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Measuring the income and payroll tax burden with emphasis on the effective marginal tax rate

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Abstract: This paper covers the current issue of income and payroll tax burdens on labour. Payroll taxes have had a significant impact on behaviour both in the labour market and economy-wide. Tax revenues and contributions to social insurance schemes are a significant source of government receipts and also an instrument that influences employment policies. This paper focuses on how this burden is measured, using a number of methods on both the macroeconomic and microeconomic levels, emphasizing the effective marginal tax rate, an indicator that reflects the income and payroll tax burden on the working population alongside those interacting with benefit schemes. It also provides an assessment of the income and payroll tax system currently operating in Slovakia, with a particular focus on the labour market, and includes recommendations from the authors.

JEL Classifications: G23, G28, J26

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1. Introduction

Fiscal and social policies are instruments, whereby government has an impact on the economy both from a macroeconomic as well as a microeconomic perspective. Income tax and levies for contributions play an important role in the economy, while having the ability of influencing the behaviour of a country's economic entities.

Payroll taxes have had a significant impact on behaviour both in the labour market and economy-wide. Taxes and mandatory contributions cause distortive effects, meaning they change behaviour of economic entities. From a microeconomic perspective on labour market, they are a wedge between the price employers pay for labour and the income employees actually earn. On the other hand, from a macroeconomic point of view, tax rates and the level of mandatory contributions are factors that can affect overall employment, unemployment rates, labour supply and the sustainability of public finances.

Tax revenues and contributions to social insurance schemes are a significant source of government receipts and also an instrument that influences employment policies. In many cases, high labour taxes reduce the labour supply and lower disposable household income, thereby choking economic growth. Social security contributions have a similar effect. Increasing premium rates reduce employers' interest in hiring as their employees become costlier for them.

Despite recent positive developments in Slovakia's overall unemployment rate, labour market issues the country is currently facing include tackling unemployment among

marginalised communities (low-income workers, the long-term unemployed, low-skilled job seekers, graduates and women after maternity leave), increasing flexibility in the labour market and the growing perception that income and payroll taxes are a burden for the working population.

Several authors believe (Kosi & Bojnec, 2006; Vork et al, 2007) one of the causes of long-term unemployment to be the high income and payroll tax burden on labour, affecting both supply and demand. From a microeconomic point of view, income and payroll tax means for employee or employer lower net income/higher employer costs, thereby causing a substitution effect or having an impact on retirement (Kubátová, 2003) Therefore, it plays a decision-making role in the deciding process of the subjects, affecting a motivation to work and ultimately impacting overall employment. The macroeconomic aspect of examining the effect of income and payroll taxes on employment incorporates overall aggregate variables, in this case monitoring total employment. It focuses on the creation of a system of income and payroll taxes that stimulates economic growth and reduces unemployment.

An optimal system can be characterised as a balance that gives the government sufficient revenue to operate with, while simultaneously pumping enough income to economic entities to motivate them to increase their workforces (Kosi & Bojnec, 2006).

In a society there is a view that Slovakia's income and payroll tax burden is high and can discourage both wanting to be employed and increasing labour productivity. The burden can be measured in several ways, both at the macroeconomic level, where we ascertained the standing the taxation of incomes holds among other taxes, and at the microeconomic level, where the impact on micro-units - individuals and households - was monitored.

Evaluations of the burden based on tax and contribution rates were very often encountered, although such assertions appear not to be justified and mostly the nominal tax rate does not correspond with an individual's overall burden. Therefore, we opted to follow a more comprehensive indicator, namely the effective marginal tax rate. The effective marginal tax rate is an indicator that reflects the income and payroll tax burden on the working population and interacts with benefit schemes at the same time.

This paper aims to identify and assess the indicators used to measure the income and payroll tax burden at both the macroeconomic and microeconomic levels, emphasising the effective marginal tax rate as an indicator reflecting the income and payroll tax burden on the working population and interacts with benefit schemes at the same time.

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2. Selected methods for measuring the income and payroll tax burden

Tax burden defines the extent to which tax levies drain a tax entity's financial resources from income. Various indicators are used to express it, such as the overall tax ratio, tax multiplier or Laffer curve. The indicators are divided into microeconomic and

macroeconomic according to their focus. Macro-indicators of the tax burden on labour are based on monitoring the economy as a whole, while micro-indicators focus on specific individuals. The economic role of taxes and contributions was monitored at the level of the entire economy. This enabled to compare countries and to understand their impact on the economy's overall income. Tax revenues were classified as macro-indicators. Microeconomic indicators of the burden on labour from taxes and contributions are the tax wedge, implicit tax rates and effective marginal tax rates (Schultzová et al., 2009). The microeconomic perspective of the income and payroll tax burden enabled us to determine the burden placed on individuals in an economy.

The method most commonly used to measure the tax burden at the economy level is the tax revenue, generally monitored per year. Taxes and compulsory insurance premiums are presented as a ratio to gross domestic product considering tax deductible items and being of informative value. However, a disadvantage is the inability to provide information about how the tax burden is distributed (Schultzová et al., 2011).

Two different tax revenues are presented in publications of the Slovakia's Ministry of Finance and the Organisation for Economic Cooperation and Development (OECD), according to the methodology they both use. The first tax revenue expresses selected taxes as a percentage of gross domestic product while the second tax revenue (Bieliková & Štofková, 2010), is expressed as composite tax revenue, with the ratio of health and social insurance contributions to gross domestic product.

