

Unemployment and its Cost to Public Budgets in the Czech Republic in 2010 – 2015¹

Robert JAHODA – Jana GODAROVÁ*

Abstract

Within the EU, the Czech Republic belongs to the countries with unemployment below average. Therefore, it may seem that unemployment benefits and other direct costs connected with unemployment constitute a rather small expenditure. In our paper we show that this first impression is false. This paper comprehensively assesses the impact of unemployment on public budgets. Its contributions are as follows: (1) we discuss the methodological problems that are associated with particular methods of the impact calculation, and (2) we quantify the impacts for the Czech Republic budgets in the years 2010 – 2015 and compare them with other studies. Our results suggest that in 2015 the annual costs of unemployment reached EUR 9.064 per unemployed person. According to other studies, the nominal value of the costs is slightly higher than is the case in Slovakia (as a similar economy) and lower than the results for traditional European countries. The results are also lower when the costs are compared to average labour costs in the economy.

Keywords: *unemployment; social policy; public expenditure; tax revenue; economic modeling*

JEL Classification: C63, E24, H24, H55, J68

Introduction

Unemployment is a result of labour market imperfections. Problems can arise on both the demand side of the labour market (lack of demand due to wage regulations) and the supply side (inadequate qualifications or region-specific features

* Robert JAHODA – Jana GODAROVÁ, Masaryk University, Faculty of Economics and Administration, Department of Public Economics, Lipová 41a, 602 00 Brno, Czech Republic; e-mail: jahoda@econ.muni.cz; godarova@mail.muni.cz

¹ The authors are thankful to the Grant Agency of Masaryk University for the grant No. MUNI/A/1047/2015.

of unemployment). Unemployment causes economic losses to individual actors. Evidently, a family with unemployed members faces a decline in disposable income and may be at risk of poverty. It is also the state that is exposed to an economic loss. Public budgets spend money on social benefits to the unemployed and various labour market programmes. Moreover, a potential loss of tax revenue can be associated with unemployment. In this paper, we design, by using the available literature and data, the methodology for assessing the costs which can be associated with one unemployed person. We analyse these unit costs for the Czech Republic and years 2010 – 2015. The number of unemployed persons decreased by almost one third in that period (see the table in the Appendix) and we investigate how this development affected the annual change in the costs per unemployed person. The paper is organized as follows: The introduction discusses current approaches toward calculation where we focus particularly on methodology and results. In the following part we describe the structure of the costs which we take into consideration, and we propose our own method for indirect costs calculation. The results are presented, compared and discussed in part 2. We conclude with pros and cons of the obtained results and suggest questions for follow-up research.

Several studies were conducted in the Czech Republic in the past few years, dealing with the impact of unemployment on the performance of the economy or on public budgets as the case may be. In 2011, Čadil et al. (2011) published a study, the aim of which was to “*quantify the total costs that one average unemployed person generates in the general budgets of the Czech Republic*”. The authors propose their calculation methodology which is based, in particular, on the practical application of Okun’s Law. The additional methods are micro-economic modelling and the analysis of the available public sector costs related to unemployment. The authors divide the costs per unemployed person to direct and indirect costs. When calculating the total fiscal impacts of unemployment, they use the change in the number of (all) unemployed persons, but when establishing direct costs, they apply the concept of “the median unemployed worker”. The costs per unemployed person calculated by their methodology amounted to EUR 4,059 annually.² However, it should be noted that in their calculation the authors do not take into account some direct costs to the public sector (the comparison will be made in the result section of the paper, see the Table 4). Domonkos and Kónig (2015) used a similar methodology for direct and administrative costs calculation, but they introduced a critique of the validity of Okun’s Law for Slovakia. They used a method based on the propensity to consume

² The authors use the fixed exchange rate of CZK 27.00 = EUR 1.00 for all the years covered in this study.

for the calculation of indirect costs. According to their estimates, the average costs of one unemployed person ranged from EUR 4,811 to EUR 6,700 per year in 2012.

