

## THE TAX WEDGE IN SLOVENIA: INTERNATIONAL COMPARISON AND POLICY RECOMMENDATIONS

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### *Abstract*

*When taxes on labor are introduced, a “tax wedge” appears between the labor costs paid by the employer (gross wage) and the net wage received by an employee. At a certain level of wage, a higher tax wedge increases unemployment and decreases employment, all other things being equal. The paper tackles three main questions: the characteristics of the tax wedge, unemployment and employment rates in OECD countries in the recent past, tax wedge policy in the EU15 and the new EU members and the tax system and its effects on the unemployment and employment rates in Slovenia. We found that the OECD countries can be classified into two groups of countries if the tax wedge, the unemployment rate and the employment rate are taken into consideration. The first group is the high tax wedge, high unemployment rate and low employment rate group of countries, whereas the other group has the opposite characteristics. European member states (old and new) have on average a higher tax burden on labor than the OECD average, consequently suffering from higher unemployment rates. Slovenia has an unreasonably high tax wedge; in the EU only Belgium and Germany have a higher tax burden. According to previous and our empirical findings we suggest that Slovenia could benefit from a reduction in the tax wedge.*

*Key words: economic policy, tax wedge, Slovenia, EU, OECD.*

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## **1 Introduction**

When taxes on labor are introduced a “tax wedge” between the labor costs paid by the employer (gross wage) and the net wage received by an employee appears. According to OECD (2004) the tax wedge is the difference between what employers pay out in wages and social security charges and what employees take home after tax, also taking into account social security deductions and cash benefits.

At a certain level of wages, a higher tax wedge increases unemployment and decreases employment, *ceteris paribus*. The actual effect of tax introduction depends on the elasticity of demand and supply curves and the flexibility of the labor market. In a perfectly flexible labor market, the introduction of taxes would have only a “quantitative” effect on employment and there would again be no unemployed, because the quantity of active population would be set at equilibrium gross (and net) wage. But in reality labor markets are not perfectly flexible because of labor unions, the mandatory minimum wage, perfectly elastic supply of work curve under a certain level of wage, etc. Thus Vodopivec (2005) points out that by creating a wedge between the costs of labor and the real consumption wage, labor taxes reduce the demand for labor and (if demand for labor is not perfectly inelastic) employment, increasing unemployment.

OECD reports that tax wedges on labor have been falling in many OECD countries in recent years. This is helping to reduce a major obstacle to job creation and people’s willingness to work (OECD, 2004). However, tax wedges are still significantly higher in most European countries than in the USA, Canada, Australia or Asian countries. According to the IMF (2003) high unemployment rates in some European countries are attributable to labor-market protection, such as generous unemployment benefits, powerful labor unions and employment protection legislation. On the other hand, Baker and Schmitt (2003) argue that the IMF analysis is not robust enough, claiming that the same result is not provided if the time period, the sample of countries or econometric specification is changed in reasonable way.

This paper tackles three main questions: (1) What are the characteristics of the tax wedge, unemployment and employment rate in OECD countries in the recent past? (2) What kind of tax wedge policy is significant for EU15 and new EU members? (3) What kind of tax system is implemented in Slovenia and what are the effects on the unemployment and employment rates?

The rest of the paper is organized as follows. The third part of the paper – after a description of data sources – discusses the characteristics of the tax wedge, unemployment and employment rates in OECD countries in the recent past, the fourth section analyses what kind of tax policy regarding the tax wedge is significant for EU15 and new EU members. The fifth section discusses what kind of tax system is implemented in Slovenia and what the effects of such a system on the unemployment and employment rates are. We sum up with concluding remarks and some policy recommendations.

## **2 Data Sources**

The analysis was based on three sources of data: (1) for OECD countries, the data on the tax wedge, the employment rate and the unemployment rate are OECD official

data (OECD, 2003), (2) for new European Union members the data on the tax wedge, the employment rate and the unemployment rate were obtained from data of Wiener Institut für Internationale Wirtschaftsvergleiche (WIIW), (3) for Slovenia, the tax wedge was calculated on the basis of current tax regulations, whereas data on the employment and unemployment rates were obtained from reports of Statistical Office of Slovenia.

All data are for the year 2002. The tax wedge data are internationally comparable, as they are all calculated for a single individual without children at the income level of the average production worker.

### **3 Characteristics of the Tax Wedge, and the Unemployment and Employment Rates in OECD Countries**

The OECD comprises 30 countries that differ economically (most of these are developed and minority of them are transition countries) as well as according to their definition of the welfare state. Therefore is not surprising that the tax wedge in these countries varies; it ranges from 16% (in Mexico) through as high as 55% in Belgium. The OECD mean tax wedge is 35.8% (see Figure 1 and Table 1; data for Slovenia are inserted for comparison).