The simplest and one of the most common methods of expressing the income and payroll tax burden is the percentage of the nominal tax rate and social security contributions. It is a micro-economic expression of the burden, as the rate affects an individual's specific income. Notwithstanding, any rate-based comparison would be the least accurate.

The implicit tax rate reflects taxes actually collected against the tax base, which allows an international comparison of tax burdens among selected aggregates. The implicit tax rate on labour measures the ration of revenue received from the taxation of personal income from employment, payroll tax and compulsory insurance on the total income of employees in an economy. Revenues received from taxes on labour include income from employment and other income from labour (Vítek, 2011).

The tax wedge defines the percentage of total labour costs not received by an employee in a net income. It reflects the percentage ration of total contributions paid (by both employee and employer) to social insurance and to other schemes and of prepayment of income tax to an employer's aggregate wage costs. An expanded version of this indicator is the effective tax wedge, which according to the OECD methodology includes in the calculation government transfers that reduce the total tax liability.

The effective marginal tax rate provides a narrower perspective of personal income tax by examining the taxation of additional earnings and simultaneously the operation of benefit schemes. From our point of view, this indicator best reflects the impact of the income and payroll tax burden on individuals and households, as it includes income tax, contributions to social insurance and health insurance as well as benefit schemes. It is a microeconomic indicator because it looks at the tax burden from the perspective of the individual. In labour market issues, especially on the supply side, it is important to examine the impact on individual decision-making in the interaction between the taxation and benefit systems. Decisions are made after comparing whether net income will grow or fall with an increase or decrease in the labour supply. Individuals seek to resolve the

dilemma of how much their net income will increase with a growing labour supply or when they switch to a better paid job. However, if an employee belongs to a low-income group, any increase in activity raises his or her taxes and contributions, while he or she simultaneously loses social benefits that are calculated from the income level. The effect of increasing taxes and decreasing benefits is then reflected in a high effective marginal tax rate. In some cases, when there is an inefficiently harmonised system of social benefits and taxes, the effective marginal tax rate can even exceed 100%. This means that any rise in wages will be accompanied by a zero or only a slight increase in total wages. Thus, high effective marginal tax rates deter any increase in work productivity and limit labour market flexibility (Dušek, Kalíšková, & Munich, 2013).

Calculation of the effective marginal tax rate per employee, which indicates how much tax increases and social benefits decrease when gross income rises by a unit of one, will identify a poverty trap. Calculation of the effective marginal tax rate results in a percentage figure expressing the income and payroll tax burden when an individual's gross income is increased by one unit. Whenever a situation arises where the effective marginal tax rate is either greater than 100% or approaches this percentage, a so called "poverty trap or poverty gap" can be said to exist. This is a situation when an increase in gross income due to increased labour activity does not lead to a higher net income for the employee. Nevertheless, scientific literature (Haveman, 1996) considers an effective marginal tax rate per employee greater than 50% to be already demotivating. The values in the range of 30-50% are considered to be optimal (for example Pavel, 2005; Repková, 2012).

An effective marginal tax rate greater than 100% represents a decrease of net income whenever gross income increases. In such a scenario, it would be illogical for individuals to increase the labour supply. Social benefits and tax advantages focus on the employee segment with the lowest income and they are slowly decreasing with the income growth. They are the main causes for the creation of the so-called "trap" (e.g. Pavel, 2005; Ódor, 2005) because a change in gross income will cause a decrease in tax advantages and social benefits, thereby reducing overall net income growth. The result is so-called "traps": the unemployment trap, the inactivity trap and the low-wage or poverty trap.

The unemployment trap is when an employee is deciding between the net income and the amount of unemployment benefit to be received. The problem arises when unemployment benefits are high and paid over a long period, so there is no incentive to look for a job (Repková, 2012).

The inactivity trap is caused when means-tested benefits are set at a high level, lowering the motivation to seek a job. Unlike the unemployment trap, the person becomes no longer entitled to receive unemployment benefits, but is instead dependent on social benefits.

The poverty (or low-wage) trap occurs when a rise in gross income due to higher productivity (overtime, promotion to a better position) causes a low increase of net income, and therefore demotivates the employee to increase its productivity. If the marginal tax rate is close to 100%, any rise in gross income will not increase net income. Means-tested benefits play an important role because they can be either lowered or terminated by an increase in gross income, causing a decline (or low growth) in total disposable income. Empirical research (Carone & Solomäki, 2005) has shown such incentives to affect labour market participation rather than the number of hours worked, especially for specific groups such as women, single-parents and low-skilled people (Carone, Immervoll, Paturot, & Salomäki, 2004).

3. Effective marginal tax rates and the emergence of traps in Slovakia

Effective marginal tax rates indicate the change in profits "taxed" by the combined effect of taxes, social security contributions and any abolition of income-related social transfers. They are an important indicator of how financially challenging it would be for an employee to increase the number of working hours or for an unemployed/inactive person to start working for the first time. The scope may have an impact on structural unemployment, the labour market and working hours at the lower end of the labour productivity scale, where labour market opportunities may not be adequate enough to attract interest in employment due to low wages.

The effect of the income and payroll tax burden may be observed in how effective marginal tax rates move. As mentioned in the previous section, the effective marginal tax rate is an indicator that represents the percentage of how much of additional gross income an employee does not receive in net wages, thereby representing an additional (marginal) tax for him or her.

