

TAXATION OF PRODUCTION FACTORS AND UNEMPLOYMENT IN ESTONIA

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■ Introduction ■

The question of links between the tax system and the high unemployment rate and extensive structural unemployment¹ has been little discussed in Estonia so far. The aim of the current article is to fill in this gap. The author focuses on the analysis of the tax burden on production factors – labour and capital – and its distribution between production factors in Estonia and the OECD countries. The Estonian tax system is characterised by low taxation of capital as compared to the tax burden on labour. In most OECD countries this ratio is vice versa (taxation on capital exceeds taxation on labour) or more or less equal for both production factors. **The main question, which the following analysis attempts to answer, is whether a high absolute or relative tax burden on labour (ie low tax burden on capital as compared to that on labour) could have a negative effect on employment.**

During the economic recession that followed the so-called Russian crisis, the unemployment level rose to nearly 15% in Estonia. The highest unemployment rate of the past decade was registered in the first quarter of 2000 at 14.8%. Although the level of unemployment has considerably decreased since then (9.1% in the third quarter of 2002), the level of structural unemployment still remains high in Estonia. In 2001 the share of the long-time unemployed² in the total number of unemployed was 48.3% and in 2002 this indicator increased further, amounting to 53.4% in the first three quarters³. Figure 1 illustrates the dynamics of structural unemployment. It shows the number of the short-term and long-term unemployed and discouraged persons in 1993–2001. Apparently, the recent fall of unemployment can mostly be attributed to the decrease in the number of the short-term unemployed. The number of the long-term unemployed and discouraged persons has changed little⁴.

The high level of unemployment and its structural nature can, first of all, be explained by the extensive economic rearrangements that took place in the course of transition. The rapid fall of employment in Estonia in the 1990s was nothing exceptional among the transition countries. In the majority of the Central and Eastern European (CEE) countries the transition process has been accompanied by the high level of long-term unemployment⁵. In transition

¹ Structural unemployment denotes a situation when there is a mismatch between the actual knowledge and skills of workers and the requirements of jobs. The level of structural unemployment is estimated by long-term unemployment.

² A person is considered to be a long-time unemployed if he or she has been out of job for more than one year.

³ Statistical Office of Estonia (SOE).

⁴ Discouraged persons are those working-age people who have lost hope of finding a job.

⁵ Employment and Labour Markets in Central European Countries. Eurostat, 2001.



Figure 1. Dynamics of structural unemployment in Estonia in 1993–2002 (annual average in thousand inhabitants, aged 15–69)

Source: Statistical Office of Estonia

countries the dynamics of income and employment mostly depends on the changes in the macroeconomic environment and thus, from the overall success of economic reforms. Considering that the transition process in the Estonian economy has reached its final stage, the structural changes will be less extensive in the future. Therefore, the analysis of the institutional framework of the labour market, including tax legislation, becomes ever more important in analysing the possible reasons of unemployment.

■ *Ex ante* and *ex post* Tax Rates in Estonia ■

Different methods can be used to evaluate the tax burden. The most commonly used method of analysing labour taxation is the calculation of *ex ante* (or anticipated) average and marginal tax rates. The average tax rate measures the ratio of taxes paid on earned income (the sum of income tax, social insurance tax and unemployment insurance tax) to the tax base. The tax base is made up of the wage costs of the employer (gross wages plus social insurance tax) and the unemployment insurance paid by the employer. The marginal tax rate measures the correlation between the growth of tax costs and income. When income increases by one kroon then the marginal tax rate shows how much of this one kroon has to be paid for taxes.

Due to the tax-exempt minimum, the Estonian tax system is moderately graduated: the average tax rate of a worker earning gross 2000 kroons per month is 35.39%, but in case of a worker earning gross 15,000 kroons per month it is 43.83%. Since the tax rate does not depend on the level of income (the tax system is not graduated) in Estonia, the marginal tax rate of earned income is constant across all income levels and equals to 45.12%.

A more precise evaluation of the tax burden on labour is possible by calculating effective tax rates for production factors (labour and capital). The effective tax rates measure the *ex post* (or materialised) tax burden and are calculated on the basis of macro data on state revenue and the aggregate income of economic agents. The variables in the numerators of the equations used to calculate the effective tax rates measure the difference between the income earned from labour and capital before and after taxes. These variables are calculated using the tax revenue, which is related to the income earned from labour or capital. The variables in the denominators of the equations denote the tax bases of different types of taxes (income from labour or capital) as measured in pretax prices.