Table 1 gives a detailed picture of the tax burden on labor and employment and unemployment rates in different OECD countries (and Slovenia; for comparison)<sup>1</sup>. In most countries the tax wedge consists of income tax and social security contributions, paid usually by the employee and employer. Hungary and Poland also have a payroll tax of 0.3 and 0.6%, respectively. It is interesting that countries have quite different structures of taxes on labor; coefficients of variation of different components are about 0.60, whereas the (relative) variability of tax burden is much lower. This shows that countries have a different perspective of what the appropriate structure of tax wedge is; at the gross level, however, the differences are not so evident.

What are the characteristics of countries in the middle of the tax burden distribution and the two groups on the left and right tail? To answer this question we divided OECD countries into three equal groups (with high, mid and low tax wedges) and calculated the average tax wedge, average unemployment rate and average employment rate. For groups' break points the 33<sup>rd</sup> and the 66<sup>th</sup> percentile were taken.

Figure 2 shows that there are no significant differences between unemployment and employment rates in the OECD mid and OECD high groups. However, statistically significant differences (at  $P = 0,00$ ) may be found for the OECD low group (compared to the other two groups). Average unemployment and employment rates in the OECD mid and OECD high group of countries are about 8.2 and 63.9%, respectively. In the OECD low group of countries, however, average unemployment and employment rates are 4.4 and 70.5%, respectively.

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<sup>1</sup> For the purpose of further analysis employment rates and unemployment rates are also shown.

*Table 1: Taxes on labor, employment rates and unemployment rates in OECD countries (and Slovenia) in 2002 (in %)<sup>a</sup>*

Country	Taxes on labor <sup>b</sup>				Total tax wedge <sup>c</sup>	Employ. rate	Unemploy. rate
	Income tax	Social security contributions		Payroll tax			
		employee	employer				
Slovenia	12.4	18.2	13.2	4.4	48.2	65.8	5.9
Belgium	21	11	24	0	55	59.7	6.9
Germany	17	17	17	0	51	65.3	8.7
France	9	9	29	0	48	62.2	8.9
Sweden	18	5	25	0	48	74.9	5.2
Hungary	13	9	24	0.3	46.3	56.2	5.8
Italy	14	7	25	0	46	55.6	9.1
Austria	8	14	23	0	45	68.2	4.9
Finland	20	5	20	0	45	67.7	9.1
Poland	5	21	17	0.6	43.6	51.7	20.3
Czech Republic	8	9	26	0	43	65.7	7.3
Denmark	32	11	1	0	43	76.4	4.3
Slovak Republic	5	9	28	0	42	56.9	18.6
Turkey	12	12	18	0	42	46.7	10.6
Spain	10	5	23	0	38	59.5	11.4
Norway	19	7	11	0	37	77.1	4.0
Netherlands	6	19	10	0	36	74.5	2.6
Greece	0	12	22	0	35	56.9	9.8
Luxembourg	7	12	12	0	32	63.6	2.6
Portugal	4	9	19	0	32	68.1	5.4
Canada	18	6	7	0	31	71.5	7.7
Switzerland	9	10	10	0	30	78.9	3.0
United Kingdom	14	7	8	0	30	72.7	5.1
United States	15	7	7	0	30	71.9	5.9
Iceland	21	0	5	0	26	82.8	3.2
Australia	24	0	0	0	24	69.2	6.1
Ireland	10	4	10	0	24	65.0	4.3
Japan	6	9	10	0	24	68.2	5.6
New Zealand	20	0	0	0	20	72.4	5.3
Korea	2	6	8	0	16	63.3	3.2
Mexico	2	1	13	0	16	60.1	2.5
Average <sup>d</sup>	12.3	8.4	15.1	0.0	36.0	66.1	6.9
Coefficient of variation <sup>d</sup>	0.6	0.6	0.6	4.0	0.3	0.1	0.6

<sup>a</sup> OECD countries sorted in descending order according to total tax burden.

