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Relationship between Employment and Effective Taxation of Labour on Enterprise Level in the EU[1]

Jana TEPPEROVÁ – Karel HELMAN***

Abstract

The taxation of labour affects labour supply and demand, influencing the decisions of both employees and employers. As the effects of labour taxation are often contradictory, final relationships between the labour tax and other variables are not always transparent. In order to describe (reveal) the relationship between effective taxation of labour and the number of employees as well as between effective taxation of labour and the ratio of employment costs to total company costs, both adjusted for the company size and a country's economic level, we conducted the empirical analysis of 19 EU countries using the Amadeus dataset of firms for the years 2010 – 2013. We emphasize the data-oriented discussion about the correct specification of a regression model. Over the whole research period, the results show a negative relationship for the two dependent variables analysed.

Keywords: *labour taxation, employment costs, number of employees, Amadeus dataset, European Union*

JEL Classification: H24, J21

Introduction

Labour taxation (personal income tax and compulsory insurance) affects the net income of employees and represents an important part of employment costs, thus being considered by companies when pursuing their human resources

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policies. However, the relationship between taxation and employment is not transparent, various factors coming into play on both the supply and demand side of the labour market.

In theory, the total tax-on-labour-supply effect (work motivation) depends on the so called income and substitution effects. The income effect causes employees to work hard despite being heavily taxed because they want to maintain the same amount of real net income, while the substitution effect decreases the motivation to work under high tax rates since people are more likely to substitute work with leisure (e.g. James and Nobes, 2014).

Employers, on the other hand, who create the labour demand, operate within their budgetary constraints, depending on marginal revenue productivity of labour. They may not therefore be able (or willing) to hire the same number of employees when the personal income tax and health and social insurance contributions rise. Pavel and Vítek (2005) suggest that high taxation of labour leads to its substitution by capital. Further more, high effective taxation of employees, compared with the tax burden of the self-employed in particular, can cause a general shift from regular to illegal employment contracts. Effective taxation of labour is often given as an argument for location decisions (Hansson and Olofsdotter, 2014).

Research on the effect of taxation on labour market has been going on for several decades. Rosen (1980), for example, argues that economic theory in itself cannot fully describe the impact of income taxation on labour supply, given the existing conflict between income and substitution effects, suggesting that empirical research into the issue is desirable. The same applies to the effects of taxation on labour demand, as different factors influence the employer's final decision on the required number of employees. Therefore, extensive empirical research in this field is necessary. Recent figures for almost all the OECD countries confirm a declining share of labour costs (payroll expenses incl. benefits) in the national income, the OECD (2012a) report discussing the factors that explain this general downward trend in detail. It is thus reasonable to assume that the gradual substitution of labour for capital is partly due to increased taxation of the former while reducing taxes on the latter.

The empirical evidence of the labour effects of payroll taxes is ambiguous (e.g. Egebark and Kaunitz, 2010). The impacts of tax evasion, shadow economy and low-skill industries are to be taken seriously. In the legal labour market, however, higher income tax rates are generally assumed to lead to the decline in workforce (e.g. Davis and Henrekson, 2004; Antolič and Bojnec, 2006).

Research outcomes indicate that the burden of income tax and compulsory insurance contributions does influence the decision to become self-employed if the same amount of tax is not imposed on entrepreneurs. Higher taxes on employment raise labour costs, thus increasing the probability of taking up self--employment (Stabile, 2004).

There are several studies on the substitution between labour and capital, however, an overall conclusion cannot be made. Cerda and Larrain (2010), for example, suggest that due to the complementarity of labour and capital, higher corporate tax rates reduce the demand for both capital and labour. Behar (2010), on the other hand, found evidence of a strong labour-capital substitution potential. He suggested that the reduction in labour costs in relation to the cost of capital would expand the employment opportunities, while cheaper capital would reduce the demand for labour, warning against a frequently used argument that the lower cost of capital results in the employment growth.

Based on the above literature, we assume that there is a negative relationship between effective employee taxation and the number of corporate employees. Further, the ratio of employment costs to overall corporate costs can decrease because of the growth of investments in equity at the expense of those in labour. Higher effective taxation of employees, on the other hand, can increase its share of total corporate costs. Therefore, the relationship between labour taxes and the proportion of employment costs to total costs is not clear enough.

