

## **ANALYSIS OF THE AVERAGE TAX BURDEN ON EARNINGS IN HUNGARY BETWEEN 1999 and 2008**

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**Keywords:** average tax rate, tax wedge, educational level, earnings.

**Abstract:** Taxes on labour earnings are a very important determinant in decision of companies' hiring and individuals' incentives to legal work. The study explores the impact of taxes on workers' income by educational level and age group in Hungary, between 1999 and 2008. We employ two commonly used indicators: the average tax rates and the tax wedges. In Hungary, the total tax burden on labour income expressed as a percentage of labour cost is very high in comparison to the European countries. The major part of the high tax burden is attributable to high employees' tax liabilities and employers' social security contribution.

### **1. THE EXAMINATION OF THE EFFECT OF TAXES ON EARNINGS - INTRODUCTION**

Taxes on labour earnings are a very important determinant in companies' decision of the employment of workers and individual's incentives to legal work. The main goal of this paper is to examine the tax burden on labour income for individuals with different educational attainment and age. The average tax rate and tax wedge were calculated for different skill workers separately. In our examination we distinct seven educational levels, which are respectively completed university, college, technical school, grammar school, secondary vocational school, apprentice vocational school, primary school.

Data of gross earnings was provided by the Hungarian Ministry of Social Affairs and Labour. Net earnings and taxes on gross earnings were calculated from gross earnings using data acquired under the Act on Personal Income Tax for the year in question.

The gap between the tax burden on earnings at a given educational level and the next lower level for employees increases by the educational levels. In fact the question can be arisen: How large are the taxes on labour income and the para-fiscal charges (and tax wedges) by the highest completed educational level?

#### **1.1. AVERAGE TAX RATES BY EDUCATIONAL ATTAINMENT**

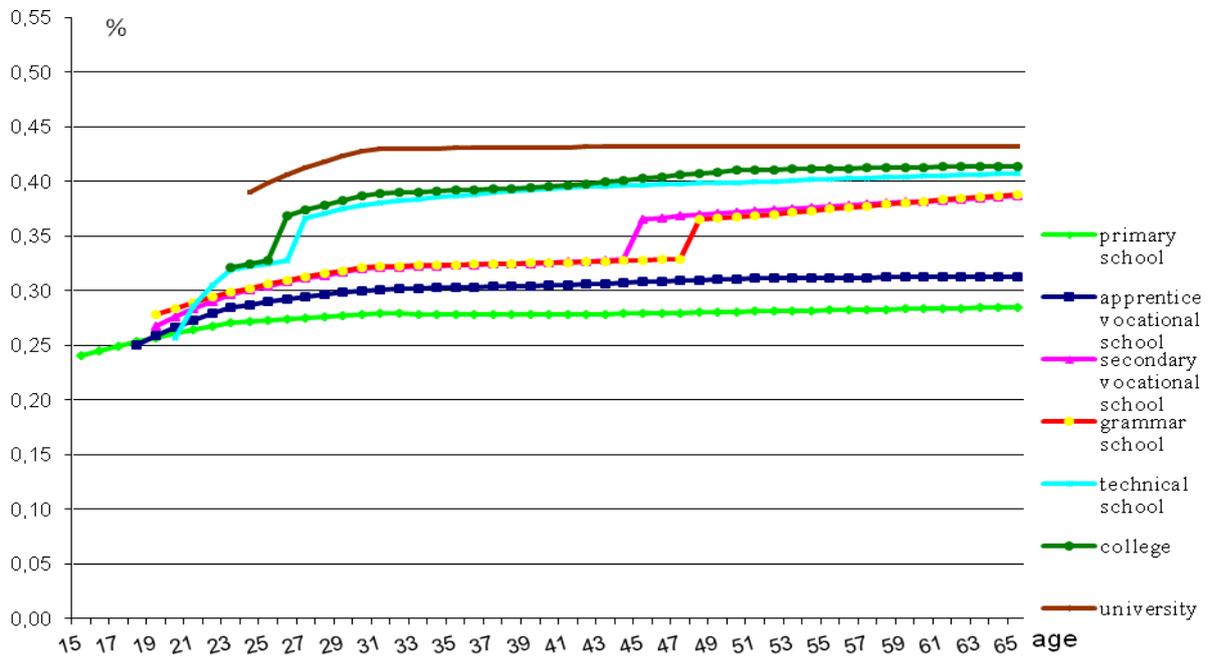
The average tax rate (*ATR*) is the ratio of the amount the employee's tax liability to taxable income (here gross earnings):

