

THE DETERMINANTS OF UNEMPLOYMENT REVISITED – EMPIRICAL EVIDENCE ON OECD

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Abstract: *Unemployment is a serious economic problem that has repercussions for people, families, and entire civilizations. It is a dynamic phenomenon with immediate and long-term implications for individuals and society. As a result, understanding unemployment and its causes is critical for politicians, economists, and academics seeking to create effective measures to alleviate its harmful consequences. It is critical to acknowledge the complexities of unemployment to establish successful policies and programs that address its core causes. The goal of this research paper is to conduct a quantitative analysis of the main determinants of unemployment in The Organization for Economic Cooperation and Development, considering demographic, governmental, economic growth, and cultural factors, as well as the period of Financial and Economic Crisis (2008-2009), to determine their impact and the evolution of unemployment, which countries have the most promising results, and who are the outliers. As a result, during a 26-year period, pooled OLS, FEM, and REM methods have been applied to a panel database. Additionally, member states are clustered based on the factors of interest and subsampled depending on the year of joining the OECD. A comparative case study regarding the differences between European Union's and OECD's unemployment situation is presented as well. Previous research, on the other hand, has frequently concentrated on individual criteria, such as education level or job experience, without considering the larger economic, social, and political issues that might impact unemployment rates. Therefore, findings in this study are novel when compared to the previous literature in the subject, and they bring a new dimension to our knowledge of the unemployment phenomenon.*

Keywords: *unemployment; economic growth; OECD; panel data.*

JEL Classification: J6; J64.

1. Introduction

Unemployment is a very challenging and frequently disputed topic at both political and academic levels because of the difficulty of tracing its origins and determining

the best strategy, policies, and methods to address it. It can help minimize unemployment and its negative consequences for individuals and communities, such as poverty, social marginalization, and mental health difficulties, by doing so. These policies might include targeted job training programs, educational efforts to increase employees' abilities in high-demand industries, infrastructure expenditures to create new jobs and encourage economic growth and supporting measures like unemployment insurance and job placement services.

Unemployment can be produced by several variables, including cyclical, structural, and frictional ones. Cyclical forces are economic ups and downs that are frequently connected with company cycles. Businesses endure diminished demand for goods and services while the economy is in a slump. As a result, they frequently lay off workers to cut expenses and retain profitability. This results in a labour excess and adds to a rise in unemployment. Businesses, on the other hand, receive higher demand for goods and services while the economy is booming. This frequently leads to their hiring additional people, lowering unemployment rates. Moreover, demographic characteristics such as age, gender, education level, and geographic region are drivers of unemployment. For example, younger individuals may have trouble obtaining a job owing to a lack of experience, but elderly workers may face age discrimination.

The following is the framework of this paper: a literature review, an explanation of the data and methods utilized in my analysis, the results obtained and their interpretation, a comparative case study, concluding with a robustness check, conclusions, study limits, and future research directions.

2. Literature review

The mission of understanding what genuinely remains behind the evolution of unemployment entails delving into economic theories, and concepts experimentally proven by the great minds of economists. Human sustainable development obviously influences the unemployment curve, as demonstrated by Okun's law, which defines the link between GDP and unemployment. Farsio (2003) conducted numerous analyses, including the Granger causality, and the Chow stability test using U.S. data to offer a logical explanation for this link and found that unemployment is substantially negatively related to GDP. Another proxy for assessment of sustainable development is governance quality. Shabbir et al (2019) used a panel vector error correction model to explore the short- and long-term link between economic factors and the unemployment rate in South Asian nations, and discovered a direct relationship between weak governance and high levels of