In 2006, the Ministry of Labour and Social Affairs of the Czech Republic (MLSA CR) had *The State Expenses per One Unemployed Person* study drawn up by the Elbona company (Elbona, 2006). It was an analysis of the impact of short-term and long-term unemployment conducted using the model of households structured by type. However, the authors themselves struggle with the aspect of the variable frequency of the household types in the entire target population of unemployed households. The average amount of the state expenses is then given by the simple arithmetic average of 720 households structured by type. The authors construct their calculations assuming full rationality of individual actors, which means that the individual gains all the benefits that he or she is entitled to in their full amount. In the area of indirect taxes, the authors work with expert estimates of the distribution of consumption expenditure. In their calculations, they further work on the assumption that the unemployed will finance their consumption partly from their savings. Elbona assessed the annual costs per unemployed person to be EUR 4,381 in 2005. Compared to the newer study discussed in the previous paragraph, the authors include the state payments made to the system of the public health insurance for the unemployed person and the average costs of the active employment policy in their calculation.

To complete the list of studies in the Czech Republic, it is also necessary to mention the results of the study conducted by the Czech-Moravian Confederation of Trade Unions (CMCTU) – which estimated the average expenses per unemployed person at EUR 4,463 – 9,081 (CMCTU, 2009), and the study conducted by the Ministry of Industry and Trade of the Czech Republic (MIT CR) – with estimated expenses amounting to EUR 6,344 (MIT CR, 2005); however, these studies do not provide details of applied methodologies.

An international comparative study brings significantly higher estimates. Gerard, Valsamis and Van der Beken (2012) compared six European countries (Belgium, France, Sweden, Germany, Spain and the UK) with yearly costs varying between EUR 18,008 and EUR 33,443 per unemployed person in 2010. Since these six countries have very different social protection and taxation systems, the authors' methodology is adapted to each country. In general, this methodology may be applied also to the other EU Member States. The authors in cooperation with national experts developed a model based on harmonized data from various sources (Eurostat Labour Market Database, MISSOC and OECD Tax Database). The costs of unemployment are divided into two parts: the public interventions for the unemployed (payment of unemployment benefits, guidance

of the unemployed and administrative costs) and the potential loss of revenue for the government (loss in the social contribution of employers and employees, loss in direct and indirect taxation).

1. Methodology and Data

1.1. The Structure of the Costs Associated with Unemployment and the Methods of their Quantification

In this paper, we divide the impacts of unemployment on the costs borne by the public sector into the following items:

- direct costs to the public sector,
- indirect costs to the public sector,
- other costs and impacts of unemployment.

Direct costs mean costs that appear in the accounts of the public sector. On the other hand, uncollected taxes, especially personal and corporate income taxes, and social and public health insurance contributions, or unpaid indirect taxes imposed on general consumption that cannot be collected from households with unemployed members due to the decline in their purchasing power can be considered to be indirect costs to the public sector. And last but not least, profits of traders, and hence also the taxes paid by them, decrease because of the multiplication effect of the decline in private consumption. The direct and indirect costs borne by the public sector are not necessarily the only costs related to unemployment. The following can also be included among the other public sector costs associated with unemployment: the cost of treating health complications associated with unemployment, the possible emergence of dependence on addictive substances (e.g. alcohol) with all the costs associated with it, the possibility of increased crime, etc. We do not quantify these other costs because it would be demanding and because the methodology would be considerably different; however, quite a detailed summary of these costs is provided in Helliwell and Huang (2011) or Elbona (2006).

Various approaches can be applied when calculating the costs of unemployment: macroeconomic, microeconomic, accounting, or statistical. The “*macroeconomic*” approach (used for example in Čadil et al., 2011) examines the impact of unemployment on the decline in GDP and related selected taxes. This approach can be used, in particular, to quantify indirect costs, but also some direct ones (payments of a social nature made by the State). The “*microeconomic*” approach (used for example in Elbona, 2006) calculates the impact of unemployment on public budgets using specimen households. This approach is particularly

suitable to quantify some of the direct and indirect costs, especially the indirect costs of tax nature for the model individual. However, without the knowledge of the statistical frequency of unemployment, the recalculation for the average unemployed person may be a problem. This approach is also easily applicable; its results can be presented in a simple manner. The “*accounting*” approach examines those public costs of unemployment that are directly connected with the implementation of public policies designed to reduce unemployment. Using this approach, we can exactly calculate a large part of the direct costs that are related to the costs of the system of State Social Support and Assistance in Material Need. However, this method does not reveal anything about the indirect costs. Its accuracy depends on the quality of the available data. The “*statistical*” approach to the calculation uses microdata from the available statistical investigations that compare the income and consumption options of similar households that differ in the number of unemployed persons. This approach enables to estimate the percentages of the direct and indirect costs (taxes and benefits) that are directly related to the unemployed person, but does not take into account other direct costs and broader tax implications for the economy. However, this approach has not been developed in detail in the conditions of the Czech Republic.