$$ATR = \frac{T_j}{W_j}, \quad (1.1)$$

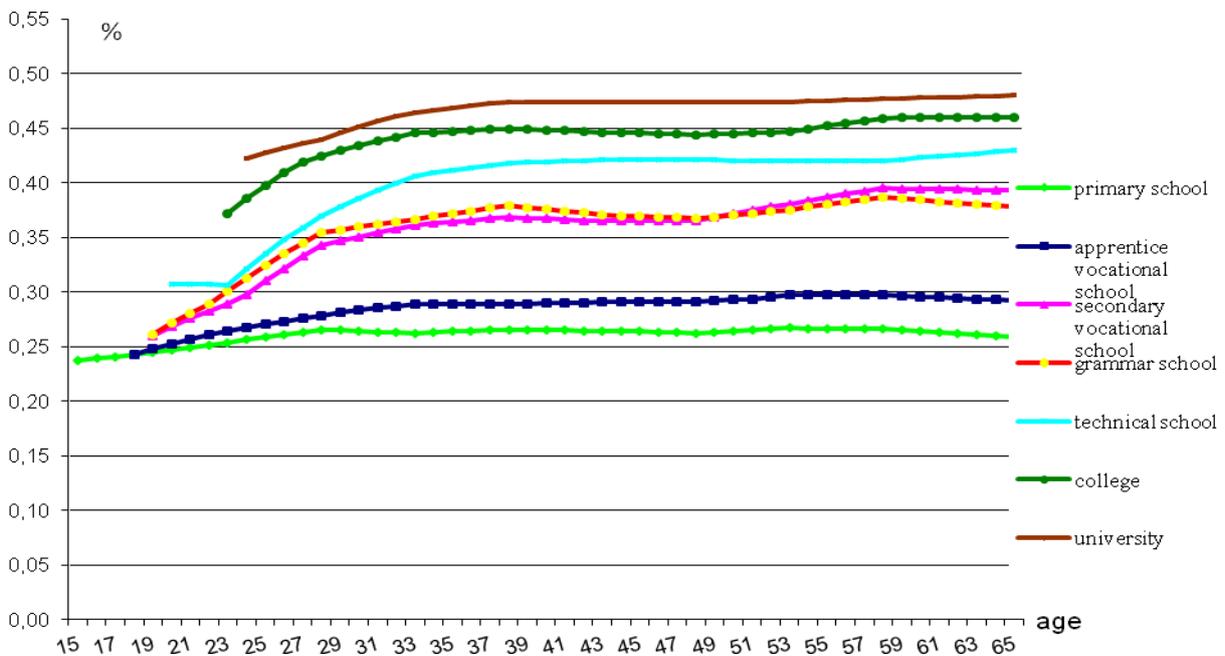
where  $T_j$  is the tax liability; the tax on gross earnings and other dues (pension contribution, employees' health insurance contribution, employees contribution to the unemployment fund) at  $j$ -th schooling level,  $W_j$  taxable gross earning at  $j$ -th schooling level. In a progressive tax system, tax rates increase as gross earnings increases, and tax rates decrease as gross earnings decreases. However, in the case of proportional taxation, the individual pays the same share of income in taxes.

The tax system is progressive in Hungary during the investigation period and after. The tax rates increase by the educational level, since individual with higher educational level has higher earnings. Results of tax rates calculations are shown in Figure 1 and Figure 2, for the beginning of the period examined (1999) and the end of period (2008).

The tax burden on earnings between a given educational level and the next lower level for employees increases by the educational levels and age groups.



