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ANALYSING THE CONTRIBUTION OF EXPORTS TO ECONOMIC GROWTH IN ZIMBABWE: (1990-2020)

BY

JOSEPH McDonald MAPWANYA

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Name of the Author : JOSEPH McDonald MAPWANYA

Registration number : B1953587

Project Tittle: **Analysing the contribution of exports to economic growth in Zimbabwe (1990-2020).**

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SIGNED

PERMANENT ADDRESS: KANYEMBA PRIMARY SCHOOL P.O.BOX 40 GLENDALE

Approval form

The undersigned certify that he has supervised the student **B1953587** with a dissertation entitled **Analysing the contribution of exports to economic growth in Zimbabwe: 1990 to 2020** submitted in Partial fulfilment of the requirements of the Bachelor of Science (Honours) Degree in Economics at Bindura University of Science Education.

……/…… ……/……..

Student Signature Date

……/…… ……/……..

Supervisor Signature Date

……/…… ……/……..

Chairperson Signature Date

……/…… ……/……..

External Examiner Signature Date

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Signed…….. Date…….

Registration number …….

Physical address……

……..

Dedications

This dissertation is dedicated to my entire family, special mention going to my mother Fungisai Chibaduke and Clara Kanjeluka

Abstract

Empirically analysing the impact of various macroeconomic factors on economic growth will assist a nation in developing beneficial policies to promote economic growth in this regard. Zimbabwe have been recording low RGDP and suffering from various economic problems for the past three decades and these issues have heightened the researcher's interest to carry out this research. Using time series data from the World Bank, this study analysed the role that exports played in Zimbabwe's economic growth from 1990 to 2020.The econometric model for this study was estimated using E-views 7.1 and ordinary least square (OLS) method. The findings showed that exports are statistically significant in explaining the changes in economic growth and that, over the period under study, they had a negative contribution to economic growth with a 1% increase in exports leads to 0.617% decrease in economic growth. While imports and gross capital formation made positive contributions to economic growth, this study found that foreign direct investment was statistically insignificant. Cointegration test for exports and economic growth was performed using the jahansen cointegration test and results shows that there is a long –run relationship between exports and economic growth. It should be emphasized that the majority of Zimbabwe's exports are raw materials and semi-finished goods with minimal market value. Therefore, it is advised that the Zimbabwean government must adopt strategies for export value addition and beneficiation in order for them to maintain their competitiveness and fetch a higher price on the global market. The government of Zimbabwe should improve access to finance for local businesses to help them to increase their exports and economic growth. This can be done by providing access to low- interest loans, grants and other financial incentives. Therefore, focus should be placed on policies that will increase the volume of a nation's exports while also encouraging the emergence and expansion of domestic industries, thereby boosting Zimbabwe's economic growth, which is the primary macroeconomic goal of any economy.

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God's blessings be upon you all.

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List of acronyms

ADF	Augmented Dick Fuller
ADB	African Development Bank
ARDL	Autoregressive Distributed Lag
BLUE	Best Linear Unbiased Estimator
BUSE	Bindura University of Science Education
PCUSUM	Cumulative- Sum - of -Residuals
DRC	Democratic Republic of Congo
DW	Durbin Watson
ECI	Economic Complexity Index
EXPO	Exports
FDI	Foreign Direct Investment
GDP	Gross Domestic Product
GCF	Gross Capital Formation
IMF	International Monetary Fund
IMPO	Imports
JB	Jarque Bera
RGDP	Real Gross Domestic Product
OLS	Ordinary Least Squares
VAR	Vector Autoregressive Model
WB	World Bank

CHAPTER I

INTRODUCTION

1.0 Introduction

All economies whether they are developing or developed, strive to optimize their rate of GDP. To increase their pace of economic growth, economies employ a variety of tactics and tools. One of the methods a nation may use to attempt to reach the GDP level it desires is through exports. However the question of whether exports are actually beneficial for nations that seek to reach their desired level of GDP growth is hotly contested among economists. Neo-classical growth theories favour export-driven economic expansion. They assert that exports have a large and advantageous effect on economic growth.