In Estonia the taxes directly related to labour are social insurance tax, unemployment insurance tax and personal income tax. The effective *ad valorem*⁶ labour tax rate measures the percentage difference between the employment-related income before and after taxes. Using aggregated data, the uniform average tax rate per representative household is calculated. Due to the fact that 12,000 kroons of income is tax-exempt, the tax rates of below-average income households are lower than the average effective tax rate (AETR) and the actual tax rates of above-average income households exceed AETR.

Capital taxes include corporate income tax and property-related indirect taxes (state dues, land tax and other property taxes). The effective tax rate of capital is positively related to the dividend rate: the higher the ratio of dividends and profits, the higher the actual tax burden of capital at the given company.

The tax burden on labour is often measured by the summarised AETR on labour and consumption. **In Estonia, consumption taxes include the VAT and the excise tax. The inclusion of consumption taxes into the tax burden on labour is justified by the fact that it does not matter to the worker whether his/her net wage (the actual sum of money he/she buys goods and services for) is higher or lower due to changes in direct labour taxes or consumption taxes.** Under this approach it is assumed that workers spend all the income they earn on consumption, ie the saving rate of the population's labour income is zero. Considering the low level of saving in Estonia, such an approach to our tax system is justified.

Table 1 illustrates the average effective tax rates of consumption, labour and capital in Estonia in 1996–2001. The AETR on labour was between 33.6% and 38.8% in this period. The AETR on capital was roughly equal to the AETR on labour before the 2000 tax reform when corporate income tax on reinvested profits was abolished. The only exception was 1997. **After the corporate income tax reform the AETR on capital has been between 10.9% and 13.4%, which is approximately three times smaller than the AETR on labour.** The combined AETR on labour and consumption ranged from 47.2% to 53.8% in the period under study.

What is the relation between the *ex ante* and *ex post* average tax rates on labour in Estonia? Leaving aside the unemployment insurance tax, which was introduced in 2002, the average

⁶ According to the value (Latin).

Table 1. Average effective tax rates on labour, capital and consumption in Estonia in 1996–2001

	1996	1997	1998	1999	2000	2001	Average
AETR on labour	34.4%	38.8%	36.5%	33.6%	35.5%	35.8%	35.8%
AETR on capital	31.1%	21.5%	32.8%	35.1%	13.4%	10.9%	24.1%
AETR on consumption	21.7%	24.5%	21.2%	20.4%	22.6%	22.8%	22.2%
AETR on labour and consumption	48.6%	53.8%	50.0%	47.2%	50.1%	50.4%	50.1%

Source: Author's calculations

ex ante tax rate of a worker earning an average gross wage in 1996–2001 was 38.2% – higher than AETR on labour, which was 35.8% in this period. The effective tax rate exceeded the *ex ante* tax level mostly because of the tax evasion – unpaid taxes from the so-called envelope wages. Another possible reason for the actual tax burden being lower than the *ex ante* tax burden is the existence of various income tax concessions (interest payments on housing and study loans are tax-exempt, etc).

■ Estonian Average Effective Tax Rates Compared ■ to the Tax Rates of the OECD Countries

The comparison between the average effective tax rates (*ex post*) of Estonian production factors and those of the OECD countries is given in Table 2. As we can see, the AETR on labour in Estonia was close to the average tax rates on labour in the OECD countries and the EU, being 2.4 percentage points higher than the respective tax rate of the OECD and one percentage point lower than the tax rate of the EU. Several EU members (France, Austria, Belgium) as well as Central European OECD members (the Czech Republic, Poland, Hungary) tax labour higher than Estonia. But in a number of countries the tax burden on labour is considerably lower than in Estonia (the USA, Japan, Great Britain, etc).

The AETR on consumption has been 22.2% in Estonia in the past six years. This is 5.1 percentage points higher than in the OECD and 3.5 percentage points higher than in the EU. As already mentioned, the summarised effective tax rate of labour and consumption is often used when analysing the tax burden on labour. In Estonia, the net sum of the AETR on labour and consumption averaged 50% in 1996–2001. In 1991–1997, the respective indicator in the OECD countries was 42.7% and in the EU – 48.3%. Comparing these figures to the Estonian indicators implies that **Estonian tax burden on labour is relatively high, if we include taxes on both labour and consumption.**

