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THE IMPACT OF EXTERNAL DEBT, POPULATION GROWTH AND INFLATION ON UNEMPLOYMENT: EVIDENCE FROM DEVELOPING COUNTRIES

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Abstract

This paper investigates the relationship between external debt, population growth, and inflation with unemployment in 26 developing countries. The study uses data from 2010 to 2021 and panel data models (fixed, random, and pooled) to analyze the relationship between the variables. Results show that external debt has a significant and positive impact on unemployment across all three models. Similarly, GDP growth has a reducing and significant impact on the unemployment rate, which shows high employment elasticity of growth in the case of these 26 developing countries. Another important finding of the study is that foreign direct investment, inflation, and population growth have a non-significant impact on unemployment. The paper suggests robust macroeconomic policies and effective debt management in these developing countries to address the issue of unemployment.

Keywords: *External Debt, Unemployment, Panel Data, Panel Unit Roots*

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DIŞ BORÇ, NÜFUS ARTIŞI VE ENFLASYONUN İŞSİZLİK ÜZERİNDEKİ ETKİSİ: GELİŞMEKTE OLAN ÜLKELERDEN KANITLAR

Öz

Bu çalışma, 26 gelişmekte olan ülkede dış borç, nüfus artışı ve enflasyon ile işsizlik arasındaki ilişkiyi araştırmaktadır. Çalışma, değişkenler arasındaki ilişkiyi analiz etmek için 2010-2021 yılları arasındaki verileri ve panel veri modellerini (Sabit Etkiler Modeli, Rassal Etkiler Modeli ve Pooled OLS Modeli) kullanmaktadır. Sonuçlar, dış borcun her üç modelde de işsizlik üzerinde anlamlı ve pozitif bir etkiye sahip olduğunu göstermektedir. Benzer şekilde, GSYH büyümesinin işsizlik oranı üzerinde azaltıcı ve anlamlı bir etkisi vardır, bu da söz konusu 26 gelişmekte olan ülke için büyümenin istihdam esnekliğinin yüksek olduğunu göstermektedir. Çalışmanın bir diğer önemli bulgusu ise doğrudan yabancı yatırım, enflasyon ve nüfus artışının işsizlik üzerinde anlamlı olmayan bir etkiye sahip olmasıdır. Çalışma, işsizlik sorununu ele almak için bu gelişmekte olan ülkelerde sağlam makroekonomik politikalar ve etkin borç yönetimi önermektedir.

Anahtar Kelimeler: *Dış Borç, İşsizlik, Panel Veri, Panel Birim Kökler*

1. INTRODUCTION

Unemployment is one of the major macroeconomic problems faced by especially developing. In the last decade with an increase in debt borrowing and population, an increase in unemployment figures can also be observed in these countries (ILO, 2023). The increasing unemployment has been a major issue for both policymakers and researchers in these developing countries, while a similar situation can also be observed in developed countries. This reflects the importance of unemployment as a major indicator of the labor market, and the overall state of the economy in general.

Over the past decades debt financing has been a popular source of income and investment in developing countries around the world. The imperative of borrowing is justified by the gaps in the economy. Developing and underdeveloped countries are characterized by budget deficits and current account deficits (Alnaa and Matey, 2023; Bittencourt, 2012). To fill these gaps these countries, turn towards internal and external financing through borrowing. These external and internal borrowings accumulate over the time, increasing the debt burden on the economy, which takes a large chunk of the national cake for debt servicing. This leaves a lower capital for domestic investment and development spending which in turn shrinks the creation of job opportunities in the labor market (Hasan and Zaheer, 2022).

Population growth and inflation are other significant factors that impact unemployment. A higher rate of the population represents an increase in the labor supply, this leads to a surplus in the labor market thus, an increase in the unemployment in the economy. It is imminent that high population growth erodes employment opportunities, increasing unemployment in the economy (Wajid and Kalim, 2013; Aurangzeb and Asif, 2013).

