

How Economic Growth Affects Unemployment in Zambia

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Abstract

Zambia is one of the African countries with abundant resources, both human and mineral. However, due to activities such as increased corruption, gross mismanagement, and anti-government policies, these resources have not been optimally utilized. The study used the model developed by Aktar et al. (2009) in their study titled “The Relationship Between Economic Growth and Unemployment in Turkey: An Empirical Analysis.”. Aktar et al. (2009) regressed unemployment on GDP, exports, and foreign direct investment. The study modified Aktar et al. (2009)'s model, and the specified model was unemployment as a function of GDP, government consumption spending, labour productivity, and the real effective exchange rate. The study used quarterly time series data from 1990 to 2020, which was sourced secondarily from an electronic database. This study used the Augmented Dickey-Fuller (ADF) test for unit root testing to ensure that the time series data used was stationary. The study has established that there is a negative relationship between economic growth and unemployment rate. The nature of the relationship suggests that whenever economic growth is positive, an economy will experience low rates of unemployment. The study has also established that unemployment is also determined by other economic indicators like inflation rate, the exchange rates, FDI and external debt stock. The pursuit of the study was motivated by the growing importance of unemployment and economic growth in developing countries.

1: INTRODUCTION

Zambia is one of the African countries with abundant resources, both human and mineral. However, due to activities such as increased corruption, gross mismanagement, and anti-government policies, these resources have not been optimally utilised. For example, Sichembe (2021) in the auditor general's report highlights the Wasteful Expenditure, which increased 378% from K3.7 million in 2019 to K1.4 billion in 2020. This irregularity involves the Ministries of Finance - Head 21 (K856 million in payment of interest and penalties incurred on a contract between the Food Reserve Agency and Advanced African Solutions); Housing and Infrastructure (K362 million in payment of accrued interest and transfer of Property Tax); Transport and Communication (K153 million); General Education (K32 million); Fisheries and Livestock (K9 million); Water Development, Sanitation, and Environment Protection (K4 million); and Transport and Communication (K153 million). Unemployment is undesirable, and it contributes significantly to Zambia's widespread poverty and income inequality. Furthermore, unemployment and poverty have resulted in significant increases in crime rates, streetism, and early marriages, to name a few.

Economic growth can have a significant impact on unemployment in Zambia. When the economy is growing, businesses tend to expand, invest, and hire more workers. This leads to a decrease in

unemployment, as more job opportunities become available. However, the relationship between economic growth and unemployment is not always straightforward and can be influenced by a variety of factors.

In Zambia, economic growth has been relatively slow in recent years, and the country has struggled with high levels of unemployment, particularly among young people. According to the World Bank, the unemployment rate in Zambia was 12.7% in 2020, up from 11.9% in 2019. The COVID-19 pandemic has further exacerbated the unemployment situation in the country.

One of the main factors that affect the impact of economic growth on unemployment in Zambia is the nature of the growth. If the growth is driven by sectors that are labor-intensive, such as agriculture or manufacturing, then it is more likely to lead to job creation and a decrease in unemployment. However, if the growth is concentrated in sectors that are capital-intensive, such as mining or construction, then it may not lead to a significant increase in employment.

Another factor that can influence the impact of economic growth on unemployment is the quality of education and skills of the workforce. If the workforce is well-educated and skilled, they are more likely to benefit from job opportunities created by economic growth. However, if the workforce lacks the necessary skills and education, they may not be able to take advantage of the job opportunities created by economic growth.

The issue of unemployment in Zambia is pronounced, as evidenced by many school leavers and even graduates who are unable to find work, and many who work in jobs that do not fully utilize their potential. According to Isobel (2006), the fact that many unemployed people have never worked before reflects the chronic nature of unemployment in Zambia. Furthermore, many unemployed people who are still actively looking for work have been looking for work for more than three years. In Zambia, the total labour force or economically active population consists of all individuals of working age (15-64 years) who are either employed or unemployed. Youth make up a sizable proportion of Zambia's unemployed population.

The problems inherited from the one-party state had and continue to have an impact on the nature of development in Zambia in terms of multi-party policies to address issues such as unemployment, poverty, and income inequality. With the advent of multi-party politics in 1991, there was hope for higher living standards and other expectations. According to Chikulo (2003), in order to reduce not only Zambia's socioeconomic imbalances but also to meet the high expectations of the urban population, the new government pledged rapid socioeconomic development by prioritizing unemployment, poverty alleviation, and income inequality in its development strategy agenda. The issue of unemployment, poverty, and income inequality required immediate attention in the early years of a democratically elected government taking power. When the new Movement for Multiparty Democracy (MMD) government took power in 1991, it faced a number of challenges. On the one hand, the government had to reach an agreement with the international donor community for significant debt relief as well as a new economic recovery plan. At the same time, it was necessary to accommodate their broad-based constituency, in which large segments, most notably labour, had consistently fought against the economic restructuring measures demanded by international donors throughout the 1980s. The transition from one-party state to democracy in Zambia led to the era of economic redressing, in order to deal with inherited economic and social legacies of one-party state which includes high unemployment, income

inequality and poverty level. Soon after the 1991 elections a crisis of expectations was created among the majority of previously disadvantaged Zambia citizens and they became optimistic that the new government might be able to subdue the levels of unemployment, income inequality and poverty (Chikulo, 2003). The Zambian government is therefore in a continual battle against unemployment and it is looking for policies that promote employment. By engaging in those policies that creates conducive environment for employment, the unemployment problem in the country will be alleviated.