The aim of this paper is to examine (reveal) the relationship between the effective taxation of labour and the number of employees and the ratio of employment costs to total corporate costs regardless of the company size and the level of a country's economy (i.e. these have to be smoothed away), evaluating the stability of such a relationship – if any – over the analysed period. This will contribute[2] to the current research on the above issue as well as companies' behaviour in different tax environments, especially their decision-making about investments in labour (as a key factor of production). The above defined aim requires a different approach than methods commonly applied in the field of studying relationship between labour taxation and labour supply (programme evaluation methodology, structural approach for modelling labour supply, the always-questionable attempts of causal modelling etc.).

We utilized the Amadeus database to aggregate the 2010 – 2013 data across 19 EU countries. To capture their economic development levels and different sizes of companies (i.e. to smooth them away), we used GDP per capita[3] (variable *GDPpc*) and revenue (turnover) figures, respectively, as the control variables.

The final effects of labour taxation on the labour markets differ for different groups of employees (low- vs. high-income, young vs. elderly, low- vs. high-skilled

[2] This paper should be seen as a *contribution* (not any kind of „*solution*") to research on companies' behaviour, which is the essence of descriptive approach.

[3] GDP per capita in PPS, index, EU-28 = 100.

ones in particular; see OECD, 2011). Other important factors, namely company size and sector classification, are discussed in the literature (e.g., Cerda and Larrain, 2010; Schwellnus and Arnold, 2008; Gawrycka, Sobiechowska-Ziegert and Szymczak, 2012). Impacts of the mix of taxes and compulsory insurance payments may differ considerably between various company groups, depending on their labour and capital intensity. Cerda and Larrain (2010) identified different company size-dependent effects of corporate labour and capital taxes. They conclude that the impact of changes in corporate tax rates on labour demand is significantly higher for large corporations, while small firms report a stronger influence on capital demand. Gawrycka, Sobiechowska-Ziegert and Szymczak (2012) argue that the reallocation of labour resources across sectors mitigates the overall impact of employment changes (caused, e.g., by technological progress) in the long run. The assumption that labour-intensive industries are more affected by an increase in secondary labour costs than capital-intensive ones seems reasonable in this context.

The above differences between specific employee groups and economic sectors are not included in the present study, their research being intended to continue. The company size aspect, on the other hand, is reflected in the companies' revenue as well as in the number of employees – the first dependent variable – affecting the relevance of the linear regression models constructed.

1. Effective Taxation of Employees in EU Countries

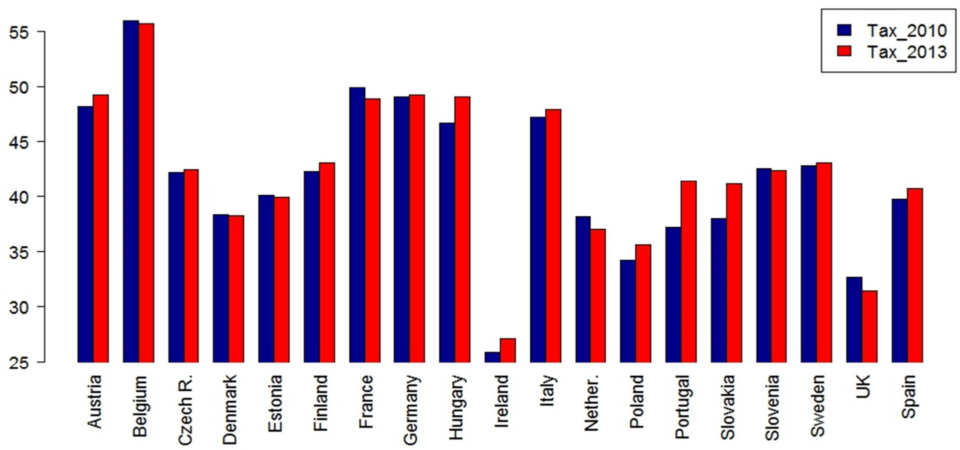
In most European countries, the taxation of labour is given great weight in the total tax mix. Some countries emphasize the role of social security benefits along with lower income tax rates (e.g., the Czech Republic, Slovakia), others put stronger emphasis on personal income tax (e.g., Denmark; cf. OECD, 2018). This distinction, particularly important in the government funding of social welfare schemes (tax-based or social security-based financing), is not determining for employers who are considering both income tax and mandatory insurance when calculating the final cost of labour.

Statutory tax rates give only limited information on tax burden levied on labour. Thus, different indicators to measure this particular tax are constructed. Among the most common ones, according to Pavel and Vítek (2005), are the ratio of labour tax revenues to GDP or to total tax revenues, and implicit and average (effective) labour tax rates. Carey and Tchilinguirian (2000) provide the methodology for determining average effective tax rates, drawing attention to its limitations, namely the income tax split between capital and labour. An alternative method for setting effective tax rates at a micro level, using the EUROMOD model, is provided by Immervoll (2004).