The AETR on capital averaged 24.1% in Estonia in 1996–2001. However, the tax burden on capital decreased considerably after the abolition of corporate income tax on reinvested income at the beginning of 2000. Therefore, the evaluation of the tax burden on this production factor should be based on the AETR on capital in 2000–2001. The respective indicator was 12.1%, which is considerably lower than the effective tax rate on capital in any OECD

Table 2. Average effective tax rates on labour, capital and consumption in the OECD countries and Estonia in 1991–1997

	AETR on labour	AETR on capital	AETR on consumption	AETR on labour and consumption
Australia	22.6	56.2	11.9	31.8
Austria	41.8	34.4	20.0	53.4
Belgium	39.7	47.0	18.7	51.0
Canada	28.7	87.7	13.1	38.0
Czech Republic	36.4	63.7	22.7	50.8
Denmark	42.8	67.7	25.7	57.5
Finland	44.5	56.5	22.7	57.1
France	40.2	41.4	18.0	51.0
Germany	35.9	36.4	15.8	46.0
Great Britain	21.0	68.6	16.9	34.4
Greece	24.3	39.4	18.6	38.4
Hungary	39.6		25.7	55.1
Iceland			23.6	
Ireland	25.1	27.6	22.8	42.2
Italy	36.3	49.6	16.0	46.5
Japan	24.0	83.6	6.7	29.1
Korea	7.7	49.0	16.0	22.5
Luxembourg			20.9	
Mexico			12.6	
Netherlands	41.0	40.7	18.7	52.0
New Zealand	24.2	50.1	19.8	39.2
Norway	35.5	38.1	26.9	52.9
Poland	42.9		19.8	54.2
Portugal	22.7	22.2	20.5	38.5
Spain	30.4	31.9	13.7	39.9
Sweden	48.5	63.5	18.7	58.1
Switzerland	30.2	75.6	8.4	36.1
Turkey			11.2	
USA	22.6	51.0	6.1	27.3
EU average	36.8	45.3	18.7	48.3
OECD average	33.4	52.2	17.1	42.7
G7 average	29.8	59.8	13.2	38.9
Estonia¹	35.8	24.1	22.2	50.0

Sources: David Carey, Harry Tchilinguirian; (OECD Working Paper No 258, 2000) and author's calculations.

¹ Average effective tax rates of Estonia are calculated for the period 1996–2001.

country. The average AETR on capital in the OECD countries and the EU was 52.2% and 45.3%, respectively, in 1990–1997.

It appears from the above that **the tax burden on labour is higher in Estonia than the OECD average, but the tax burden on capital is considerably lower**. What impact could this distribution of the tax burden between the production factors have on unemployment?

■ The Impact of Labour Taxes on Employment and Unemployment ■

Generally, the analysis of the possible relations between the tax system and unemployment proceeds from the way different taxes influence the relative prices of production factors in the economy. *Ceteris paribus*, there is a rule that changes in tax policy leading to the growth of labour costs or, in other words, the price of labour, decrease the demand for labour. However, the decline in the demand for labour as a production factor can be caused by not just the absolute increase of labour costs (ie increase of the tax burden on labour), but also changes in the tax system that decrease the relative price of capital as compared to the price of labour.

What impact does high tax burden on labour as such have on unemployment, if we disregard the distribution of the tax burden between capital and labour? Can changes in the labour-related tax levels affect the level of unemployment? The answers to these questions depend on labour supply elasticity, flexibility of wages and the level of competition on the labour market.

Like all types of taxes, labour taxes, too, create a tax wedge. On the labour market the tax wedge denotes the difference between the pretax wage paid out by the employer and the after-tax wage taken home by the employee. Analysing the impact of the tax wedge on employment, it is important to determine which party – employees or employers – bears the tax burden. **In the long run, the distribution of the tax burden between the employee and the employer does not depend on which labour market party has the obligation to pay tax, but on the demand and supply elasticities of labour.** If labour supply is relatively inelastic, the majority of the tax burden falls on employees, and vice versa.

The higher the elasticity of labour supply compared to demand, the smaller the change in the net wage of the employee after the increase of taxes and the greater the impact of the growth of the tax burden on unemployment. If the supply of labour is fully inelastic (the elasticity coefficient equals zero) the increase of the tax burden is transferred entirely to the employee (net wage drops, the wage costs of the employer remain unchanged) and tax hikes have no effect on employment and unemployment.