For the quantification of the average costs to public budgets in relation to unemployment, we used a combination of the above-mentioned approaches. Using the macroeconomic approach, we will specify, in particular, the lost tax revenues for the state in connection with unemployment. We will use the accounting approach, complemented by statistical approaches, to quantify the direct costs. In determining specific procedures, we will use such methods that will be easily applicable in the future and, when applied, will bring time-consistent results.

1.2. Direct Costs to the Public Sector

We divide the quantification of the average direct costs per one unemployed person into three parts: the employment policy costs; the welfare system costs; and the payments of contributions made by the State for unemployed persons. The total direct costs are the sum of the aforementioned three parts.

The conversion of the total costs registered by the MLSA CR (2016a) in the form of simple averaging, using the number of unemployed persons according to the Labour Force Survey by the Czech Statistical Office (see CZSO, 2016a), is used to calculate the direct costs of the employment policy.

The second part of the direct costs is made up of the cost of the Housing Allowance (part of State Social Support System; Act No. 117/1995 Coll.) and the system of Assistance in Material Need (Act No. 111/2006 Coll.). First we

calculated the proportion of the total costs of these social systems (MLSA CR, 2015; 2016b) that are paid out to the unemployed. For this we used the EU SILC data (2010 – 2015). In order to determine the costs per unemployed person we divided the resulting figure by the total number of the unemployed (CZSO, 2016a).

We suppose that this caused some inaccuracy and our estimate is likely to be higher than the reality. We would achieve greater accuracy by using administrative data on households with unemployed members, which is, however, not publicly available.

The third part of the direct costs consists of premiums payments into the system of Public Health Insurance, which are paid from the state budget for each unemployed person. Since 2010, the monthly payment per unemployed person has changed twice. At the end of 2013 it was increased from EUR 26.78 to 29.15, and in mid-2014 from EUR 29.15 to EUR 31.30, which corresponds to the payment of EUR 321.33 and EUR 362.67, respectively, per calendar year (Act No. 592/1992 Coll.) in the selected period.

1.3. Indirect Costs to the Public Sector

To quantify the indirect costs borne by the public sector, we use the macroeconomic model which assumes that employment of the unemployed will increase the level of GDP, thereby will also lead to increased tax collection. In our model, each employee contributes to the GDP with an amount which corresponds to his/her gross wage (hereafter referred to as wage). The following equation 1 shows in general the amount of additionally collected taxes when one unemployed person is employed.

$$\overline{TY^{UN}} = \overline{GDP^{UN}} * \overline{t.q.} \quad (1)$$

Where $\overline{TY^{UN}}$ is the average tax yield in the case when one unemployed person becomes employed, $\overline{GDP^{UN}}$ expresses the average increase in GDP in the case when an unemployed person becomes employed, and $\overline{t.q.}$ represents the tax quota. Tax quota is then defined as the ratio between the increase in tax revenues and the increase in GDP generated by employment of an average unemployed person. In the case of unemployed persons, we then consider two variants, *the maximum* and *the minimum variant*, of their possible contribution to the GDP formation when they become employed.

The maximum variant assumes that the contribution to the GDP made by an unemployed person who meets the *i* characteristics is the same as the contribution of an employed person of the same characteristics. The average contribution

to the GDP formation of the unemployed person ($\overline{GDP^{UN}}$) can be expressed as follows (see equation 2).

$$\overline{GDP_{MAX}^{UN}} = \frac{\sum_{i=1}^n UN^i * GDP_{MAX}^i}{\sum_{i=1}^n UN^i} = \sum_{i=1}^n \frac{UN^i}{\sum_{i=1}^n UN^i} * GDP_{MAX}^i \quad (2)$$

This variant is called *the maximum variant* since it assumes that the fact of unemployment does not have any effect on the potential economic performance of the person. The value of the UN^i represents the number of unemployed persons with the i characteristic, and the GDP_{MAX}^i is then the contribution made by this unemployed person to the formation of GDP. The contribution to GDP made by an employed person with the i characteristic is given by his/her average wage (AW^i) and the number of employed persons ($EMPL^i$) for all persons with the given i characteristic (see equation 3).

$$GDP_{MAX}^i = \frac{GDP}{\sum_{i=1}^n EMPL^i * AW^i} * AW^i \quad (3)$$

Among the basic i characteristics that are studied for employed and unemployed persons, whose wage characteristics we know, are gender, achieved education, and the field of activity according to CZ-ISCO. According to the above-mentioned method, an average employee contributed EUR 33,460 to the GDP in 2015. If employed, an average unemployed person would have contributed approximately 75 – 87% of the above mentioned figure to the GDP. His/her contribution is lower due to a generally lower level of his/her education and qualification, and it also slightly differs with regard to the applied characteristic in the calculation (for summary, see Table 2).