3.1. The unemployment trap in Slovakia for 2001-2016

The unemployment trap - or the implicit tax on returning to work for unemployed persons - defines the part of additional gross income (for an employed person who had previously been unemployed) that is taxed in the form of increased taxes and withdrawn benefits such as unemployment benefits, social assistance and housing benefits. The "trap" indicates that the change in disposable income is small and, conversely, the unemployment benefits are large.

The economic database of indicators published by the European Commission (2017) presents values for different model situations. To calculate the marginal effective tax rate, household types that allow for international comparison were used. An individual is assumed to be 40 years old and net income depends on gross income. If children are living under one roof with adults, then two children age 4-6 years are considered in the data. There are also other assumptions regarding unemployment that the European Commission takes into account, the payment of unemployment benefits, in approach of unemployed to seeking a job.

Table 1 shows the unemployment trap (effective marginal tax rate indicator values when considering income earned by a new job and funds received from unemployment benefits) for one person to have different values both over an interim period and between different income levels. If a person previously employed in a job with an income of 33% of the average wage was to have a new job with a gross income at 33% of the average wage, this employee would be the most vulnerable to the unemployment trap because in 2001-2003 the effective marginal tax rate would have either reached more than 100% or would have been close to it. Remarkably, this would have also been the situation for people in new jobs earning more than in the previous one (67%, 100% and 120% of the average wage), and they would have been still at risk of the unemployment trap since the additional unit of their income would have been reflected in net income by an approx. 45-75% decrease. According to facts already identified, this burden can be considered demotivating since it would have been greater than the optimal effective marginal tax rate of 30-50%.

TABLE 1. UNEMPLOYMENT TRAP IN 2001-2016 FOR INDIVIDUALS PREVIOUSLY EMPLOYED AT 33% OF AVERAGE EARNINGS IN THE ECONOMY

NEW EMPLOYMENT WITH WAGES IN % OF AVERAGE WAGE	33	67	100	120
2001	110,37	74,38	57,89	53,28
2002	110,36	72,69	56,6	52,2
2003	85,98	58,5	47,57	44,68
2004	38,4	17,47	13,31	13,88
2005	38,4	17,41	13,26	11,86
2006	38,4	17,96	13,63	12,17
2007	38,4	18,23	13,81	12,32
2008	38,4	18,97	14,31	12,73
2009	32,33	16,86	12,09	11,56
2010	33,3	17,24	13,15	11,77
2011	36,81	18,96	14,3	12,73
2012	36,97	18,94	14,29	12,72
2013	37,1	18,89	14,26	12,69
2014	37,6	19,13	14,42	12,83
2015	34,4	19,36	14,58	12,96
2016	34,4	19,6	14,74	13,09

Source: Processed from data provided by the European Commission (2018).

TABLE 2. UNEMPLOYMENT TRAP IN 2001-2016 FOR INDIVIDUALS PREVIOUSLY EMPLOYED AT 67% OF AVERAGE EARNINGS IN THE ECONOMY

NEW EMPLOYMENT WITH WAGES IN % OF AVERAGE WAGE	33	67	100	120
2001	108,75	73,58	57,36	52,84
2002	108,92	71,99	56,12	51,81
2003	111,53	71,08	56	51,7
2004	89,92	42,84	30,31	28,04
2005	89,92	42,78	30,26	26,03
2006	89,92	43,33	30,63	26,34
2007	89,92	43,6	30,81	26,49
2008	89,92	44,34	31,31	26,9
2009	83,85	42,23	29,9	25,72
2010	84,81	42,61	30,15	25,94
2011	88,32	44,33	31,3	26,9
2012	88,48	44,32	31,29	26,89
2013	88,61	44,26	31,26	26,86
2014	89,11	44,51	31,42	26,99
2015	85,92	44,74	31,58	27,12
2016	85,92	44,98	31,74	27,26

Source: Processed from data provided by the European Commission (2018).

Based on the effective marginal tax rate shown above, the 2004 tax reform's elimination of the progressive taxation of income freed people from the unemployment trap who had been offered jobs paying more than their previous jobs.

Table 2 illustrates the unemployment trap for an employee who, before receiving unemployment benefits, was earning 67% of the average wage.

If a new job pays a lower wage than what the person had originally earned before receiving unemployment benefits, the risk of the unemployment trap will be high because the effective marginal tax rate will reach over 80% and demotivate him or her from accepting the job. In the years before the flat tax was introduced in Slovakia, high effective marginal tax rate values were reported in 2001-2003 also for earnings from employment equal to or greater than previously paid, which could have been caused mainly by income tax progression. Since 2004, the unemployment trap in Slovakia can be characterised as stable.

TABLE 3. UNEMPLOYMENT TRAP IN 2001-2016 FOR INDIVIDUALS PREVIOUSLY EMPLOYED AT 100% OF AVERAGE EARNINGS IN THE ECONOMY

NEW EMPLOYMENT WITH WAGES IN % OF AVERAGE WAGE	33	67	100	120
2001	130,6	84,34	64,57	58,85
2002	131,24	82,98	63,49	57,95
2003	136,99	83,63	64,4	58,71
2004	139,92	67,47	46,81	41,79
2005	139,92	67,41	46,76	39,78
2006	139,92	67,96	47,13	40,09
2007	139,92	68,23	47,31	40,24
2008	139,92	68,97	47,81	40,65
2009	133,85	66,86	46,4	39,47
2010	134,81	67,24	46,65	39,69
2011	138,32	68,96	47,8	40,65
2012	138,48	68,94	47,79	40,64
2013	138,61	68,89	47,76	40,61
2014	139,11	69,13	47,92	40,74
2015	135,92	69,36	48,08	40,87
2016	135,92	69,6	48,24	41,01

Source: Processed from data provided by the European Commission (2018).