The majority of empirical studies measuring labour supply elasticity indicate that the supply elasticity of the so-called typical employee (full-time working man) is close to zero⁷. Therefore, **in case of sufficiently flexible wages, changes in the level of taxes on labour do not affect unemployment.** An indirect proof of the fact that the bulk of labour taxes-related tax burden is carried by employees is provided by the OECD analysis, which shows that above-average labour taxes lead to the lower share of wages in production⁸.

The impact of labour taxes on unemployment also depends on the competition on the labour market. In the existence of centralised wage agreements (ie strong trade unions)

⁷ Pencavel, J. Labour Supply of Men: A Survey. Handbook of Labour Economics, Vol 1, 1986.

⁸ The OECD Jobs Study: Taxation, Employment and Unemployment (1995).

the employees have a monopolistic power on the labour market. In that case changes in taxes are transferred to the wage costs of the employer, not the net wages, and thus influence unemployment. On the other hand, if wage negotiations are decentralised and the company has a monopsony power on the labour market, changes in taxes will be passed on to net wages. In such a case, the increase or decrease of the tax burden on labour causes no change in the wage costs of the employer and, *ceteris paribus*, the labour demand of the company remains unchanged.

Generally there is a rule that **the lower the flexibility of the net wage, the higher the likelihood that the increase of the tax burden on labour will lead to the growth of long-term unemployment rate**. In the long run, the increase of the tax burden on labour does not affect employment if labour market is not highly regulated and wages are flexible. In the case of high regulation of the labour market, the increase of the tax burden on labour can have a permanently negative effect on employment.

The empirical studies on the possible links between labour taxes and unemployment have generally found that correlation between the unemployment rate and growth of employment on the one hand and the average tax rates on labour or the ratio of taxes/GDP on the other hand is practically non-existent in the long run⁹. If a statistically significant correlation exists, its impact on unemployment is short-term, or it exists mostly in countries where trade unions have a great role in wage bargaining and wages are not flexible enough¹⁰.

■ The Impact of Capital Taxes on Employment ■ and Unemployment

How would the low tax burden on capital or reduction of capital taxes affect employment? As we already mentioned, changes in capital tax can affect the labour market since they change the relative prices of the production factors – labour and capital. In the short run, the lowering of capital taxes, *ceteris paribus*, increases the relative price of labour as a production factor, which can lead to an increase of the capital/labour ratio in production. Assuming that the total volume of production does not change much, the decrease of the share of labour in production reduces employment. The extent of the change in the capital/labour ratio depends mostly on how well can labour as a production factor be replaced by capital.

Poorly educated and unskilled labour is usually a substitute for capital, while highly skilled labour is a complement for capital. Therefore, the lowering of capital taxes increases the demand for skilled labour and reduces the demand for unskilled labour. In the short run (while the net wage has not yet adjusted to changes in the tax system) this leads to the growth of unemployment among unskilled workers and can cause a shortage of skilled

⁹ Ibidem.

¹⁰ A longer survey on econometric studies analysing the relations between labour taxes and unemployment can be found in Disney, Richard. The Impact of Tax and Welfare Policies on Employment and Unemployment in OECD Countries. IMF Working Paper, No 164, 2000.

labour. Besides the length of the period, the impact of such changes in the tax system on unemployment also depends on the flexibility of wages. Regulative acts that reduce the flexibility of wages can, in combination with the lowering of capital taxes, therefore contribute to long-term unemployment.

From the above we can conclude that **in the short run the lowering of capital taxes can lead to higher unemployment. In the long run, however, such changes in tax policy can have a positive impact on employment:** the lowering of capital taxes reduces the cost of capital, which, *ceteris paribus*, leads to higher investments that have favourable impact on economic growth and thus also boost employment.

Since capital is internationally more mobile than labour, the elasticity of supply of capital is relatively high. **The low tax burden on capital as compared to other countries therefore gives Estonia a competitive edge and probably increases the inflow of foreign investments.**

Although there is abundant literature on the impact of capital taxes on investments, economic growth and employment, there are not many studies on how the distribution of the tax burden between the production factors (ie the relative tax burden on capital and labour) would affect unemployment. Also, in the political discussions on unemployment little attention has been paid on the differences in the tax rates of the production factors¹¹. The possible reason is in the fact that due to the controversial consequences of changes in the tax burden it is difficult to evaluate the net impact of such changes in legal acts on employment and unemployment.

