

SLOVAK LABOUR LANDSCAPE: EXAMINING THE RELATIONSHIP BETWEEN GOVERNMENT EXPENDITURES AND UNEMPLOYMENT

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Abstract:

Research background: We all regard unemployment as a negative phenomenon. It can have a negative impact on the individual but also on society as a whole. In an effort to reduce unemployment, governments around the world are spending considerable sums of money on financing active labour market policy instruments that help unemployed people to reintegrate into the labour market. It is therefore highly desirable for individual governments to know whether the level of government spending on active labour market policy instruments can influence the unemployment rate in their country. The analysis of the relationship between unemployment rates and government expenditure is crucial not only for policymakers but also for all parties invested in the prosperity of the nation.

Purpose of the article: The main aim of this paper is to assess the correlation between government expenditures on active labour market policy and the unemployment rate in Slovakia.

Methods: In order to assess the impact of government expenditure on active labour market policy on the unemployment rate in the Slovak Republic, we use correlation analysis, specifically the Pearson correlation coefficient. The data needed for this analysis come from publicly available databases, and we focus our analysis on the period 2009-2021.

Findings & Value added: The Pearson correlation coefficient value provides information about the strength of relationship between government expenditure on active labour market policy on the unemployment rate. In this case, the value of the correlation coefficient was -0.469, i.e. it was an indirect moderate linear relationship. Based on the result of the statistical significance test of the correlation coefficient to be zero, i.e. statistically insignificant, and hence government expenditure spent on ALMP instruments and the unemployment rate in the Slovak Republic are uncorrelated.

Keywords: unemployment; Pearson's correlation; active labour market policy; Slovakia; government expenditures

JEL Classification: J08; J60

1. Introduction

Unemployment, an enduring economic challenge faced by nations worldwide, serves as an indicator of a country's fiscal and social well-being (Abouelfarag and Qutb, 2021). Unemployment is a multifaceted issue with extensive ramifications that extend beyond the confines of the employment sector. The ramifications of unemployment extend beyond the individual level, encompassing communities and societies at large (Fiori et al., 2016).

An increasing body of scientific research has established that job insecurity has adverse effects on a variety of parts of life (Fiori et al., 2016; Svabova et al., 2019). The psychological impacts of unemployment have been explored, for example, by Lim (2010), de Witte et al. (2012), the health impacts of unemployment have been addressed by Ronchetti and Terriau (2020), on self-perceived health (Ronchetti and Terriau, 2019), on mental health (Thill et al., 2019; Cygan-Rehm et al., 2017; Amin et al., 2023; Drydakakis, 2015), health of young people (Vancea and Utzet, 2017), the impact of unemployment on mental disorders, physical health and quality of life is examined in detail by Subramaniam et al. (2021), assessing the impact of unemployment on commercial firms is examined in a study by Zazdravnykh (2023).

Governments are faced with the intricate task of devising policies that promote economic expansion while also addressing the fundamental elements that contribute to unemployment. Government spending functions as a critical tool of fiscal policy, providing the government with the ability to regulate aggregate demand. Subsequently, employment levels, the distribution of national income, and economic growth rates are influenced by this control (El-Baz, 2016).

To alleviate unemployment, numerous initiatives are implemented in various nations as part of labour market policies. A common classification for these labour market indicators is between active and passive (Zielinski, 2015). Active labour market policies (ALMP) are widely implemented in order to improve the employment prospects of individuals who are unemployed (Crepon and Van Den Berg, 2016). Active labour market policies aim to retain employees, entice them to participate in the workforce, increase their wages and productivity, and improve labour market operations (Wisniewski, 2022). ALMP endeavours to address deficiencies in the labour market (Karasova et al., 2018). Passive labour market tools, which are designed to aid individuals in their job search and mitigate the risk of sudden income loss, have a defensive nature (Fossati et al., 2021).

A significant proportion of state expenditures are devoted to active labour market measures (Crepon and Van Den Berg, 2016). Constantly monitoring the quantity and effectiveness of these particular expenditures is an absolute needed (Banociova and Martinkova, 2017).

This article examines the relationship between government expenditures and unemployment, concentrating on the context of Slovakia. Slovakia, being a significant participant in the European Union, encounters the same economic obstacles that impact developed and emerging economies on a larger scale. The analysis of the relationship between unemployment rates and government expenditure is crucial not only for policymakers but also for all parties invested in the prosperity of the nation. The main aim of this paper is to assess the correlation between government expenditures on active labour market policy and the unemployment rate in Slovakia.