The effective taxation of labour differs with different income levels in most of the countries as progressive income tax rates are common in the EU countries. Even the states with the flat-rate tax system usually provide tax relief leading to a zero personal income tax for the lowest-income groups, other tax benefits being granted, for example, to married couples, people raising children, the disabled, etc. Social insurance contributions, on the other hand, are usually paid at the same rate regardless of the income level. The entitlement to insurance can be determined by the minimum level of income or/and the maximum amount of the assessment base is required in some countries in order to limit the effective taxation of high income earners.

For comparison of the analysed countries, as well as for further analysis, we decided to use the tax burden calculated as the percentage of income tax plus insurance premiums paid by employees and employers – calculated for a childless person with an average income – minus cash benefits, as provided by OECD (2015) (variable *Tax*). Due to the data (un)availability, only 19 EU countries were included in the present analysis so as to avoid mixing different datasets thus ensuring comparibility between the samples. In 12 of the selected countries, the effective taxation of labour was increasing throughout the analysed period, i.e. from 2010 to 2013, the highest growth being recorded in Portugal, Slovakia and Hungary. The remaining countries, on the other hand, experienced small degrees of decline in effective taxation, the most significant decrease being evident in the UK, the Netherlands and France (see Figure 1).

F i g u r e 1
2010 and 2013 Tax Burden as Percentage of Labour Costs



Source: OECD data.

Differences over the period between 2010 and 2013 are mainly driven by changes in personal income tax. In 2010/2011, in most of the countries surveyed, with the exception of the Netherlands and the UK, personal income tax was increasing (cf. OECD, 2012b). In 2011/2012 as well as in 2012/2013, however, a decrease in income tax was reported in nine and eight countries, respectively (OECD, 2013; 2014). Let us take the case of Portugal which recorded the highest income tax growth (by 3.54 percentage points, p.p.) from 2012 to 2013, the 2010/2011 increase (1.38 p.p.) having been to a large extent offset by a decline in 2011/2012 (–1.26 p.p.). Countries with the highest taxes on labour are still the same throughout the years under review, Belgium always on top, followed by Germany, Hungary, France and Austria (cf. OECD, 2012b; 2013; 2014).

2. Data and Methodology

All complete 2010 – 2013 company data available in the Amadeus database were collected for the present study, the 2011 – 2014 data not being exploited since the number of firms in question would be reduced considerably. The variables listed below were downloaded from the Amadeus database:

- Operating revenue (turnover; *T*) (in thousands EUR);
- Number of employees (*NoE*);
- Employment costs (in thousands EUR);
- Profit/loss before tax (in thousands EUR);
- NACE classification.

Additionally, we calculated (estimated) the total corporate costs as the difference between turnover and profit (or loss) and determined the ratio of employment costs to total costs (*REC*).

The resulting dataset was further modified by removing companies with the following characteristics in any year of the analysed period:

- Zero number of employees;
- Non-positive turnover;
- Negative employment costs;
- Higher-than-one ratio of employment costs to total costs.

The last three case characteristics can be conditioned by accounting or dataset errors or specific annual adjustments. Zero number of employees along with positive employment costs may be the result of additional payments to workers who are no longer employed in the company. Such data were thus considered inaccurate and, consequently, irrelevant for the analysis.

The final dataset consists of 993,772 companies, the numbers differing a lot between the countries, ranging from units to hundreds of thousands per country.

T a b l e 1

Number of Companies in Individual Countries

Country	Freq.	Country	Freq.	Country	Freq.	Country	Freq.
Austria	1,287	Finland	11,829	Italy	160,931	Slovenia	8,430
Belgium	12,866	France	59,112	Netherlands	1,086	Spain	273,916
Czech R.	46,079	Germany	20,836	Poland	2,201	Sweden	59,199
Denmark	2,006	Hungary	64,474	Portugal	168,985	UK	39,292
Estonia	19,678	Ireland	4,016	Slovakia	37,549		

Source: Amadeus database.

This purely descriptive research was carried out over the period of four years (2010 – 2013), aiming at a detailed understanding of the relationships between the variables as well as the development of these relationships in time. Generally, the descriptive statistics characterize and summarize properties of the given data-sets, using graphical charts, numerical measures and appropriate models. The statistical tools utilized in this paper were chosen to adequately describe the relationships between the variable *NoE* (or *REC*) and effective taxation (variable *Tax*), and between the economic development level (variable *GDPpc*) and company size (variable *T*). No inferential statistical tools were employed as, due to the sample size, all statistical hypothesis tests would have a great power, and thus any deviations from the null hypothesis would be presented as statistically significant regardless of having no practical significance. Another difficulty would arise from defining the population in question. Any statistical hypothesis test contains an implicit assumption about a population (its parameters, characteristics or the distribution of a random variable), the collected data being considered as a sample drawn from that population (i.e. a subset of the population). In the case of our data, it is rather unclear how such a population would be defined since the numbers of companies representing each country differ a lot (see Table 1) and the analysed data set is clearly not a representative sample from the population of all companies. It is arguable, however, that our data form a statistical population; in such a case, the use of inferential statistics would make no sense.