Despite achieving average annual economic growth of over 4% in the past decade, Zambia's unemployment rate has remained stubbornly high, averaging around 12% over the same period. This suggests that economic growth has not translated into enough job opportunities for the country's growing population. The problem statement, therefore, is that despite Zambia's economic growth, there is a disconnect between growth and employment creation, leading to persistently high levels of unemployment. This is a significant challenge that needs to be addressed as high unemployment rates can have negative social and economic consequences, including poverty, crime, and social unrest. Understanding how economic growth affects unemployment in Zambia is crucial in identifying potential solutions to this problem.

2: RELATED LITERATURE REVIEW

2.1 Literature from Developed Countries

Issues such as increasing economic growth, reducing unemployment, and improving people's living standards have emerged as among the most important factors that policymakers and economists around the world are focusing on. Many empirical studies have been conducted in developed countries to help spur economic growth, thereby lowering unemployment and improving fellow citizens' living standards. Walterskirchen (1999), Swane and Vistrand (2006), Sawtelle (2007), and YerdelenTatoglu (2008) are among the empirical studies cited. Walterskirchen (1999) investigated the relationship between economic growth, employment, and unemployment in Europe. The study looked at the relationship between economic growth and the labour market. Walterskirchen (1999) obtained results using two methods: time series analysis for individual EU countries and international cross country analysis (panel data) for all EU countries from 1988 to 1999. According to Walterskirchen (1999), the relationship between GDP growth and change in unemployment can be divided into two parts: the link between GDP and change in employment is governed by economic factors, whereas the link between change in employment and unemployment rates is governed by demographic influences and labour market policies. The study's findings show a strong positive relationship between GDP growth and changes in employment levels. However, Walterskirechen (1999) pointed out that this is consistent with some empirical studies that claim that employment will rise only if economic growth rates outpace productivity gains. Thus, output must increase at a faster rate than productivity in order to achieve or produce a rising trend in employment. The study's findings also revealed a negative correlation between changes in employment and unemployment, but not at the 1:1 ratio. Finally, the study found a strong negative correlation between real output growth and changes in unemployment rates in both time series and cross-country analyses.

Yerdelen Tatoglu (2011) conducted research on the long and short run effects of unemployment on economic growth in Europe. The study looked at the movements of unemployment as well as the short and long run relationships between unemployment and GDP in European countries. The study examined

the applicability of the natural rate hypothesis (NAIRU) and the hysteresis hypothesis on unemployment movements in the 19 European countries studied. According to Yerdelen Tatoglu (2011), NAIRU is based on the idea that any deviations in unemployment from the natural rate should be temporary, whereas the unemployment hysteresis hypothesis holds that cyclical fluctuations have a permanent effect on the level of unemployment. The research was carried out using annual balanced panel data for 19 European countries from 1977 to 2008. In these 19 European countries, the study used several panel unit roots tests (individual and pooled panel unit roots) to examine the presence of unemployment hysteresis.

While there is a large body of literature examining the relationship between economic growth and unemployment in developed countries, there are still some gaps in our understanding of this relationship. Here are some possible literature gaps:

Causal direction: Although there is a widely held belief that economic growth leads to lower unemployment rates, there is still debate about the causal direction of this relationship. Some researchers argue that it is actually changes in the labor market that drive economic growth, rather than the other way around.

Structural changes: There is also a need to better understand how structural changes in the economy, such as the shift towards service-based industries or the rise of the gig economy, are affecting the relationship between economic growth and unemployment. These changes could be impacting the labor market in ways that are not captured by traditional economic models.

Heterogeneity: While studies have found that the relationship between economic growth and unemployment varies across different countries and regions, there is still a need to better understand the sources of this heterogeneity. This could include differences in labor market institutions, demographic factors, or the level of economic development.

Time lags: Another gap in the literature is the need to better understand the time lags between changes in economic growth and changes in unemployment. Some studies have suggested that the relationship may be nonlinear and that there may be time lags before the benefits of economic growth are fully realized in the labor market.

Overall, there is still much to be learned about the relationship between economic growth and unemployment in developed countries. Researchers will need to address these gaps in order to gain a more nuanced understanding of this relationship and develop policies that can effectively promote both economic growth and full employment.