Some economists, however, contend that exports only have a small impact on the economy in the short – term and have a long- term association with the nation's economic progress. The historical record is replete with examples of nations that promoted exports in order to achieve their desired level of economic expansion. Germany, which began its export driven growth initiative in 1950, and Japan, which adopted this program in 1960, serve as excellent examples

Many researchers have conducted various studies in developing economies to analyse impact of exports to GDP growth. According to these studies, it shows that there is little consensus on the exact connection between exports and GDP growth. According to Kavoussi (1984), and Ram (1987), some economists support that exports have a positive and significant impact on countries economic growth. However according to Medina-Smith E.J, (2001) and Abbas, S. (2012), there are a number of other economists who argued that exports have a negative relationship to economic growth.

Exports are essential drive to economic growth of an economy, countries should adopt strategies of promoting exports base of their economies. If exports are promoted, the economy will actually get foreign currency which can be used to purchase machinery which helps in the manufacturing of goods and services of the developing nations. Therefore exports represents a flow of income into the economy and because of that exports are regarded as an injector of the economy and they boost the economy by creating employment and increasing investment. This

chapter will deal with background, statement of problem, questions of the research, hypothesis, and assumptions of the study .It will go on in explaining limitations, significance and delimitations of the research.

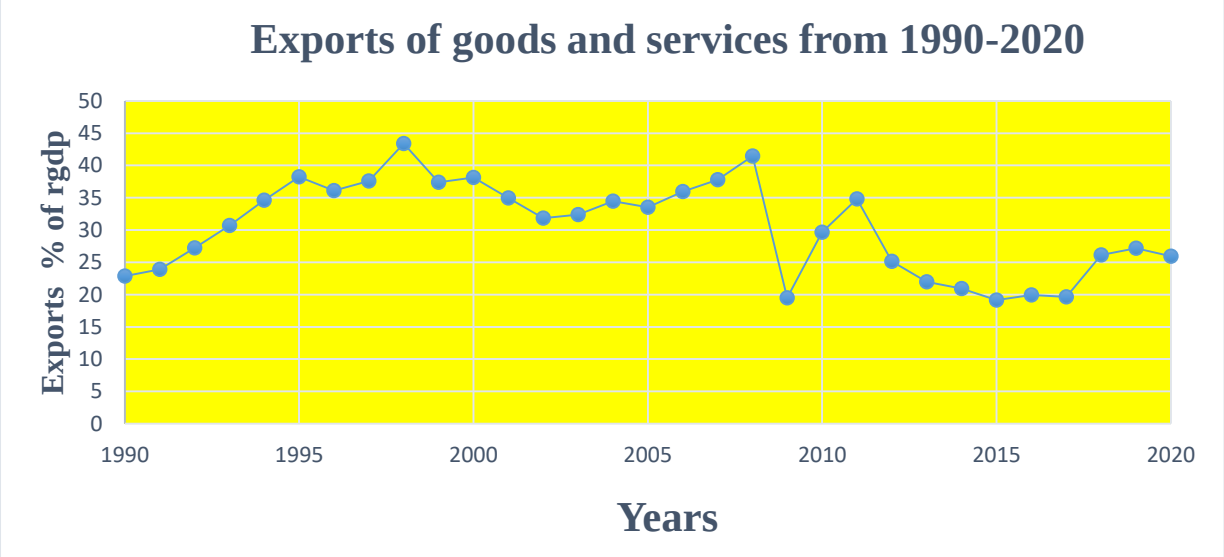
1.1 Background of the study

Analysis of exports and economic growth in Zimbabwe from 1990-2020 is set against the backdrop of the country's economic history. Zimbabwe was once a highly prosperous country in the region, with strong agricultural sector and a well- developed manufacturing industry. However, since the late 1990s, the economy of Zimbabwe experienced an economic downturn due to a number of factors, including, hyperinflation, and drought, lack of foreign investment, land reform program, poor governance and corruption. This has led to a decrease in exports and a decrease of economic growth. The country has gone through a period of hyperinflation, economic decline, and political unrest.