■ Estonian Tax System and Unemployment ■

The tax burden on labour, measured as the average effective tax rate on labour, has mostly increased in the majority of the OECD countries (first of all in Western Europe) in 1980–1997¹². This has mainly occurred due to the increase in the share of the social insurance tax, which is related to the ageing of the population in several countries. The average age of the population is increasing in Estonia, too, and therefore it is likely that the tax burden on labour will increase in the future. The possibility of such a trend has been indicated by some recent and planned changes in legal acts. From 2002 a new tax on labour – unemployment insurance tax – was added, which varies and can amount to 3% of the total wage costs. Riigikogu is also discussing the draft law on the insurance against work traumas and occupational diseases under which employers would be obliged to pay premiums to a special fund in order to insure their workers against work-related traumas and occupational diseases. If the draft is adopted in its original form, it would mean an additional increase of the tax burden on labour. An amendment in the tax law that abolished corporate income tax

¹¹ In the OECD countries such political discussion has taken place only in Ireland and Belgium; see Zee, Howell H. Taxation and Unemployment. IMF Working Paper, May 1996.

¹² Carey, David; Tchilinguirian, Harry. Average Effective Tax Rates on Capital, Labour, and Consumption. OECD Economics Department, Working Paper No 258, 2000.

on reinvested income since 2000 also led to a considerable increase in the relative tax burden on labour.

Can the increase of the tax burden on labour lead to any significant growth of the unemployment rate? Proceeding from the above we can say that **no long-term relation exists between unemployment and the aggregated levels of the tax burden on labour, although changes in legal acts that increase the tax burden on labour can cause a short-term drop of employment.** This can become permanent in sectors where wages are not flexible. In Estonia, this kind of rise in unemployment can occur mostly among unskilled workers with low wages, since their wage level is most regulated on the state level and their labour is easily replaceable by capital as an alternative production factor.

The flexibility of the wages of low-paid workers is reduced by the high unemployment benefits and large social benefits, as well as high minimum wages. In the Estonian system of social benefits the replacement income to the unemployed can amount to 100% of the potential wages in case of low-income households¹³. Currently, the minimum wage amounts to approximately 30% of the average wage level, which is not high as compared to the European countries. However, in the near future the minimum wage is expected to increase considerably – according to the agreement between trade unions and employer federations, the minimum wage is to be increased gradually, until it reaches 41% of the average wage in 2008.

Besides the above factors, the flexibility of the wages of low-paid workers is reduced by the lower regional mobility of such workers as compared to other segments of labour. Inter-regional movement can be hindered by big regional differences in housing costs (rent, communal payments) and property prices. In regions with higher incomes housing-related costs can be several times higher than in rural regions.

■ Conclusion ■

Comparing the average effective tax rates of production factors in Estonia and the OECD countries implies that the tax burden on labour is moderately higher in Estonia than the OECD average, but the tax burden on capital is considerably lower. Several recent and future changes in legal acts (introduction of the unemployment insurance tax, discussion of the draft law on insurance against work-related traumas and occupational diseases, etc) point to the possibility that the tax burden on labour is going to increase further in Estonia.

The impact of the decrease of the tax burden on capital and the increase of the tax burden on labour on the labour market is reflected in the change of the relative prices of capital and labour as production factors. **The impact such changes in the tax system have on employment depends mostly on the flexibility of the net wage. In case of low flexibility**

¹³ Arvo Kuddo, Reelika Leetmaa, Lauri Leppik, Mai Luuk, Andres Võrk. 'Sotsiaaltoetuste efektiivsus ja mõju tööjõupakkumisele' (Social Benefits in Estonia: Efficiency and Work Incentives), Center for Policy Studies PRAXIS, 2002.

these changes can lead to higher unemployment. However, the decrease of capital taxes also reduces the cost of capital, which in the long run should have a favourable impact on investments and through the growth of production also on employment.

Poorly educated and low-skilled labour is usually a replacement factor for capital, whereas highly skilled labour is a complementary factor for capital. High structural unemployment that is characteristic of Estonia – the supply of unskilled labour exceeds demand and the demand for highly skilled labour exceeds supply – can thus be partially caused by the relatively high tax burden on labour.

In the long run it is not the changes of the tax system that have a significant impact on employment, but institutional changes that increase the flexibility and efficiency of the labour market. Effective are such measures that aim at reducing the gap between the skills of workers and the needs of employers, increasing labour mobility, reducing the negative impact of the minimum wage, etc. If wages are flexible enough and competition exists on the labour market, the increase of the tax burden or its redistribution among the production factors has no long-term effect on unemployment.