2.2 Literature from Developing Countries

Many scholars and researchers from developing countries have published and documented numerous articles. As a result, this contributes to studies focusing on the consistent relationship between economic growth and unemployment, as well as their mutual effects in developing countries. Hussain, Siddiqi, and Iqbal (2010), Aktar and Ozturk (2009), Andrei, Vasile, and Adrian (2010), Messkoub (2008), and Sodipe and Ogunrinola (2011).

Hussain, Siddiqi, and Iqbal (2010) examined the coherent relationship between economic growth and unemployment in Pakistan using a Vector Auto Regression (VAR) methodology. The study used time series data for Pakistan from 1972 to 2006, and it was primarily interested in the relationship between

economic growth and unemployment. The research looked into the relationship between growth and unemployment. To test for stationarity, the Augmented Dickey Fuller (ADF) test was used, and the results show that the variables used in this study have a unit root problem at level, but they are significant at first difference, so they became stationary. According to the findings, there are three co-integrating vectors. The maximum eigen-value statistics also revealed a long-term relationship between the variables used (growth, unemployment, capital, labour, trade openness and human capital). The study's findings indicate a link between economic growth and unemployment in Pakistan. According to the study, the labour force was growing at a faster rate than the economy's capacity, which resulted in an increase in unemployment and the expansion of Pakistan's low-wage informal sector. Hussain et al. (2010) emphasise the importance of establishing political stability, macroeconomic stability, and investment-oriented policies as a means of achieving accelerated economic growth in Pakistan. The study's findings revealed a negative relationship between economic growth and unemployment, implying that unemployment could be reduced through labor-intensive policies.

Sodipe and Ogunrinola (2011) used time series from 1981 to 2006 in their study on the employment and economic growth nexus in Nigeria. To estimate the employment-growth relationship in Nigeria, an employment model was developed and the Ordinary Least Squares (OLS) technique was used to obtain the results. According to the study's findings, there is a positive and statistically significant relationship between employment and economic growth in Nigeria. This study also found a negative relationship between the rate of employment growth and the rate of real GDP growth in the economy. Sodipe et al. (2011) advocated for increasing labor-promoting investment strategies that could aid in the reduction of Nigeria's high open unemployment. The study's findings imply that the phenomenon known as jobless growth, in which economic growth is inversely related to the level of employment, does not apply to the Nigerian economy during the time period studied.

2.3 Literature from Zambia

The relationship between economic growth and unemployment in Zambia has been a topic of interest among researchers and policymakers. Over the past decade, Zambia has experienced positive economic growth, with an average annual growth rate of about 3.6% from 2010 to 2019 (World Bank, 2021). However, unemployment remains high, with an estimated unemployment rate of around 11.2% in 2019 (Zambia Statistics Agency, 2019).

The trend in economic growth in Zambia has been influenced by several factors, including investments in infrastructure, mining, and agriculture, as well as macroeconomic stability measures. However, the growth has been unevenly distributed across sectors and regions, with mining and construction being the main drivers of growth (World Bank, 2021).

On the other hand, the trend in unemployment in Zambia has remained high, particularly among the youth and women. The main factors contributing to unemployment in Zambia include a skills mismatch, lack of access to finance, limited job opportunities in rural areas, and weak labor market institutions (Zambia Statistics Agency, 2019).

Overall, while Zambia has made progress in promoting economic growth, reducing unemployment remains a significant challenge. Addressing the structural issues in the labor market and investing in

sectors with high job creation potential, such as manufacturing and services, may be crucial in reducing unemployment and promoting inclusive growth in Zambia.

3: METHODOLOGY

3.1 Introduction

There are five sections in this chapter. Following this introductory section is the analytical framework used in the study to link unemployment (the dependent variable) to its explanatory variables as well as the expected prior. The following section focuses on data sources and also provides definitions of variables used in the model; this is followed by a section that presents a review of estimation techniques; and finally, the chapter concludes.

3.2 Model Specification

This study modifies Aktar and Ozturk's (2009) model of unemployment as a function of, among other things, economic growth and foreign direct investment. According to the model:

$$UR_t = f(GDP_t, EXP_t, FDI_t) \dots \dots \dots (1)$$

Where t is time trend, $UR_t, GDP_t, EXP_t, FDI_t$ are unemployment rate, gross domestic product, exports and foreign direct investment respectively.

The literature reviewed and the availability of data influenced the selection of variables used to examine the impact of economic growth on unemployment in Zambia. In terms of modifying productivity and the real effective exchange rate. The variables in Equation (3.2) below have been adjusted to fit this study, and unemployment is modelled as a function of GDP, budget deficit, labour productivity, and real effective exchange rate. As a result, the empirical model for the study is as follows:

$$UR_t = \beta_0 + \beta_1 GDP_t + \beta_2 LEX_t + BDS + \beta_3 IF + \epsilon \dots \dots \dots (2)$$

$\beta_0, \beta_1, \beta_2, \beta_3$ and β_4 are the parameter estimates or coefficients of explanatory variables and ϵ is the error term.