A trend of Zimbabwe's exports for the past three decades

As shown on the graph below, exports for Zimbabwe economy maintained an upward trend from 1990 to 2020. For the past three decades the maximum value of exports is 43.393% recorded in 1998 and the minimum value is 19.160% recorded in 2015.

Fig 1.1 .A trend of Zimbabwe's exports for the past three decades



Source: own computation using dataset collected from World Bank

Theoretically, for an exporting economy, resources obtained should offset the value of imports and boost the domestic economy, enhancing the gross domestic product (GDP). Therefore, exports benefit the economy while accelerating revenue circulation, expansion of industries,

and creation of jobs and improvement of living standards. According to World Bank, exports accounted for nearly 20% of Zimbabwe's GDP in 2019, up from 5% in 1990. This suggests that exports have been important factor in the country's economic growth over the past three decades. Exports have also been the source of foreign currency for Zimbabwe, and this has helped the country to pay for essential imports such as fuel, food and medical supplies. On average, a decade from 2000 to 2010, exports declined by an average of 4.2% per year. This was largely due to the effects of hyperinflation, which made Zimbabwe's exports less competitive on the global market. The economy also suffered from lack of foreign direct investment, as international community imposed sanctions on the country in response to human rights abuses.

The importance of export revenue/ earnings to the economy of Zimbabwe.

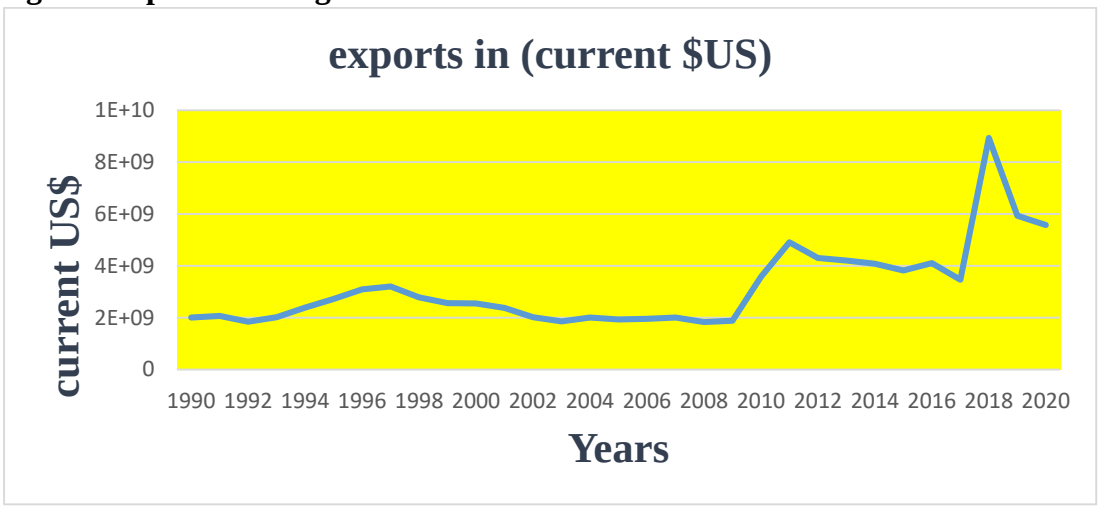
Stimulate economic growth

Exports revenue helps to stimulate economic growth by providing foreign currency for the purchase of capital goods and other vital imports. This helps to create jobs and increase the level of economic activity. These exports revenue can also be utilised to develop the economy by funding public services such as healthcare, education and infrastructure.