The structure of the paper is as follows, after an introduction to the problem addressed, followed by a review of the literature, followed by a description of the methods and data used in this study. The Results section presents the most important findings, i.e. the results of our investigation along with testing and validation of the hypothesis. The Discussion section compares the results of our study with those of studies dealing with similar issues and the last section, Conclusion, contains a brief summary of the whole paper.

2. Literature Review

There are now several academic studies that assess the impact of government spending on reducing unemployment in a country. Such an evaluation is also the focus of a recent study by Abouelfarag and Qutb (2021), who sought to examine the impact of government spending on unemployment in Egypt during the period 1980-2017. They use Johansen's cointegration test and an error vector correction model. The study by Yuruk and Acarolgu (2021) seeks to confirm or refute the validity of the Abrams curve hypothesis, which, in a nutshell, states that a large size of the public sector increases the unemployment rate in a country. Since the results of the analysis have shown the invalidity of the Abrams hypothesis, they recommend reducing the financial burden of government spending to fight unemployment in Turkey. For a sustained reduction in unemployment, active employment policies aimed at creating job opportunities should be a priority. Afonso et al. (2021) examined the relationship between government size and unemployment in eight large market economies such as Argentina, Turkey, Brazil and China. Based on the use of panel cointegration and causality, their results suggest the validity of the Abrams curve and demonstrate a long-run relationship between government size and unemployment rate in a country. However, this relationship depends on the methodology by which the size of government is measured. As long as government consumption expenditures and indirect taxes are taken as measures of government size, there is a fairly strong, positive and statistically significant relationship between government size and unemployment.

The impact of government expenditures on unemployment rates in two Baltic countries (Estonia and Latvia) is the subject of a study by Ozmen et al. (2023). Nepram et al. (2021) examine the relationship between government spending and unemployment rates in India using panel data analysis. In addition to government expenditure, the growth rate of state domestic product, level of education or per capita income were also entered as independent variables in this analysis. The study by Mahdavi and Alanis (2013), who take a closer look at selected US states, also examines the relationship between government spending and unemployment rates.

An assessment of the impact of government spending on individual labour market policies (in particular active labour market policies) on unemployment rates in OECD countries is the subject of a study by Hur (2019). He uses panel data for the period 2001-2013 for his analysis. By using panel regression and difference-in-differences analysis, it provides information on the performance of active labour market policies in reproducing unemployment rates. A study by Celikay (2023) looks extensively at social spending and its impact on chronic unemployment in OECD countries. These countries are typically characterised by different spending intensities and therefore it compares the effect of social spending on long-term unemployment rates in these countries. If there is an increase in the share of social spending in GDP, there will be an increase in the share of the long-term unemployed, i.e. those who have been unemployed for 12 months or more, in the total number of unemployed. Among the countries analysed, this interaction is most pronounced in those countries where social spending is high, such as Denmark, Sweden or Austria.

Azam et al. (2016) examined the relationship between military spending and unemployment rates in selected South Asian countries. While examining this long-run relationship, they also considered the impact of various macroeconomic variables such as foreign direct investment, GDP per capita, and population growth rate. The causality results suggest that there is an inverse causality between energy consumption, GDP per capita and population growth rate with unemployment rate in the short run.

The study by Liu et al. (2022) does not only focus on the impact of government spending on unemployment, but also acknowledges other factors that could affect unemployment, namely trade openness and institutional performance. The study focuses on countries belonging to the

Organization of Islamic Cooperation (OIC). As far as public expenditure is concerned, they find that it has an inverse and moreover significant correlation with unemployment in these countries.

3. Methodology

In order to assess the impact of government expenditure on active labour market policy on the unemployment rate in the Slovak Republic, we use correlation analysis. The data needed for this analysis come from publicly available databases such as Eurostat and the OECD database, and we focus our analysis on the period 2009-2021.

One of the variables that enters into our analysis is the unemployment rate. The values of this variable were obtained from the Eurostat database. Eurostat is the statistical office of the entire European Union, whose mission is to provide statistics of the highest possible quality (Eurostat, 2023).

The individual values of the unemployment rate that could be observed in Slovakia during the analysed period are presented in Table 1.

