**УДК.001.201**

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# UNEMPLOYMENT AND ITS DETERMINANTS IN AUSTRIA

**Abstract:** This article examines the unemployment data in Austria. An econometric model is constructed and economic forecasting and methods of solving them using linear regression are obtained . Studies of the relationship between financial development and GDP, population growth in Austria in recent years.

**Key words:** Linear regression, OLS, GDP,correlation.

## Introduction

Recognizing the basic determinants of unemployment in Austria is essential for suitable and efficient government formation and for assessing the influence of public policy alterations and for evaluating such demand for unemployment rate. Additionally, unemployment plays direct role on productivity in the country. Over the last decades, interest of the human resource investment increased consistently, although there are some contradictory views, regarding constant increase of such expenditures. Therefore, the unemployment sector and its determinants is on the focus of

unemployment economists. In this paper, the main purpose is study and analysis the determinants of unemployment by applying OLS model.

Sections are organized as following. The first section provides brief information about previous researches regarding unemployment rate in various countries. The second one illustrates utilized data statistics and applied methodology. In last section, the result of OLS regressions test is discussed and summarized.

Methodology

| A | Unemployment rate | Gross domestic product constant prices | Wage and salaried workers, total (% of total employment) (modeled ILO estimate) | Foreign direct investment, net inflows (% of GDP) | Inflation average consumer prices | Population | General government revenue |
|---|---|---|---|---|---|---|---|
| 1990 | 7,998 | 511,604 | 50,32569 | 0,474527 | 60,317 | 55,511 | 40,675 |
| 1991 | 7,66 | 516,342 | 51,49 | 0,5399 | 65,967 | 56,457 | 40,857 |
| 1992 | 7,944 | 547,242 | 51,67 | 0,532629 | 70,073 | 57,394 | 42,2674 |
| 1993 | 8,368 | 591,253 | 52,07 | 0,376312 | 66,097 | 58,328 | 44,6526 |
| 1994 | 8,013 | 558,994 | 51,72 | 0,465222 | 104,54 | 59,259 | 45,9541 |
| 1995 | 7,109 | 599,186 | 52,15 | 0,522167 | 89,566 | 60,184 | 45,952 |
| 1996 | 6,124 | 641,172 | 52,7 | 0,39785 | 80,236 | 61,106 | 48,25 |
| 1997 | 6,318 | 689,437 | 53,44 | 0,424053 | 85,653 | 62,023 | 49,85 |
| 1998 | 6,373 | 710,757 | 53,8 | 0,34062 | 84,721 | 62,912 | 50,106 |
| 1999 | 7,155 | 687,564 | 53,45 | 0,305399 | 64,87 | 63,818 | 52,259 |
| 2000 | 5,997 | 735,235 | 54,25 | 0,357998 | 55,035 | 64,73 | 53,344 |
| 2001 | 7,804 | 692,959 | 53,35 | 1,661453 | 54,246 | 65,603 | 80,038 |
| 2002 | 9,764 | 737,639 | 53,99 | 0,450358 | 45,134 | 66,402 | 107,452 |
| 2003 | 9,925 | 780,15 | 54,65 | 0,541017 | 25,337 | 67,187 | 145,694 |
| 2004 | 9,688 | 856,573 | 56,03 | 0,681136 | 8,599 | 68,01 | 177,408 |
| 2005 | 9,213 | 933,599 | 57,54 | 1,981204 | 8,179 | 68,861 | 213,357 |
| 2006 | 8,725 | 998,465 | 58,9 | 3,623502 | 9,597 | 69,73 | 265,328 |
| 2007 | 8,897 | 1048,823 | 60,46 | 3,235842 | 8,756 | 70,586 | 279,79 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 2008 | 9,849 | 1057,371 | 60,99 | 2,576506 | 10,444 | 71,517 | 316,381 |
| 2009 | 12,95 | 1006,372 | 60,03 | 1,322249 | 6,251 | 72,561 | 322,541 |
| 2010 | 11,035 | 1091,181 | 60,9 | 1,171054 | 8,566 | 73,723 | 379,056 |
| 2011 | 8,983 | 1213,394 | 61,71 | 1,92927 | 6,472 | 74,724 | 455,777 |
| 2012 | 8,316 | 1271,497 | 62,93 | 1,560831 | 8,892 | 75,627 | 511,349 |
| 2013 | 8,878 | 1379,394 | 64,07 | 1,416083 | 7,493 | 76,668 | 592,202 |
| 2014 | 9,897 | 1447,532 | 66,06 | 1,420412 | 8,855 | 77,696 | 650,203 |
| 2015 | 10,316 | 1535,607 | 67,14 | 2,228697 | 7,671 | 78,741 | 750,827 |
| 2016 | 10,915 | 1586,637 | 67,55 | 1,590791 | 7,775 | 79,815 | 853,769 |
| 2017 | 10,918 | 1705,666 | 67,27 | 1,302683 | 11,144 | 80,811 | 976,552 |
| 2018 | 10,907 | 1756,493 | 67,99 | 1,606352 | 16,332 | 82,004 | 1158,566 |
| 2019 | 13,731 | 1770,257 | 68,46 | 1,257943 | 15,177 | 83,155 | 1334,935 |
| 2020 | 13,147 | 1804,601 | 68,56895 | 1,087707 | 12,279 | 83,614 | 1456,632 |
| 2021 | 11,96 | 2009,486 | 69,4579 | 1,078807 | 19,596 | 84,68 | 1981,779 |
| 2022 | 10,761 | 2109,285 | 69,56987 | 1,064587 | 73,125 | 85,682 | 4153,757 |