Reduces poverty

Export revenue helps to reduce poverty by providing employment opportunities and increasing the incomes of the people. This helps to improve the living standards of the people and reduce inequality.

Fig 1.2: Exports earnings for Zimbabwe from 1990-2020



Source: own computation using dataset extracted from World Bank

The above graph depicts a trend of export revenues from 1990 – 2020. From 1990 to 2020, Zimbabwe exported goods and services worth US$97,953,605,791 in total. From 1990 to 2020, the value of exports varied, reaching a high of US$8,936,584,957 in 2018 and a low of US$1,831,052,800 in 2008. Zimbabwe exported goods worth US$5,574,671,609 in 2020.

Resource endowments is very high in Zimbabwe, natural resources including diamond, gold ,iron ore, nickel, lithium, copper and diamond. Gold, platinum and diamond are the most highly valued natural resources mined in Zimbabwe. The nation has very fertile land suitable for agricultural production, but only 10% of the land is arable. Exports products from agriculture sector are tobacco, cotton, wheat, maize, coffee, sugarcane, peanuts, sheep, goats and pigs.

Fig 1.3: The trend of economic growth of Zimbabwe from 1990- 2020

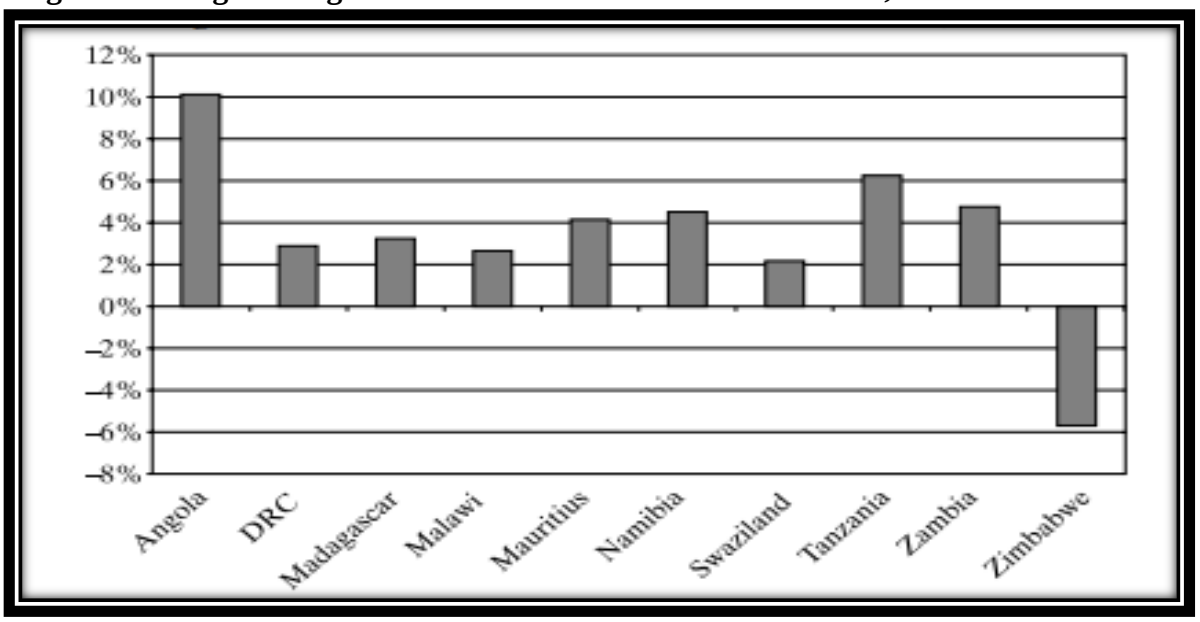
Source: Author's computation using World Bank data