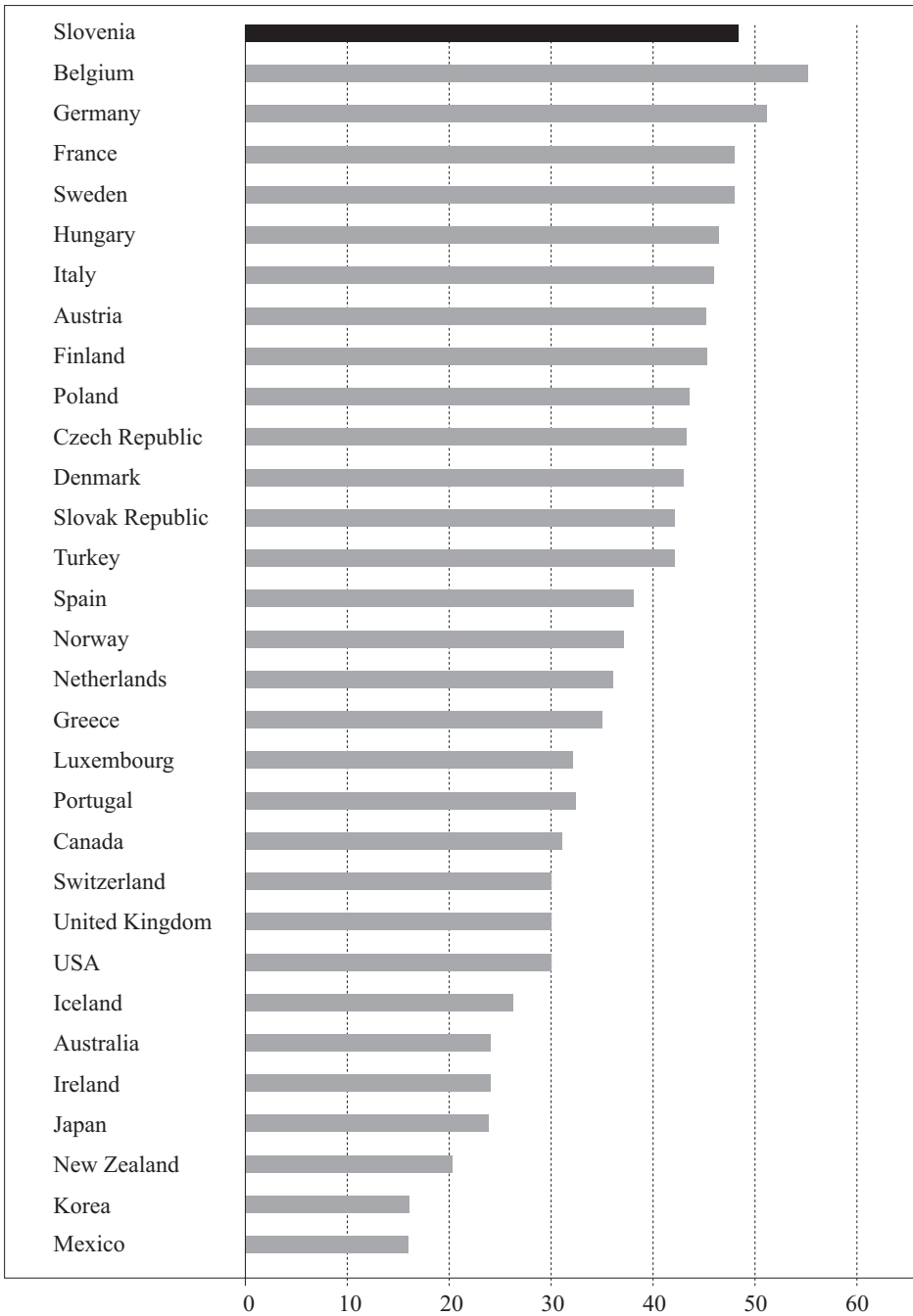
<sup>b</sup> Taxes on labor represent the structure of taxes in employer's costs of an employee.

<sup>c</sup> Tax wedge is the coefficient between all taxes and social security contribution payments, paid by employer and employee, and total cost of an employee for employer.

<sup>d</sup> Parameters calculated for OECD countries.

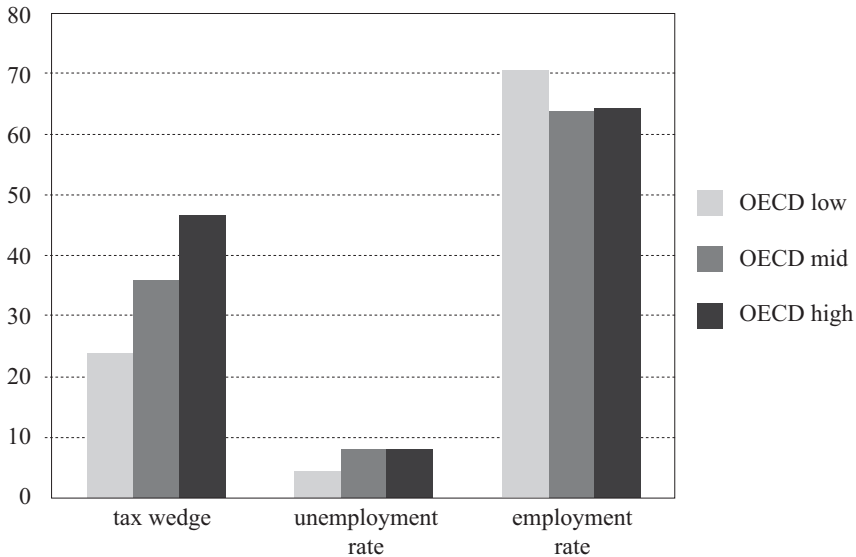
Source: OECD (2003); Statistical office of Slovenia; own calculations.

*Figure 1: The tax wedge in Slovenia and OECD countries in 2002 (in %)*



Source: OECD (2003); own calculations.

Figure 2: *The tax wedge, unemployment rate and employment rate in three groups of OECD countries in 2002 (in %)*



Source: Table 1; own calculations.

