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Reinterpreting the Keynesian and Neoclassical Growth Models in Zimbabwe: The History of Economic Thought in Perspective

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Abstract: This study sought to reinterpret the Keynesians and Neoclassical growth models in the Zimbabwe context. The study adopted an Error Correction Model for estimating annual time series data for the period 1990 to 2020. Out of the five growth models examined, the results of the study confirmed a positive relationship between real GDP and the Harrod-Domar, Solow, Schumpeter and Nurkse growth models, with Lewis growth model exhibiting an inverse relationship, contrary to the positive relationship that underpins the model. The study, recommend the need for the government of Zimbabwe to come up with policies that enhances the attraction of Foreign Direct Investment which could enhance the growth of fixed capital formation. There is also need for revitalization of the industrial sector given that it is operating below capacity as suggested by the study results. The government of Zimbabwe should continue supporting the agricultural sector through its Command agricultural and Pfumvudza initiatives as this would spur agricultural exports, which are key for growth. The government of Zimbabwe should also come up with initiates that enhances innovation, through making budgets for research and development, and enacting laws that govern patents.

Keywords: Economic Development; Economic Growth; Error Correction Model

JEL Classification: B10

1. Introduction

Many of the important developments in the history of economics since the time of Adam Smith's (1776) Wealth of Nations, rationalised a greater involvement of contemporary economist such as Sir Roy F. Harrod (1900-1978), Robert M. Solow (1924-), Joseph Alois Schumpeter (1883-1950), Ragnar Nurkse (1907-1959) and Arthur W. Lewis (1915-1991) who devoted much thought to economic growth and development. Their works are still holding in the New Classism epoch, though with flashes of some critics from economist such as Michael Todaro (1942-) who argued the sustenance of the models in the underdeveloped economies.

This paper starts by presenting five divergent analysis of economic growth and development. We begin with a discussion of the Keynesian growth model established by Harrod and Domar, followed by Solow's Neoclassical Growth Model. We then look at Schumpeter's theory of economic development and institutional change. This is followed by a discussion of Nurkse and Lewis, who both provide seminal ideas on economic development. Key to this discussion will be underpinned by the terms

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'economic growth and economic development'. The paper concludes with an econometric methodological orientation on how these models hold in Zimbabwe.

2. Background of the Study

Sir Roy F. Harrod and Evsey Domar (1900-1997): separately contributed to what today is known as the Harrod-Domar analysis of growth. They established their theories within the Keynesian framework. Domar noted that net investment spending add to the nation's stock of capital, increases the economy's productive capacity, and raises its potential level of income. He said that the change in productive capacity will depend on the level of investment and the potential social average productivity of new investment. Domar reached his major conclusion that the economy must grow in order to maintain full employment of its resources. To realise the rate of income growth required to match the growth of income capacity, investment must annually increase at a percentage rate equal to the product of the potential social average productivity of investment and the propensity to save. Domar and Harrod model, therefore, reinforced the Keynesian conclusion that the economy is inherently unstable.

In fact their model implied that the economy is on a 'knife edge.' If investment did not grow at the required or wanted rate, the economy would recede. On the other hand, if the growth of investment spending exceeded the required or warranted rate, demand-pull inflation would result.

Robert M. Solow (1924-): Solow has contributed to several facets of economics, including linear programming, macroeconomic theory, environmental economics, and labour economics. Over the years he has defended the mainstream synthesis of neoclassical microeconomics and Keynesian based macroeconomics, sparring intellectually with advocates of monetarism, post-Keynesianism and more recently, new classical macroeconomics. In view of his self-described 'eclectic Keynesian and new-Keynesian views,' it is, somewhat ironic that his macroeconomic growth theory is rooted in neoclassicism, not Keynesianism.

Solow published an influential analysis of economic growth. Solow's theory supported the neoclassical view that the economy adjusts internally to achieve stable equilibrium growth. Unlike the Harrod-Domar model which implied that an economy's growth path is inherently unstable. The Solow growth model contains several elements which are; production, the labour force, and balance investment. According to Solow, the economy tends toward a steady state point at which actual investment equals balanced investment.