Basic information about the structure of employed and unemployed persons, as well as information on their wages in 2015 is shown in the following Table 1. However, due to a considerable extent of underlying data we present the information only for an average individual, without distinction between men and women, and only for the characteristic of educational attainment and the year 2015 (for more detailed data see the table in Appendix). All data used is from the Czech Statistical Office.

However, the assumption of a similar contribution to the GDP by both the unemployed and the employed person may be too unrealistic. Therefore, we also construct *the minimum variant* in addition to *the maximum* one. This variant is derived from the neoclassical microeconomic model, where a firm employs an additional worker only if the marginal revenue product is higher than the marginal cost of worker.

Table 1

Structure of Employed and Unemployed Persons and their Wages in 2015

Characteristic: highest educational attainment	Number of employees and their monthly gross wages [EUR]			Number of unemployed [thousands]
	number [thousands]	average wages	first decile wages	
Primary education	200.0	675.9	386.4	58.7
Secondary without GCE	1,775.6	789.1	423.6	108.5
Secondary with GCE	1,891.0	1,009.6	499.3	72.1
Post-secondary education	1,174.4	1,537.6	694.6	28.7
Total	5,041.0	1,030.0	454.7	268.0

Source: CZSO (2016b); CZSO (2016c).

Therefore, we assume that the marginal GDP contribution from the employment is exactly the amount of the marginal costs related to the employment of this person. On the labour supply side, job-search models imply the restriction that reservation wages are less than or equal to expected wages. Further on, Brown and Taylor (2013) showed that the elasticity of reservation wages with respect to unemployment duration is inelastic and negative. Their conclusion is in accordance with the existing literature. This is the reason why we associate the marginal cost (the potential wage) with the wage of the first decile of the wage distribution. While this decision might be seen as arbitrary, the first decile wage is monitored by the Czech Statistical Office for employees that have similar i characteristics (see the above Table).

At the same time, the first-decile wage was only 33% above the national minimum wage in 2015. In the model, the wage is marked as w_{1D}^i , and ssc is the amount of the compulsory premiums (percentage of gross wage) which the employer is legally obliged to pay. The schematic description of the relation is provided in the equation below (4). The average contribution to the formation of the GDP made by the unemployed person is similar as in *the maximum variant* – see equation (2).

$$GDP_{MIN}^i = w_{1D}^i * (1 + ssc) \quad (4)$$

When determining the average tax quotas, we again work with the two aforementioned basic variants. The following equations describe how the tax quota is calculated in order to determine the amount of the amount of taxes generated through employment of a previously unemployed person. Some variables are assumed to be zero, while other ones are based on expert estimates. This is so because, in the case of the latter, the determination of the exact amount would not increase the accuracy of the calculation and, at the same time, precise determination of the amount would be too complicated.

In the case of *the maximum variant*, we assume that the additional tax revenues from the GDP growth associated with employment of an unemployed person will be equal to the average tax quota of the respective state (see equation 5).

$$\overline{t.q.}_{MAX} = TQ_{CZ} \quad (5)$$

According to the Fiscal Outlook prepared by the Ministry of Finance of the Czech Republic (see MoF CR, 2015), the Czech Republic tax quota varied between 32.4% and 34.7% in the years 2010 – 2014. For the year 2015, we determined the tax quota as 34.0%.