Table 1: Unemployment rate in the Slovak Republic during the period 2009-2021

Year	Unemployment rate [%]
2009	12.00
2010	14.30
2011	13.50
2012	13.90
2013	14.10
2014	13.10
2015	11.50
2016	9.60
2017	8.10
2018	6.50
2019	5.70
2020	6.70
2021	6.80

Source: Eurostat database

The second variable that enters the analysis is the amount of public expenditure that the Slovak government spends on active labour market policy instruments. This data can be obtained as a percentage of GDP. We obtained the GDP from the OECD website and the percentage of expenditure on ALMPs from Eurostat.

The amount of ALMP expenditures incurred by the Slovak government during the period analysed is shown in the Table 2.

We measure the correlation between government spending on ALMPs and the unemployment rate in Slovakia based on the Pearson correlation coefficient because both variables, i.e. the unemployment rate and the amount of government spending on ALMPs, are quantitative variables.

The covariance, due to its value being dependent on the scales of measurements for x and y, is frequently unsuitable as a descriptive measure of association. In order to render it a generally applicable measure of association, standardisation is necessary. The standardized measure of association is precisely the correlation coefficient. Different correlation coefficients exist to account for the unique attributes of dichotomous and ordinal variables, in addition to additional measures of association that can be applied to nominal and ordinal variables (Asuero et al., 2006).

Table 2: ALMP expenditure over the period 2009-2021

Year	GDP [million €]	Expenditure on ALMP [% of GDP]	Expenditures on ALMP [€]
2009	64,095.50	0.25 %	160,238,750.00
2010	68,764.90	0.32 %	220,047,680.00
2011	71,785.80	0.28 %	201,000,240.00
2012	73,649.30	0.25 %	184,123,250.00
2013	74,492.80	0.22 %	163,884,160.00
2014	76,354.50	0.20 %	152,709,000.00
2015	80,126.00	0.19 %	152,239,400.00
2016	81,265.20	0.26 %	211,289,520.00
2017	84,669.90	0.23 %	194,740,770.00
2018	89,874.70	0.24 %	215,699,280.00
2019	94,429.70	0.23 %	217,188,310.00
2020	93,444.10	0.33 %	308,365,530.00
2021	100,255.70	0.17 %	170,434,690.00

Source: own elaboration based on data from Eurostat database and OECD website

The majority of studies in educational and psychological research use correlation coefficients, and the Pearson correlation coefficient in particular, either as the primary mode of analysis to test major hypotheses or as a secondary mode of analysis to provide background information on the relationships between variables of interest prior to or after a more complex statistical analysis (Onwuegbuzie and Daniel, 1999).

The correlation coefficient is generally based on the covariance of random variables and is a measure of linear dependence between variables. It is a statistical measure that expresses the strength of the linear relationship between a pair of variables (Varadaraj et al., 2021).

The correlation coefficient as such is meaningless to us unless we are able to interpret its value correctly. It is a scalar variable, that is, we classify the values of the correlation coefficient into several intervals that will give us the strength of the dependence between the variables, ranging from weak, to moderate, to strong dependence (Taylor, 1990).

One of the most important properties of the correlation coefficient is that it can take values from the interval $r \in (-1; 1)$, whereby the closer the value of the correlation coefficient is to 1 or -1, respectively, the stronger the linear dependence between the variables X and Y will be (Bhuiyan et al., 2021). A correlation coefficient value of 0 indicates no linear relationship between the pair of variables (Ratner, 2009).

If $r > 0$, i.e. the correlation coefficient takes a positive value, the variables X and Y are directly proportional dependent. If $r < 0$, i.e. the correlation coefficient takes a negative value, the variables X and Y are inversely proportional dependent.