This simple analysis confirms the hypothesis that a lower tax wedge corresponds to lower unemployment rate and higher employment rate. The results are comparable to Vodopivec (2005), Nickell and Layard (1999), Daveri and Tabellini (2000), Haltiwanger, Scarpetta, and Vodopivec (2003). It seems that for OECD countries the threshold of the tax wedge is about 30%.

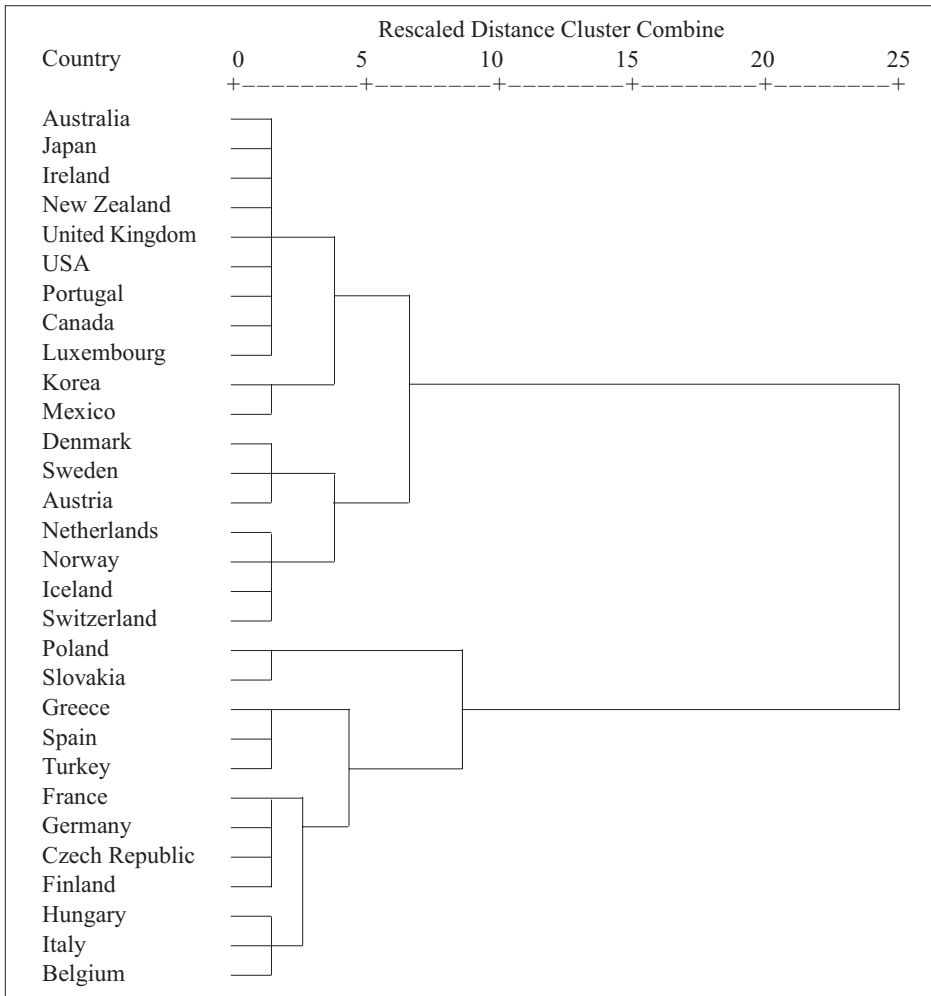
Not to be misled by descriptive statistics, cluster analysis has been applied to identify groups of OECD countries that are similar to each other with respect to the tax wedge, unemployment and employment rates. Taking all three variables<sup>2</sup> into consideration the (statistical) distance among the countries shows which countries are near or apart. Note that variables were standardized to avoid different averages influencing the relative importance of a variable.

Graphical representation of hierarchical clustering is presented by a dendrogram (Figure 3). The observations are listed on the vertical axis, and the horizontal axis represents the Euclidean distance between the centroids of the clusters (i.e. group averages). A large Euclidean distance between the centroids of the clusters is interpreted as a large difference between clusters; in this case observations are not supposed to be joint in one cluster.<sup>3</sup> In our case it is obvious that there are two groups of OECD countries, which confirms (however statistically firmly) our previous speculation. The characteristics of these two groups of countries are shown in Table 2.

<sup>2</sup> Variables were standardized to avoid different averages influencing the relative importance of a variable.

<sup>3</sup> For detailed interpretation of cluster analysis and dendrogram see Sharma (1996:185-232).

*Figure 3: Dendrogram for OECD countries using the Ward Method and Hierarchical Clustering*



*Source: Table 1; own calculations.*

*Table 2: Characteristics of two groups of OECD countries clustered with respect to tax wedge, unemployment and employment rates*

Group	Tax wedge	Unemployment rate	Employment rate
1 (n = 18)	30.2 ± 9.2	4.5 ± 1.4	71.0 ± 5.9
2 (n = 12)	44.5 ± 5.4	10.5 ± 4.4	58.7 ± 6.1
Total (n = 30)	35.9 ± 10.5	6.9 ± 4.2	66.1 ± 8.5

*Source: Table 1; own calculations.*

The first group is the low tax wedge, low unemployment rate and high employment rate group of OECD countries, whereas the second group is the alternative one (high tax wedge, high unemployment rate and low employment rate group of OECD countries). Our empirical evidence shows, that (at least in OECD countries) countries with a low tax wedge have low unemployment and high employment rates, and the other way around.