unemployment. Sumaryoto et al. (2020) used the Human Development Index (HDI) to explain Indonesian unemployment and discovered a negative and significant association. Furthermore, if the HDI value in an area is great, the unemployment rate in that zone will be lower, and vice versa, if the HDI is small, the unemployment rate in that area would be higher. A special shelf in the previously conducted studies is dedicated to the income inequality, defined by Gini index. Authors such as Cysne (2009) worked on proving the positive relationship between inequality and unemployment using job search models: a modification of McCall's model. Population growth should be factored into future analyses, as it can increase landlessness and poverty. Ahlburg (1996) argues that population growth can influence poverty by influencing economic growth, income, income disparity, availability of education and health services, and the number and structure of households. This can affect income and well-being, and directly regulate the level of unemployment. Urbanization and population expansion can lead to higher unemployment rates in small towns and rural regions due to limited social networks and economic growth opportunities. Sato (2014) investigated the effects of urbanization by using Bellman equations and determining the optimum equilibrium and its efficiency. He concluded that interactions of smart and skilled people in urban areas enhance the development of person-specific human capital and increase the rate at which new ideas are formed, but only to a certain level. Life expectancy is an important factor in addressing unemployment, as well as health, psychosocial factors, and well-being. According to the Health Foundation UK (2019), better healthy life expectancy is closely associated with higher employment rates, particularly for males. Healthy life expectancy increases by around 5 years per each 10% increase in employment. Keynesian theory (1936) suggests that unemployment and inflation have an inverse relationship, and governments should manipulate fiscal policy to ensure a balance. Cashell (2004) discovered that unemployment below 5% leads to greater inflation rates. Hofstede's cultural dimensions suggest that a culture with a high-power distance Index score avoids questioning the authority of elders. Bazyl (2014) found that the more a population has control over its decisions, the lower the level of long-term unemployment is. This suggests that there is a negative link between unemployment and power distance index. Abdelrahim (2021) found that long-term oriented cultures focus on long-term outcomes and are cautious and determined to take hazardous decisions, making it easier to accept work and deal with unemployment.

3. Data and methodology

In this section of the study, justified theories experimentally proven in prior studies are used to the specific population of OECD, are described the research instruments, the explanatory variables chosen, and the findings gained via numerous trials of data processing. The overall sample is analyzed first, using simple and multiple regressions and the Fixed or Random Effects Method, followed by related research on subsamples and a cluster analysis using the prior study findings. A general overview on the unemployment evolution emphasizes that starting with the specified date 1996 the OECD's unemployment rate decreased drastically by roughly 3% until the Financial and Economic Crisis of 2008-2009, when it increased dramatically by 4%. After a smooth recovery, it recovered to pre-crisis levels in ten years, until 2020, when a dramatic spike occurred due to COVID pandemics.

The sample for this study consists of the 38 member countries of the Organization for Economic Cooperation and Development, for which the explanatory variables were chosen over a 26-year period (1996-2021).

To assess the influence of the governance quality and its effectiveness, Worldwide Governance Indicators are considered as relevant proxies when constructing the database but analyzing their strong correlation and hence the impossibility to include all the dimensions in one regression due to multicollinearity risk, the arithmetic mean is used as a generalized index.

Table 1 Independent variables included in the analysis and the expected relationships.

Indicator	Previously conducted studies	Expected relationship	Used proxy	Abbreviation	Sources
GDP capita /	Farsio (2003)	Negative	GDP per capita, PPP (constant 2017 international \$)	GDPcap	World Bank Database - World Development Indicators
Governance efficiency	Shabbir (2019)	Negative	World Governance Indicators (Control of Corruption, Governance Effectiveness,	WGI (CC, GE, PS, RQ, RL, VA)	World Bank Database - World Development Indicators