Our analysis is not intended to be either explanatory (causal) or predictive. In explanatory modelling, the values of a dependent variable are to be convincingly generated by an underlying causal function represented by a regression model indicating how the data were generated, i.e. how the dependent variable values change in response to changes in explanatory variables. The fact that there is always only one underlying causal function (for each dependent variable) makes any attempts for causal modelling very difficult and always-questionable. The regression models calculated as a descriptive tool for our data capture the relationships between variables in the dataset (via the partial regression coefficients), not allowing, however, to represent the underlying causal function since the dependent variables (*NoE* and *REC*) are affected by many other factors (variables) not included in the analysis. In predictive modelling, generating accurate predictions is a priority, the interpretability of the models applied playing a subsidiary role. The purpose of this paper, on the other hand, is to recognize and describe the relationships between statistical variables in the analysed dataset, the interpretability of our results thus being essential. Different principles apply in the construction of explanatory (causal), predictive and descriptive models. For the discussion of differences in regression modelling, see, e.g., Achen (2005), Shmueli (2010) and Berk (2010).

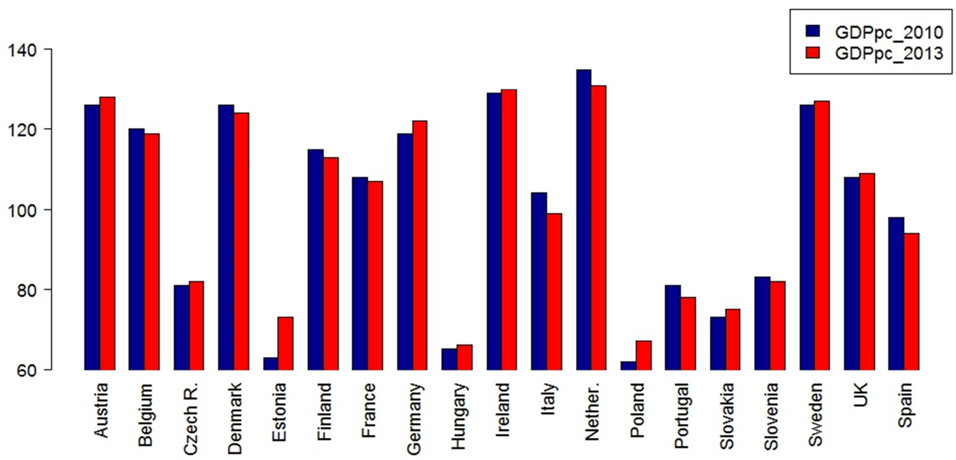
In our analysis we strongly emphasize the data-oriented discussion (which is, unfortunately, often neglected or even omitted in regression-based scientific papers) about the correctness of specification of the calculated regression models; the regression models presented in our paper thus correctly (truly) describe (reveal) phenomenons inherent in economics of the selected European countries.

3. Descriptive Analysis and Tentative Conclusions

We start our analysis by a simple overview of the data, emphasizing the *Tax* variable in previous chapter. In the case of the two variables which are constant for each country (i.e. *Tax* and *GDPpc*), a bar chart is an appropriate visual aid, allowing the changes in time to be seen too (see Figure 1 in previous chapter and Figure 2). For the remaining variables, we chose box plots as comprehensive and acceptable presentation (descriptive) tool (see Figure 3).