Over the past three decades (1990-2020), as shown on graph above, the GDP growth of Zimbabwe was not stable. Real growth in GDP for the country was high in 2010 and very low in 2008 over the period under review. In 2010 the annual growth rate was 21,452% and in 2008 the annual growth was -17,669% , and this is due to the fact that the country experienced a hyperinflation in 2008 and hence low economic activities since most industries shut down production and the nation failed to export more goods and services. After the land reform programme in 2000, the nation suffered from negative growth rate in subsequence years due to fact that the agricultural sector was heavily affected by the land reform programme. On average a decade from 1990 to 2000, Zimbabwe's real GDP grew at an average of 2.363%. This growth was largely driven by agricultural sector, which accounted for more than half of the country' GDP, World Bank (2022). However, the economy began to slow down in early 2000s due to

number of factors, including fast track land reform program, which saw the government seize white-owned farms and redistribute them to clueless and poor black Zimbabweans who had no capital and technical know –how about farming at that time. This lead to a decrease in agricultural production, and the economy began to decline.

The economic growth of Zimbabwe have been decreasing when other nations in Africa were showing a better growth rate. Zimbabwe's GDP from 1998 to 2007 declined much while there was a gain in other African countries. The graph below compares Zimbabwe economic growth with other 9 selected African nations.

Fig 1.4: Average GDP growth rates for selected African nations, from 2000-2006



Source: African Development Bank (2010)

From graph above, it is indicated that Angola, performed better in terms of average GDP, followed by Tanzania, Zambia, Namibia, Mauritius, Madagascar, DRC, Malawi, Swaziland. Lastly Zimbabwe had the lowest growth rate and it was the only nation with a negative average GDP growth rate from 2000-2006.

In 2021, Zimbabwe was the number 103 economy in the world in terms of GDP (current US$), number 107 in total exports, the number 124 in total imports , the number 145 economy in terms of GDP per capita (current US$) and the number 98 most complex economy, according to Economic Complexity Index (2021).

1.2 Statement of the problem

Despite high basket of resources in Zimbabwe which can be used to boost exports for the nation, the economic growth for the Zimbabwean economy continues to perform poorly. The economy of Zimbabwe is very rich in mineral resources like gold, diamond, nickel, platinum, and these mineral are key in terms of expanding the export base of the nation and to boost the country's gross domestic product and creation of employment. From the theoretical perceptive, exports growth are an injector to the economy. As highlighted above there, has been a negative growth rates for the period between 2000 and 2006, this has motivated the researcher's interests to analyse the contribution of exports to economic growth in Zimbabwe. The economy of Zimbabwe have been halted by poor economic performance, particularly in terms of producing enough output for its growing population. As such the level of unemployment has gone high in the country, low investment, little foreign currency, high inflation rates, low exports and high imports, leading to persistence balance of payment deficits, high levels of corruption and poor governance are some of the major features of the Zimbabwean economic problems which need to be addressed for the economy to prosper.

1.3 Objectives of the study

Main objective

To analyse the contribution of exports to economic growth in Zimbabwe from 1990 to 2020.

Sub objective

i. To determine whether exports contribute negatively or positively to economic growth in Zimbabwe
ii. To determine if there is cointegration between exports and economic growth in Zimbabwe
iii. To give recommendations on what should be done to resuscitate Zimbabwe's export sector and economic growth

1.4 Research Questions

i. Does exports contribute negatively or positively to economic growth in Zimbabwe?

ii. Is there cointegration between exports and economic growth in Zimbabwe?
iii. What are the recommendations that should be taken into consideration to increase exports and economic growth in Zimbabwe?

1.5 Hypothesis formulation

$\boldsymbol{H_0}$: Exports have a positive contribution to economic growth in Zimbabwe from 1990-2020.

$\boldsymbol{H_1}$**:** Exports have a negative contribution to economic growth in Zimbabwe from 1990- 2020.