			Political Stability, Regulatory Quality, Rule of Law, Voice and Accountability)		
Population growth	Ahlburg (1996)	Negative / positive	Population growth (annual %)	Popgr	World Bank Database - World Development Indicators
Urbanization	Sato (2014)	Negative / positive	Urban population (% of total population)	Urb	World Bank Database - World Development Indicators
Inflation	Keynes (1936) Cashell (2004)	Negative	Inflation, consumer prices (annual %)	CPI	World Bank Database - World Development Indicators
Culture	Bazyl (2014) Abdelrahim (2021)	Negative / positive	Hofstede's cultural dimensions: Power distance, Individualism vs Collectivism, Uncertainty Avoidance, Masculinity vs Femininity, Long-term orientation, Indulgence vs Restraint	PDI, IDV, UAI, MAS, LTO, IVR	Hofstede Insights
Life expectancy	Health Foundation UK (2019)	Negative	Life expectancy	LE	World Bank Database - World Development

					nt Indicators
Poverty	Sen (1973)	Positive	Multidimension al poverty headcount ratio (% of total population) Poverty headcount ratio at national poverty lines (% of population)	Povmult Pov	World Bank Database - World Developme nt Indicators

Source: Authors' processions based on the specialized literature

4. Findings and discussions

An important step in assessing the influence of multiple factors on evolution of unemployment is the separate analysis of each potential determinant by placing them in simple linear regressions to further rank them according to their decreasing explanatory power – adjusted R^2 .

As confirmed by economic theory and literature review presented previously GDP per capita, World Government Indicator and Human Development Index show the sustainable development of a country, so it is peculiar to engage them in one regression with unemployment, also given their strong correlation (above 0.75). Initially as the starting point WGI was chosen, being a variable of interest to assess the influence of the quality of governance quality of OECD. After including other variables to the model, we found out that WGI as well as AHDI are strongly correlated with another predictors of interest. The model was rebuilt by using instead of WGI - GDP per capita to improve the further quality of the model and increase its predictive power. So, in further analysis will remain only the logarithm of GDP per capita, considering its highest R^2 and future implications with other determinants of interest. The second variable included is population growth, followed by population growth, power distance index. Life expectancy, even though increases the predictive power of the model, is avoided because of the multicollinearity risk, considering its strong correlation with GDP per capita (0.71). The further estimation follows by adding to the multiple regression long-term orientation and consumer price index. The remaining variables will be left out as they have either insignificant p-value or cause endogeneity issues, as in the case of poverty, which is a very debatable predictor, which is often viewed as a result rather than a cause of

unemployment. The cultural dimensions could not be added altogether to a multiple regression again due to multicollinearity issues. The correlation matrix is available at demand.

Table 2: Simple regressions

	1	2	3	4	5	6	7	8	9	10
Constant	45.891 ***	28.864 ***	31.841 ***	4.224 ***	8.653 ***	4.799 ***	8.077 ***	7.621 ***	13.836 ***	2.921 ***
Ln (GDP/capita)	-3.65 ***									
World Governance Indicator		-1.493 ***								
Life Expectancy			-0.307 ***							
Gini				0.109 ***						
Population growth					- 1.627 ***					
Power Distance Index						0.062 ***				
Long-term Orientation							- 0.007 ***			
Consumer Price Index								- 0.004 ***		
Urbanization									-0.081 ***	
Poverty										0.247 ***
R ²	0.1828	0.135	0.063	0.039	0.097	0.086	0.02	0.01	0.048	0.204
R ² adj.	0.1820	0.134	0.062	0.037	0.096	0.085	0.01	0.01	0.047	0.201

Source: Author's processing in Stata

Hence, there exists a positive relationship between unemployment and Gini Index, Power Distance Index and Poverty and a negative one between unemployment and GDP per capita, World Governance Indicator, life expectancy, population growth, Long-term Orientation Index and Consumer Price Index.