Balanced investment being the amount of investment needed to keep the capital stock growing at the same rate as the labour force. If actual investment is less than balanced investment, capital per worker decreases. Solow also included technology as an exogenous variable in his model. For Solow, technological advance includes not only improved production techniques but also improvements in the quality of labour and capital. When Solow introduced technological advance into his growth theory, the hypothetical economy achieves higher rates of output growth independent of increases in the amount of capital per worker. In conclusion, Solow posits that increases in labour and capital inputs explains less than half of economic growth. The residual he said results from technological progress.

Joseph Alois Schumpeter (1883-1950): The two major intellectual influences in Schumpeter's life were Leon Walras (1834-1910) and Karl Heinrich Marx (1818-1883). From Walras, Schumpeter

derived his emphasis on the interdependence of economic quantities. Schumpeter had a strong aversion to Marxism, but he admired Marx's understanding of the process of economic change. Schumpeter was deeply devoted to the institutions of capitalism, and he viewed with alarm the forces engendered by the very success of capitalism, because he thought that they would destroy the system. He agreed with Marx that capitalism would collapse, although for different reasons and with profound regret.

In his Schumpeter's model, he constructed a theoretical system to explain both the business cycles and the theory of economic development. The key process in economic change, according to Schumpeter, is the introduction of innovation, and the central innovator being the entrepreneur. From today's perspective, it is, clear that Schumpeter, like Marx before him, and was much too pessimistic about the near-term future of capitalism. Since the period in which Schumpeter wrote, capitalism has continued to expand and flourish in much of the world. Moreover, the collapse of communism led several former socialist economies to embrace capitalism as the ultimate goal of their reform efforts. Entrepreneurship recently has thrived throughout the world, as evidenced by highly successful start-up firms and major innovations relating to personal computing, communications, genetic engineering and the internet.

Schumpeter's overall contribution to economics, thus, lie less with his views on the long-run fate of capitalism than with his emphasis on the importance of entrepreneurs and innovation in achieving economic growth. New and improved technology, much of it commercialised by entrepreneurs, explains a large portion of the economic growth of the advanced industrial nations.

Ragnar Nurkse (1907-1959): Nurkse gave a renewed emphasis to external economies. He posited that the more investment made, the more viable each undertaking becomes. Therefore, he argued that the low-income economies require progress on a broad front, with simultaneous expansion of industries that support each other and increase the chance of success. The greater difficulty is that the poverty of countries has limited their capital formation. Nurkse explained his model on two key concepts: the vicious circle of poverty and balanced development.

On the Vicious Circle of poverty side, Nurkse argued that the incentive for private businesses to invest is severely limited by the size of the domestic market. The size of the domestic market he said, is determined by the general level of productivity. He concluded that the capacity to buy not only depends on, but is actually defined by capacity to produce.

On the balanced development side, Nurkse argued that if the poor countries are to advance, they must rely increasingly on industrialisation instead of primarily on the production and export of raw materials. Nurkse believed that in low - income countries, the forces that would defeat the grip of economic stagnation must be deliberately organised through some central direction or collective enterprise.

Arthur W. Lewis (1915-1991): In 1949 Lewis published a book 'the principles of economic planning in which he warned of the impracticality of central planning and argued for planning through markets. The major work was followed in 1954 by his now famous article on development namely, 'economic development with unlimited supplies of labour'. A year later he published 'the theory of economic growth, in which he emphasised the growth process in developing economies. In his 'two sector model', often referred to as a dual model of economic development, he divided the economy into two sectors, a traditional rural subsistence sector and a modern urban industrial sector. Lewis argued that the rural sector has so much surplus labour relative to capital and natural resources, that much of this labour could be transferred to the urban sector without diminishing agricultural output. He claimed that the urban

sector is industrialised and profitable. A portion of these profits is saved and invested in capital goods. Because of this expansion of plant and equipment, the urban sector has a growing demand for labour. It also has a substantial higher wage rate than the rural sector. The implication of this model is that once the process begins, expansion of national output and income happens rather automatically. Of interest to note from this model is that Lewis's two sector model follows the tradition of Smith's classical economic theory.