F i g u r e 2

2010 and 2013 GDP per capita in PPS

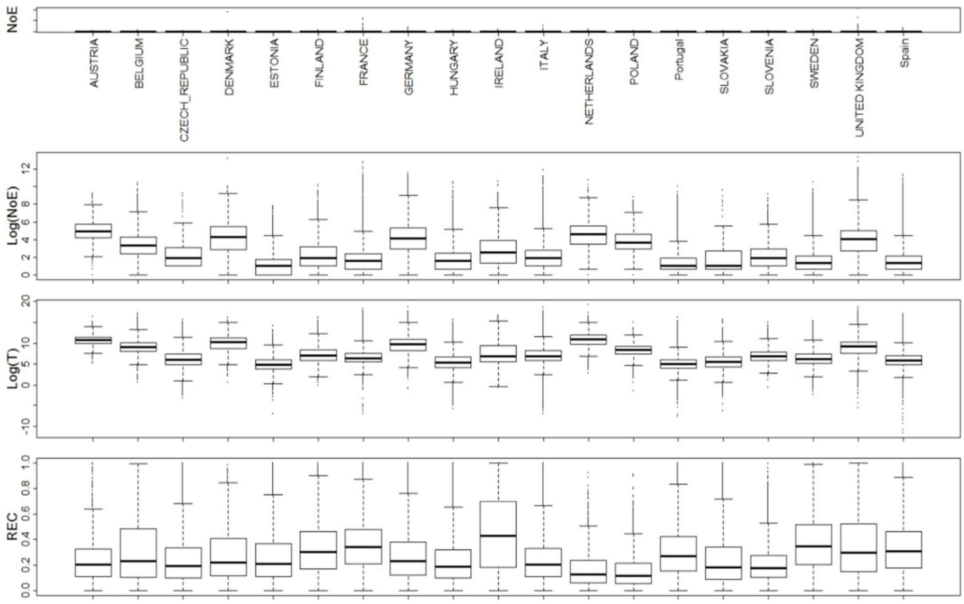


Source: Eurostat (2015).

Having chosen gross domestic product per capita as a benchmark of economic performance in each country, the respective annual *GDPpc* figures were taken from the Eurostat database. The ranking of countries is evident in the sample – Estonia, Hungary and Poland representing those with the lowest *GDPpc*, while the countries like the Netherlands, Ireland, Austria, Denmark and Sweden show high levels of *GPDpc*. Except Estonia and Poland, there are no remarkable relative changes between the first and the last years analysed.

Figure 3

2013 Country-specific Box Plots for Variables *NoE*, *NoE* Logarithms, *T* Logarithms and *REC*



Note: Thick horizontal lines represent the medians, the height of the boxes shows the interquartile range, horizontal lines below and above the boxes representing either the minimum/maximum value in the data set or 1.5 times the interquartile range – from the bottom and top of the boxes.

Source: Amadeus database.

The uppermost chart in Figure 3 is groundless as any representation of the variable *NoE* is utterly distorted by the biggest companies. The fact that some companies in the final sample are hugely larger than most of the remaining ones would also have a disturbing impact on the analysis of the relationships between *NoE* and other variables of interest. The same conclusions may be drawn for the variable *T*. In order to counter the largest companies' effect and to easily study the relationships between the variables, the two ones that are strongly affected by the company size (i.e. *NoE* and *T*) entered the analysis in the form of logarithms.

The charts for *NoE* logarithms and *T* logarithms (i.e. the second and third ones in Figure 3) show a similar pattern. If the median value for a particular country is low/high for one variable, it tends to be low/high for the other variable as well. Higher country-specific medians of these two variables indicate that in such a country larger companies (i.e. those with a higher number of employees and turnover) are relatively more represented in the final dataset than in that with lower medians.

The last chart in Figure 3 (variable *REC*), on the other hand, contains no such obvious information about the distribution of companies in terms of their size (there is not such a pattern as displayed in the two above-discussed charts). The Figure 3 last chart, however, shows that the highest median in concurrence with the highest variation was reported for Ireland. This cannot be explained by a low number of companies in this country (see Table 1) since, for example, Poland, which also has a relatively small number of companies in the final dataset, has the lowest median and variation scores.

Since two of the variables (namely *Tax* and *GDPpc*) are constant for each country, it is easy to explore the relationships between the other variables (i.e. *NoE* and *T*; *REC* and *T*) separately for each country. The countries can be considered as representatives of different levels/combinations of *Tax* and *GDPpc*. Because of very large sample sizes, it was not possible to draw charts showing every single observation (company). (Such charts would be confusing due to a number of points, not allowing to draw any relevant conclusions.) That is why we decided to describe and capture the relationships using the country-specific B-splines[4] with five degrees of freedom. The 2013 results are presented in Figure 4, each curve/colour representing a different country.

As for the dependent variable logarithm of *NoE* (see Figure 4 left chart), the described relationship is almost linear, the deviations from perfect linearity being very small for big companies (B-splines between the median and the 95 percent quantile of *T* logarithm are almost straight lines) and relatively large for small companies (B-splines below the median of the turnover logarithm are quite far from the straight lines). The approximate linearity of the relationship can be also demonstrated in the case of the other dependent variable *REC*, the largest deviations from linearity having appeared for Austria, Belgium, Ireland and the United Kingdom (see the four uppermost curves in the right graph in Figure 4, far from resembling straight lines).