Table 3 presents the characteristics of an unemployment trap for an individual receiving unemployment benefits after having worked at the average wage. For values greater than 100%, any additional income earned from gross pay would decrease net earnings. Therefore, it can be expected that a person's motivation to apply for a job with less pay is very low. Again, it is evident that effective marginal tax rate values significantly fell since the introduction of tax reform in 2004, mainly for average wage earnings, and when compared for individuals against 2003, additional income was taxed, deducted from pay as contributions and the loss of other social benefits in 2004 and therefore lower by almost 20%.

Table 4 displays the situation for individuals whose earnings are 120% of the average wage. Here, effective marginal tax rate values greater than 100% and approaching 90% will clearly not sufficiently motivate them to accept a job paying a wage lower than what they earned in their previous jobs. Values greater than 50% are considered to be demotivating, which in a majority of cases means that the working population would not accept a job paying a wage lower than their previous job.

TABLE 4. UNEMPLOYMENT TRAP IN 2001-2016 FOR INDIVIDUALS PREVIOUSLY EMPLOYED AT 120% OF AVERAGE EARNINGS IN THE ECONOMY

NEW EMPLOYMENT WITH WAGES IN % OF AVERAGE WAGE	33	67	100	120
2001	130,6	84,34	64,57	58,85
2002	131,24	82,98	63,49	57,95
2003	136,99	83,63	64,4	58,71
2004	155,81	75,3	52,05	46,17
2005	170,22	82,33	56,76	48,11
2006	170,22	82,88	57,13	48,42
2007	170,22	83,15	57,31	48,57
2008	170,22	83,89	57,81	48,98
2009	164,15	81,78	56,4	47,81
2010	165,11	82,16	56,65	48,02
2011	168,63	83,88	57,8	48,98
2012	168,79	83,87	57,79	48,97
2013	168,92	83,81	57,76	48,94
2014	169,42	84,06	57,92	49,08
2015	166,22	84,29	58,08	49,21
2016	166,22	84,53	58,24	49,34

Source: Processed from data provided by the European Commission (2018).

Based on the foregoing data, in most cases the working population receiving unemployment benefits will accept a new job paying at least a wage equal to what they received in their previous job. If a lower wage is offered, it is quite probable that they will remain unemployed, while taking advantage of the unemployment benefit system.

3.2. The inactivity trap in Slovakia for 2001-2016

The inactivity trap - or the implicit tax on returning to work for inactive persons - measures the part of additional gross income that is taxed away when an inactive person no longer eligible to receive unemployment benefits starts working. In other words, this indicator measures the financial incentives to move from inactivity, where receiving only social assistance, to employment.

Table 5 illustrates the situation for an individual, where effective marginal tax rates that can lead to the inactivity trap are monitored, or in other words, when high values demotivate a person from seeking employment because it is economically more preferable to receive social benefits. Values in 2001-2003 indicate that if an individual would be employed in a job that pays 33% of the average wage, his or her net earnings from employment would be less than what he or she had received in social benefits prior thereto.

Such a situation would result in long-term unemployment, where it is more acceptable to receive social benefits instead. Development was stable in the years of 2004-2014, turning positive in 2014-2016 for employees earning 67% of the average wage because any additional income would be decreased with the loss of social benefits and the introduction of taxes and contributions of about 18%.

Table 6 and 7 show data divided by family type. The European Commission characterises households where there are one-earner couples, single parents with two children and one-earner couples where the other adult has no income.

TABLE 5. INACTIVITY TRAP IN 2001-2016 FOR INDIVIDUALS

EMPLOYMENT WITH WAGES IN % OF AVERAGE WAGE	33	67	100	120
2001	124,87	81,52	62,68	57,27
2002	124,86	79,84	61,38	56,19
2003	100,48	65,64	52,35	48,67
2004	62,19	27,79	28,47	36,56
2005	58,47	26,97	27,92	35,51
2006	61,73	28,51	28,95	36,71
2007	61,1	27,97	28,59	36,69
2008	57,6	28,31	28,82	36,14
2009	54,9	28,17	28,72	35,89
2010	54,43	28,22	28,76	35,71
2011	56,66	29,64	29,71	36,31
2012	55,82	29,4	29,55	36,03
2013	55,11	29,15	29,38	35,77
2014	53,56	28,84	29,18	29,29
2015	49,44	18,27	36,29	35,22
2016	48,5	18,54	36,14	35,09

Source: Processed from data provided by the European Commission (2018).