Our study will explore the impact of external debt and population growth on unemployment in 26 developing countries. The reason to choose these countries is that firstly, these countries are high debt levels (both external and internal). Secondly, in the past few decades although these countries have shown good economic growth but unemployment in these countries is increasing. Thirdly, all these countries have a considerable amount of high population which we believe is one of the factors in impacting the unemployment rate in these countries. Lastly, these countries are characterized as middle, lower-income, and developing countries, analyzing these countries can pave the way for better policy solutions in similar countries.

An important contribution of this study is the focus on developing countries. Most economic research focuses primarily on developed countries, and research focusing on the dynamics of external debt, population growth, inflation, and unemployment in developing countries may be limited. This study provides insight into the interplay of these factors in the context of the unique challenges facing developing countries. Moreover, using data from 2010 to 2021, the study presents a contemporary time frame and provides current insights into the relationships between external debt, population growth, inflation, and unemployment. These time frames are important for understanding how these variables interact in the recent economic context of developing countries. Lastly, the study's specific findings, such as the significant and positive impact of external debt on unemployment and the high elasticity of employment growth for the 26 developing countries studied, provide valuable insights into the literature. Finding the marginal effects of foreign direct investment, inflation, and population growth on unemployment also adds nuance to our understanding of these relationships.

Panel data models will be used to estimate the impact of population growth, inflation, and external debt on unemployment, and to establish a relationship between dependent and independent variables. A summary of dependent and independent variables is given in Table 1 below.

2. BRIEF REVIEW OF THE LITERATURE

Cahyadin and Ratwianingsih (2020) studied the relationship between external debt, exchange rate, and unemployment in selected ASEAN countries (i.e., Indonesia, Malaysia, Thailand, and the Philippines). They found a causal relationship between external debt, exchange rate, and unemployment. Moreover, they concluded a co-movement link between external debt, exchange rate, and unemployment. Therefore, they emphasized on robust macroeconomic policies, such as pro-stability exchange rates, and efficient external debt risk management for these countries. Sajjad et al. (2018) in there on debt, and growth, and unemployment, found a negative relation between variables. They argued that if external debt is not utilized properly and managed effectively, it will become a huge burden on the economy. It is not only true for Pakistan but to other countries that are dependent on external financing.

Maqbool et al. (2013) found that external debt insignificantly impacts the unemployment rate in Pakistan. On the other hand, GDP, population, inflation, and FDI are significant determinants of unemployment in Pakistan. They concluded that an increase in GDP and FDI

has a decreasing impact on unemployment, while population growth and inflation have increasing effects on unemployment in the case of Pakistan.

Alnaa and Matey (2023) using a panel data model study, the relationship between unemployment and external debt in 25 sub-Saharan countries. They concluded a non-linear relationship between debt and unemployment. They argued that inefficient fiscal policies and embezzlement of borrowed funds by officials are the main causes of the increase in unemployment in these countries. Thus, for better management of unemployment, robust macroeconomic policies, sustainable growth, and investment are steppingstones for these economies (also see Doğru, 2013).

Shuaibu et al. (2021) used ARDL and ECM models to investigate the relationship. They concluded that a long-run relationship exists between public debt and unemployment in Nigeria. A positive and significant relationship exists between the variable, indicating an increase in the public debt increases the unemployment rate in the Nigerian economy. Interestingly, external debt causes more increase in the unemployment rate than public debt in the case of Nigeria. Furthermore, they did not find any significant relationship between inflation and unemployment in the case of the Nigerian economy.

Donaldson et al. (2019) in their study on household indebtedness and unemployment in the US, concluded that due to household debt overhang, households are required to work for a high-wage job. However, the limited supply of high-wage jobs in the markets leaves these households temporarily unemployed, increasing the overall unemployment in the economy. Thus, household indebtedness has a positive impact on unemployment affirming that an increase in household indebtedness increases unemployment in the US economy. Oshora et al. (2021) using time series data examined the correlation between economic growth, population growth, investment, and unemployment in the case of Ethiopia. The results revealed that an increase in unemployment is positively correlated but in the opposite direction to economic growth, investment, population growth, and working-age population. They concluded that COVID-19 coupled with political instability led to distress in the economy, disrupting security and investment, increasing unemployment, and decreasing economic growth in the case of Ethiopia. Moreover, they recommended that to address unemployment government must ensure political stability, sustainable economic growth, and infrastructural investment in the economy.