Table 3: Multiple regressions

<i>FULL SAMPLE</i>	OLS 1	OLS 2	OLS 3	OLS 4	OLS5	OLS6	OLS 7	FEM	REM
CONSTANT	45.89 1 ***	43.05 6 ***	38.88 1 ***	17.73 1 ***	23.96 4 ***	30.54 3 ***	29.193 ***	102.26 3	85.510
LN GDPCAP	- 3.650 ***	- 3.306 ***	- 2.986 ***	- 1.321 ***	- 1.695 ***	- 2.305 ***	-2.186 ***	-9.726	-7.488
POPGR		- 1.301 ***	- 1.255 ***	- 1.700 ***	- 1.772 ***	- 1.557 ***	-1.572 ***	-2.699	-2.632
PDI			0.017 **	0.035 ***	0.032 ***	0.031 ***	0.032 ***	omitted	-0.058
GINI				0.103 ***	0.078 **	0.080 **	0.081 **	0.306	0.190
LTO					- 0.023 ***	- 0.021 **	-0.021 **	omitted	-0.011
CPI						- 0.168 ***	-0.141 ***	-0.185	-0.162
Dcrisis_2008							0.351 **	Within R ² = 0.3928	Within R ² = 0.3863
Dcrisis_2009							0.492 *	Between R ² = 0.2318	Between R ² = 0.2029
R ²	0.183	0.243	0.248	0.252	0.268	0.283	0.291	Overall R ² = 0.2437	Overall R ² = 0.2238
R ² ADJ	0.182	0.242	0.246	0.247	0.262	0.276	0.282		
NO. OBS.	987	987	987	619	594	594	594	594	594
							Panel diagnosis: s:	chi2(4) = 21.71 Prob>chi2 = 0.0002 → FEM	

Note: *** means 1% significant coefficient, ** means 5% significant and * 10%. NS – not significant (above 10%); Source: Author's processing in Stata

All other things being equal, at an increase of 1% in the level of GDP per capita, the unemployment will decrease, on average, with -2.186 units. Once the power distance increases by 1 unit, meaning a less equal treatment of everyone and greater deference to a person of authority, the unemployment will increase, on average, by 0.032 units. One unit increase in the Gini index will lead to an increase of

unemployment by 0.081 units, on average, *ceteris paribus*. At an increase with 1 unit of long-term orientation index, which leads to a greater emphasize on long-term growth, unemployment will decrease by 0.021 units on average. If the Consumer Price Index increases with one unit, the unemployment will slacken with 0.141 on average, *ceteris paribus*. During the period of financial crisis (year 2008), the unemployment increased on average by 0.351 units and in 2009 average by 0.492 units.

4.1 Cluster Analysis

Based on the previously discovered explanatory factors, a cluster analysis is used to identify and classify nations with cossomparable traits in terms of these determinants. These average values are computed for each nation based on each predictor, changing the dataset from panel to cross-section. To ensure that all variables contribute equally to a scale, standardized values for the independent variables were subtracted from it and divided by its standard deviation. The variables have a zero mean and a unit standard deviation after being standardized. K-means is used to identify the clusters. Luxembourg behaves as an outlier and does not relate to a specific cluster, so it was excluded from the further analysis.

Table 4: Number of Cases in each Cluster

Cluster	1	5	Chile, Columbia, Costa Rica, Mexico, Turkey
	2	15	Australia, Austria, Canada, Denmark, Finland, Iceland, Ireland, Israel, Netherlands, New Zeeland, Norway, Sweeden, United Kingdom, United States
	3	17	Belgium, Czech Republic, Estonia, France, Germany, Greece, Hungary, Italy, Japan, South Korea, Latvia, Lithuania, Poland, Portugal, Slovakia, Slovenia, Spain
Valid		37.	

Source: Author's processing in IBM SPSS Statistics

The first cluster consists of nations with the greatest levels of unemployment, Power Index, inequality, inflation, and population growth, as well as the lowest levels of GDP per capita and long-term orientation. The second cluster exhibits divergent results, since it performs best in terms of unemployment, power distance, Gini index, CPI, and GDP per capita. The third cluster consists of average players in terms of the predictors mentioned previously, but who have the greatest Long-term Orientation ratings and the lowest population growth.

Principal Components Analysis was used to compress the information included in the variables studied to two components for a better depiction of the nations involved in cluster analysis.