**Figure 1. Average tax rate by educational attainment and age in 1999**  
 (The tax rate for a single person without children, 100% of average earnings)  
 Source: own calculation



**Figure 2. Average tax rate by educational attainment and age in 2008**  
 (The tax rate for a single person without children, 100% of average earnings)  
 Source: own calculation

As can be observed in Figure 1 and Figure 2, average tax rates increased at all levels of education, except for individuals who completed primary school and apprentice school, between 1999 and 2008. The greatest increase took place for agents with a college degree or university degree. At tertiary educational level the average tax rates rose by 4-5 percentage points during the examined period. At the average earnings level, university graduated workers without children paid over 42 per cent of their annual wages in personal income tax and employee social security contributions plus employees' contribution to the unemployment fund in 2008. The value of the average tax rate for the individuals with university degree was 47 per cent from the age of 34 and reached 48 per cent at the age of 54. The average tax rates decreased by 1,1 - 2,6 percentage points for primary school graduated and by 1,1 - 2,1 percentage points for apprentice vocational school graduated between 1999 and 2008. The decrease in these values can partly be explained by the change in tax system, the lowest tax bracket was widened. However, the employees' pension security contribution and health insurance contribution has increased by 3 - 3 percentage points separately, but this change has no significant effect on the gap of the average tax rates between different educational levels. The average tax rate, on average, increased by 1,5 – 2 percentage points for the agents with upper secondary qualification (Figure 1, 2).

## 1.2. TAX WEDGE

The tax wedge shows how much the government collects revenues as a result of taxing the labour force. Tax wedge ( $TW$ ) is the sum of personal income tax ( $PIT_j$ ) and employee ( $SSC_j^{employee}$ ) plus employer social security contributions ( $SSC_j^{employer}$ ) together with any payroll tax less cash transfers, expressed as a percentage of labour costs (OECD, 2008) [7]:

$$TW = \frac{PIT_j + SSC_j^{employee} + SSC_j^{employer}}{W_j + SSC_j^{employer}}$$

where  $j$  is the schooling level,  $W_j$  taxable gross earning at  $j$ -th schooling level.

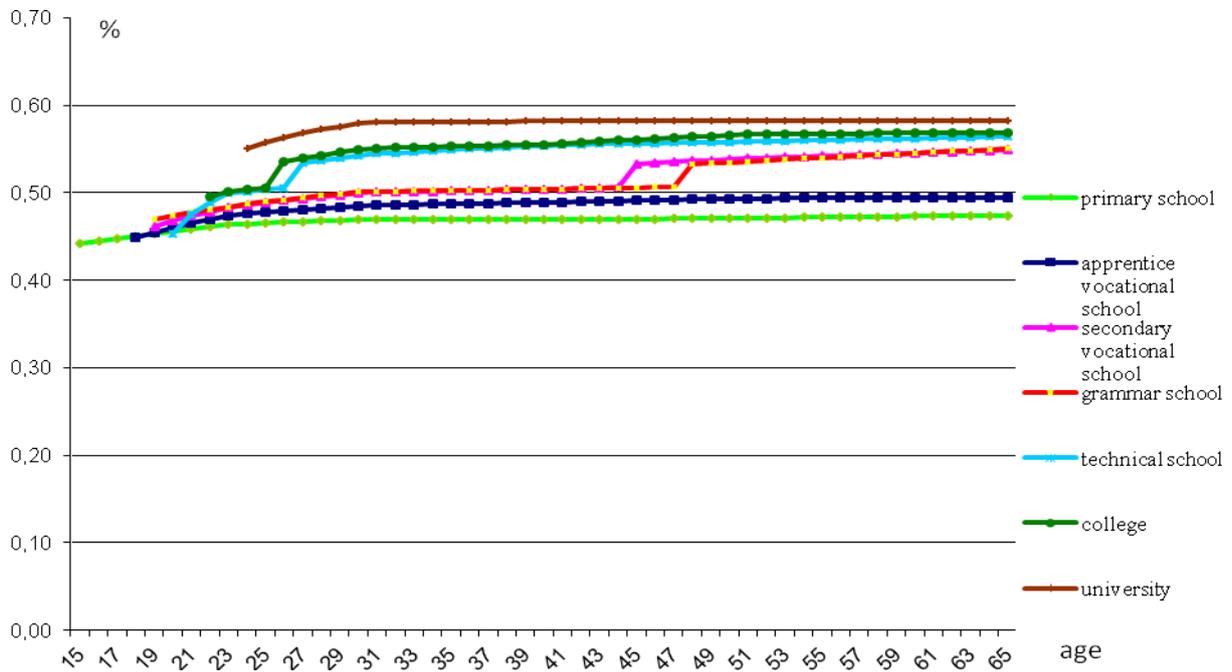
Main components of the labour tax wedge:

- compensation of employees' with wages and salaries,
- employers' social contribution,
- employers contribution to the unemployment fund,
- vocational-training costs (less subsidies to vocational training),
- less subsidies received by the employer.