If the empirical results are to be applicable for other countries, e.g. Slovenia, we developed a rule to classify countries in these two groups. For this purpose two-group discriminant analysis has been used.

*Equation 1: Estimated discriminant function*

$$\hat{Z} = 3.668 + 0.101TW + 0.142UR - 0.125ER$$

*Cut-off value for Z is 0. Countries with positive Z are high tax wedge, high unemployment rate and low employment rate group of countries. The analysis has predicted group membership with 100% accuracy (for OECD countries). TW – tax wedge, UR – unemployment rate and ER – employment rate.*

The likelihood of a country being classified as a high tax wedge, high unemployment rate and low employment rate country rises if the tax wedge increases (which, according to theoretical and empirical expectations, also causes an increase of unemployment and decrease of employment, pushing up the likelihood even more).

Here it should be stressed that the causality is obviously not clear-cut. If all countries had the same ratio between the sum of employed and unemployed with respect to the active population, only the number of employed and unemployed would be used to form groups. In this case the tax wedge would be considered an instrument, not an outcome!

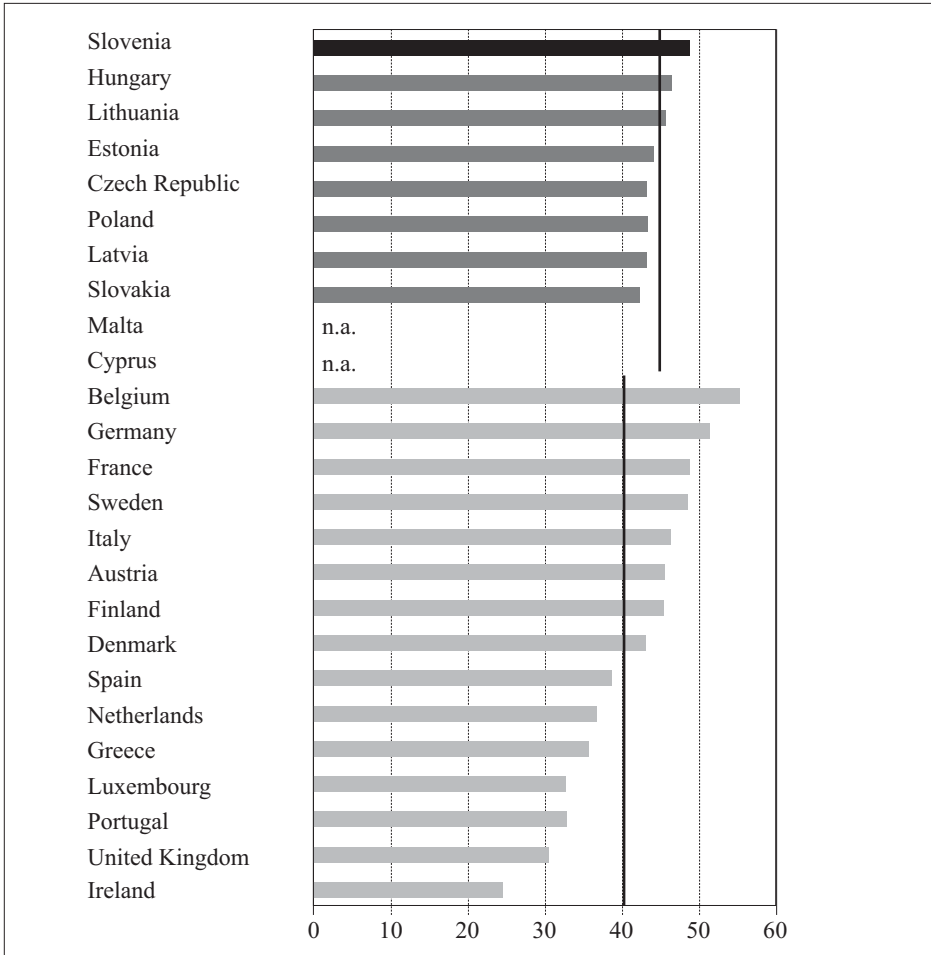
#### **4 Characteristics of the Tax Wedge in EU15 and New EU Members**

The above analysis shows that EU15 countries (old EU members) are almost equally distributed in the first and the second group. The high tax wedge, high unemployment rate and low employment rate group of countries is composed of Greece, Spain, France, Germany, Finland, Italy and Belgium, whereas other countries belong to the alternative group.

On average, European Union member states have a higher tax burden than the OECD average. The average tax wedge in the EU15 countries is 40.5% (4% pts higher than the OECD average) and for new EU members the figure is even a bit higher, 44.3% (see Figure 4). The difference between the tax burden in European Union member states and OECD countries is, we believe, the result of different factors, e.g. different definition of the welfare state, different demographic characteristics, etc.