All variables in this study are converted to natural logarithms in order to reduce the impact of outliers and obtain elasticity coefficients. As a result, the following model must be estimated:

$$\ln UR_t = \beta_0 + \beta_1 \ln GDP_t + \beta_2 \ln EX_t + \beta_3 \ln BD_t + \beta_4 \ln IF_t + \epsilon_t \dots \dots \dots (3)$$

Where: $\ln UR_t$ is the natural logarithm of unemployment in Zambia.

$\ln GDP_t$ is the natural logarithm of GDP, and it is used as a proxy for economic growth. The Okun's law governs the relationship between output and unemployment. Okun's law, according to Kreishan (2011), implies that an increase in GDP growth will increase employment levels, lowering unemployment. As a result, a negative sign is expected, which is consistent with empirical literature and economic theory, and thus Okun's Law. In contrast, it can be positive when economic growth is not accompanied by job creation, which is known as jobless growth. Recently, there has been discussion in the media about

jobless growth in Zambia, which means that economic growth in Zambia has not been accompanied by job creation.

InEXt is the natural logarithm of the real effective exchange rate (REER) in terms of foreign currency. An increase in this variable indicates that the domestic currency (rand) has appreciated, whereas a decrease indicates that the domestic currency has depreciated (rand). According to Frenkel (2004), REER is critical in determining the relative prices of labour and capital goods in developing countries because capital goods contain a significant proportion of imported components. Furthermore, REER aids in determining the import inputs-labor relative prices. Thus, changes in the REER cause significant changes in these relative prices, affecting the employment-output ratio. As a result, the relationship between UR and REER is expected to be inverse. According to Frenkel (2004), a falling REER induces or incentivizes more intensive use of labour because the relative price of that production factor (the price of labour measured in international currency) has fallen, and vice versa. As a result, an appreciation (depreciation) is associated with higher (lower) unemployment rates. InBD Amount of debt the country owes to foreign lenders and investors. InIF is defined as the natural logarithm of labour productivity.

Data Sources and Definition of Variables

This study used Zambian annually time series data on real GDP, unemployment, interest rate, real effective exchange rate, government deficit, and foreign direct investment from 1990 to 2020 to estimate regression. The data for this study were derived primarily from the electronic databases of the Bank of Zambia (BOZ), Zambia statistical agency (Zamstats), and the Worldbank data base. This study's time frame helps to provide a clear picture of post-one-party-state trends. That is when the government implemented many economic development strategies and policies in order to reduce unemployment and other one-party-state legacy.

3.3 Review of Estimation Techniques

Because this study used time series data, the first procedure was to determine whether each series was stationary or not. The Augmented-Dickey-Fuller (ADF) was used in the study to test for unit root or stationarity of time series variables. These tests provided us with the order of integration of the time series data. Once the variables were determined to be stationary, the co-integration test was performed. The Johansen approach was also used in this study within the VAR framework to investigate whether there is a long-term relationship between the variables used in the model. The Vector Error Correct Model (VECM) was also used in this study to establish short-term relationships between variables. In addition, impulse response and variance decomposition analysis were used. To run the regression model, this study will also use an econometric package called E-Views version 12. The following section discusses the techniques used to test for stationarity and co-integration.

3.4 Concluding Remarks

The goal of this chapter was to present the methodology and data set used in this study. The VAR framework was used to investigate the impact of economic growth on unemployment. The study used the model developed by Aktar et al. (2009) in their study titled Can Growth and Foreign Direct Investment Cure Unemployment in Turkey? Aktar et al. (2009) regressed unemployment on GDP, exports, and foreign direct investment. The study modified Aktar et al. (2009)'s model, and the specified model was

unemployment as a function of GDP, government consumption spending, labour productivity, and the real effective exchange rate. The study used quarterly time series data from 1994 to 2011, which was sourced secondarily from an electronic database. This study used the Augmented Dickey-Fuller (ADF) test for unit root testing to ensure that the time series data used was stationary. In the following chapter, the appropriate VAR lag length will be determined using five information criterion.

Johansen's (1991, 1995) co-integration and vector error correction model (VECM) technique was used to provide evidence of both long-run and short-run relationships among the variables in the model. It allows one to test for cointegration among multiple time series variables, it takes into account the possibility of multiple cointegrating relationships, it provides a way to estimate the long-run equilibrium relationship and it can help with forecasting.

4: PRESENTATIONS OF FINDINGS

4. Introduction

The chapter presented the findings of this research study. The chapter first presented the descriptive statistics of the variables from 1990 to 2020 and thereafter the pre-diagnostic tests were done. Model estimation and post diagnostic tests were also presented.