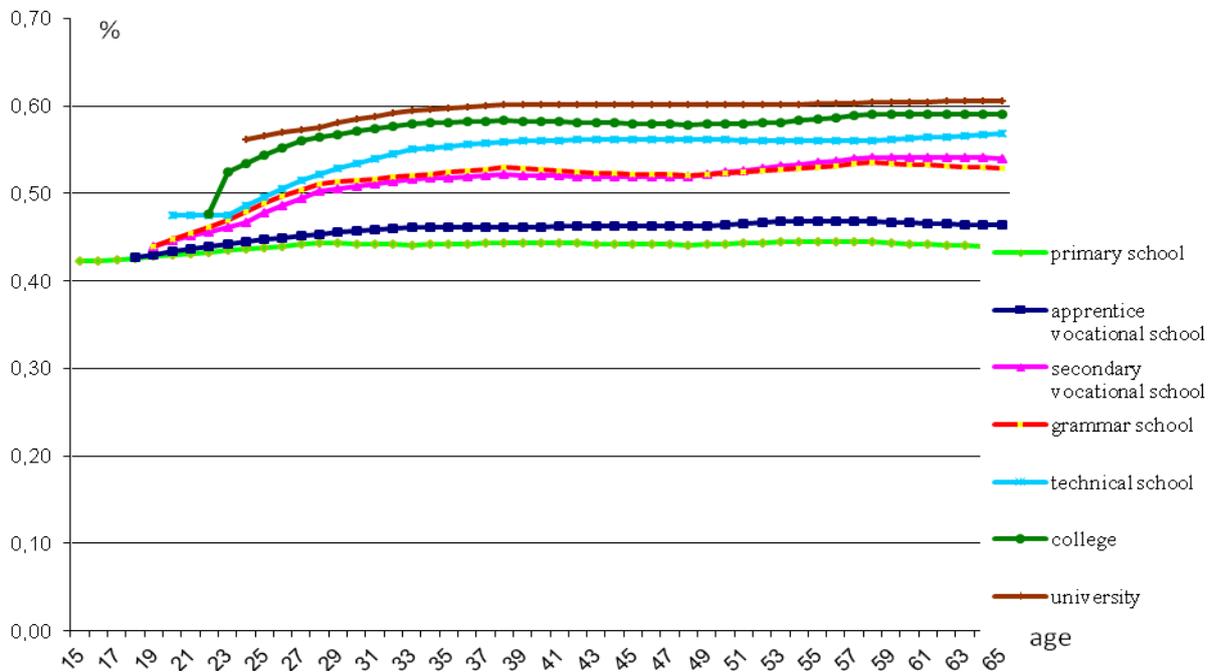
The value of the tax wedge varied between 42% (for persons with primary school) and 61% (for university graduated) depending on the age group and the level of education in 2008 (Figure 4). The tax wedge reached and exceeded 50% for agent with secondary vocational school and grammar school. The tax burden expressed as a percentage of labour cost at tertiary educational level showed the largest values, between 48% and 59%, among those with college degree, and between 56% and 61% among those with university degree (Figure 4).

The value of the tax wedge increased on average by 1 - 3 percentage points for individuals with college or university degree between 1999 and 2008. However, the tax

wedge remained relatively stable for agents with secondary school graduated (Figure 3, 4).