*Figure 4: Tax wedge in EU15 countries and new EU members 2002 (in %)*



*Source: Table 1; WIIW; own calculations.*

*Table 3: Comparison of EU member states and non-EU OECD countries with respect to the tax wedge, and employment and unemployment rates*

Group	Tax wedge	Unemployment rate	Employment rate
EU member states	41.3 ± 7.8	7.6 ± 4.6	64.9 ± 7.4
Non-EU OECD countries	25.9 ± 7.9	5.3 ± 2.5	68.5 ± 10.1
T-test	-5.15	1.48	1.11
P-value	0.00	0.05	0.14

*Source: Table 1; own calculations.*

We mentioned above the difference between the average tax wedge in the EU15 countries and that in the new EU member states. The difference, however, is not statistically significant ( $P = 0.14$ ). The insignificance is probably due to the high variability of the tax wedge in EU15 countries,<sup>4</sup> whereas the (relative) variability of the tax wedge in new EU member states is much smaller.<sup>5</sup>

But when comparing EU (old and new member states) with non-EU OECD countries we found that the tax wedge is higher in EU member states; the difference is more than 15 percentage points and significant at negligible significance. The difference in employment rates is not significant, probably due to the extremely high variance in non-EU OECD countries, but the difference in the unemployment rate is obvious – EU member states have significantly higher unemployment rates (see Table 3).

Here it is worthwhile to stress also that the unemployment rate is quite high (on average) in new EU member states, even though not entirely caused by high tax burden, but also (or mostly) by the other factors that are “squeezing” all transition economies.

## **5 The Tax Wedge in Slovenia**

In Slovenia tax wedge is composed of personal income tax (paid by the employee) and social security contributions (paid both by employer and employee). Unusually, Slovenia has also introduced a payroll tax (paid by the employer). Among OECD and EU countries such a tax is used only in Hungary and Poland; it is, however significantly lower than in Slovenia (see Table 1). According to OECD methodology the tax wedge for a single individual without children at the income level of the average production worker was estimated at 48.2%<sup>6</sup> in 2002 (see Equation 2 and Figure 5). Because the tax system has not changed much since the early 1990s, the time dimension of the tax wedge in Slovenia does not show any significant trends or characteristics. In fact, the estimated tax wedge for the same category of a worker in 2003 amounted to 48.1%. This is due to the fact that taxes and benefits are mainly connected to average wages rather than being fixed or linked to e.g. GDP. Any significant change of tax wedge would be caused only by a significant change of tax system.

*Equation 2: Calculation of the tax wedge in Slovenia in 2002 (according to OECD methodology; for a single individual without children at the income level of the average production worker)*

$$\text{tax wedge} = \frac{\text{PD} + \text{DSOUK} + \text{PPL}}{\text{BRPL} + \text{DSOP} + \text{PPL}} = 48.2\%$$

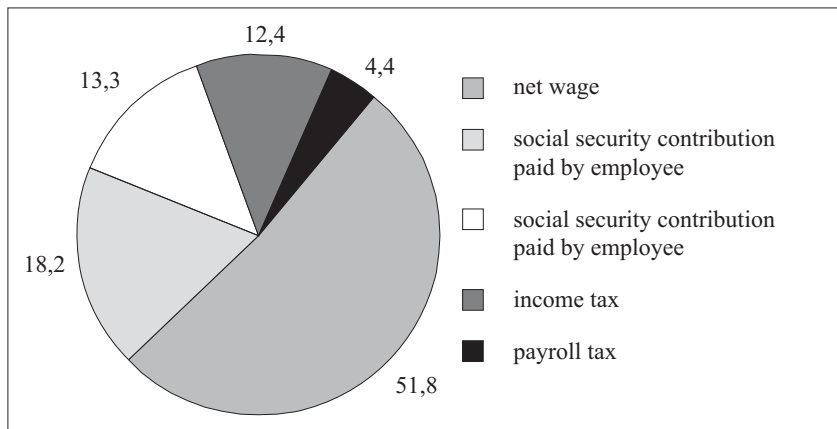
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<sup>4</sup> Coefficient of variation is 0.21.

<sup>5</sup> Coefficient of variation is 0.04.

<sup>6</sup> We calculated the figure on our own, because officially published data from different sources (note that OECD data for Slovenia is not available) are not necessarily comparable directly to OECD methodology.

*Figure 5: The composition of the gross cost of work in Slovenia in 2002 (for a single individual without children at the income level of the average production worker)*



*Source: Statistical Office of Slovenia; own calculations.*

Slovenia has the highest tax wedge among new EU members (see Figure 5) and in the context of the EU25 countries the tax wedge is higher only in two countries (Germany and Belgium). Using both methods, i.e. discriminant function, which has been estimated for OECD countries, and cluster analysis (recluster OECD countries with Slovenian data attached) we can classify Slovenia into the high tax wedge, high unemployment rate and low employment rate countries (Equation 3 and Figure 6). According to cluster analysis, Slovenia is most similar to Austria, France, Germany, Finland and the Czech Republic when three parameters are compared simultaneously: tax wedge, employment rate and unemployment rate. All these countries have one of the highest tax wedges in the OECD as well as an above average unemployment rate.