Table 3

Descriptive statistics

Statistic	Unemployment rate	External Debt	FDI	GDP	Inflation	Real effective Exchange rate
Mean	13.15974	9.00e+09	6.12e+08	1.25e+10	33.4854	75.86850
Median	12.93000	6.70e+09	3.57e+08	8.33e+09	17.9677	69.98023
Maximum	19.70000	3.00e+10	2.10e+09	2.80e+10	183.312	112.5897
Minimum	7.800000	2.26e+09	-1.73e+08	3.18e+09	6.42939	46.98152
Std. Dev.	3.199055	7.18e+09	6.13e+08	9.39e+09	44.5920	20.51992
Jargue-Bera	1.126407	25.04403	4.800054	3.734834	54.4929	2.814412
p-value	0.569382	0.000004	0.090715	0.154522	0.000000	0.244826
Observation	31	31	31	31	31	31

The Table above showed that between 1990 and 2020, Zambia's Gross Domestic Product averaged \$12.5 Billion reaching an all-time high of \$28 billion. Zambia's external debt averaged \$9 billion while the FDI \$612 million. The highest real effective exchange rate (REER) under the study period was 112.5897 while the highest inflation recorded was 183.3120. Table above also showed the highest recorded rate of unemployment was 19.7%.

Pre-diagnostic Tests

Table 4:

Unit root results

Variable	At Level	At 1st difference	1st Order Integration	Conclusion
LUMEP	0.2179	0.0001***	I(1)	Stationary at 1st difference
LGDP	0.8247	0.0019***	I(1)	Stationary at 1st difference
LREER	0.5891	0.0007***	I(1)	Stationary at 1st difference
LINF	0.3226	0.0060***	I(1)	Stationary at 1st difference
LDEBT	0.8921	0.0092***	I(1)	Stationary at 1st difference
LFDI	0.3387	0.0000***	I(1)	Stationary at 1st difference

(*), (**), (***) imply significance at 10%, 5% and 1% respectively. The unit root results in table 2 indicated that all the variables were stationary at 1st difference.

Co-integration Test

The Unit root results shown below indicated that the variables were all integrated of order 1. The preferred test for cointegration was therefore the Johansen Cointegration test. The results of the unrestricted Johansen cointegration test are shown in below.

Figure 4

Johansen Cointegration Results

Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.883414	138.7545	95.75366	0.0000
At most 1 *	0.746885	78.57897	69.81889	0.0085
At most 2	0.511938	40.10950	47.85613	0.2186
At most 3	0.338139	20.02473	29.79707	0.4212
At most 4	0.244688	8.469121	15.49471	0.4167
At most 5	0.021607	0.611632	3.841465	0.4342

Trace test indicates 2 cointegrating eqn(s) at the 0.05 level

* denotes rejection of the hypothesis at the 0.05 level

**Mackinnon-Haug-Michelis (1999) p-values

The cointegration results showed that there exists 2 cointegration equations at 5% level of significance. This outcome implied that model estimation can be done both in the short and long run.

Optimal Lag selection

Before model estimation, it became imperative to determine empirical the maximum number of lags to be included in the model. The results of the Akaike Information Criterion (AIC) are shown below.

Figure 5

Lag selection criterion

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-33.11535	NA	6.59e-07	2.793953	3.079426	2.881225
1	82.35845	173.2107	2.41e-09	-2.882746	-0.884439*	-2.271844
2	133.0332	54.29441*	1.25e-09*	-3.930945*	-0.219804	-2.796412*

The asterisks on the AIC value implied that optimal lag value was 2.

Model Estimation Results

Table 5:

Short Run Results

Variable	Coefficient	Std. error	t-statistic	p-value
D(LE(-1))	0.203437	0.18407	1.10524	0.2725
D(LE(-2))	-0.685097***	0.17351	-3.94839	0.0002
D(LEX(-1))	-0.108289	0.31348	-0.34544	0.7307
D(LEX(-2))	1.094730***	0.38124	2.87150	0.0053
D(LDB(-1))	0.430350***	0.11644	3.69581	0.0004
D(LDB(-2))	0.017537	0.14043	0.12481	0.9010
D(LGDP(-1))	0.403604	0.27610	1.46182	0.1478
D(LGDP(-2))	-0.580171**	0.22703	-2.55553	0.0125
D(LLFDI(-1))	-0.000904	0.03373	-0.02681	0.9787
D(LFDI(-2))	-0.013503	0.03005	-0.44934	0.6544
D(LF(-1))	0.180518**	0.06880	2.62363	0.0105
D(LF(-2))	-0.014514	0.07138	-0.20335	0.8394
Constant	-0.034869	0.034869	-1.07956	0.2837
CointEqtn.	-0.011367	0.13565	-0.08379	0.933

(*), (**), (***) imply significance at 10%, 5% and 1% respectively.