**Figure 3. Tax wedge by educational attainment and age in 1999**  
*(The tax wedge for a single person without children, 100% of average earnings)*  
**Source: own calculation**



**Figure 4. Tax wedge by educational attainment and age in 2008**  
*(The tax wedge for a single person without children, 100% of average earnings)*  
**Source: own calculation**

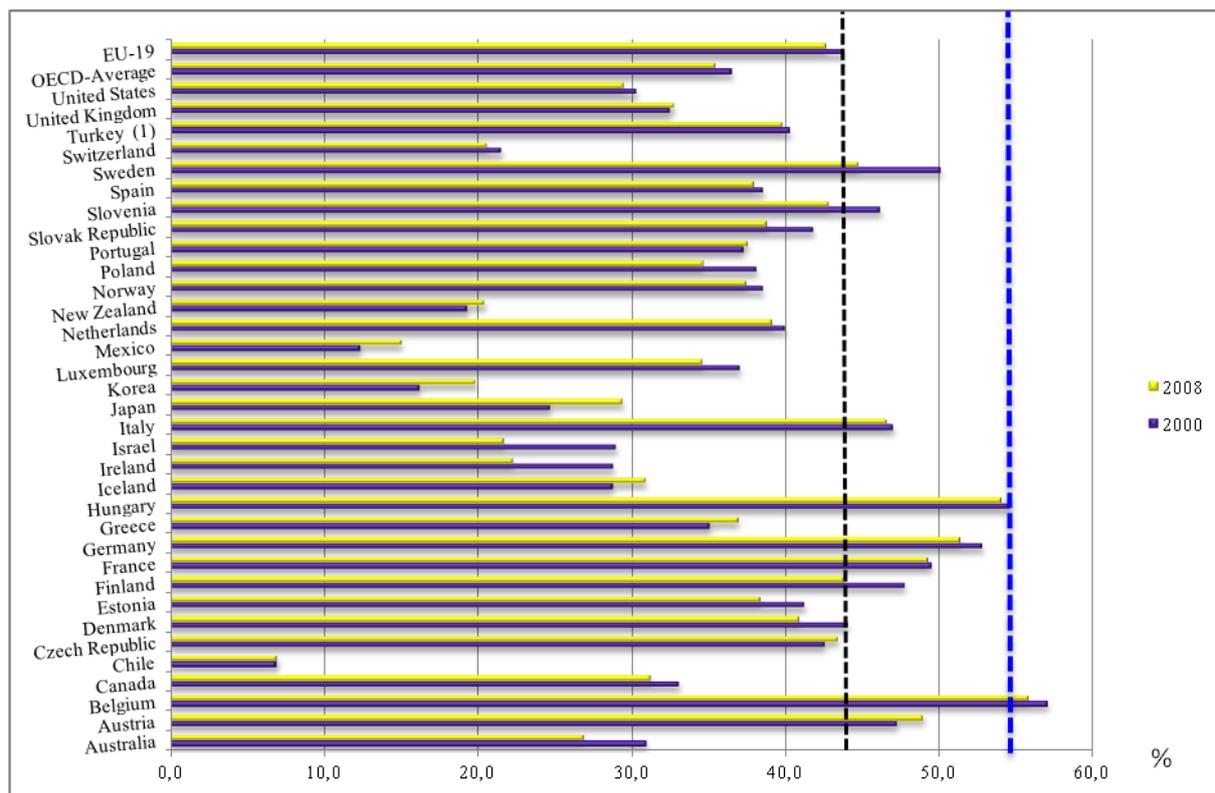
Among the individuals with different educational background, the exceptions are individuals with primary school and apprentice vocational school graduated on which tax wedges are significantly lower and decreased in the examined period.

The gap between tax wedges for agents with different educational qualification increased between 1999 and 2008, since the gap between gross earnings widened (Figure 4, 5). The other reason for the changes of tax burdens at different earnings level lies in changing of tax system. The three bracket tax system introduced in 1999 was superseded, from 1<sup>th</sup> January 2005, with a two bracket system. This two bracket system remained unchanged for a year. The tax rates (18%, 36%) utilised in 2006 was the same until 2008. The employee's contributions (pension contribution, health insurance contribution, employee's contribution to the Employment Fund) increased by 6 percentage points and the employer's contribution (employer' social security contribution, employer's contribution to the Employment Fund) decreased by 1 percentage points between 1999 and 2008. The level of the tax wedge (in the case of progressive tax system) increases with the earnings, which means that the higher the education level of the individual, the greater the amount of the tax wedge.