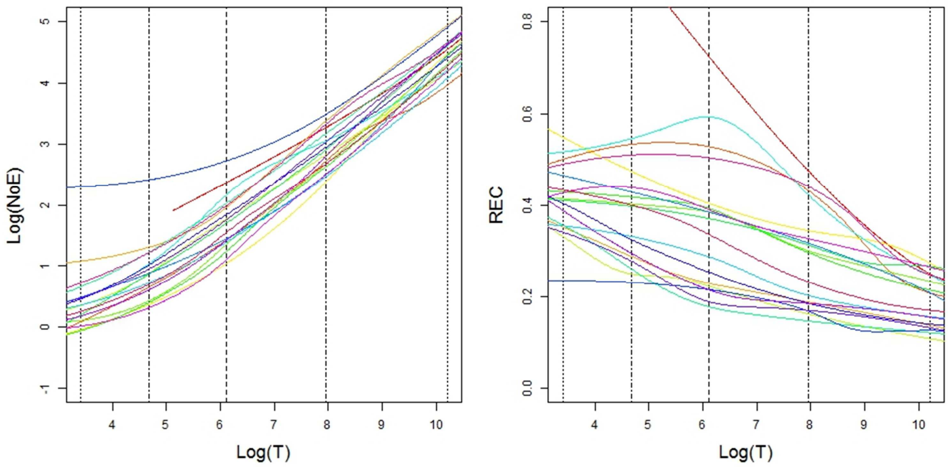
Another effective tool for the modelling of the relationship between the logarithm of *NoE* (and *REC*) and that of *T* are country-specific OLS[5] regression lines.

[4] Splines are flexible functions able to adapt themselves to data curve fitting, thus proving excellent in describing the nature (format, type) of the relationships examined.

Figure 4 confirms that the regression lines are proven models for our data. If the relationship between the two alternative dependent variables (logarithm of *NoE* and *REC*) and three explanatory ones (*Tax*, *GDPpc* and *T* logarithm) was perfectly linear, the country-specific regression lines would differ only in the intercepts, i.e. they all would have the same slope. The results shown in Figure 5 suggest that the linear relationships between the two dependent variables and the logarithm of *T* are similar in all countries (i.e. for different levels/combinations of *Tax* and *GDPpc*).[5]

Figure 4

2013 Country-specific B-splines



Note: (dashed, dot-dashed and dotted vertical lines referring to the median, 20% and 80% quantiles and 5% and 95% quantiles of turnover logarithms /in the whole data set/, respectively)

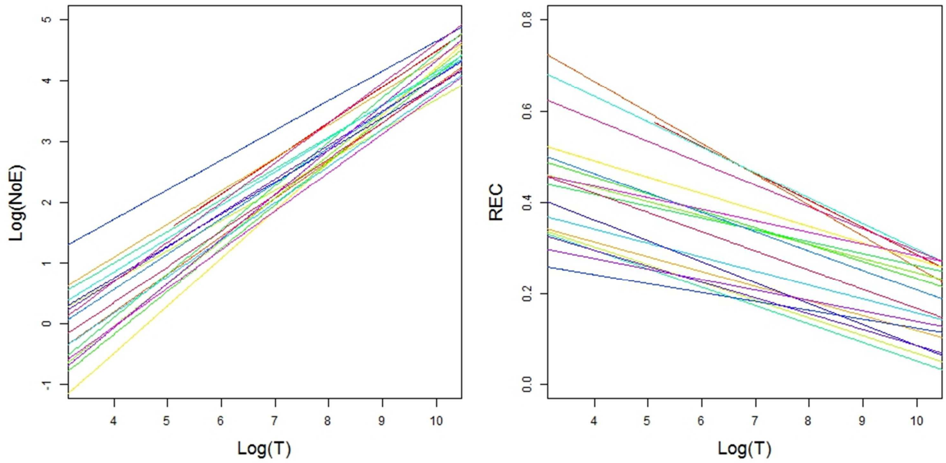
Source: Amadeus database.

Based on the above results, we may conclude that the relationships between the logarithm of *NoE* and that of *T* as well as between *REC* and the logarithm of *T* are approximately linear and (additionally) the country-specific OLS regression lines have almost identical slopes, differing only in the intercepts. These conclusions allow for the recognition and study of the nature (format) of the relationships in question in the whole dataset. It is possible to plot the intercepts of the country-specific regression lines as a function of *Tax* and *GDPpc* variables. The results together with the regression planes plotted are displayed in Figure 6. The regression line intercept of Austria was set to zero, the vertical *y*-axis showing the deviations of other regression line intercepts from zero.