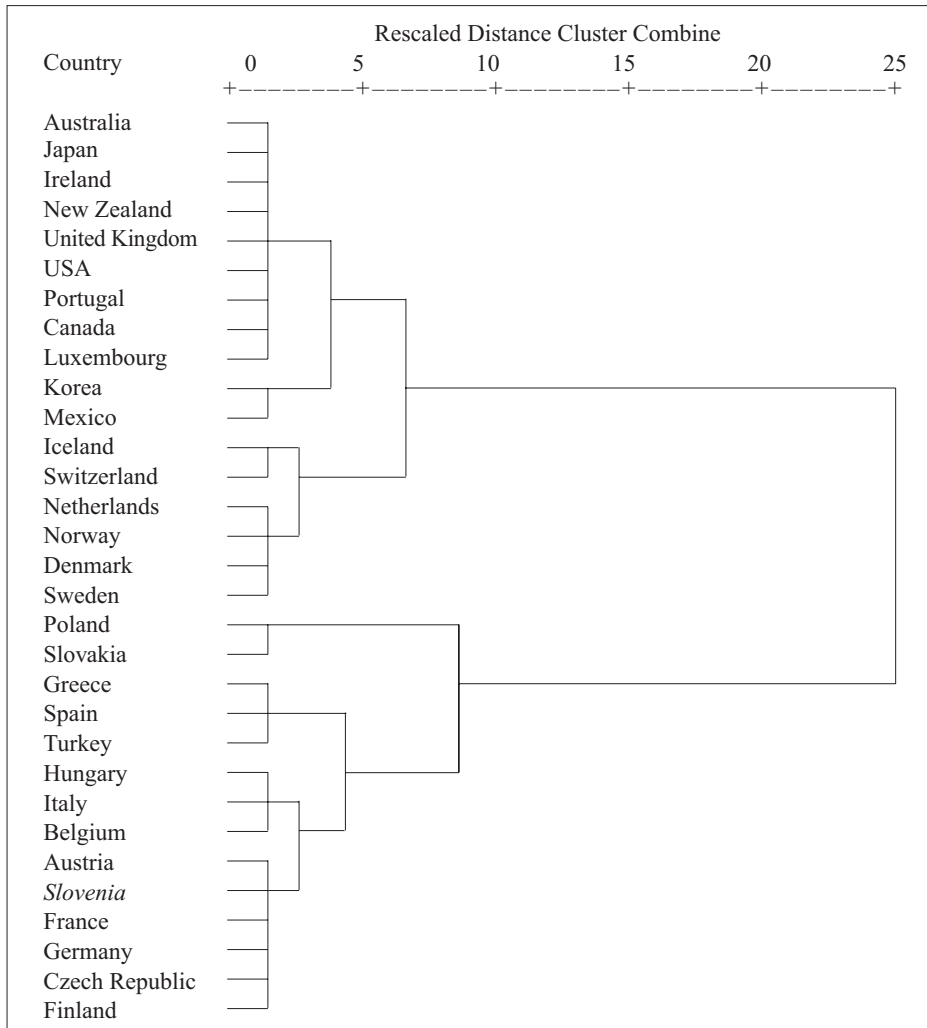
This fact was stressed also by European Commission in the latest Joint Employment Report (see European Commission 2005). It was explicitly pointed out that Slovenia still has an above average tax burden on labor, although some progress has been achieved through the recent tax reform package.

*Equation 3: Estimated discriminant score for Slovenia (estimate for 2002)*

$$\hat{Z} = 3.668 + 0.101 \times 48.2 + 0.142 \times 5.9 - 0.125 \times 65.8 = 1.15 \quad (3)$$

Even though Slovenia has the highest tax wedge among new EU countries, its employment and unemployment rate is not critical, compared to data from other new EU countries. Slovenia has much lower unemployment rate and higher employment rate

*Figure 6: Dendrogram for Slovenia and OECD countries using the Ward Method and Hierarchical Clustering*



*Source: Table 1; WIIW; own calculations.*

than Slovakia or Latvia, for example, even though its tax wedge is 5% pts higher. Compared to Hungary Slovenia has a similar tax wedge (only 2% pts higher than Hungary) and unemployment rate, but a significantly higher employment rate. Compared to the other new EU members, Slovenia is a highly ranked economy despite its relatively high tax wedge. However, according to the European Commission (2005), the low employment rate (compared to EU15 countries), especially for persons over 55, is still a challenging problem in Slovenia.

When compared to OECD countries, Slovenia's estimated discriminant score is 1.15, whereas the mean in the group of countries with a high tax wedge, high unemployment rate and low employment rate is 2.31. This suggests that Slovenia is not far from the cut-off point (i.e. not far from the low tax wedge, low unemployment rate and high employment rate group of countries). In fact, with respect to the employment and unemployment rates, Slovenia is somewhere in between, but the high tax wedge pushes it up.