TABLE 6. INACTIVITY TRAP IN 2001-2016 FOR ONE-EARNER FAMILIES

FAMILY TYPE	PAIR WITH 1 WORKING	PAIR WITH 1 WORKING	PAIR WITH 1 WORKING	PAIR WITH 1 WORKING	AN INDIVIDUAL, 2 CHILDREN	AN INDIVIDUAL, 2 CHILDREN
EMPLOYMENT WITH WAGES IN % OF AVERAGE WAGE	33	67	100	120	33	67
2001	125,3	115,2	84,87	75,57	125,3	105,29
2002	125,3	113,6	83,26	74,42	125,3	103,46
2003	125,3	98,91	73,95	66,66	125,3	84,11
2004	78,35	40,9	32,18	39,66	62,85	35,05
2005	78,35	38,81	30,7	37,82	-2,27	9,74
2006	78,35	39,53	31,92	39,18	-4,17	9,67
2007	78,35	38,45	31,56	39,16	-2,9	10,57
2008	78,35	36,86	31,48	38,36	-2,53	11, 50
2009	72,28	40,2	31,36	37,7	-6,56	-2,1
2010	73,25	39,39	30,86	37,46	2,21	2,50
2011	76,76	38,67	32,68	38,79	3,67	3,54
2012	76,92	38,11	32,29	38,31	1,69	2,74
2013	77,05	37,64	31,9	37,86	0,48	2,24
2014	78,15	36,3	31,33	31,8	-0,04	2,44
2015	76,36	25,19	38,39	36,97	-2,96	-7,54
2016	74,78	24,91	38,19	36,8	-2,67	-6,66

Source: Processed from data provided by the European Commission (2018).

TABLE 6 (contd.). INACTIVITY TRAP IN 2001-2016 FOR ONE-EARNER FAMILIES

FAMILY TYPE	AN INDIVIDUAL, 2 CHILDREN	AN INDIVIDUAL, 2 CHILDREN	PAIR WITH 1 WORKING, 2 CHILDREN	PAIR WITH 1 WORKING, 2 CHILDREN	PAIR WITH 1 WORKING, 2 CHILDREN	PAIR WITH 1 WORKING, 2 CHILDREN
EMPLOYMENT WITH WAGES IN % OF AVERAGE WAGE	100	120	33	67	100	120
2001	81,6	72,39	125,3	124,7	100,8	87,88
2002	79,67	70,37	125,3	125,01	99,04	86,12
2003	66,51	62,97	125,3	116,74	85,75	77,9
2004	33,07	40,26	62,85	41,97	32,76	40
2005	16,11	18,27	63,43	39,43	30,97	37,91
2006	16,33	18,59	60,78	39,21	31,7	39
2007	16,93	19,9	62,05	38,6	31,66	39,24
2008	17,55	19,6	62,42	36,76	31,42	38,31
2009	8,44	41,42	56,2	43,06	33,27	39,29
2010	11,53	43,12	57,63	45,84	35,18	41,06
2011	12,23	43,42	61,21	44,75	36,76	42,18
2012	11,69	42,87	61,33	43,87	36,15	41,53
2013	11,36	42,44	61,62	43,22	35,64	40,98
2014	11,49	35,37	74,41	41,05	34,51	33,74
2015	19	41,16	73,7	29,84	41,51	39,57
2016	19,25	40,9	73,78	29,45	41,23	39,34

Source: Processed from data provided by the European Commission (2018).

TABLE 7. INACTIVITY TRAP IN 2001-2016 FOR DUAL-EARNER FAMILIES (selected)

FAMILY TYPE	TWO WORKING PEOPLE (the 2nd earnings 67%)	TWO WORKING PEOPLE (the 2nd earnings 67%) 2 CHILDREN	TWO WORKING PEOPLE (the 2nd earnings 67%) 2 CHILDREN	TWO WORKING PEOPLE (the 2nd earnings 33%) 2 CHILDREN	TWO WORKING PEOPLE (the 2nd earnings 33%) 2 CHILDREN	TWO WORKING PEOPLE (the 2nd earnings 100%) 2 CHILDREN	TWO WORKING PEOPLE (the 2nd earnings 100%) 2 CHILDREN
EMPLOYMENT WITH WAGES IN % OF AVERAGE WAGE	33	33	67	100	120	33	100
2001	17.07	46.05	39.53	34.55	33.83	27.28	26.43
2002	16.53	41.31	36.12	32.09	31.78	26.38	23.91
2003	16.83	18.14	24.42	24.73	28.71	26.09	27.98
2004	13.40	13.40	22.47	24.91	25.73	13.40	29.85
2005	13.40	13.40	22.35	24.83	25.66	13.40	29.85
2006	13.40	13.40	23.26	25.44	26.17	13.40	29.85
2007	17.56	17.56	23.80	25.80	26.47	29.85	29.85
2008	20.58	20.58	25.28	26.79	27.30	29.85	29.85
2009	7.33	7.33	21.06	23.96	24.94	22.39	29.39
2010	8.44	8.44	21.82	24.47	25.37	24.75	29.85
2011	18.94	18.94	25.26	26.78	27.29	28.26	29.85
2012	19.04	19.04	25.24	26.76	27.28	28.42	29.85
2013	18.94	18.94	25.12	26.68	27.21	28.55	29.85
2014	-1.57	-1.57	3.93	12.49	15.38	7.05	15.33
2015	-24.09	-24.09	-16.31	13.12	15.91	26.61	29.85
2016	-22.11	-22.11	-14.84	13.78	16.46	26.61	29.85

Source: Processed from data provided by the European Commission (2018).

These data make it possible to identify the households most at risk of the inactivity trap. In the case of a couple where one person earns an income, the inactivity trap is most prominent over the long term when earnings are 33% of the average wage. In all remaining cases, the effect of additional taxation was dangerous especially in the period of 2001-2003.