Folawewo and Adeboje (2017) studied the impact of economic growth and inflation on unemployment in West African countries. They found that economic growth has a reducing but insignificant impact on unemployment, indicating low employment elasticity of growth in the region. Moreover, they found that FDI and external debt has a weak negative impact on unemployment, indicating debt as a reducing factor in reducing unemployment, meanwhile, population growth has an increasing effect on unemployment. Meanwhile, they also found that labor productivity is positively related to unemployment, indicating a trade-off between labor productivity and employment. The study suggests that efficient macroeconomic policies with structural changes can play a major role in addressing the unemployment issues in West African Countries.

Barros (2022) investigated the relationship between inflation and unemployment in the US economy. He argued that the relationship between inflation and unemployment in the US is not a simple issue as it may appear in the Phillips curve interpretation. Political and institutional factors are pivotal when it comes to inflation and unemployment. Although, low rates of both are desired but in practice, there will always be some sort of trade-off between two variables in the short run, and policy regimes to keep the low may come at the cost of weakening the bargaining power of the working class and thus may lead to concentration income.

3. DATA AND METHODOLOGY

The study will follow a panel data analysis of 26 developing countries with data ranging from 2010 to 2021. The data for the variables are obtained from WDI, and IMF respectively.

Using (Doğan, 2012) and (Folawewo and Adeboje, 2017) the estimation equation for this study is as follows:

$$\boldsymbol{y_{it}} = \boldsymbol{\alpha \Gamma X_{it}} + \boldsymbol{\varepsilon_{it}} \quad \ldots\ldots. \ (1)$$

Where y represents unemployment, X represents the independent variables (determinants of unemployment), ε denotes the random errors of the model, i represents each country in the study, and t represents the year, i.e., t = 2010, ..., 2021. The extended form of the model can be written as:

$$\boldsymbol{Unemp_{it}} = \boldsymbol{\alpha_{1i}} + \boldsymbol{\alpha_2 GDPgr_{it}} + \boldsymbol{\alpha_3 FDI_{it}} + \boldsymbol{\alpha_4 Inf_{it}} + \boldsymbol{\alpha_5 PopGr_{it}} + \boldsymbol{\alpha_{it} EDS_{it}} + \boldsymbol{\nu_{it}} \ldots\ldots \ (2)$$

Where $\nu_{it} = \varepsilon_i + \mu_{it}$. ε_i represents the individual or cross-section error components, whereas μ_{it} represents the combined error component of time series and cross-section.

Equation (2) shows the relation between the dependent variable and independent variables. Where, unemployment (Unemp) is our dependent variable, and independent variables include GDP growth (GDPgr), foreign direct investment (FDI), inflation (Inf), population growth (PopGr), and external debt/GDP (EDS).

A summary of variables data source and definition is given in table 1 below. Data is obtained from World Bank (WDI), and International Monetary Fund (IMF).

Table 1. Data Source and Unit

Variables	Descriptions	Measurement	Sources
uenmp	Unemployment	Annual Percentage of Change (%)	WDI
GDPgr	Gross Domestic Product	Annual Percentage of Change (%)	WDI
EDS	External Debt to GDP Ratio	Annual Percentage Change (%)	IMF, WDI
FDI	Foreign Direct Investment	Annual Percentage of Change (%)	WDI
PopGr	Population Growth	Annual Percentage of Change (%)	WDI
Inf	Inflation	Annual Percentage Change (%)	WDI

4. RESULTS AND DISCUSSION

4.1. Unit Root Test

To determine the stationarity of variables, panel unit roots are applied. All the variables of the study are stationary at the level. (Levina et al., 2002) panel unit root testing has been employed because it allows intercept and trend to vary freely across the cross-sections and gives efficient pooled t statistics. Table 2 shows the unit root statistics for each variable of the study.