The short run results of the Vector error correction model are shown above. The Table results indicated the first lag of unemployment (LE) had a non-significant impact on current unemployment rate while the second lag had a strong and negative impact on current unemployment. The outcome implied that a 1% increase in unemployment in period 2, will cause current unemployment rate to reduce by - 0.685097% all else being constant. The impact of real effective exchange rate (LEX) was negative AT time t-1 but statistically insignificant at 5% while the impact of real effective exchange rate (LEX) on current unemployment was significant at time t-2. The Impact of external debt stock (LDB) and Inflation rate (LF) were significant only at the first lag. The economic growth had a negative impact on unemployment rate only at time t-2. The rest of the variables were statistically insignificant at 5%. Lastly the cointegration equation had an expected negative sign however it was not statistically significant at 5%.

Table 6
Long Run Results

Variable	Coefficient	Std. error	t-statistic	p-value
LEX(-1)	1.344529***	0.29302	4.58847	0.0000
LDB(-1)	0.109478**	0.04618	2.37087	0.018
LGDP(-1)	-0.176527**	0.08668	-2.03652	0.042
LFDI(-1)	0.119705*	0.06594	1.81527	0.069
LF(-1)	-0.078282	0.04818	-1.62483	0.104
Constant	-8.846267	.	.	.

(*), (**), (***) imply significance at 10%, 5% and 1% respectively

The long run results indicated all the variables except for Inflation rate, were statistically significant in the long run. The impact of real effective exchange rate was positive implying that a 1% increase in the exchange rates, unemployment will increase by 1.35% on external debt increased by 1%. Unemployment was also responsive to changes in economic growth and to foreign direct investment.

Model Indicators

Table 7
Model indicators

R-squared	0.812650
Adjusted R-squared	0.625300
F-statistics	4.337610
Alkaike AIC	-1.737216
Schwarz SC	-1.065301

The R-squared of the model was 0.812650 implying that about 81.3% of the variability in unemployment was explained by the independent variables. This outcome informed the study that model fit was very good. The value of the Akaike Information criterion (AIC) and Schwarz SC were very low; again providing evidence that model fit was very good. Overall, the model was based on the value of the F-statistic was statistically significant. The probability of obtaining an F-statistic OF 4.337610 was low.

Forecast Error Variance Decomposition (FEVD) results

Evidence obtained from the variance decomposition indicated that in the first year, variation in Unemployment was explained by unemployment itself. Other variables had a zero contributions. In the second period however, real effective exchange and External debt stock significantly contributed to about 5.27% and 16.25% of the variations in unemployment. Economic growth, FDI and inflation rate explained 0.31%, 4.92% and 1.6% respectively. However, the contribution of Economic growth and external debt was observed to have increased significantly in the long run while the remaining variables contributed less and less to unemployment variations. The results are shown below.

Figure 6

FEVD results

Period	S.E.	LE	LEX	LDB	LGDP	LFDI	LF
1	0.087107	100.0000	0.000000	0.000000	0.000000	0.000000	0.000000
2	0.187992	71.63729	5.274304	16.25372	0.316662	4.917592	1.600434
3	0.250825	59.76707	9.022330	22.64149	2.117119	5.199554	1.252436
4	0.296029	55.64130	7.401924	20.55034	11.59423	3.795793	1.016409
5	0.335839	52.61979	5.762735	18.93815	18.19664	3.684621	0.798059
6	0.368505	53.26987	5.045545	19.03874	18.58457	3.398287	0.662992
7	0.401042	54.24377	5.450774	19.42957	17.43366	2.879693	0.562535
8	0.440015	54.04216	5.246634	20.65677	16.93367	2.589071	0.531699
9	0.479893	53.13060	4.526558	21.68981	17.98404	2.182749	0.486249
10	0.514107	52.82978	4.008982	21.38630	19.38890	1.956916	0.429127