The situation of an individual with two children is specific because the effective marginal tax rates will reach negative values in some years, meaning that any increase in net income will be greater than the growth of gross earnings from employment. Again, in the 2001-2003, the inactivity trap was more than 100%, and it can be concluded that such a benefit system setup is likely to demotivate a working person from seeking a job and for the optimal choice to be remaining in the benefit system. On the other hand, when the inactivity trap reaches low values, there is a high motivation to seek a job.

One-earner couples with two children at 33%, 67%, 100% and 120% of the average wage were most at risk of the inactivity trap in 2001-2003, when values were fluctuating above 100%. The inactivity trap was also significant during the entire period for one-earner families at 33% of the average wage.

For families where both parents are in the labour force, the inactivity trap reaches acceptable values up to 30%. It means that dual-earner families are not generally at risk of the inactivity trap. Table 6 shows selected values, as developments in the monitored period were very similar for the household types monitored and effective marginal tax rates were fluctuating around 20-30%.

3.3. The low-wage trap in Slovakia for 2001-16

The low-wage trap is defined as the rate at which taxes are increased and social benefits withdrawn as earnings rise due to an increase in work productivity. This type of trap most commonly occurs at low wage levels due to the fact that the withdrawal of social transfers, which are usually available only to persons with a low income, increases the marginal rate of income taxes and social security contributions.

In this period, the low-wage trap was evaluated first for individuals by comparing their situation when earnings increased by 1% and when they increased by 33%, with the low-wage trap values illustrated in Table 8.

The risk of the low-wage trap may be seen in low-income individuals whose earnings were one-third of the average wage prior to the 2004 tax reform, where we monitored effective marginal tax rates that cause a decline in total earnings when gross income rises by one percent. An extraordinary situation occurred in 2014 for individuals whose earnings were 40% of the average wage. Here, net earnings rose with an increase in gross employment income. Such a situation is called the existence of negative effective tax rate.

Based on effective marginal tax rate values, it can be stated that, in 2016, employees would be at risk of the inactivity trap if they were earning 67% of the average wage and their employment income rose by 33%. Their motivation for higher productivity would be jeopardised, as more than 70% of additional income would be deducted in the form of taxes, contributions and the loss of other social transfers.

Table 9 presents selected values that represent the low-wage trap and types of families at risk.

TABLE 8. LOW-WAGE TRAP IN 2001-2016 FOR INDIVIDUALS

ORIGINAL WAGE IN % OF AVERAGE WAGE	33	40	50	67	100	120	33	40	50	67	100	120
% WAGE INCREASE	o 1 %						o 33 %					
2001	122.2	45.52	45.52	23.26	30.24	30.24	39.93	32.77	26.03	24.43	30.24	32.15
2002	120.0	44.28	44.28	21.52	30.24	30.24	36.58	29.46	22.56	23.92	30.24	30.24
2003	44.28	44.28	21.52	21.52	30.24	30.24	32.14	27.31	21.52	25.36	30.24	31.89
2004	13.40	13.40	29.85	29.85	29.85	29.85	-6.67	25.41	29.85	29.85	58.39	29.11
2005	13.40	13.40	29.85	29.85	29.85	29.85	-4.61	25.29	29.85	29.85	56.21	29.12
2006	13.40	13.40	29.85	29.85	29.85	29.85	-4.75	26.40	29.85	29.85	57.52	29.18
2007	13.40	13.40	29.85	29.85	29.85	29.85	-5.22	26.95	29.85	29.85	58.53	29.22
2008	13.40	13.40	29.85	29.85	29.85	29.85	-1.04	28.46	29.85	29.85	55.81	29.12
2009	13.40	29.85	29.85	29.85	29.85	29.85	1.38	29.85	29.85	29.85	55.22	29.36
2010	13.40	29.85	29.85	29.85	29.85	29.85	1.96	29.85	29.85	29.85	54.45	29.46
2011	13.40	29.85	29.85	29.85	29.85	29.85	2.62	29.85	29.85	29.85	53.76	29.40
2012	13.40	29.39	29.85	29.85	29.85	29.85	2.97	29.84	29.85	29.85	53.23	29.45
2013	13.40	21.23	29.85	29.85	29.85	29.85	3.17	29.59	29.85	29.85	52.79	29.85
2014	13.40	705.2	29.85	29.85	29.85	29.85	4.09	7.58	29.85	29.85	51.86	51.86
2015	9.40	26.61	36.33	29.85	29.85	29.85	-13.3	-9.24	32.63	72.88	29.85	29.85
2016	9.40	26.61	36.33	29.85	29.85	29.85	-11.8	-8.23	32.34	71.87	29.85	29.85

Source: Processed from data provided by the European Commission (2018).