Table 2. Panel Unit Root Tests

Variables	t-statistic	p-value	Order of the Integration
Unemp	-9.7501***	0.0000	*I(0)*
Inf	-7.3785***	0.0000	*I(0)*
PopGr	-7.5660 ***	0.0000	*I(0)*
FDI	-7.0700***	0.0000	*I(0)*
EDS	-4.9697***	0.0000	*I(0)*

GDPgr	-3.1363***	0.0009	*I(0)*

*Note: *** represents significance at the 1% level, ** at the 5% level, and * at the 10% level respectively.*

As all the variables are stationary at the level i.e., I(0) thus, there is no need to test for the co-integration in the data.

As our data ranges from 2010 to 2021 (12 years). This implies that there is no need for testing cross-sectional dependence, and serial correlation, which are problem in macro panels with long time series (20-30 years) (Torres-Reyna, 2007). As for heteroscedasticity in the case of random effects model we employed Breusch and Pagan Lagrangian Multiplier Test for random effects and, the results are shown in table 3.

H0: Panel Homoscedasticity

Table 3. Breusch and Pagan Lagrangian Multiplier Test

	Var	**SD**
Unemp	32.71164	5.719409
e	3.318805	1.821759
u	24.56848	4.956661

Chibar2 (01) = 1.19526

P- value = 0.2385

As the P value for our test are greater than the 0.05 threshold level, thus we failed to reject the null hypothesis and conclude that panel data is homoscedastic.

4.2. Empirical Results

Hausman specification test (Hausman, 1978) is employed to determine whether a random or fixed effect model is preferable, results show that the random effects model is efficient and consistent for our data set. Although, we ran all three models (pooled, random effects, and fixed effects) our interpretation is based on the random effects model's estimates. Table 4 shows the results for the Hausman specification test and table 5 shows the estimation of the models.

Table 4. Hausman Specification Test

	Fixed Effects	Random Effects
Inf	0.001513	0.0013524
PopGr	-0.1701133	-0.3647821
FDI	-0.0042742	0.0364198
EDS	0.0333462	0.033537
GDPgr	-0.0627426	-0.0703557
Chi-squared	5.16	

p-value	0.3964	

Table 5. Panel Regression Estimates

	Random Effects	Fixed Effects	Pooled
Inf	0.00135	0.00151	-0.00170
	(0.40)	(0.45)	(-0.20)
PopGr	-0.365	-0.170	-1.058*
	(-0.94)	(-0.42)	(-2.38)
FDI	0.0364	-0.00427	0.606***
	(0.38)	(-0.04)	(4.04)
EDS	0.0335***	0.0333**	0.00806
	(3.31)	(3.19)	(0.68)
GDPgr	-0.0704*	-0.0627*	-0.314***
	(-2.28)	(-2.03)	(-4.20)
_cons	6.877***	6.777***	8.232***
	(5.57)	(8.86)	(7.62)
N	312	312	312

t statistics in parentheses (* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$)

In line with previous studies, inflation has an insignificant and weak positive relationship with unemployment. The small coefficient of 0.00135, although shows the presence of an opposite relation to the Phillips curve hypothesis, between unemployment and inflation, however, it is weak and negligible, indicating no relationship between unemployment and inflation in the long run (Shuaibu et al., 2021; Folawewo and Adeboje, 2017; Abugamea, 2018). Similarly, population growth and foreign direct investment have insignificant but opposite impacts (decreasing/increasing unemployment), contrary to prior expectations (increasing/decreasing unemployment) (Folawewo and Adeboje, 2017; Alisa, 2015). This may be due to an increase in migration to other countries from these countries due to better employment opportunities abroad. This, in turn, decreases labor force participation in the local labor market, thus impacting the unemployment rate negatively (Kreishan, 2011; Shabbir et al., 2020). For FDI most of these developing countries receive little to no FDI due to huge funds mismanagement, and official barriers such as high taxes, low security, and high political instability. These factors in turn impact employment opportunities adversely and increase unemployment in the local market (Strat et al., 2015; Alam et al., 2020).