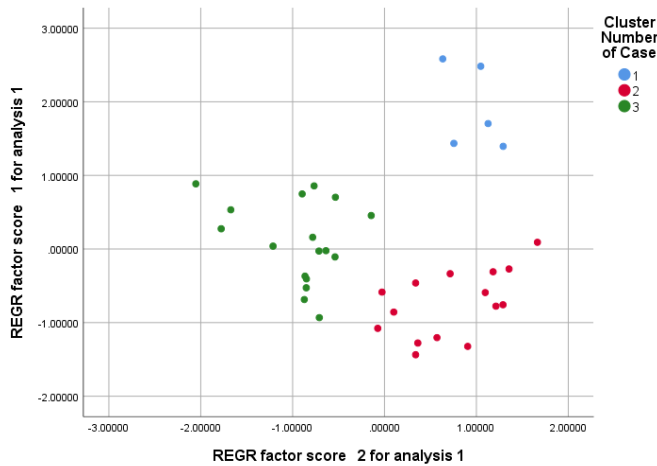


Figure 1: Representation of clusters
Source: Author's processing in IBM SPSS Statistics

5. Robustness checks

To check the results and to analyze the impact of the previously determined explanatory variables, OECD countries were divided, subsampled into 2 categories: old and new, based on the year of becoming a part of the organization. Founding members (Austria, Belgium, Canada, Denmark, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, Turkey, United Kingdom, United States) who signed the Convention in December 1960 are considered as Old members and the ones who joined later (Australia, Chile, Columbia, Costa Rica, Czech Republic, Estonia, Finland, Hungary, Israel, Japan, South Korea, Latvia, Lithuania, Mexico, New Zealand, Poland, Slovakia and Slovenia) as new members. According to the International Labor Organization and the United Nations report on the Global Social Situation, the global and economic crisis prompted substantial production contractions in all industrialized nations in 2009, leading to a substantial rise in unemployment, in 2007-2010.

The subsamples were analyzed considering the explanatory variables determined on the full sample. In 26 years, on average, the countries from the new subsample had greater rates of unemployment, inflation, long-term orientation, and power distance scores, as well as Gini index values, but a lower level of GDP per capita and population growth rate, confirming the previously found connections.

Subsamples verified the negative connections between unemployment, GDP per capita logarithm, population growth, long term orientation, and consumer price index, as well as the positive link with Gini index. The differing effect of the Power Distance index on unemployment is one of the discrepancies that happened. A more evenly distributed power for founding members will result in a greater unemployment rate on average, and the opposite for the ones who joined later. Only the old subsample is significantly impacted by the financial and economic crisis. The detailed results for pooled OLS, FEM and REM for the subsamples are listed in the table 5.

Table 5: OLS, FEM, REM for old and new subsamples

	OLD			NEW		
	(1) OLS	(2) REM	(3) FEM	(1) OLS	(2) REM	(3) FEM
Constant	41.8568 ***	70.3010 ***	58.1176 ***	136.2025 ***	146.9283 ***	159.5502 ***
Ln(GDP/cap)	-3.5443 ***	-6.6619 ***	-5.4663 ***	-11.1333 ***	-13.7002 ***	-13.6521 ***
Population growth	-1.6975 ***	-3.0773 ***	-3.0142 ***	-0.44115 **	-1.1104 **	-0.8474 **
PDI	0.0901 ***	(omitted)	0.0322 NS	-0.0665 ***	(omitted)	-0.0905 ***
Gini Index	0.0956 *	0.3629 ***	0.3084 ***	0.2526 **	0.0579 *	-0.1728 **
LTO	-0.0223 **	(omitted)	-0.0049 NS	-0.0189 ***	(omitted)	-0.0029 NS
CPI	-0.2153 ***	-0.2091 ***	-0.2022 ***	-0.183 **	-0.1449 ***	-0.1284 **
Dcrisis_2008	0.8948 **	0.5725 **	0.6334 **	1.09722 NS	1.1792 *	1.18097 *
Dcrsis_2009	0.1148 *	0.1310 *	0.1447 *	1.1078 NS	0.8336 NS	0.8289 NS
	R ² =0.457 6	WITHIN R ² =0.3927	WITHIN R ² =0.3913	R ² =0.40 2	WITHIN R ² =0.4669	WITHIN R ² =0.4503
	R ² ADJ.= 0.4453	BETWEE N R ² =0.4379	BETWEE N R ² =0.4785	R ² ADJ.= 0.3803	BETWEE N R ² =0.2709	BETWEE N R ² =0.4449
		OVERALL R ² =0.3843	OVERALL R ² =0.4136		OVERALL R ² =0.2402	OVERALL R ² =0.3586
	364	364	364	230	230	230