TABLE 9. LOW-WAGE TRAP IN 2001-2016 FOR ONE-EARNER COUPLES WITH A 33% RISE IN WAGES

% WAGE INCREASE	30	33	35	40	45	50	55	60	65	67
2001	114.48	107.22	101.74	86.54	71.54	56.54	41.54	28.01	24.64	23.29
2002	113.50	104.68	98.39	82.98	67.64	52.31	36.97	24.20	21.52	21.68
2003	84.32	74.88	68.70	53.36	38.02	28.44	24.99	21.54	22.73	23.26
2004	9.19	4.29	0.35	19.09	13.40	13.40	13.40	13.40	13.48	14.48
2005	5.94	0.03	-3.90	13.40	13.40	13.40	13.40	13.40	13.40	14.23
2006	7.40	1.50	-2.44	15.38	13.40	13.40	13.40	13.40	15.47	16.47
2007	5.22	-0.68	-4.62	14.22	13.40	13.40	13.40	14.7	16.56	17.56
2008	1.98	-3.92	-7.86	13.40	13.40	13.40	14.59	17.09	19.58	20.58
2009	14.84	8.93	5.00	20.14	16.59	14.10	13.40	13.40	13.40	13.40
2010	12.23	6.33	2.39	18.31	15.82	13.40	13.40	13.40	13.40	13.55
2011	7.25	1.34	-2.59	14.82	13.40	13.40	14.55	17.04	19.53	20.53
2012	5.95	0.05	-3.89	14.83	13.40	13.40	14.49	16.99	19.48	20.48
2013	4.86	-1.04	-4.98	14.70	13.40	13.40	14.26	16.75	19.25	20.25
2014	1.4	-4.87	-7.80	-7.80	-6.68	13.40	15.26	17.75	20.24	21.24
2015	-21.09	-25.63	-25.38	-24.78	18.04	17.14	61.44	62.72	64.21	65.21
2016	-21.37	-24.61	-24.37	-23.76	17.68	17.74	19.02	62.31	64.16	65.16

Source: Processed from data provided by the European Commission (2018).

A couple with no children and one of them employed was at risk of the low-wage trap where earnings were at 50% of the average wage or lower in 2001-2003, as additional income was taxed at a marginal tax rate greater than 50%. After those years, harmonious developments were reported until 2015 and 2016, where the low-income trap was encountered in households earning incomes greater than 60% of the average wage. In cases above 67%, no low-wage trap was documented.

TABLE 10. LOW-WAGE TRAP IN 2001-2016 FOR DUAL-EARNER FAMILIES WITH NO CHILDREN (selected)

	TWO WORKING, THE 1ST EARNS 67% OF THE AVERAGE WAGE		TWO WORKING, THE 1ST EARNS 100% OF THE AVERAGE WAGE				TWO WORKING, THE 1ST EARNS 167% OF THE AVERAGE WAGE			
THE 2ND MEMBER EARNS % OF AVERAGE WAGE	55	67	50	55	60	67	55	60	65	67
2001	23.26	24.43	23.26	23.26	23.26	24.43	23.26	23.26	22.98	24.43
2002	21.52	23.92	21.52	21.52	22.34	23.92	21.52	22.32	23.39	23.92
2003	22.19	25.36	21.52	22.19	23.51	25.36	22.19	23.51	24.84	25.36
2004	29.85	29.85	29.85	29.85	29.85	29.85	29.85	29.85	29.85	29.85
2005	29.85	29.85	29.85	29.85	29.85	29.85	29.85	29.85	29.85	29.85
2006	29.85	29.85	29.85	29.85	29.85	29.85	29.85	29.85	29.85	29.85
2007	29.85	29.85	29.85	29.85	29.85	29.85	29.85	29.85	29.85	29.85
2008	29.85	29.85	29.85	29.85	29.85	29.85	29.85	29.85	29.85	29.85
2009	29.85	29.85	30.55	29.85	29.85	29.85	29.85	29.85	29.85	29.85
2010	29.85	29.85	29.85	29.85	29.85	29.85	29.85	29.85	29.85	29.85
2011	29.85	29.85	29.85	29.85	29.85	29.85	29.85	29.85	29.85	29.85
2012	29.85	29.85	29.85	29.85	29.85	29.85	29.85	29.85	29.85	29.85
2013	29.85	29.85	29.85	29.85	29.85	29.85	29.85	29.85	29.85	29.85
2014	29.85	29.85	29.85	29.85	29.85	29.85	29.85	29.85	29.85	29.85
2015	74.68	72.88	32.63	74.68	73.70	72.88	74.68	73.70	72.88	72.88
2016	31.36	71.87	32.34	31.36	72.39	71.87	31.36	72.39	71.87	71.87

Source: Processed from data provided by the European Commission (2018).

TABLE 11. LOW-WAGE TRAP IN 2001-2016 FOR FAMILIES WITH TWO CHILDREN (SELECTED)

	TWO WORKING, 2 CHILDREN, THE 2ND EARNS 67% OF THE AVERAGE WAGE					TWO WORKING, 2 CHILDREN, THE 2ND EARNS 100% OF THE AVERAGE WAGE				TWO WORKING, 2 CHILDREN, THE 2ND EARNS 167% OF THE AVERAGE WAGE			
THE 2ND MEMBER EARNS % OF AVERAGE WAGE	30	55	60	65	67	55	60	65	67	55	60	65	67
2001	33.50	33.50	23.26	24.01	24.43	23.26	23.26	24.20	28.86	23.26	23.26	24.01	24.43
2002	31.37	31.37	22.07	23.39	23.92	21.52	22.07	23.39	23.92	21.52	22.07	23.39	23.92
2003	30.78	22.19	23.51	24.84	25.36	33.35	34.67	35.99	36.52	22.19	23.51	24.84	25.36
2004	29.83	29.85	29.85	29.85	29.85	29.85	29.85	29.85	29.85	29.85	29.85	29.85	29.85
2005	29.58	29.85	29.85	29.85	29.85	29.85	29.85	29.85	29.85	29.85	29.85	29.85	29.85
2006	31.42	29.85	29.85	29.85	29.85	29.85	29.85	29.85	29.85	29.85	29.85	29.85	29.85
2007	29.85	29.85	29.85	29.85	29.85	29.85	29.85	29.85	29.85	29.85	29.85	29.85	29.85
2008	29.85	29.85	29.85	29.85	29.85	29.85	29.85	29.85	29.85	29.85	29.85	29.85	29.85
2009	33.02	29.85	29.85	29.85	29.85	29.85	29.85	29.85	29.85	29.85	29.85	29.85	29.85
2010	33.61	29.85	29.85	29.85	29.85	29.85	29.85	29.85	29.85	29.85	29.85	29.85	29.85
2011	31.44	29.85	29.85	29.85	29.85	29.85	29.85	29.85	29.85	29.85	29.85	29.85	29.85
2012	31.29	29.85	29.85	29.85	29.85	29.85	29.85	29.85	29.85	29.85	29.85	29.85	29.85
2013	31.16	29.85	29.85	29.85	29.85	29.85	29.85	29.85	29.85	29.85	29.85	29.85	29.85
2014	8.65	29.85	29.85	29.85	29.85	29.85	29.85	29.85	29.85	29.85	29.85	29.85	29.85
2015	-0.45	74.68	73.70	72.88	72.88	74.68	73.70	72.88	72.88	74.68	73.70	72.88	72.88
2016	-9.21	31.36	72.39	71.87	71.87	31.36	72.39	71.87	71.87	31.36	72.39	71.87	71.87