In the case of *the minimum variant*, we construct the tax quota in a different way. Here we work on the assumption of the model unemployed person whose additional income from employment, which is also identical with the GDP created by this unemployed person, will fully translate into payments of direct (DT^i) and indirect taxes (IT^i) and into an increase in consumption (C^i) (see equation 6).

$$GDP^i = DT^i + IT^i + C^i \quad (6)$$

Additionally paid direct taxes are equal to the insurance paid by the employer (SSC_{er}^i), the employee himself or herself (SSC_{ee}^i) and the personal income tax (PIT^i). We assume (see equation 7) that the employer pays premiums equal to 34% of the gross wage of the employee, the employee contributes 11% of the gross wage, and the personal income tax is zero. The assumption of zero paid PIT derives from the fact that a single childless person with a wage below EUR 381 does not pay PIT. This threshold increases with the number of dependent children in the household, e.g. a tax payer with two children starts to pay PIT only when his/her monthly wage exceeds EUR 830.

$$DT^i = SSC_{ee}^i + SSC_{er}^i + PIT^i = w_{1D}^i * 0.11 + w_{1D}^i * 0.34 + 0 \quad (7)$$

Additional indirect taxes are given by an increase in consumption on the grounds of additional income when the person who was unemployed becomes employed. In *the minimum variant*, workers with the first-decile wage do not save up; all their additional income is transferred into consumption. These taxes consist of the value added tax (VAT^i) and excise duties (ED^i). Since we do not know the exact structure of consumption of the unemployed household, we assume that the additional consumption will be taxed at the average VAT rate of 19% (expert estimation). In the case of excise duties, we assume that the person does not buy any other goods subject to tax than those he or she consumes at the moment. We therefore assume that the extra revenue from excise duties is zero (see equation 8).

$$IT^i = VAT^i + ED^i = w_{LD}^i * 0.89 * 0.19 + 0 \quad (8)$$

In the *minimum variant*, corporate income tax (CIT^i) is considered to be zero, since marginal income from employment covers only a marginal labour cost of employment (see equation 4). The total tax quota of the person (see equation 9) is then given by the ratio of the sum of paid taxes and economic benefits from the unemployed person's employment.

$$t.q.^i_{MIN} = \frac{SSC_{ee}^i + SSC_{er}^i + PIT^i + VAT^i + ED^i + CIT^i}{GDP^i} = 46.2\% = \overline{t.q.^i_{MIN}} \quad (9)$$

The tax quota is higher in the case of the *minimum variant* than it is in the case of the *maximum variant*. At the same time, the additional tax revenue is calculated from a lower GDP in the *minimum variant* (compare equations 3 and 4). Since the main parameters of the tax system described in equations 7 and 8 remained the same between 2010 and 2015, we apply the tax quota of 46.2% for all the analysed years.

2. Results and Discussion

The following Table 2 presents our estimates of GDP creation per unemployed person, both for the maximum and the minimum variant. Whereas the maximum variant assumes that an unemployed person produces almost 80% of the GDP value of a standard employee, the minimum variant considers his or her GDP creation at between 22% and 25%.

Table 2

GDP Generated by one Unemployed Person when Employed, and the Related Indirect Costs

	2010		2011		2012		2013		2014		2015	
	nominal (EUR)	%	nominal (EUR)	%	nominal (EUR)	%	nominal (EUR)	%	nominal (EUR)	%	nominal (EUR)	%
GDP per average employee	29,982	100	30,386	100	30,617	100	30,591	100	31,730	100	33,464	100
GDP_{MIN}^{UN}	7,633	25	6,800	22	7,052	23	7,160	23	7,349	23	7,337	22
GDP_{MAX}^{UN}	24,077	80	24,391	80	24,161	79	24,291	79	25,343	80	26,594	79
Tax yield per average employee	9,711	100	10,184	100	10,429	100	10,613	100	10,774	100	11,378	100
TY_{MIN}^{UN}	3,527	36	3,142	31	3,258	31	3,308	31	3,395	32	3,390	30
TY_{MAX}^{UN}	7,798	80	8,175	80	8,230	79	8,427	79	8,605	80	9,042	79

Source: Own calculations.

Čadil et al. (2011) use a different model for GDP quantification, but they conclude (p. 631) that one unemployed person decreases the GDP by 73% of the average GDP per employee. Our calculations showed that the difference in indirect costs between the maximum and the minimum variant is negatively correlated with the total number of unemployed people. We find this finding logical. In years when unemployment is rather low (unemployed people are, on average, less qualified), the use of the maximum variant leads to an overestimation of the amount of indirect costs. On the contrary, in years with higher unemployment (the unemployed come from skilled workforce), the use of the minimum variant leads to an underestimation of the amount of indirect costs.