These results suggest that Slovenia is at the boundary; it has a relatively low unemployment rate and a relatively high employment rate with respect to the tax wedge. However, it would probably be difficult to lower the unemployment rate and raise the employment rate without a significant change in the tax wedge. This could reduce a major obstacle to job creation and increase people's willingness to work, resulting in expectedly higher employment and lower unemployment rates.

## **6 Concluding Remarks**

OECD and IMF studies have shown that higher taxes on labor, including unemployment benefit contributions, significantly increase unemployment (see OECD, 2004 and IMF, 2003). This was confirmed in this study; our empirical evidence shows, that (at least in the OECD) countries with a lower tax wedge have a lower unemployment rate and a higher employment rate, and vice versa.

European countries have a high tax wedge, as compared to the OECD average. The average tax wedge in EU15 countries is 40.5% (4% pts higher than OECD average) and for new EU members the figure is even a bit higher, at 44.3%. Differences between EU15 countries and new EU members were not found to be statistically significant.

In Slovenia the tax wedge is composed of personal income tax (paid by the employee), social security contributions (paid both by employer and employee) and payroll tax (paid by the employer). The later is also used only in Hungary and Poland, but here the tax rate is 5-10 times lower than in Slovenia. Compared to OECD countries, EU15 countries and the new EU members Slovenia has a very high tax wage on labor (for single individual without children at the income level of the average production worker the tax wedge was estimated at 48.2% in 2002). In our opinion this hinders any more effective battle with unemployment.

According to Vodopivec (2005), Nickell and Layard (1999), Daveri and Tabellini (2000), Haltiwanger, Scarpetta, and Vodopivec (2003) a tax reduction could increase demand for labor and employment and result in lower unemployment. Nickell and Layard (1999), Daveri and Tabellini (2000), Haltiwanger, Scarpetta, and Vodopivec (2003) argue that higher taxes on labor, including unemployment benefit contributions, significantly increase unemployment. Nickell and Layard (1999), for example, report that a 5 percentage point decrease in the aggregate tax wage (which includes payroll, income, and consumption taxes) would reduce the unemployment rate by 13 percent (for example, from 8 percent to 7 percent). They also argue that different types of taxes have the same effect on unemployment. If we apply Nickell and Layard's analysis to Slovenia, a 5% pts decrease in the aggregate tax wage (that is from

approximately 48 to 43) could reduce the unemployment rate by about 13 percent (that is from 5.9 to 5.1 in 2002).

Thorough analysis of the influence of tax wedge on employment and unemployment rates in Slovenia should maybe base on time series data for Slovenia. However, because the tax system has not changed much in the last 15 years and since there is no relevant information for the period before the 1990s (because of the incomparable economic systems), our analysis could be based only on cross section data. This analysis shows that only the abolition of Slovenian peculiarity (the payroll tax) would lower the tax wedge by 2.4% pts. But the budget revenue from this tax amounted to 93 billion tolar in 2002, which is approximately 8% of the yearly budget. This figure shows clearly why the government hesitates to abolish the payroll tax although employers and labor unions are constantly warning, that this tax (in combination with other taxes on labor) causes unreasonable pressure on the labor market. Nevertheless, loss in budget incomes due to the abolition of the payroll tax would be compensated for by savings on unemployment insurance and unemployment assistance payments due to (the expected) lower unemployment and additional budgetary income from the newly employed, probably also moving from undeclared work.

One could argue that due to strong labor unions the reduction of tax wedge would be passed on to net wages without any effect on employment. This could be the case if there were no strong social partnership (which is represented in Economic and Social Council), therefore it is really unlikely that only the labor unions (or the already employed) would gain the positive effect; due to cooperation among the social partners it is very likely that the effect would be also or primarily on employment. Besides that the social dialog in Slovenia usually prefers employment prior to the level of wages.

Keeping the above figures in mind, Slovenia could reach the low tax wedge, low unemployment rate and high employment rate group of OECD countries with a reduction of the tax on labor of approximately 9% pts. This would, *ceteris paribus*, reduce the unemployment rate to the mean of the low tax wedge, low unemployment rate and high employment rate group of OECD countries (4.5%). However, this tax reduction would not be sufficient to increase the employment rate to the group's average. For this to happen, not only should the unemployed be reactivated, but also others, who are capable of working but not willing to, should be encouraged to join (official) employment.

To sum up, Slovenia should follow the trend that has characterised OECD countries in recent years, where tax wedges on labor have been falling, helping to reduce a major obstacle to job creation and people's willingness to work (OECD, 2004). However, a tax reduction along probably would not be sufficient. In Slovenia (as in many European countries, as reported by (IMF, 2003)) the high unemployment rate is attributable to labor-market protection, such as generous unemployment benefits, powerful unions and, especially, employment protection legislation.

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