To statistically verify the significance of the value of the correlation coefficient, we perform the test of statistical significance of the correlation coefficient. Using this test, the null hypothesis takes the following form:

H_0 : *The random variables X and Y are linearly independent, i.e. uncorrelated. Thus, the correlation coefficient can be considered as zero.*

What can be formally written as:

$$H_0: r = 0 \tag{1}$$

If the null hypothesis is rejected, we accept the validity of the alternative hypothesis, which is as follows:

H_1 : *The random variables X and Y are linearly dependent. Thus, the correlation coefficient can be considered non-zero.*

What can be formally written as:

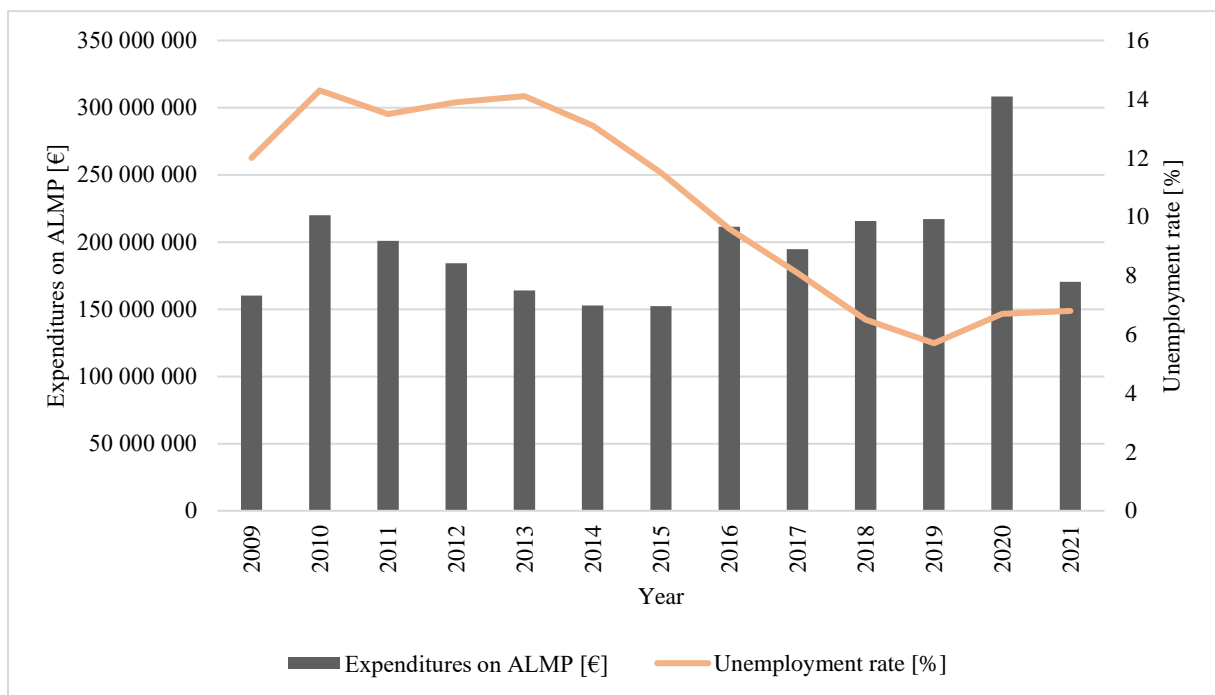
$$H_1: r \neq 0 \tag{2}$$

We test the significance of the correlation coefficient at the significance level $\alpha = 0.05$. The calculations are performed in the statistical software IBM SPSS Statistics version 26.0.

4. Results and Discussion

We used correlation analysis to assess the relative impact of government expenditure on ALMP instruments on the unemployment rate in the Slovak Republic. The actual development of the two variables analysed over the period 2009-2021 is shown in Figure 1.

Figure 1: Development of ALMP expenditures and unemployment rates in Slovakia for the period 2009-2021