Source: Processed from data provided by the European Commission (2018).

In most cases, dual-earner couples with no children are not vulnerable to significant changes in burden. An exception is the cases shown in Table 10. Households without children whose earnings were 50% of the average wage were most at risk. In lower income groups, no low-wage trap was registered in all monitored years for values ranging up to 30% and below 50% of the average wage. Effective marginal tax rates exceeded 50% in 2015 and 2016 for dual-earner couples with earnings of 55% and 67% of the average wage. For dual-earner couples with one member earning 100% of the average wage and the other 55-67% in 2015 and 2016, marginal taxation of increased gross earnings was seen as greater than 70%. Similarly, in the case of dual-earner families where one member was earning 167% of the average wage and the other in a range of 55-67%, values in 2015 and 2016 were greater than 70%.

Dual-earner households with two children were subject to marginal taxation at the values shown in Table 11. Again, these values are selected and they differ from acceptable effective marginal tax rates, which we characterised as ranging up to 50%. The European Commission's statistics (and those of the OECD) monitor the low-wage trap for the lowest earning families with two children at 30% and 67% of average wage, and from the data for these families there was no one at risk of marginal taxation for the years 2001-2016 when there was a 33% increase in earnings. For dual-earner couples, the low-wage trap was evident in earnings of up to 67% of average wage in 2015 and 2016, despite the assertion that it was not the lowest earning group among working people. The low-wage trap, which also appeared in dual-earning couples with earnings at 100% and 167% of the average wage, caused more than 70% of the additional income to be taxed away when gross income rose by 33%, possibly demotivating such households from an increase of their earnings through employment.

4. Conclusion

The income and payroll tax issue is highly topical today and it is essential to pay attention to the impact the burden from income tax and contributions has on working people and households. Despite Slovakia's unemployment rate being currently at the lowest level in recent years, problem population groups still persist in the labour market. The long-term unemployed and both low-wage and low-skilled working people remain the most at risk of not being motivated to seek a job, due to the income and payroll tax burden.

Personal income tax represents approximately 50% of total revenues obtained from direct taxes. Employers account for almost 70% of insurance contributions paid, while employees pay in approximately 35% and self-employed people 5%. In our opinion, changes in the income and payroll tax system have contributed to an overall increase in the burden borne in recent years by people with respect to income tax and contributions. In the years before the implementation of the so-called "flat tax" in 2004, when also the extensive tax reform occurred, there was both a high income and payroll tax burden and a complicated system of progressive taxation which additionally caused a high effective marginal tax rate to exist. The post-reform period can be characterised by a reduced income and payroll tax burden in general and the positive impact of the flat tax on Slovakia's overall economic situation. An increased income and tax burden has been recorded since 2013 and 2014, when a progressive tax was reintroduced and contributions began to be paid from revenues resulting from agreements. Since then, the income and payroll tax burden ceased to decrease.

We are inclined to agree with the opinion expressed by several economists that, from a macroeconomic point of view, taxes and contributions are very important and it is desirable for an economy to maximise their use. Nevertheless, direct income taxes on working people should not be unilaterally targeted. For an economy to operate properly as a whole, the tax burden needs to be fairly distributed so that not only a certain segment of businesses is overburdened. For individuals, the income and payroll tax burden is a significant factor influencing their behaviour in the labour market. As has been pointed out in this paper, there are situations and limits to taxation that can discourage employment and work performance. These situations have been evaluated by using the effective marginal tax rate as an indicator and the unemployment, inactivity and low-wage traps were identified.

However, we are aware of the high contribution burden derived from the nature of Slovakia's social system, which is contributory and based on a high degree of solidarity. Here, contributions are a source of revenue for a social system able to aid individuals and households in the unfavourable situations. Therefore, it is questionable how much any reduction in mandatory contributions would be appropriate in terms of maintaining the public finance system's sustainability. A partial solution, in the absence of a reduction in total contributions, could be the replacement of income and payroll tax measures focusing on problematic groups with a so-called "non-taxable contribution" part of the tax base. It would work similarly to the basic allowance if income is earns up to a certain amount and where the exempted amount is reduced or becomes zero as income rises.

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