To explain socioeconomic determinants of Austria's unemployment, several related and available data are utilized in the OLS regression as explanatory. Taking natural logarithm for unemployment and its determinants was require to reduce fluctuations and outliers and eliminate collinearity.

Therefore, OLS model is employed as following:

$$Ln\_unemployment_i = \alpha + \beta_1 ln\_GDP + \beta_{2Wage\ and\ salaries\ workers} + \beta_{3Foreign\ direct\ investment} + \beta_{4Inflation\ average\ consumer\ prices} + \beta_{5Population} + \beta_{6General\ government\ revenue} + \varepsilon$$

Unemployment's dependent variable and independent variable are gross domestic product, Wage and salaried workers, Foreign direct investment, Inflation average consumer prices, Population, General government revenue. It is derived from the labor force minus employed work. If normally defined as when a person wants to work but has no job.

The GDP is negatively related to unemployment. GDP is the market value of all services and goods produced in an economy. An increase in GDP creates employment opportunities and reduces unemployment. Inflation could also have a significant relationship with unemployment. There is a trade-off between inflation and unemployment, this trade-off indicates the Philip curve. The population is taken as total and has a positive relation to unemployment. Population expansion is followed by an increase by a labor force of the community which leads a substantial chunk of the population to unemployment.

The increasing population has severe implication on poverty also. The general government revenue has the positive effect on the unemployment because when its increase that means the percentage of unemployment will decrease. The foreign direct investments (FDI) also has the positive effect on the unemployment because when its increase that means the percentage of unemployment will decrease. In my mind wage and salaried workers has a negative impact to unemployment because when it rise the amount unemployed people also rise.

**Results and discussion**

Correlation and variables

| | Unemployment rates | domestic product | constant ptotal (% of total employment, | nıge | corpulativernment revenue |
|---|---|---|---|---|---|
| Unemployment rate | 1 | | | | |
| Gross domestic produc | 0,74698171 | 1 | | | |
| Wage and salaried wo | 0,76408046 | 0,982473362 | 1 | | |
| Foreign direct investm | 0,305494077 | 0,375154057 | 0,47357557 | 1 | |
| Inflation average consı | -0,663812207 | -0,571603568 | -0,674599323 | -0,67 | 1 |
| Population | 0,776754121 | 0,973682836 | 0,982268758 | 0,45 | -0,69 |
| General government re | 0,558157878 | 0,833442297 | 0,742221991 | 0,13 | -0,16 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Unemployment rate | | | | | | | |
| Gross domestic produc | | | | | | | |
| Wage and salaried wo | | | | | | | |
| Foreign direct investm | | | | | | | |
| Inflation average consı | | | | | | | |
| Population | 1 | | | | | | |
| General government re | 0,75 | 1 | | | | | |

So in my correlation table population is highly depend on GDP by 0.77 and 0.97.