Table 2.1. Growth and Development Models and their Key Variables

Economic Growth: the Rate of Change of Real GDP

Model	Variable (s)	Proxy Variable (s)
Harrod-Domar Model	Investment	Capital Investment
Solow Model	Technological Progress	Value added by Manufacturing Sector as a percentage of GDP
Schumpeter Model	Innovation	Exports of goods and services
Nurkse Model	Industry Expansion	Value added by Industry Sector as a percentage of GDP
Lewis Model	Increased employment rate in the Industrial Sector	Employment in Industrial Sector as a percentage of Total Employment

Information in table 2.1 shows that in the Harrod-Domar model, investment is the driver of economic growth and development, in which they said net investment adds to the nation's stock of capital, with the Solow model suggesting technological progress as a key driver to economic growth and development, the reason being that technology enhances productivity. Furthermore, Schumpeter model indicated innovation as paramount to the growth of economies, citing creation of new products and creation of new markets as forms of innovation, this indirectly would improve nation's exports, thus propelling growth, whilst Nurkse model attributed growth to industry expansion, arguing that increased employment in the industrial sector will stimulate demand for goods and service, thus, attracting the much needed investment. Lastly, the Lewis model asserted that increased employment rate in the industrial sector is deemed plausible for it enhances economic growth. Figure 2.1 below depicts the data trend followed by the variables that informs the growth and development models under study.

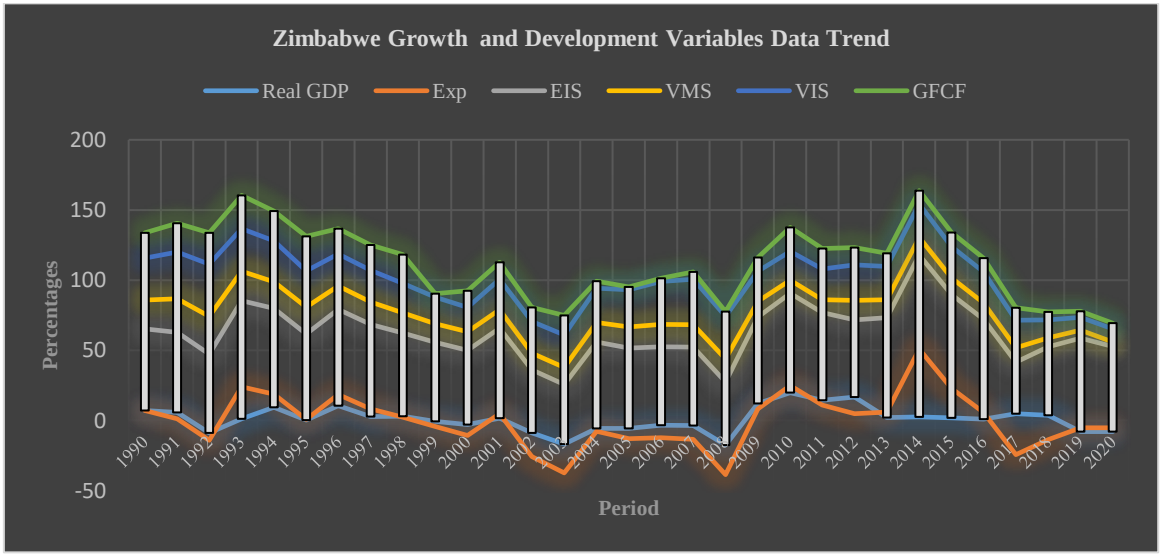

Figure 2.1. Zimbabwe Growth and Development Variables Data Trend

Source: Adapted from World Bank Database (2021)

Information depicted in Figure 2.1 suggests a linear relationship between the variables, meaning to say the variables data is moving in the same trend. This trend suggest that the variables have economic meaning on each other prompting the study to determine the nature of the relationship between them.

2.1. Critiquing the Economic Growth and Development Models' Diverging Thoughts

From the five divergent economic growth and development analysis undertaken, one can agree that since 1945, a vast outpouring of scholarship on growth and development has occurred. There are several reasons for this. The first is that economic growth is highly variable among nations. Why have some nations grown far more rapidly than others? The second reason is that the industrially advanced countries have overcome the worst excesses of business depressions through stabilisation policies and more flexible markets. The emphasis has, therefore, turned ways to achieve higher rates of growth. The third reason is that most poor countries, many of them colonies before World War II are now politically free and pursuing strategies to promote economic growth. The fourth reason is that the collapse of Marxian socialism in Eastern Europe and the Soviet Union has focused much attention on growth and development in these regions. Can the former communist countries transform their economies to capitalism and achieve rapid economic growth? Lastly, the rising standard of living in developing nations has become economically important to the industrially advanced nations in terms of direct investment, international trade, and international finance.