As expected and consistent with previous studies external debt has a positive and significant impact on unemployment. This indicates an increase in external borrowing increases

unemployment in the economy (Cahyadin and Ratwianingsih, 2020; Alnaa and Matey, 2023; Siddiqa, 2021). A plausible explanation for this can be that as the burden of external debt increases, a large chunk of the national cake is vested in debt servicing. As a result, the spending on public sector development programs shrinks in the economy leading to lower employment growth and fewer employment opportunities and thus, an increase in unemployment in the economy (Trimurti and Komalasari, 2014). This indicates a need for robust long-term debt management in these countries. Borrowing with a simultaneous investment in development projects can create employment opportunities, thus, increasing employment in the economy and decreasing unemployment. Our findings are consistent with findings of (Shuaibu et al., 2021; Alnaa and Matey, 2023)

The estimated impact of GDP growth on unemployment is highly significant. A negative coefficient of -0.074 indicates an inverse relationship between GDP growth and unemployment, confirming the presence of Okun's law. This indicates that the growth in these developing countries is not jobless growth, rather with GDP growth more and more employment opportunities are created in the labor market (Maqbool et al., 2013; Oshora et al., 2021). Thus, sustained, and long-term economic growth can further stimulate the labor market acting as a catalyst for creating jobs in the market.

5. CONCLUSION and RECOMMENDATIONS

In this study panel data model techniques are used to estimate the relationship between inflation, external debt, population growth, and unemployment in 26 developing countries from 2010-2021. Panel cointegration tests are employed to check the long-run relationship between variables. The results show the existence significant long-run relationship between variables. Empirical analysis showed that GDP growth and external debt are significant determinants of unemployment for the 26 developing countries under study, meanwhile, inflation, FDI, and population growth are insignificant determinants of unemployment.

The study found a significant and negative relationship between GDP growth and unemployment, in line with the theoretical postulate of Okun's law. It means that higher and sustained GDP growth can drive down the unemployment rate and boost employment opportunities in these countries. The study confirms the findings of past studies such as (Maqbool et al., 2013; Sahnoun and Abdennadher, 2019).

Another important finding of the study is that external debt and unemployment have a significantly positive relationship. This indicates a trade-off between external borrowing and employment in these 26 developing countries. A higher external corresponds to higher unemployment, and lower employment, due to the huge burden of external debt servicing. This in turn shrinks the fund availability for developmental projects, thus shrinking the employment creation in the job market (Alnaa and Matey, 2023; Moosa, 2008). This indicates an urgent need for better debt management in these countries.

As regards to policy recommendations of the study, it is recommended that sustainable and long-term economic growth that has the potential to generate employment in these countries should be pursued. It is advised that these countries should follow economic growth with real production, boosting the manufacturing sector, and specific sectors special to each country. Moreover, diversifying the economy will also be effective in creating jobs in the labor market. Consequently, the countries should embark on growth policies that ensure sustainable and inclusive growth. The effective management of debt is another major policy emergency that these countries need to ponder. For employment creation, external debt should be managed properly and should be channeled toward sustainable and productive investment. Having proper accountability, transparency, and fund-utilizing schemes can minimize the embezzlement of funds and can contribute to job creation in the economy.

REFERENCES

Abugamea, G. (2018). *Determinants of Unemployment: Empirical Evidence from Palestine*, MPRA Paper. https://mpra.ub.uni-muenchen.de/89424/ (Accessed: 13th October 2023).

Alam, J., Alam, Q. N., & Hoque, T. (2020). Impact of GDP, inflation, population growth and FDI on unemployment:A study on Bangladesh economy. *African Journal of Economics and Sustainable Development, 3*(3), 67-79.

Alisa, M. (2015). The relationship between inflation and unemployment: A theoretical discussion. *Journal of International Business and Economics, 3*(2), 89-97.

Alnaa, S. E., & Matey, J. (2023). Dynamic relationship between external debt and unemployment in Sub-Saharan Africa. *Theoretical and Applied Economics, 1*(634), 137-152.

Aurangzeb, D., & Asif, K. (2013). Factors effecting unemployment: A cross country analysis. *International Journal of Academic Research in Business and Social Sciences, 3*(1), 219-230.

Barros, L. A. (2022). The relationship between inflation and unemployment in the USA in the surplus approach. *Atlantic Review of Economics (ARoEc), 5*(2), 1-25.