Correlation is a statistical analysis that is used to check the intensity of the relationship between two quantitative variables. The result given in the table above shows how much one variable changes with the changes in other variables. It also provides the linear relationship between two variables. The correlation value changes between – 1 and +1 from the above matrix can be seen where unemployment shows positive relation to GDP, population, general government revenue, FDI, wage and salaried workers and negative relation to inflation.

| Unemploymentrate | Coef. | Std. Err. | t | P>\|t\| | [95% Conf. | Interval] |
|---|---|---|---|---|---|---|
| Grossdomesticproductconstant | -.0019602 | .0052158 | -0.38 | 0.710 | -.0126813 | .008761 |
| Wageandsalariedworkerstotal | .1651816 | .340925 | 0.48 | 0.632 | -.5355997 | .865963 |
| Foreigndirectinvestmentneti | -.6922714 | .3855796 | -1.80 | 0.084 | -1.484842 | .1002988 |
| Inflationaverageconsumerprice | -.0395247 | .0154516 | -2.56 | 0.017 | -.071286 | -.0077634 |
| Population | .0207266 | .1499534 | 0.14 | 0.891 | -.2875071 | .3289603 |
| Generalgovernmentrevenue | .0010304 | .000804 | 1.28 | 0.211 | -.0006222 | .002683 |
| _cons | 1.857342 | 15.55158 | 0.12 | 0.906 | -30.10939 | 33.82407 |

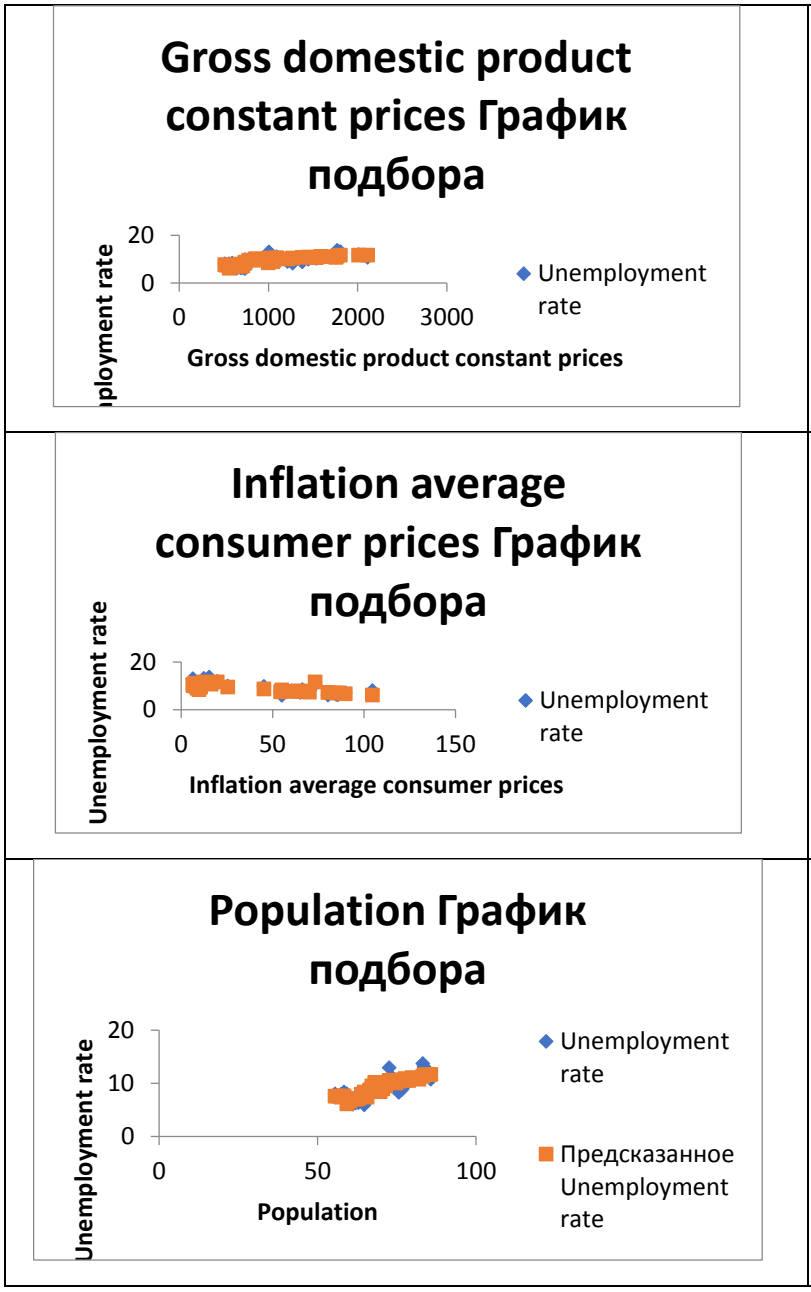
| Source | SS | df | MS | Number of obs | = | 33 |
|---|---|---|---|---|---|---|
| | | | | F(6, 26) | = | 9.83 |
| Model | 90.7745383 | 6 | 15.1290897 | Prob > F | = | 0.0000 |
| Residual | 40.0002698 | 26 | 1.53847192 | R-squared | = | 0.6941 |
| | | | | Adj R-squared | = | 0.6235 |
| Total | 130.774808 | 32 | 4.08671275 | Root MSE | = | 1.2404 |