Now, considering that econometrics has become standard fare within the neoclassical and Keynesian tradition, as evidenced by the works of Antoine Augustin Cournot (1801-1877), Leon Walras (1834-1910) and Vilfredo Pareto (1848-1923), this paper incorporated mathematics and statistics into its basic methodology in the determination of whether the five models discussed hold in the Zimbabwe context.

3. Materials and Method

3.1. Sample of the Study

The sample period of 1990 to 2020 for data collection was chosen on the basis that it gives the key dynamic economic fundamentals which are important in explaining the current as well as future economic trends of economic growth and development for Zimbabwe. The period of data gathered therefore, represent the remaining period in their economic effects, which may be relevant in determining the relationship between the variables of the study. Infact, data for the study were collected from World Bank Database.

3.2. Methodological Orientation

This section explores the methodology applied in the study to determine the relationship between real GDP and Gross Fixed Capital Formation (GFCF), Value added by Manufacturing Sector as a percentage of GDP (VMS), Exports (Exp01), Value added by Industry Sector as a percentage of GDP (VIS), and Employment in Industrial Sector as a percentage of Total Employment (EIS). The study employed the ECM. Data were transformed into their natural logarithmic form. Some diagnostic tests that comprises of normality, correlation, and unit root tests were undertaken. Before conducting cointegration test, lag length were determined in unrestricted VAR using the Akaike information Criterion. Lag length

determination is deemed credible during the cointegration, model estimation and residual diagnostic testing (Magazzino, 2011). After conducting the cointegration test, ECM model was adopted as the data for the variables became stationary at levels and first differencing.

Furthermore, residual diagnostic testing were undertaken to determine the specificity of the model, and these comprised of the Jarque-Bera: Cholesky Lutkepohl Normality, Breusch-Godfrey Serial Correlation Langrage Multiplier and the Breusch-Pagan-Godfrey Heteroskedasticity tests.

(a) Normality Test

Normality tests were undertaken to determine normal distribution of the data. The underlying assumption is that data have to be normality distributed for them to be used for informed projections.

Table 3.1. Normality Test Results: Jacque-Berra Probability Technique

	REAL_GDP	EXP01	VMS	VIS	EIS	GFCF
Mean	0.864516	-1.153194	14.09868	23.61916	63.31258	11.96084
Median	1.440000	-2.056000	13.38800	23.00200	63.67000	10.17200
Maximum	19.67500	48.41100	26.89900	37.21200	67.24000	24.57700
Minimum	-17.66900	-29.27100	3.162000	9.116000	58.01000	2.000000
Std. Dev.	8.791637	14.56242	5.080754	6.395076	2.839891	6.931144
Skewness	0.001623	1.107522	0.329852	-0.288507	-0.162001	0.237796
Kurtosis	2.915192	5.902547	3.436719	3.304710	1.649547	1.869851
Jarque-Bera	0.009304	17.21946	0.808495	0.549982	2.491239	1.941922
Probability	0.995359	0.000182	0.667479	0.759579	0.287763	0.378719
Observations	**31**	**31**	**31**	**31**	**31**	**31**

Source: Secondary data: Eviews Version (8) Statistical Package Output

Eviews Output (2021)

Using the Jacque-Berra technique to determine if the data are normally distributed, the results show that out of the six variables, only Exports (EXP01) are not normally distributed as depicted by the Jarque-Bera p-value of less than 0.05. Given these results, the study proceeded to test for the correlation test.

(b) Correlation Test

The study conducted correlation tests to determine the degree of association between the variables of the study.