[5] The regression parameters were obtained by the ordinary least squares method, an important detail being that in descriptive modelling the regression parameters are *calculated* (not *estimated* as there is nothing to estimate).

F i g u r e 5

2013 Country-specific OLS Regression Lines

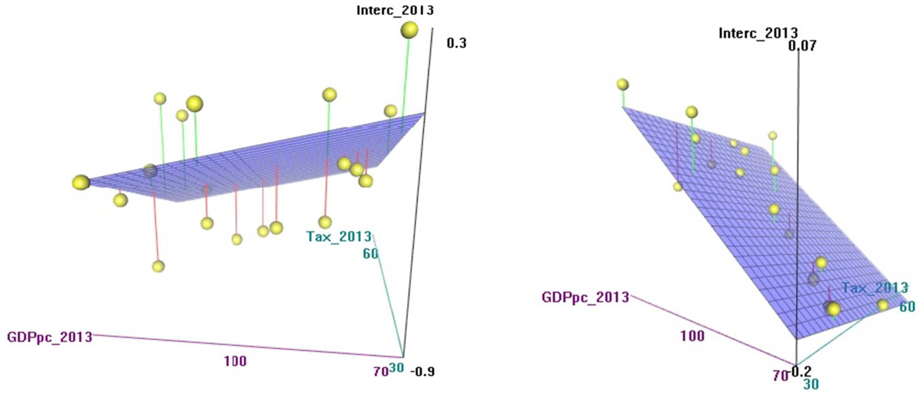


Source: Amadeus database.

If the relationship between the selected variables was perfectly linear, all 19 points (representing 19 analysed countries) would be lying exactly on the regression planes. As we can see in Figure 6, the regression planes fit the data presented here satisfactorily for both dependent variables (*NoE* – left, *REC* – right), the fit of the model being more adequate for the latter variable.

F i g u r e 6

2013 Relationship between Country-specific Regression-line-intercept Deviations (from zero; *y*-axis) for *NoE* (left chart) and *REC* (right chart), *Tax* (*x*-axis) and *GDPpc* (*z*-axis)



Source: Amadeus database.

In view of the foregoing description, it can be finally concluded that the relationships between the analysed variables are approximately linear, linear regression models thus being appropriate (despite their weaknesses; see Figures 4, 5 and 6 again). Multiple linear regression models suitable for the description of the linear relationships between the variables in our dataset were justified as follows:

$$\log(NoE) = b_0 + b_1 Tax + b_2 GDPpc + b_3 \log(T) \tag{1}$$

$$REC = b_0 + b_1 Tax + b_2 GDPpc + b_3 \log(T) \tag{2}$$

The same analysis as the 2013 one (results presented here) was also conducted using data from the years 2010 – 2012, leading to a similar conclusion on the appropriateness of multiple linear regression models (1) and (2). The OLS partial regression coefficients for models (1) and (2) calculated separately for the years 2010, 2011, 2012 and 2013 are displayed in Table 2.

Table 2 allows for some general conclusions. Based on mutually similar values of OLS partial regression coefficients, we may infer that the relationships described by multiple linear regression models were very similar for each year over the analysed period. Considering the sample size, on the other hand, we cannot conclude that the partial regression coefficients remained the same. Prior to factual interpretation, which follows in the next chapter, it is to be stressed again that even though in terms of average values the interpretation is correct, it fits for large companies better than for small ones as regards the first dependent variable (*NoE*), and – as far as the other dependent variable (*REC*) is concerned – may be relatively less accurate for Austria, Belgium, Ireland and the UK than for other countries.

Table 2

OLS Partial Regression Coefficients of Multiple Linear Regression Models

Year	**Dependent variable**	**Intercept**	***Tax***	***GDPpc***	**log(*T*)**
2013	log(*NoE*)	–0.20296	–0.01891	–0.01131	0.62069
2012	log(*NoE*)	–0.52458	–0.01450	–0.01099	0.63315
2011	log(*NoE*)	–0.59551	–0.01042	–0.01220	0.63540
2010	log(*NoE*)	–0.43977	–0.01548	–0.01123	0.63071
2013	*REC*	0.39870	–0.00409	0.00338	–0.03722
2012	*REC*	0.40155	–0.00386	0.00341	–0.03963
2011	*REC*	0.41170	–0.00412	0.00339	–0.04014
2010	*REC*	0.36142	–0.00369	0.00351	–0.03856

Source: Amadeus database.