There are large differences in the level of tax wedge among OECD countries and European countries. Switzerland (20,6%), Ireland (22,3%) and Iceland (30,9%) showed the lowest tax wedge for a single person without children at 100 per cent of the earnings of an average workers in 2008 (Figure 5), plus Malta according to the Eurostat Labour Market data (17,9%, for a single person without children at 67 per cent of the average earnings level). The value of the tax wedge in Hungary is the second highest among OECD countries and it is well above the EU 19 average (Figure 5). The largest tax wedge could be found in Belgium (55,9%), Hungary (54,1%), Germany (51,5%), France (49,3%) in 2008. In most of the European countries the tax burden as a labour cost decreased or remained unchanged between 1999 and 2008; excluding six countries (Austria, Czech Republic, Greece, Iceland, Portugal, United Kingdom) in which the tax wedge increased. The highest growth occurred in Greece and Iceland with 1,8 and 2,1 percentage points respectively.

In Hungary the pre-tax earnings advantage of those with higher education degree are quite high compared to those among secondary and primary education. The gross earnings for those with higher education was 100% more than that of individuals with secondary education in 1999 (aged 25-64) and 110% more in 2008 (OECD, 2009; see Annex 1. table). According to the data of Education at a Glance, and compared it with other countries, we cannot find another country between 1997 and 2007 where the income advantage would be as high as in Hungary (OECD, 2009; see Annex 1. table). In Hungary, the total tax burden on labour income expressed as a percentage of labour cost is very high relative to the European countries. For example the tax wedge exceeded the EU-19 average by 11,3 percentage points in 2000, and by 10,8 percentage points in 2008 (Figure 5).

The amount of the labour cost is relevant factor of the value of tax wedge, if the labour cost increases the tax wedge increases too. The labour costs measures how much the employer has to pay for employing an employee. Trends in the tax wedge is determining the changes in the labour costs.



**Figure 5. Tax wedge in 2000, 2008**

*(The tax wedge for a single person without children, 100% of average earnings)*

*EU-15 area countries are: Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, Netherlands, Portugal, Spain, Sweden and United Kingdom. EU-19 area countries are: EU-15 countries plus Czech Republic, Hungary, Poland and Slovak Republic. Source: OECD, 2012*

The labor demand depends negatively on labour costs, which means that increase in the incomes taxes and employee’s contributions, may affect the trends in the employment and unemployment rate. Many researchers studied, the employers' social security contributions actually have an effect on unemployment, employment trends. The employer's burden, and unemployment (employment) between the positive (negative) relationship revealed, among others. [1]; [2]; [4]; [5]

In Hungary, the labour cost is relatively high due to the considerable employees’ and employers' tax liabilities. It is a very serious problem in Hungary that the high labour cost could be disincentive effect on the legal employment on the labour demand side, and increasing labour costs could depress the propensity to the legal work on the labour supply side.

## 2. CONCLUSIONS

This article gives a summarized review about employee’s and employer’s tax liabilities, the tax burden by level of educational attainment and age group in Hungary between 1999 and 2008. To measure the tax burden on earnings we calculate the average tax rates and tax wedges. The average tax rate is equal to the personal income tax and employee social security contribution and employee contribution to the unemployment fund expressed as a percentage of gross wage earnings. In Hungary, the gap of average tax rate between the different educational attainment increased from 1999 to 2008. The main reason of this change is the increased tax liabilities for higher educated individuals

significantly. At the average earnings level, workers with university degree without children paid between 42 per cent and 48 per cent of their annual wages in personal income tax and employee social security contributions plus employees' contribution to the unemployment fund in 2008. In EU-19 area countries the tax wedge decreased by 1,1 percentage points over the examined period, in Hungary the reduction of tax wedge was only 0,5 percentage points over 1999 and 2008 period, consequently the value of the tax wedge remained at a relatively high level.

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### Annexe 1.

	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
All	179	184	200	194	194	205	219	217	215	219	211	210

Relative earnings of the population with income from employment  
 by level of educational attainment for 25-64 year-olds, (upper secondary and post-secondary non-  
 tertiary education = 100), Hungary

Source: Education at a Glance 2009 (OECD, 2009: A7.2a-c. table)