Table 3.2. Correlation Test Results: Correlation Matrix

	REAL_GDP	GFCF	VMS	EXP01	VIS	EIS
REAL_GDP	1	0.379618	-0.028792	0.264921	-0.032925	0.153381
GFCF	0.379618	1	0.591350	0.263289	0.378052	-0.414706
VMS	-0.028792	0.591350	1	0.080374	0.888935	-0.320231
EXP01	0.264921	0.263289	0.080374	1	0.011202	-0.023927
VIS	-0.032925	0.378052	0.888935	0.011202	1	0.005522
EIS	0.153381	-0.414706	-0.320231	-0.023927	0.005522	1

Eviews Output (2021)

Results in table 3.2 shows that real GDP has a positive linear relationship with Government Fixed Capital Formation (GFCF), Exports (EXP01) and Employment in Industrial Sector as a percentage of

Total Employment (EIS). However, there is a negative association between real GDP and, Value added by Manufacturing Sector as a percentage of GDP (VMS) and Value added by Industry Sector as a percentage of GDP (VIS).

This result for real GDP, Value added by Manufacturing Sector as a percentage of GDP (VMS) and Value added by Industry Sector as a percentage of GDP (VIS) seem to be in contrast to the researchers' untested imagination, economic theory and information depicted in Figure 2.1 of this study which suggests a positive relationship. Also, of interest to note is that the coefficients recorded are weak to conclude a strong correlation in Zimbabwe.

(c) .Unit Root Tests

The underlying assumption is that working with non-stationary time series data result in spurious research results. To that end, Augmented Dickey Fuller (ADF) was used to test for data stationarity.

Table 3.3. Unit Root Test Results: (Augmented Dickey Fuller)

Variable	t-ADF Statistic	Critical Value 1%	Critical Value 5%	Critical Value 10%	Conclusion
real GDP	-3.219996	-3.670170	-2.963972	-2.621007	I(0)
GFCF	-7.180862	-3.679322	-2.967767	-2.622989	I(1)
VMS	-4.892333	-3.679322	-2.967767	-2.622989	I(1)
Exp01	-3.979081	-3.679322	-2.967767	-2.622989	I(0)
VIS	-4.146445	-3.679322	-2.967767	-2.622989	I(1)
EIS	-3.350813	-3.689194	-2.971853	-2.625121	I(1)

, **, * Indicates Significance at 1%, 5% and 10%:*
Source: Eviews Output (2021)

Table 3.3 shows that the variables became stationary at levels and after first differencing. These results have serious implications on the type of estimation model a study has to adopt. If the data are stationary at levels, OLS is adopted. When data are stationary at both level and first difference ECM is adopted. The ARDL model requires data to have second differencing. Given that the data for this study became stationary at levels and first differencing, ECM was adopted to determine the truth on the extent to which the Keynesian and Neoclassical growth models hold in Zimbabwe. Before conducting cointegration test to determine if the variables' data move together in the long-run, the study conducted an unrestricted VAR to find out the optimal lag length for the model. Econometrics has it that if the lags are many, there tend to be lose of degrees of freedom, resulting in statistically insignificant coefficients and multicollinearity. Again, when lags are too few, specification errors are experienced. The results are presented below.

(d) Vector Autoregression Estimates

Table 3.4. Unrestricted VAR Lag Order Selection Criteria: Akaike Information Criterion (AIC)

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-521.9324	NA	2.62e+08	36.40913	36.69202	36.49773
1	-437.4509	128.1788	9787598.	33.06558	35.04580*	33.68576
2	-387.0044	55.66511*	5143188.*	32.06927*	35.74683	33.22104*

** indicates lag order selected by the criterion*
Source: Eviews Output (2021)

This study's lag order selection was informed by the Akaike Information Criterion (AIC) which was chosen ahead of the other five techniques. To that end, basing on the information shown in table 3.4 above, lag of two informed the study as shown by the asterisked coefficient 32.06927 below the AIC technique.

(e) Cointegration Test

Johansen Cointegration test as informed by Trace Statistic technique was used to determine the long-run relationship among variables of the study. A lag of two as alluded to in the preceding sections of this paper guided the cointegration process. The results of the cointegration testing are shown in table 3.5 below.