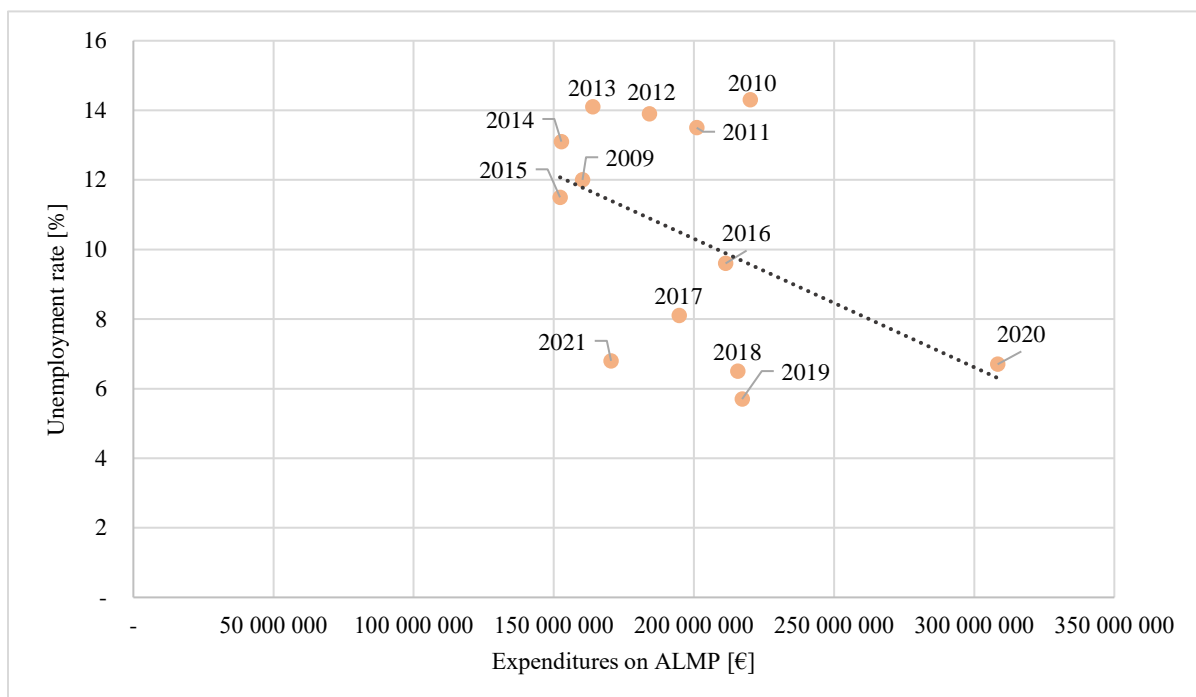
Source: own elaboration

For government expenditure on ALMP instruments to have a positive effect on the unemployment rate, i.e. to reduce it, it would mean that the trend of government expenditure and the unemployment rate would be exactly opposite. For government expenditure to have a positive effect on a country's unemployment rate, it would have to be increasing while the unemployment rate is decreasing.

However, Figure 1 shows that movements in government expenditure and the unemployment rate have been different. From 2009-2015, based on the movement of the two variables analysed, we would not be able to say unequivocally that government expenditure has affected unemployment in a "positive" sense. Since 2016, however, the situation is significantly different and the unemployment rate has fallen below 10 %, and there has been an increase in government expenditure during this period.

We have further illustrated the dependence of the unemployment rate on government expenditure on ALMPs with a dot plot for clarity. However, even from this graph, it is not possible to say unequivocally that as government expenditure on ALMPs increases, the unemployment rate in the country would fall.

Figure 2: Dependence of the unemployment rate on government expenditure for the period 2009-2021



Source: own elaboration

Since we cannot clearly assess the impact of government spending on ALMPs on the unemployment rate from Figures 1 and 2, the value of the Pearson correlation coefficient, which is reported in the table below, provides information about this correlation.

Table 3: Correlation coefficient and statistical significance test

		Unemployment rate	Expenditures on ALMP
Unemployment rate	Pearson Correlation	1	-0.469
	Sig. (2-tailed)		0.106
	N	13	13
Expenditures on ALMP	Pearson Correlation	-0.469	1
	Sig. (2-tailed)	0.106	
	N	13	13

Source: own elaboration

The value of the correlation coefficient is -0.469, which corresponds to a moderate linear relationship between the unemployment rate and ALMP expenditures. The negative sign of the correlation coefficient indicates an inverse linear relationship between the pair of variables analysed, which can also be seen in Figure 2. Table 3 also contains the p-value of the statistical significance test of the correlation coefficient. Since the p-value (0.106) is greater than our chosen significance level (0.05), we do not reject the null hypothesis that we set in the Methodology section. The value of the correlation coefficient is considered statistically insignificant and hence government expenditure on ALMP and unemployment rate can be considered uncorrelated with each other.

Zulhanafi et al. (2013) in their study concluded that national government spending can affect unemployment to a large extent. If there is an increase in government spending, for example, in order to improve infrastructure, which can lead to an expansion of output and an increase in the demand for the basic factors of production, one of which is labor - employment, that is, there will be a reduction in unemployment. Conversely, if government spending is reduced, the way in which products and services are produced will be reduced, i.e. the demand for the

elements of production will also be reduced, causing unemployment to rise. Saraireh (2020) found that long-term unemployment decreases if the government spends more on infrastructure, health and education. Another important finding was the existence of a negative relationship between government spending and unemployment in Jordan.