Note: *** means 1% significant coefficient, ** means 5% significant and * 10%. NS – not significant (above 10%);

6. Heterogeneity: comparison with EU-27

The present chapter's goal is to compare the impact of previously discovered explanatory factors on unemployment persistence in the 27 European Union member countries to the OECD.

OECD and EU-27 member countries followed the same trend throughout time, with the OECD achieving greater achievements in terms of unemployment and GDP per capita. During 1996-1997, the OECD had a faster population growth rate of roughly 3.78% and a lower Gini coefficient of 3 points on average. The EU-27 has a higher average Long-term Orientation and Power Distance Index score.

Table 6: Descriptive statistics of the variables included in the model OECD vs EU-27

Variable	EU27					OECD				
	Obs	Mean	Std. Dev.	Min	Max	Obs	Mean	Std. Dev.	Min	Max
Unempl	702.00	8.69	4.31	1.81	27.47	988.00	7.70	4.06	1.81	27.47
Gini	578.00	31.15	3.64	23.20	41.30	619.00	34.22	7.30	23.20	58.70
Popgr	702.00	0.21	0.83	-3.85	3.93	988.00	0.59	0.78	-2.26	2.89
GDPcap	702.00	37875.26	18800.18	9959.12	120647.80	987.00	38948.61	18190.05	9023.62	120647.80
CPI	702.00	4.92	40.76	-4.48	1058.37	988.00	3.46	6.55	-4.48	85.67
LTO	702.00	57.56	17.03	24.00	83.00	962.00	51.89	21.99	13.00	100.00
PDI	702.00	51.74	20.23	11.00	100.00	988.00	46.61	19.16	11.00	100.00

Using the same procedure as in the case of the OECD, each explanatory variable was included in a simple regression with unemployment to assess the explanatory power and significance of the coefficients separately and afterwards based on the individual significance and adjusted R^2 .

Table 7: Multiple regressions – EU-27.

	OLS	FEM	REM
Constant	19.7314	88.3478	-7.4429
LnGDPcap	-2.0709	-9.1185	-7.4429
Popgr	-0.6183	-1.7721	-1.5751
PDI	0.0191	omitted	-0.054
Gini	0.3096	0.5249	0.4222
R2	0.2506	Within: 0.3693	0.3689
R2 adj	0.2454	Between: 0.2476	0.2052
		Overall: 0.2347	0.2136
		Prob>chi2 = 0.0000 → FEM	

not significant for the EU-27 population.

The results obtained in the multiple OLS regression and FEM and REM confirm the findings obtained on the OECD population, negative relationship between the unemployment, GDP per capita and population growth and a positive association between unemployment, Power Distance and Gini Index. The Consumer Price Index, Long-term orientation's coefficients are

7. Conclusions

To summarize, unemployment is a huge concern for countries across the world, and study on the subject is critical to understanding its complicated and diverse character. The results obtained from the OECD, comparative study on the European Union, cluster analysis, and multiple regressions have provided insight on the link between unemployment and a variety of characteristics, including GDP per capita, inflation, inequality, culture, and demographic factors. The study also emphasizes the necessity of knowing how many factors interact with one another in affecting unemployment rates. The application of statistical approaches such as cluster analysis and multiple regressions aids in the identification of these complicated interactions and gives policymakers with insights that can help them make more successful policy decisions.

Overall, the findings highlight the importance of a complete and integrated strategy to address unemployment that takes into account many causes and their interconnections.

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