Table 3.5. Cointegration Test: Johansen Cointegration Test

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.941258	210.4726	95.75366	0.0000
At most 1 *	0.839273	131.1039	69.81889	0.0000
At most 2 *	0.707504	79.91848	47.85613	0.0000
At most 3 *	0.566256	45.49794	29.79707	0.0004
At most 4 *	0.380350	22.10953	15.49471	0.0044
At most 5 *	0.267305	8.708715	3.841466	0.0032

** denotes rejection of the hypothesis at the 0.05 level: **MacKinnon-Haug-Michelis (1999) p-values*
Source: Eviews Output (2021)

The null hypothesis of no cointegration amongst variables is tested against alternative hypothesis of existence of cointegration. The results for the study confirms the existence of cointegration amongst variables, as supported by trace value of 210.4726, with a calculated p-value of 0.0000, falling within the 5 percent significance level, making it statistically significant. The AIC lag of two was adopted. The results of the normalisation are depicted in table 3.6 below;

Table 3.6. Johansen Normalization Cointegration Coefficients

real GDP	GFCF	VMS	EXP01	VIS	EIS
1.000000	0.000000	-18.93099	3.851156	4.084798	-26.47052
	--------	(4.58761)	(0.41277)	(3.14322)	(3.78388)

**Standard error in parentheses*
Source: Eviews Output (2021)

Results in table 3.6 suggest that there is a negative normalisation coefficient between the dependent variable and independent variables GFCF, EXP01 and VIS. The study also recorded a positive normalisation coefficients on VMS and EIS. These results are supported by an implied t-statistic value for the variables which is lower than two. The t-statistic is determined by dividing the cointegration coefficient by the standard error values. In a nutshell, the null hypothesis of no cointegration is rejected against the alternative of a cointegrating relationship in the model. The existence of the long-run relationship, with an optimal normalization effect, necessitates the estimation of the Error Correction Model (ECM). Of interest to note is that in interpreting the normalisation cointegration coefficient, positive signs of the coefficients are interpreted as negative signs and vice-versa. In fact, an error correction model allows us to determine the short run dynamics of the relationships. A lag of one was used in the modelling of the ECM, which is one lag less to that which was determined by the AIC, a condition to be observed in the error correction modelling. The results are depicted in table 3.7 below.

(f) Model Estimation

Table 3.7. Error Correction Model

Dependent Variable: D (Real GDP)

Variables	Coefficient	Standard Error	t-Statistic
D(GFCF)	0.014517	0.05262	-0.27586
D(VMS)	0.055232	0.01576	3.50524
D(EXP01)	0.435892	0.11866	-3.67339
D(VIS)	0.081504	0.02528	3.22356
D(EIS)	-0.000007	0.00915	0.03360

Constant = 0.030216
R-Squared = 0.6958
Source: Eviews Output (2021)

Basing on the R-squared value, the independent variables are relatively adequate to explain the variations in the dependent variable. The results can be presented by the following model;

$$\Delta \text{ Log real GDP}_{t-i} = \beta_o + \beta_1 \Delta \text{ Log GFCF}_{t-i} + \beta_2 \Delta \text{ Log VMS}_{t-i} + \beta_3 \Delta \text{ Log Exp}_{t-i} + \beta_4 \Delta \text{ Log VIS}_{t-i} + \beta_5 \Delta \text{ Log EIS}_{t-i} + \varepsilon_t$$

$$\Delta \text{ Log real GDP}_{t-i} = 0.030216 + 0.014517 \Delta \text{ Log GFCF}_{t-i} + 0.055232 \Delta \text{ Log VMS}_{t-i} + 0.435892 \Delta \text{ Log Exp01}_{t-i} + 0.081504 \Delta \text{ Log VIS}_{t-i} - 0.000007 \Delta \text{ Log EIS}_{t-i} + \varepsilon_t$$

Government Fixed Capital Formation (GFCF):

The coefficient of GFCF has a positive sign and statistically significant. This means that an increase in GFCF result in one percent increase in real GDP.

Value added by Manufacturing Sector as a percentage of GDP (VMS): The coefficient of VMS has a positive sign and statistically significant. This means that a one percent increase in VMS lead to an increase in real GDP by six percent.

Exports (EXP01): The coefficient of EXP01 has a positive sign and statistically significant. The result suggests that one percent increase in exports would result in 44 percent increase in real GDP.

Value added by Industry Sector as a percentage of GDP (VIS): The coefficient of the variable VIS has a positive sign and statistically significant. The result show that one percent increase in VIS result in eight percent increase in real GDP.