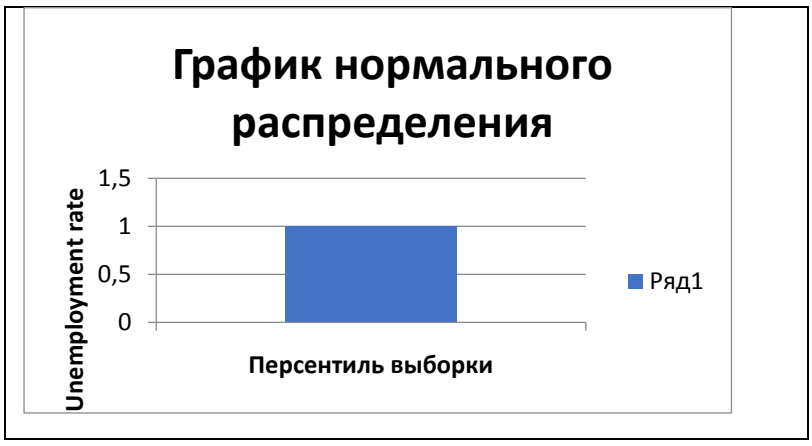
Before starting I want to mention that I've got the equation of regression like this:

***Y=-0.001 β 1+0.165 β 2+(-0.692 β 3)+(0.039 β 4)+0.207 β 5+0.001 β 6***

Unemployment has negative relation with the GDP,FDI, inflation, and positive result with wage and salaried workers, population and with general government revenue as shown in the table above. All variables are statistically significant R squared measures the goodness of fit, its value is 0.69 means that 0.69 variations in unemployment are explained by the under-study variables. The FDI foreign direct investment has a negative and significant impact on unemployment. The coefficient of FDI shows that there is a – 0.69 unit decrease in FDI. It has also a significant impact on unemployment. Inflation also has a negative impact on unemployment. The inflation coefficient shows that there is a -0.039 unit decrease in unemployment if inflation increases by one unit. GDP have a negative impact on unemployment. The unemployment decrease -0.0019 unit if GDP increase by one unit. Wage and salaried workers has positive and

significant impact on unemployment. The coefficient of Wage and salaried workers shows that that unemployment will rise by 0.16 units if Wage and salaried workers rises by one unit. The population has a positive and significant impact on unemployment. The coefficient of population shows that unemployment will rise by 0.020 units if pop rises by one unit. The general government revenue has also positive relation to unemployment. The coefficient of general government revenue shows that unemployment increases by 0.001 units if general government revenue increases by one unit. The results revealed that GDP,FDI, inflation has a negative and significant relation to unemployment, and wage and salaried workers, population with general government revenue has a positive relation to unemployment.






CONCLUSIONS

The paper analyzes the unemployment and its determinants in Austria using OLS model.

The underlying variables of the study show that unemployment is greatly affected by these variables and respond according to their relation. It is concluded from the results that to reduce unemployment in developing countries all developing economies should increase their GDP. Because an increase in GDP creates employment opportunities in the economy. An increase in inflation also reduces unemployment. Because high prices demand more money, and more money can only be generated by employment opportunities.

OLS Assumption

I. The coefficients or parameters and standard errors of regression model must be linear. If we consider the model $Y_i=\alpha+\beta_1X_1+\beta_2X_2+\beta_3X_3+\ldots+\beta_iX_i+\varepsilon$ all β coefficients and ε's power should be one.

II. There must be zero population mean value of disturbance term. Very closer to zero or zero values of population mean of residuals show right assumption.

III. There must be equal variance in residuals in which there must not be

heteroscedasticity problem. $Var(\varepsilon|X)=\sigma^2$ that is error terms in every X's must be equal.

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F(6, 26)          =      9.83
Prob > F          =    0.0000
```

IV. There must not be autocorrelation among observations of error terms. It is the case in time series data where present value of dependent value is correlated with previous year's value.

V. Residuals and explanatory variables in the sample must free of any correlation.

VI. There should be more number of observations in the sample than the number of parameters.

VII. There must be any changeability in explanatory variables in which the values of X must not be the same.

VIII. There must be correct model specification where the relationship of dependent and independent variablesshould correctly be modeled.

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