Table 3 shows the average annual costs per unemployed person for the years 2010 – 2015. *According to our calculations, the average cost incurred by the public sector that can be related to one unemployed person ranged between around EUR 6,096 and EUR 9,064 annually in the period 2010 – 2015.* This cost includes mainly uncollected taxes (38 – 54%) and the costs of all social benefits (28 – 37%). Our calculation does not include any administrative costs, which are not publicly available and which would slightly increase the average costs. Neither do we take into account the impact on the pension system and non-financial implications of unemployment in the total costs. *If we calculate in the maximum variant for foregone tax revenues, these costs increase by approximately EUR 5,050 yearly.*

Table 3

The Calculation of the Average Costs of Unemployment to Public Budgets for the Minimum Variant

	2010		2011		2012		2013		2014		2015	
	average costs (EUR)	%	average costs (EUR)	%	average costs (EUR)	%	average costs (EUR)	%	average costs (EUR)	%	average costs (EUR)	%
Direct costs (payments)												
of PEP	1,289	20	1,093	18	884	15	971	14	1,062	13	1,146	13
of AEP	596	9	403	7	247	4	427	6	731	9	1,335	15
other costs of EP	310	5	388	6	396	6	402	6	505	6	628	7
of the HA and SA	535	8	778	13	990	16	1,474	21	1,876	24	2,189	24
payments to the PHI	321	5	321	5	321	5	326	5	363	5	376	4
Indirect costs												
of direct taxes on labor	2,679	41	2,387	39	2,475	41	2,513	36	2,579	33	2,575	28
of indirect taxes	848	13	755	12	783	13	795	12	816	10	815	9
Total costs	6,578	100	6,126	100	6,096	100	6,908	100	7,932	100	9,064	100

Note: PEP – passive employment policy; AEP – active employment policy; EP – employment policy; HA – housing allowance; SA – social assistance; PHI – public health insurance.

Source: Own calculations.

It is necessary to be careful when interpreting the follow-up question on total costs for all unemployed persons, which are calculated by multiplying the average costs by the number of unemployed persons. Such estimate would be based on the assumption that all the unemployed are immediately and easily employable, and that positive economic benefits associated with their employment can be identified. However, these can be relatively strong assumptions, particularly in the case of long-term unemployed persons with qualifications that are not demanded by the labour market. This is the main reason why we are rather reluctant to present such estimates here.

The selected period saw not only the growth of the average cost per unemployed person, but also important changes in the relative weight of the various cost elements. While the costs of PEP were related to the inflows and outflows into and from unemployment, the costs of AEP were related to the government policy in this area and the total number of unemployed people. Without suggesting a causal relationship, there was a doubling of expenditure on AEP between 2013 and 2015, accompanied by a decrease in the number of the unemployed by almost 30%. A large relative increase of direct costs occurred in the part of social policy that is indirectly influenced by the level of unemployment. Social assistance and housing benefits sharply increased (up to 165%) between 2010 and 2015, and the vast majority of these benefits were directed to jobless households.

In comparison with the already mentioned studies for the Czech Republic, our estimates are rather high (see Table 4). Only the study of the Czech-Moravian Confederation of Trade Unions (CMCTU, 2009) arrived at figures that were even higher. This may be explained by several facts:

- Firstly, we estimate costs for the years 2010 – 2015. Due to the inflation and wage growth, the nominal values are higher than they were in studies for previous years.
- Secondly, the estimate is based on an assessment of a complex range of costs associated with unemployment. We used a wider range of costs than did the already mentioned studies.
- Thirdly, the estimate of the average costs is, to a certain extent, influenced by the used methodology. Where the previous studies worked with the registered unemployment rate, the calculated average costs were lower than in the case when the average unemployment rate from the Labour Force Sample Survey was used for the calculation. The previous studies do not discuss the total cost for the economy. If they did, their estimates would then be closer to the estimates presented in this study.

If only some of the costs are taken into account, the results of our study can be compared, for example, with the study of Čadil et al. (2011), which, however,

used a different quantification methodology for the estimation of the impact of unemployment on GDP. Taking into account the tax quota of 33.2%, the authors calculated the total indirect cost per unemployed person borne by the public budgets to be approximately EUR 2,720. This estimate is rather close to the estimate of indirect costs made in our study.