1.6 Significance of the Study

To the Author

The research is crucial to the researcher because it sheds light on how important it is to ascertain how exports and economic growth relate to one another for the Zimbabwe economy. Additionally, this study will deepen the student's understanding of how exports contribute to economic growth. The study will also hone the student's analytical abilities by coming up with practical suggestions for reviving Zimbabwe's economy

To the university

The fact that this research will expand the university's e-learning resources and enhance the university's reputation makes it crucial for Bindura University's educational mission. The study will provide empirical data on the examination of exports and economic growth in Zimbabwe and as a result, other students will benefit from this study.

Finance and economic development ministry

This study will give the above ministry crucial information for formulating economic policies (fiscal and other economic policies). It will also assist the ministry in developing strategies for export promotion and accelerating economic growth.

1.7 Assumptions

i. GDP is a good measure of economic growth, hence changes in GDP will indicate the level of economic growth.
ii. The study will be completed on the stipulated time set by the department.
iii. Findings from the research will be bias free.
iv. There will no spurious regression.
v. Dataset used in this research is accurate and reliable.

1.8 Delimitations

i. The research utilise secondary data only.
ii. The study is mainly for the Zimbabwean economy only.
iii. The research is going to cover only three decades, from 1990 to 2020.

1.9 Limitations

In gathering information and data for the research, the author encountered a variety of restrictions. One of the biggest challenges encountered while working on the project was availability and trustworthiness of secondary data. There were numerous gaps in data sets found on World Bank and other statistical organisations. There were additional times when the researcher discovered differences in data sets, particularly those related to World Bank and IMF. In order to address this problem, the author make strong comparison of data sets from different statistical agencies. Effectively conducting this research was also hindered by the financial component

1.10 Chapter summary

The research issue was presented in this chapter along with explanation of its background, research problem, objectives, research questions, research hypothesis, significant of the study, delimitations and limitations. This study will look at how exports have contributed to Zimbabwe's economic growth. There will be five primary chapters in this study. The gap analysis and literature review (both theoretical and empirical) linked to the area of emphasis will be covered in the following chapter.

CHAPTER II

LITERATURE REVIEW

2.0 Introduction

Different literature that is connected to exports and economic expansion in developing nations is still a crucial consideration in policy development. Several recommendations on debate previously addressed are provided by theory and empirical literature. Although some research reveal a negative influence, the majority of empirical investigations tend to connect the idea that exports have a beneficial impact on economic growth. This chapter will look at various literature both theoretical and empirical that is linked to the research topic.

2.1 Theoretical Literature Review

2.1.1 Export-led Growth Theory

Export-led growth model was developed by economist W.W Rostow in 1960. Export-led growth is an economic strategy that focuses on increasing a country's exports as a way to stimulate economic growth. This strategy is based on the idea that increased exports will lead to increased production and employment, which will in turn lead to higher incomes and higher economic growth. This strategy is often used by developing countries as way to increase their economic growth and reduce poverty.

According to Krugman and Obstfeld (2003) export-driven growth is essential in explaining the association of exports and economic growth in developing nations. Export-driven growth is important to growth in developing nations as it create jobs and reduce unemployment. This is especially true in countries with limited access to capital and investment opportunities. Exports can create jobs in production, transportation, and marketing, producing an important source of income for individuals and families. This can help to reduce poverty and inequality and can lead to economic growth. Export- driven growth can also lead to increased trade, and economic growth as countries benefit from the exchange of goods and services. Export –driven growth can also attract foreign currency to developing nations which is essential in purchasing capital goods for economic development. This can help in infrastructural investment and hence an increased economic growth in the long run.