Nepram et al. (2021) examined the relationship between government expenditure and unemployment rate in India based on panel data analysis. In addition to government expenditure, the growth rate of state domestic product, education level or per capita income were also entered as independent variables in this analysis. Through their analysis they found that government expenditure increases the unemployment rate.

However, the empirical results of a study by Aboufarag and Qutb (2021), who used Johansen's cointegration test and an error vector correction model, suggest that government policy fails to reduce the unemployment rate in Egypt. Even the authors showed that an increase in gross government spending causes an increase in the unemployment rate, in the long term.

Azmi (2013) examined the impact of several variables such as unemployment rate, interest rate and government expenditure on GDP in Malaysia. From the correlation matrix developed, a negative relationship can be observed between the unemployment rate and the amount of GDP as the correlation coefficient was at -0.575776.

Kaderabkova and Jasova (2016) examined the relationship between the minimum wage and selected unemployment indicators in Slovakia and the Czech Republic. The average positive value of the correlation coefficient for selected unemployment indicators is 0.56 and the average negative value of the correlation coefficient for selected unemployment indicators is -0.64. That is, the negative correlation coefficient prevails, which confirms the claim that an increase in the minimum wage leads to a decrease in unemployment in the country.

A negative value of the correlation coefficient could also be observed in the study by Gibescu (2013). Which examined the relationship between GDP and unemployment rate in Romania. Its value is -0.819579515, which means a very strong relationship between the indicators. Its negative value means an inverse relationship between the two indicators.

A study by Netoiu et al. (2014) examines the relationship of key labour market indicators using correlation analysis. At the EU level, a strong and direct index dependence of 0.926 was observed between gross minimum wage and social protection, with a very low Sig level, indicating a high level of confidence in our correlation. The relationship between gross minimum wage and poverty in the EU shows a correlation coefficient of 0.933. It shows a strong and direct correlation with the level of these two indicators, with a very low significance level further reinforcing the importance of this correlation. The correlation between social protection and poverty in the European Union shows a correlation coefficient of 0.985. The correlation found in this case is a very strong, direct one. The Sig value was very low, indicating a high level of confidence in our correlation.

5. Conclusions

In this paper, we focused on the assessment of the correlation between the government expenditures that are spent by the Slovak government on the implementation of ALMP instruments and the unemployment rate in the Slovak Republic. For the analysis we worked with available data, which we obtained from Eurostat and OECD databases.

Correlation analysis was used to assess the correlation between pairs of quantitative variables. Since it was not possible to clearly assess the correlation between the variables from the graphical assessment, the Pearson correlation coefficient value provides information about the strength of this relationship. In this case, the value of the correlation coefficient was -0.469,

i.e. it was an indirect moderate linear relationship. To statistically verify the significance of the value of the correlation coefficient, a statistical test was performed and the p-value came out greater than our significance level (0.05), i.e. we did not reject the null hypothesis. Thus, we consider the value of the correlation coefficient to be zero, i.e. statistically insignificant, and hence government expenditure spent on ALMP instruments and the unemployment rate in the Slovak Republic are uncorrelated. Thus, from the above results it can be concluded that the expenditures made by the Government of the Slovak Republic on ALMP instruments aimed at reducing unemployment during the analysed period were not able to influence unemployment to such an extent that the negative value of the correlation coefficient found by us could be considered statistically significant.

The biggest limitation of this study can be considered the fact that we focused our attention only on the Slovak Republic. Therefore, in future research we would like to focus on a number of countries that are in some way interconnected, such as the V4 countries or the countries of the European Union. However, since unemployment in a country does not depend only on the amount of spending on ALMP instruments, it would be useful to investigate the interaction of several variables on unemployment and use, for example, one of the models for panel data.

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Data Availability Statement: Publicly available datasets were analyzed in this study. This data can be found here:

[<https://ec.europa.eu/eurostat/databrowser/view/teilm010/default/table?lang=en>]

[<https://stats.oecd.org/#>]

[https://ec.europa.eu/eurostat/databrowser/view/naida_10_gdp__custom_7842452/default/table?lang=en].

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