Table 4

Comparison of the Results of Quantification of Public Budgets Costs per Unemployed Person

Study	Year of the quantification	Estimated amount [EUR]	Costs not taken into consideration
MIT CR (2005)	2004	6,344	The study does not discuss the methodology of calculation.
Elbona (2006)	2005	4,381	<ul style="list-style-type: none"> • The administrative costs of PEP, AEP, payments of social benefits • A decrease in excise taxes due to a decrease in revenues and a related decline in consumer expenditures was not established because data was lacking • Impact on the expenditures of the pension system • Non-financial implications of unemployment
CMCTU (2009)	2009	4,463 – 9,081	The study does not discuss the methodology of calculation.
Čadil et al. (2011)	2009	4,059	<ul style="list-style-type: none"> • Benefits of the SSS and SA • Active employment policy • Payments made by the state to the general health care system • Administrative expenses • Impact on the expenditures of the pension system • Non-financial implications of unemployment
Gerard, Valsamis and Van der Beken (2012)	2010	BE 33,443 DE 25,550 FR 28,737 ES 19,991 SE 26,905 UK 18,008	<ul style="list-style-type: none"> • Only expenditures directly and uniquely linked to registered unemployed were taken into account in the model (training programmes are not taken into account) • Impact on the expenditures of the pension system • Non-financial implications of unemployment
Domonkos and König (2015)	2008 – 2012	SK 4,635 – 6,700	<ul style="list-style-type: none"> • Impact on the expenditures of the pension system • Non-financial implications of unemployment
Jahoda and Godarová (2016)	2010 – 2015	6,126 – 9,064	<ul style="list-style-type: none"> • Administrative expenses • Impact on the expenditures of the pension system • Non-financial implications of unemployment

Source: Authors and studies mentioned in the table.

In comparison, the results of the foreign study calculations (Gerard, Valsamis and Van der Beken, 2012) are higher in both the categories, direct and indirect costs. The difference is caused by two main reasons. Firstly, the Czech Republic

allocates significantly less funding to passive labor market policy. Although the unemployment rate was lower in Germany than in the CR over the whole period analyzed, unemployment benefits, expressed as a % of GDP, were significantly higher (e.g. six times in 2014). Higher GDP per capita then further increases costs in nominal units. We can see the highest proportion of unemployment benefits as a proportion of the total costs in Spain, where it reached 54% (it was only 28% in the CR in 2010). The lowest proportion can be seen in the UK. However, the related administrative costs in the UK are among the highest ones (10% of the total costs), and the same applies to Sweden (11%). Secondly, we could challenge the methodology of indirect costs calculation. These are calculated as the potential tax revenue from unemployed persons in the event of them getting a job for an average wage in the economy. Even though this is similar to the approach used in our analysis, we still believe that our minimum variant represents a more realistic method of calculation. Lastly, the total costs may be influenced by taking into account the administrative costs of unemployment. Due to differences in economic levels, it may be worthwhile comparing the average cost per unemployed person with average labor costs (i.e. average wage increased by the employer's premiums). These relative costs of unemployment are highest in Germany (90%), whereas they were 41 – 58% in the Czech Republic in 2010 – 2015. This is only slightly below the value in the UK (59%), which, in Gerard, Valsamis and Van der Beken (2012), represents the country with the lowest value.

Conclusion

The aim of this paper was to design a methodology for the calculation of the public sector costs which are connected to unemployment, since there is no one common methodology to be found in current literature. We identified two main reasons behind this fact. Firstly, unemployed persons constitute quite a heterogeneous group and therefore the costs per one unemployed person differ within this group too. Secondly, the cost structure is relatively rich and not all types of costs are easily obtained from the accounting systems of the public sector. For some costs, it is necessary to design appropriate economic models that are based on assumptions the portability of which between countries or over time can be problematic. Therefore, our methodology is prepared with respect to: (1) simplicity – the calculations can be replicated over a long-time period (in this paper we present the results for the years 2010 – 2015), and (2) the inclusion of the public sector costs in the most comprehensive perspective.

The results of our paper suggest that the average yearly cost per one unemployed person in the Czech Republic varied between EUR 6,096 and EUR 9,064

in the years 2010 – 2015. When the maximum variant for foregone tax revenues is used, the total cost will increase by approximately EUR 5,050. The relative weight of each part of the costs is influenced by the public expenditure on programmes connected to unemployment and the number of unemployed persons in the economy. These factors lie behind the fact that, in the selected period, the relative costs of activation policy and social benefit programmes grew, while the influence of indirect costs decreased.