2.1.2 The Neoclassical growth theory

Neoclassical growth theory is an economic theory that explains the long- term economic growth of country. It is based on the idea that economic growth is determined by the accumulation of capital and the rate of technological progress. The theory was developed by Robert Solow in 1956 and is considered one of the most influential theories in economics. The theory states that the long –term economic growth of a country is determined by the accumulation of capital and the state of technological progress. It suggests that economic growth is driven by the accumulation of physical capital, such as machines and factories, as well as human capital, such as education and skills. The theory also suggests that technological progress is the main driver of economic growth, as it allow more and higher productivity. The neoclassical production function, which includes imports and exports as extra production factors in addition to labour, capital, and technology, can be used to quickly analyse studies on economic growth. The following production function provides a summary of this:

$$Y = f(L, K, A, EXP, IMP)$$

Where Y is a level of GDP, K is capital stock, L is labour force, A is technological progress, EXP is exports and IMP is imports. For developing countries like Zimbabwe, exports are important in the sense that they bring in foreign currency which is important in importation of capital goods and technologies that aid in production of goods and services. Neoclassical growth theory can be used to explain the contribution of exports to economic growth in Zimbabwe. The theory suggests that exports can contribute to economic growth by increasing the amount of capital available for investment and by providing access to new technologies.

2.1.3 Absolute Advantage Theory

The theory of absolute advantage was developed by Adam Smith in 1776. The theory is an economic concept that states that a country has an absolute advantage over another country if it can produce a good or service at a lower cost than another country. The theory states that a country can increase its wealth by specialising in the production of certain goods and services that it has an absolute advantage in producing. This specialising will lead to increased production and lower costs, which will results in higher profits

Trade between nations should be based on absolute advantage, according to Adam Smith. Two countries should specialise in manufacturing of goods of their absolute advantage. When one country is more productive than the other nation in producing one good while being less productive (and hence having an absolute disadvantage) in producing the other (Salvatore,

2013). According to Krugman and Obstfeld (2013), in order to benefit from trade, every nation should sell goods of absolute advantage and import the goods of absolute disadvantage. Production efficiency, lead to production of more goods with less resources, which increases output, which may promote economic growth. This theory is so important due to the fact that it lead to increased economic growth, as countries can specialise in goods and services of their advantage, hence more will be exported and the nation will get profits and foreign currency to invest in capital and infrastructure. Based on facts the economy of Zimbabwe has absolute advantage in mineral resources particularly gold, nickel and diamond and also arable fertile land coupled with favourable climatic conditions. As such the government of Zimbabwe can boost its economic growth by exporting processed and value added products from mining and agricultural sectors respectively. Moreover, according to this theory more specifically, the research anticipates that exports will contribute positively to economic growth, ceteris paribus.

2.1.4 The Ricardian Model

The Ricardian model is an economic model developed by David Ricardo in his book on Principles of Political Economy and Taxation. The model is based on the idea of comparative advantage, which states that a country has a comparative advantage over another country in the production of good or service if it can produce it at lower opportunity cost than the other country this theory can be used to analyse the contribution of exports to economic growth of an economy. The comparative advantage idea was introduced by David Ricardo in 1817. The concept makes the assumption that two nations will cooperate to manufacture two commodities using one factor of production, often labour. As it is believed that all nations and businesses create identical items, there are no shipping expenses for moving commodities between them (Salvatore, 2013). According to the paradigm, a nation has a comparative advantage if its opportunity cost for manufacturing an item is lower than that of other nations. The Ricardian model is linked to exports and economic growth in developing countries because it suggests that countries can benefit from specialisation and trade. According to this model, countries should specialise in the production of goods and services that are relatively more efficient at producing. This can lead to increased exports, which can help increase economic growth. Additionally, the model suggests that countries should focus on increasing their exports to countries. The model's conclusion is that exports would result in higher living standards through economic development and growth (Krugman and Obstfeld 2003). Gains in trade occur as a consequence of increased exports as nation's deals with another because efficient production makes it possible to raise output at a cheaper cost. According to this hypothesis,

this study's results should show favourable correlation of exports and economic growth, ceteris paribus.