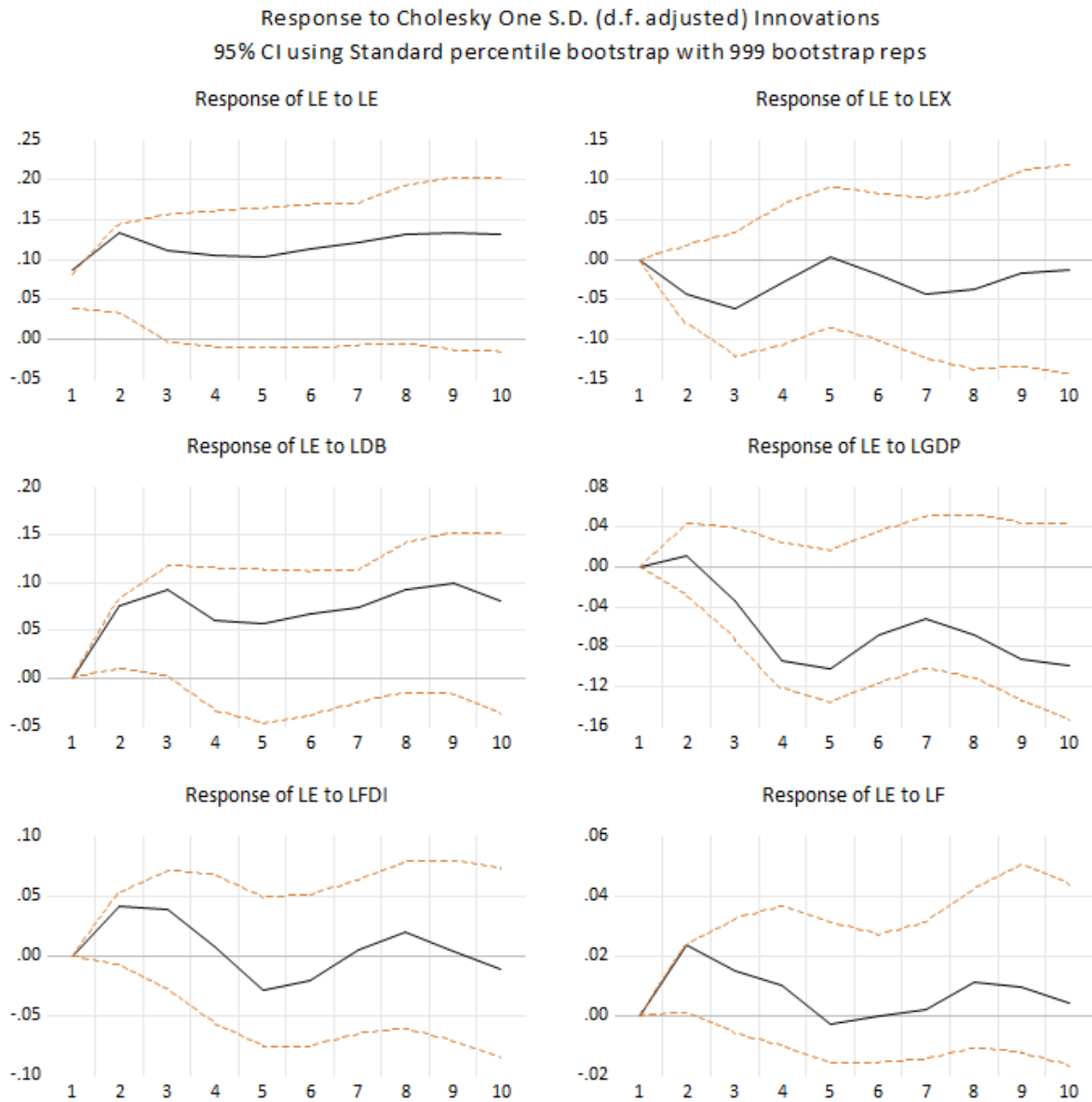
Cholesky Ordering: LE LEX LDB LGDP LFDI LF

Impulse Response Functions

The impulse Response Function indicated that a one standard deviation shock or innovation in unemployment rate (LE) will gradually cause itself to increase from the 1st period until the next period and thereafter declined and remained relatively flat from the 3rd until the end of the 5th period. A similar outcome was observed with innovations in External debt (LDB). Overall the response of unemployment on itself and External debt on unemployment rate was positive.

A shock in real effective exchange rate (LEX) caused a negative response in unemployment from the 1st until the 5th period and thereafter the shock had negative effects on unemployment rate. Unemployment responds negatively to innovation in economic growth rate (LGDP) from the 2nd period all the way to the 10th period. At lastly the response of unemployment to shocks in foreign direct investment (LFDI) was positive between the 1st and 4th period, negative between the 4th and 6th period and thereafter became positive. The results are shown in figure below.

Figure 7
The impulse Response Functions



Post Diagnostic Tests

Autocorrelation/ Serial correlation

The results of the autocorrelation below showed the null hypothesis of no serial correlation was not rejected. This outcome informed the study that autocorrelation was not a problem in our model.

Figure 8

Autocorrelation results

VEC Residual Serial Correlation LM Tests						
Date: 09/29/22 Time: 19:33						
Sample: 1990 2020						
Included observations: 27						
Null hypothesis: No serial correlation at lag h						
Lag	LRE* stat	df	Prob.	Rao F-stat	df	Prob.
1	35.89825	36	0.4734	0.807151	(36, 11.5)	0.7030
2	53.65453	36	0.0294	1.780213	(36, 11.5)	0.1474

Normality Test

Based on the value of Jargue-bera, the results informed the study that the residues were normally distributed.

Figure 9

Normality Results

Component	Jarque-Bera	df	Prob.
1	0.434740	2	0.8046
2	0.307538	2	0.8575
3	0.197480	2	0.9060
4	5.635027	2	0.0598
5	1.501806	2	0.4719
6	1.618689	2	0.4451
Joint	9.695280	12	0.6427

5: DISCUSSION OF FINDINGS

Introduction

The chapter will present a discussion of the empirical findings of this study and whenever possible, the researcher will close reference with the findings of other scholars.