Any time the costs of the unemployed are quantified, the question is raised about the potential use of the obtained estimate. Should it serve as a benchmark value for the costs of maintaining employees in employment? Or should we compare it with the costs associated with the return of unemployed persons to the labour market? In this context, are we to distinguish between short-term and long-term unemployed persons or the unemployed according to their education, knowledge or abilities? For example, our study suggests that in the case of a long-term unemployed person we may expect lower annual costs, but the costs are incurred over longer periods of time.

The authors of the study recommend continuing the examination of the issue in question and trying to refine the estimates in the following cases in particular:

- As for the indirect costs, we recommend quantifying more accurately the potential economic benefits of employment for different groups of unemployed persons.
- As for the direct costs, we recommend including the administrative costs of the operation of the social system related to unemployment and, at the same time, excluding those costs the relevance of which is rather marginal (e.g. supervisory and regulatory activities).
- Furthermore, as regards the direct costs, assessing the complex impact of unemployment on the pension system expenditure is recommended.
- And finally, with regard to the direct costs, using administrative data from relevant systems may provide a more accurate estimate, when computing the amount of social expenditures connected to the unemployed, than using data from the EU-SILC Survey.

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Appendix

Structure of Employed and Unemployed Persons in 2010 and 2015

Table 1

Characteristic: sex and highest educational attainment		Number of employees (thousand)					
		2010	2011	2012	2013	2014	2015
ALL	Primary education	238.3	221.4	209.1	207.1	204.8	200.0
	Secondary without GCE	1,884.1	1,869.1	1,809.9	1,790.1	1,758.2	1,775.6
	Secondary with GCE	1,861.7	1,841.0	1,846.2	1,836.8	1,875.7	1,891.0
	Post-secondary education	899.8	971.5	1,023.9	1,102.2	1,134.8	1,174.4
	Total	4,884.0	4,903.0	4,889.1	4,936.2	4,973.5	5,041.0
MEN	Primary education	101.1	92.4	91.0	97.8	97.5	96.6
	Secondary without GCE	1,266.9	1,245.5	1,206.6	1,190.5	1,163.9	1,164.9
	Secondary with GCE	920.6	911.2	925.6	913.3	953.6	963.1
	Post-secondary education	509.2	544.6	554.8	592.1	601.6	612.2
	Total	2,797.8	2,793.7	2,778.0	2,793.7	2,816.7	2,836.8
WOMEN	Primary education	137.2	129.0	118.1	109.3	107.3	103.4
	Secondary without GCE	617.3	623.6	603.2	599.6	594.3	610.7
	Secondary with GCE	941.1	929.8	920.6	923.5	922.1	927.9
	Post-secondary education	390.6	426.9	469.1	510.1	533.2	562.1
	Total	2,086.2	2,109.3	2,111.1	2,142.6	2,156.9	2,204.2

Source: Table 207/1 from CZSO (2016c) and similar tables from previous years.

Table 2

Characteristic: sex and highest educational attainment		Number of unemployed (thousand)					
		2010	2011	2012	2013	2014	2015
ALL	Primary education	79.5	71.2	83.4	71.5	58.1	58.7
	Secondary without GCE	174.0	157.0	157.3	163.3	138.2	108.5
	Secondary with GCE	104.5	97.1	96.0	102.9	94.0	72.1
	Post-secondary education	25.6	27.9	30.2	31.3	33.3	28.7
	Total	383.7	353.2	366.8	368.9	323.6	268.0
MEN	Primary education	37.1	35.9	42.1	35.3	29.7	28.9
	Secondary without GCE	95.0	84.0	83.2	83.6	71.2	57.0
	Secondary with GCE	45.0	38.6	39.1	42.9	35.8	26.8
	Post-secondary education	13.7	13.7	13.7	13.5	14.6	12.7
	Total	190.8	172.2	178.1	175.3	151.3	125.4
WOMEN	Primary education	42.5	35.3	41.3	36.2	28.3	29.8
	Secondary without GCE	79.0	73.0	74.1	79.7	67.0	51.5
	Secondary with GCE	59.5	58.5	56.9	60.0	58.2	45.3
	Post-secondary education	11.9	14.2	16.5	17.7	18.7	16.0
	Total	192.9	181.0	188.7	193.6	172.3	142.7

Source: Table 402/1 from CZSO (2016c) and similar tables from previous years.