Employment in Industrial Sector as a percentage of Total Employment (EIS): The coefficient of EIS has a negative sign and statistically significant. The result suggests that one percent increase in EIS result in zero percent decrease in real GDP.

The results of the five models evaluated shows that exports are key in propelling growth for Zimbabwe. This is as a result of the argument by Schumpeter who stated in his model, that innovation result in the introduction of new products and new markets. New markets which can be domestically and or foreign markets. This is an interesting result for the Zimbabwe economy. The result suggest that as more and more labour finds its way in the industrial sector from the agricultural sector the industrial output is insignificant. This could be an issue of increased labour relative to what the industry can absorb. The result is, therefore, in total divergence to what Lewis model had predicted. These results also affected Nurkse model who suggested for industrial expansion as shown by a one percent increase in real GDP.

It can be observed from these results that the five models evaluated contribute 58 percent to the total growth of real GDP, which is a significant figure. The other 42 percent could be accounted by the agricultural, mining sector and service sector which were impliedly stated in this paper. Table 3.8 below depicts the residual diagnostic test results.

(g) Residuals Diagnostic Tests

Table 3.8. Normality Test Results: Jarque-Bera: Cholesky Lutkepohl

	Jarque-Bera	df	Prob.
Joint Test	**40.29473**	**12**	**0.0001**

**Jarque-Bera Joint P-Value was used for interpreting the Results*
Source: Output (2021)

The results failed to reject the null hypothesis of non-normality distribution of the residuals as the joint p-value of the Jarque-Bera statistic is 0.0001, which is less than 0.05. Thus, the residuals are not normally distributed. The study went further to test for serial correlation. Using the Breusch-Godfrey Serial Correlation LM test to determine the presence of the serial correlation of successive error terms. The results are shown in table 3.9 below:

Table 3.9. Breusch-Godfrey Serial Correlation Langrage Multiplier Test

Lags	LM-Stat	Prob.
1	43.92630	0.1709
2	24.80994	0.9202

P-Value was used for interpreting the Results
Source: Eviews Output (2021)

Results in Table 3.10 show that the null hypothesis of serial correlation is rejected since the p-value of 0.9202 is greater than 0.05, suggesting that there is no serial correlation on the residuals. The study went further to test for heteroscedasticity. The Breusch-Pagan-Godfrey was used to test for heteroscedasticity. Table 3.10 below shows the heteroscedasticity test results;

Table 3.10. Heteroscedasticity Test Results

	Chi-sq	df	Prob.
Joint Test	300.7996	294	0.3799

P-Value was used for interpreting the Results
Source: Eviews Output (2021)

Results in table 3.10 show that there is homoscedasticity given the p-value of 0.3799, which is greater than 0.05. It follows, therefore, that the model that this study used is well-specified.

4. Conclusion

The purpose of this paper was to determine whether the Keynesian and Neoclassical models hold in Zimbabwe. The Error Correction Model (ECM) was applied to determine the reality. The unit root properties of the data were examined using the Augmented Dickey Fuller (ADF), after which the cointegration was informed by Johansen using the Trace values. The results showed that the variables' data were stationary at levels and first differencing. The cointegration test confirmed that the variables are cointegrated, indicating an existence of long-run equilibrium relationship as confirmed by the

Johansen test results. The ECM test confirmed the existence of relationship between the variables of the study, with exports from the Schumpeter model having positive relationship and contributing much to the real GDP. The Lewis models posted an inverse relationship, hence reinterpreting the models in the Zimbabwe context. The stability tests were also conducted and they confirmed that the ECM is well specified.

5. Recommendations

This study suggest the following recommendations:

- There is need for the government of Zimbabwe to come up with policies that enhances the attraction of Foreign Direct Investment. This could enhance the growth capital formation.
- There is need for revitalisation of the industrial sector as it is currently operating below capacity. This would results in industries absorbing more labour, thus increasing nation's output.
- The government of Zimbabwe should continue supporting the Agricultural Sector through its Command and Pfumvudza Agricultural initiative as seen by the contribution exports have in increasing economic growth.
- The government of Zimbabwe should come up with initiates that enhances innovation, through making budgets for research and development.
- Government of Zimbabwe should enact laws that govern patents so as to promote innovation.

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