Even though the variables *Tax* and *GDPpc* are constant for each country all the calculated partial regression coefficients presented in Table 2 (and their factual interpretation, which follows) are based on the variation in the whole data set (there is at least one variable not constant for each country on both sides of the regression model). For example a partial regression coefficient for the variable *Tax* shows an average change in dependent variable corresponding to labour tax higher by one percentage point for any (!) fixed levels (combinations of levels) of variables *GDPpc* and log(*T*).

4. Discussion and Conclusion

Strictly speaking, the present descriptive analysis has revealed hitherto unknown properties of a given data file (relationships between the analyzed variables), not allowing generalization of the findings. The results confirm our hypothesis about the relationship between the effective taxation of labour and the number of employees, the relationship being negative in all the years investigated. Also, the relationship between effective labour taxation and the ratio of employment costs to total corporate costs has proven to be negative, the outcomes being consistent throughout the research period too.

These findings are very valuable as the sign of the partial regression coefficient for the *Tax* variable in model (2) was not clear on the basis of the economic theory and thus was revealed by the analysis presented in this paper. Further, the rationalized constructed regression models (the partial regression coefficients) allow for the factual interpretation of the linear relationships between the analysed variables.

The negative relationship between the effective taxation of labour and the number of employees indicates that higher effective taxation corresponds with a lower number of employees, partial regression coefficients ranging from –0.019 in 2013 to –0.01 in 2011. An example for the year 2013 shows that the labour tax increase by one percentage point corresponds to, on average, a 1.9 percent decrease in the number of employees (i.e. the logarithm of the number of employees minus 0.019), assuming unchanged GDP per capita and the company's turnover.

The negative relationship between the effective taxation of labour and the ratio of employment costs to total costs means that higher taxation corresponds with a lower ratio of employment costs to total costs, partial regression coefficients ranging from –0.0041 in 2011 to –0.0037 in 2010. An example for the year 2011 indicates that the labour tax increase by one percentage point corresponds on average to the employment-costs-to-corporate-costs ratio decreased by 0.0041, assuming unchanged GDP per capita and the turnover of the company.

The level of effective taxation and turnover being held fixed, our analysis also revealed a negative relationship between GDP per capita and the number of employees and a positive relationship between GDP per capita and the ratio of employment costs to total costs. Generally, the more developed the country, the greater the share of wages in GDP since labour is shrinking and its price increasing. The above-described negative relationship could be caused by the replacement of human labour with new technologies of production in the developed world.

The size of the company affects the format of the relationships explored. According to the graphical diagnosis of the model (1) (left chart in Figure 4), the relationships for large companies (above the turnover median) are relatively better represented by the model (1) than those for small companies, the latter ones allowing for rather inaccurate or inappropriate interpretations. The same "warning" applies for Austrian, Belgian, Irish and British companies within the scope of the model (2). However, within the range of data the models yield reliable results, there is a positive relationship between the turnover and the number of employees and a negative one between the turnover and the ratio of employment costs to corporate costs (assuming a fixed level of effective taxation and GDP per capita in both cases).

The two findings revealing a negative relationship of effective labour taxation to both the number of employees and an employment-to-total-cost ratio meet the objective of this paper, Moreover, they are in line with the theoretical assumption of higher costs of labour leading to its substitution with capital and/or to a shift from employment contracts to other non-standard forms of work agreements (cf. Pavel and Vítek, 2005, and/or Stabile, 2004). According to Cerda and Larrain (2010), higher corporate tax rates reduce the demand for both capital and labour, since the factors are complementary to each other. Considering the corporate tax as an additional cost for the company, similar to labour tax, the present study outcomes indicate that higher effective taxation decreases labour demand, thus being consistent with Cerda and Larrain (2010). In general, our research results are aligned with the assumption that higher income tax rates cause workforce decline (see also Davis and Henrekson, 2004, and/or Antolič and Bojnec, 2006).

If we move beyond the descriptive analysis, assuming our dataset is a representative sample drawn from the population of all companies in the selected European countries, we can conclude that our research supports[6] the theory that companies react to the changes in the effective taxation of labour which is reflected in a reduction of the workforce and a lower ratio of employment costs to total corporate costs. Despite not being strong, the above relationship should receive serious attention of policy makers who decide on labour tax changes.

[6] Results of research presented in this paper should be seen as *support* (and not as *evidence*) for any generalizing conclusions.

Since the size of the company affects the mode of the studied relationships for the first dependent variable, the company-size-related analysis should follow. Sector analysis taking into account the factors of production, i.e. capital- and labour-based industry specifics, as well as a country-specific analysis will also contribute to a more detailed understanding of the issue.

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