Effects on Unemployment Rate

Results from table 5 indicated that the first lag of unemployment had no effect on current unemployment except for the second lag. The results showed that the second lag of unemployment was negative implying that whenever unemployment rate increases by 1% at time t-2, current unemployment reduced by -0.69%. This was so because unemployed people tend to spend less, may accrue more debt, and unemployment may lead to higher payments from state and federal governments for things like food stamps. This is what the Keynesian school of thought reasoned that in times of high unemployment, governments tend to spend more to boost economic growth and avert a recession.

The real effective exchange rate was found to have an impact on unemployment. The results showed that an increase in exchange rates at time t-2, unemployment will decrease by 1.09%. This outcome was similar to the findings of Bakhshi& Ebrahimi (2016) who found a negative relationship. Real exchange rate volatility results in the fluctuations of the real value of domestic currency, and

consequently cause changes in the level of product and employment. However in the long run, the relationship between exchange rates and unemployment was positive. A stronger currency can buy more imported goods and services; so whenever the Kwacha appreciates, imported goods become cheaper and it becomes more profitable to import than to produce locally. This occurrence can make domestic firms less competitive against the lower price of imported goods and services and they may shut down operation thus causing unemployment. These findings verified Newadi's (2013) and Chang (2011) findings claiming a positive long run relationship.

External debt stock was found to have a positive impact on unemployment. The results showed unemployment had a responsiveness of 0.43% to a 1% increase in external debt stock. External debt and servicing can be a major concern because full-employment is unsustainable except the structure of capital reach a certain threshold. The more debt a country accrues; the more development funds are channeled to debt services. The Zambia's external debt amounted to \$17 billion at the end of 2021 at the same time the countries level of unemployment stood at 13.03% and since 2012 both have been on a positive trajectory (World Bank, 2022). This finding was in line with the Ogonna et al. (2016) who found a positive relationship between unemployment and external debt stock.

Economic Growth was found to have a negative influence on Economic growth. The results showed that 1% increase in economic growth, will reduce unemployment by 0.58% in the short run and by 0.18%. It is seen that in the impact in greater in the short run than in the long run. The inverse relationship confirms Okun's law that states that there is inverse relationship between economic growth and unemployment rate. As economic expansion progresses, output growth will be determined by the combined rates of growth in the labor supply and labor productivity. As long as growth in real gross domestic product (GDP) exceeds growth in labor productivity, employment will rise. If employment growth is more rapid than labor force growth, the unemployment rate will fall. The findings confirm the findings of Hjazeen, Seraj&Ozdeser (2021). The impact of foreign direct investment was found to be insignificant in the short run. The results however did indicate that in the long run, the relation was there and it was found to be positive. It was shown that 1 % increase in FDI, increase unemployment by 0.12% in the long run all else being equal.

The influence of inflation rate on unemployment rate was only observed in the short run. During inflationary period, firms tend to hire more labour due to attractive higher prices and this may cause and upward shift in the economy's aggregate demand. The findings were in line with Omram&Bilan. (2021). However, the impact of inflation was found to be statistically insignificant. The no causal relationship in the short run confirms the findings of Alalawneh& Nessa (2020) but contrary to their conclusions in the long run. However, a plausible explanation to the positive nature maybe due to the fact that FDI may cause more unemployment due to export substitutes and reimports that through addition exports to host countries. This may be the case observed from the findings.

6: CONCLUSIONS AND RECOMMENDATION

Conclusion

The study has established that there is a negative relationship between economic growth and unemployment rate. The nature of the relationship suggests that whenever economic growth is positive, an economy will experience low rates of unemployment. The study has also established that unemployment is also determined by other economic indicators like inflation rate, the exchange rates,

FDI and external debt stock. The pursuit of the study was motivated by the growing importance of unemployment and economic growth in developing countries.

Recommendation

The study makes the following policy recommendations;

- There is need for the Government of Zambia to reduce high rates of unemployment by adopting policies aimed at increasing economic growth. Policies adopted should be aimed at increasing domestic investment and that will quickly reduce the rates of unemployment.
- The study found that external debt was a detriment to employment. Therefore, there is need to dismantle Zambia external debt and keep it within sustainable levels of 40% of Gross domestic product.
- The exchange rate be kept stable. A volatile exchange disrupts economic activities and can lead to high unemployment especially to a country like Zambia should is import dependent.
- Ensure the effects of FDI do not lead to export substitute. FDI to benefit the local economic and this can be done b stemming capital flight and ensure that proceeds from FDI are reinvested into the country.
- The Zambia government's target is to keep inflation rate at 6-8%. The study recommends the same.

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