Bittencourt, M. (2012). Inflation and economic growth in Latin America: Some panel time-series evidence. *Economic Modelling, 29*(2), 333-340.

Cahyadin, M., & Ratwianingsih, L. (2020). External debt, exchange rate, and unemployment in selected ASEAN countries. *Jurnal Ekonomi & Studi Pembangunan, 21*(1), 16-36.

Doğan, T. T. (2012). Macroeconomic variables and unemployment: The case of Turkey. *International Journal of Economics and Financial Issues, 2*(1), 71-78.

Doğru, B. (2013). The link between unemployment rate and real output in Eurozone: A panel error correction approach. *Procedia - Social and Behavioral Sciences, 99*, 94-103.

Donaldson, J. R., Piacentino, G., & Thakor, A. (2019). Household debt overhang and unemployment. *The Journal of Finance, 74*(3), 1473-1502.

Folawewo, A. O., & Adeboje, O. M. (2017). Macroeconomic determinants of unemployment: Empirical evidence from economic community of West African States. *African Development Review, 29*(2), 197-210.

Hasan, A., & Zaheer, R. (2022). Factors responsible for unemployment in Pakistan: A time series evidence. *Journal of Research in Social Development and Sustainability, 1*(2), 1-12.

Hausman, J. A. (1978). Specification tests in econometrics. *Econometrica, 46*(6), 1251-1271.

ILO. (2023). *Mutually reinforcing crises have worsened the global employment divide*. ILO Monitor on the World of Work.

Kreishan, F. (2011). Economic growth and unemployment: An empirical analysis. *Journal of Social Sciences, 7*(2), 228-231.

Levina, A., Lin, C. F., & Chu, C. S. J. (2002). Unit root tests in panel data: Asymptotic and finite-sample properties. *Journal of Econometrics, 108*(1), 1-24.

Maqbool, S., Sattar, A., Mahmood, T., & Minallah, M. N. (2013). Determinants of unemployment empirical evidences from Pakistan. *Pakistan Economic and Social Review, 51*(2), 191-207.

Moosa, I. (2008). Economic growth and unemployment in Arab Countries: Is Okun's law valid?. *Journal of Development and Economic Policies, 10*(2), 5-23.

Oshora, B., Nguse, T., Fekete-Farkas, M., & Zeman, Z. (2021). Economic growth, investment, population growth and unemployment in Ethiopia. In *SHS Web of Conferences* (Vol. 90, p. 01013). EDP Sciences.

Sahnoun, M., & Abdennadher, C. (2019). Causality between inflation, economic growth and unemployment in North African countries. *Economic Alternatives, 1*, 77-92.

Sajjad, I., Bilal, M., & Khan, D. M. (2018). Investigating the impact of external debt on economic growth: A case study of Pakistan. *Journal of Business and Tourism, 4*(2), 41-51.

Shabbir, A., Kousar, S., & Alam, M. Z. (2020). Factors affecting level of unemployment in South Asia. *Journal of Economic and Administrative Sciences, 37*(1), 1-25.

Shuaibu, M., Muhammad, H. M., Abdullahi, S. I., & Gwazawa, U. G. (2021). Impact of public debt on inflation and unemployment in Nigeria: An ARDL vector error correction model. *Noble International Journal of Economics and Financial Research, 6*(5), 91-98.

Siddiqa, A. (2021). Determinants of unemployment in selected developing countries: A panel data analysis. *Journal of Economic Impact, 3*(1), 19-26.

Strat, V. A., Davidescu, A., & Paul, A. M. (2015). FDI and the unemployment - A causality analysis for the latest EU members. *Procedia Economics and Finance, 23*, 635-643.

Torres-Reyna, O. (2007). Panel data analysis fixed and random effects using Stata (v. 6.0, pp. 48-51). Princeton University.

Trimurti, C. P., & Komalasari, Y. (2014). Determinants of unemployment: Empirical evidences from 7 Province in Indonesia. *Scientific Research Journal (SCIRJ), 2*(8), 5-9.

Wajid, A., & Kalim, R. (2013). *The impact of inflation and economic growth on unemployment: Time series evidence from Pakistan*. 3rd International Conference UMT, Lahore.

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