weight in the richest group is below 7%. The importance of income received from paid work is over 50% only for half of the people.

There has been a significant change in the **structure of spending** (see Table 3). The joint weight of food and housing has fallen from 58% to 46%, which means that in richer households food and housing costs account for only 35% of the total expenditure. This means that there are now better opportunities for both saving and taking loans, since saving is possible above all at the expense of all other spending.

Table 2. Distribution of income by type (%)

	I decile		V decile		X decile	
	1996	2002	1996	2002	1996	2002
Income from paid work	45	37	50	45	73	76
Income from individual work activity	11	4	12	6
Pension	25	30	31	42	4	3
Child allowance	21	17	4	3	1	1
Other transfers	10	14	3	4	3	3
Other income	1	3	1	2	7	11
Total net earnings	100	100	100	100	100	100

... negative income

Source: Statistical Office

Table 3. Distribution of spending by type (%)

	I decile		V decile		X decile	
	1996	2002	1996	2002	1996	2002
Food and non-alcoholic beverages	54	45	51	41	31	23
Housing	17	17	21	20	14	12
Clothes and footwear	5	4	5	5	9	7
Household expenses	4	4	3	3	7	7
Transport	4	5	4	7	10	10
Other	16	25	16	24	29	41
Total spending	100	100	100	100	100	100

Source: Statistical Office

What was said above gives grounds to reckon that **both saving and borrowing might constitute a problem for many people**. Nevertheless, in the period under study people have taken into account future income when shaping their consumption today. Consequently, even though liquidity constraints may restrict people's behaviour, there is an interval in which consumption is being optimised.

Conducting empirical tests does not enable to reach universal conclusions either. According to the Haque and Montiel⁸ model, consumption should not depend on the income of the same period, but on the consumption of the preceding periods. This means that **the expected growth/fall in income does not affect consumption, since the change has previously already been taken into account**. Consumption could only be affected by an unexpected rise in income. **On the basis of empirical tests it was not possible to reject the hypothesis that Estonian people had liquidity constraints and were incapable of levelling off consumption**⁹. However, one cannot be certain of such an outcome, as income and spending were so highly correlated that it impedes the evaluation of the connection.

⁸ Haque, N. U., Montiel, P., 1989. Consumption in Developing Countries: Tests for Liquidity Constraints and Finite Horizons. *The Review of Economics and Statistics*, 71(3), 408–415.

⁹ Kaadu, H., Uusküla, L., 2004. Liquidity Constraints and Ricardo Equivalence. Working Paper of Eesti Pank, to be published.

Aschauer¹⁰ estimated government and private consumption equations simultaneously. In the government consumption equation the spending of the current period depended on the lagged spending and the deficits. The private consumption depended on the lagged private consumption and government expenditure. If consumers are rational and take government expenditure into consideration, the growth in government spending should lead to declining private consumption. **As a result of an empirical study it was not always possible to reject the hypothesis that people do not take government consumption into account.**

These are not contradictory results, even though a single conclusion is not possible. It seems that **people can optimise consumption between periods and that the planning horizon is sufficiently long.** These are necessary conditions for the Ricardian equivalence to be effective in Estonia. **However, there is no sufficient proof that people would reduce consumption at the time when government consumption is in deficit.**

■ Ricardian Equivalence Elsewhere in the World ■

It is easy to find examples of not balanced government budgets anywhere in the world. This constitutes the Keynesian demand-side policy whose aim is to stabilise economic activity. **Developing countries hope that consumption supports economic growth, and due to greater future wealth it will be easier to repay the loan. Rich countries try to smooth economic cycles with budgetary policy by supporting demand at the time of recession.** This is all done in the hope that people would not behave according to the “Ricardian way” and that an increase in government expenditure would boost the total demand.

Such government policy has for a long time also been of interest to economists. Ever since Barro's article in 1974 there have been multiple studies about different countries and periods. Leaving aside several technical reasons that impede the evaluation of the connection, one can claim, as was already done at the start of this article, that empirical studies yield contradictory results.

In studies about **developing countries** the Ricardian equivalence is rejected because of arguments mainly based on liquidity constraints. **Since most countries have budgets in deficit, according to studies, people do not save in anticipation of future taxes.** In many of these countries the problem of poverty may exist in such a wide extent that in order to survive it is impossible to save anything for the years to come. On the other hand, the institutional framework might not enable it either. For example, monetary stability may not be sufficient or the bonds issued by the government trustworthy enough in order to be used as means of preserving value. Since only monetary savings can be treated as savings when using macroeconomic data, the use of other assets (e.g. gold and precious

¹⁰ Aschauer, D. A., 1985. Fiscal Policy and Aggregate Demand. *The American Economic Review*, 75(1), 117–127.

metals) cannot be separately checked. Besides, the risk of government bankruptcy may be so big that repayment of the debt from tax revenue is not even expected. The list of arguments as to why the Ricardian equivalence cannot be applied may continue, but the important thing is that **the main reasons arise from the economic environment and less from the attitude towards government expenditure.**

In developed countries the validity and non-validity of the Ricardian equivalence is much more disputable. Firstly, people's behaviour should not have the constraints that are tackled in the developing countries. First of all, it is possible to **take long-term consumption loans** due to the developments in banking. On the other hand, there are established **habits that smooth consumption**. The most typical example would be pension funds whose units people have obtained on both mandatory and voluntary basis. If people are able to save for their pension, it is possible that they can also save in anticipation of future tax rises.

Thus the question is whether people decide to save in anticipation of future spending or take loans against their income. And if the consumption of the people responds to government expenditure, to which extent does this happen? A question arises: if the government spends one million kroons more than it earns in revenues during the same period, will people reduce spending also by one million kroons, or will the response be much more muted? Elasticity, which is between zero and one, shows to which extent government consumption affects total consumption. Hence the government expenditure of one million kroons increases total economic spending by just 400,000 provided that elasticity stands at 0.6 (excluding the effect of government expenditure multiplier). **The smaller the elasticity, the more total consumption increases with government expenditure and the easier it is for the government to balance the economy. On the other hand, it will contribute to larger contraction of the economy later.**

■ Conclusion ■

In the global context Estonia stands out with prudent budgetary policy. However, during the past seven years there have been budgets with deficit as well as budgets with surplus. Contradictory study results about Estonia fit well into the context. Liquidity constraints do not considerably prevent Estonians from smoothing consumption. Borrowing has increased, and also saving for the retirement age has proved to be popular. There is a behavioural model of levelling off consumption that would enable to respond to government expenditure. Meanwhile all the steps taken by the government can be explained by one-off factors that reduce the ability to respond according to the Ricardian equivalence. Besides obvious changes in the economy, government budget surplus and deficit have been small and have not had a significant effect on future income expectations. Therefore it is not necessary to adjust behaviour considerably. This was also proven by an econometric analysis. The result must not be generalised by claiming that Estonians

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do not act according to the Ricardian equivalence, since a more significant government budget deficit/surplus during a longer period might affect consumer expectations and unleash a reaction that is not evident in the context of small deficit/surplus.

Obviously, in this article it was not possible to uncover all the possible aspects of the Ricardian equivalence that are relevant in analysing the existence and extent of the effect. For example, it is possible that the reaction of the consumers greatly differs upon saving and borrowing. When taking a loan, people might be more conservative than upon saving. Therefore, budget deficit and surplus will not lead to symmetrical effects. Economic theory cannot provide a sufficient answer as to how private consumption should react to the steps taken by the government. Nevertheless, it is possible to assess undergoing and anticipated changes.