2.1.5 The Dependency growth theory

This theory was developed by the Latin American Economist Andre Gunder Frank in the 1960s.The dependency theory is an economic theory that states that the economic growth of a developing country is dependent on other countries. The dependency theory states that economic growth in developing countries is dependent on economic growth of developed nations. This theory suggests that economic growth of developing countries is largely determined by the economic policies of developed nations. Raul Prebisch created the hypothesis in the 1950s after learning that economic expansion in affluent nations was not required for progress in less developed nations. The dependence theorists argue against the neoclassical premise that economic growth helps all economies equally since the benefits cannot be distributed equitably (Ferraro, 2008). Although Adam and smith David Ricardo claimed that commerce between states is possible regardless of the type of the products, the dependence theory holds a different perspective. According to Rual Prebisch's theory, impoverished countries sell primary goods to wealthy nations, which then use those goods to produce goods that are then sold to the poor nations. As the value added on produced items exceeds the value of primary goods, export earnings from primary commodities are less than the value that is paid on imports. Because of this, developing nations would never make enough money from their exports. Based on the arguments put out in this hypothesis, exports are predicted to have a negative impact on economic growth in Zimbabwe, ceteris paribus.

2.2 Empirical Literature Review

This section will look at past studies that have been conducted in various nations and these studies are similar to the research topic of this study.

Hemazawi and Umotoni, (2021) used ordinary least square (OLS) method to examine the impact of exports and imports on economic growth in Rwanda. They used time series data from 2000 to 2020 for gross domestic product, exports, imports, capital, labour and technology. Their results revealed that 1% increase in exports result in 0.05% increase in GDP and 1% increase in imports cause an increase in GDP by 0.32%. They concluded that both exports and imports are statistical contributors to economic growth of the Rwanda economy.

Using yearly time series data covering the years 1972 to 2015, Khan et al, (2016), assessed the significance of exports and its influence on economic growth in Pakistan government. Unit root test among other econometric tests were employed in the analysis of the data. The research's findings showed that exports and their determinants had few impact on Pakistan's economic growth during 1972 to 2015

Bonga et al, (2015) investigated the contribution of Zimbabwe's export sector to economic growth. Time series data from 1975 to 2013 were utilised in their study. They conducted the analysis using unit root tests, Granger tests among others. Their research revealed strong evidence for a short –run causal relationship between the growth of exports and economic growth.

Moreover , Kumar,(2015) conducted study to determine if an outwardly focused trade policy is better than an inwardly focused trade policy for promoting economic growth using time series data. Two hypotheses- the growth- led export hypothesis and the export –led hypothesis –were created in accordance with the analysis. The study focused on exports and GDP as variables and looked at the link between them in India from 1980 to 2009. By using the Granger Causality estimate method, the research results showed a two-way link between exports and GDP. The research's remarks was that from 1980 to 2009, India's economic growth was driven by exports.

For the years 1980 to 2013, Gokmenonglu et al, (2015) conducted a research in Costa Rica to test the theory that exports enhance economic growth. The estimate methods utilised for the variables real exports and real GDP, were Granger test and the Jahansen Cointegration test, both tests demonstrate a long term association between exports and economic growth. The research's conclusion was that export growth in Costa Rica throughout the study period was a result of economic growth, demonstrating that the nation did not experience export –led growth.

Furthermore, Chigusiwa et al. (2011) used annual time series data for the years 1977 to 2006 to analyse the applicability of export- led growth hypothesis in Zimbabwe. The estimating approaches employed two models: the overall export model and the model that separated exports into exports of produced items and exports of raw materials. The research's results show that the Zimbabwe's export –led growth hypothesis is correct, and moreover that there is a long – term link between exports and non-exports GDP, with the short –term direction of relationship running from exports to non- exports. In summary, the analysis supported

Zimbabwe's export –led growth, since raw materials significantly boosted both exports and economic growth. Furthermore, the experts concurred that Zimbabwe's economy depends heavily on foreign commerce and the health of global economy, thus the government must implement effective economic policies to promote long – term growth. The findings of their study add up to those discovered by Parida and Saboo (2007), who found a long –term connection between South Asia's exports and non- exports GDP.

More specifically, between 1971 and 2004, Hassan (2007) looked at the connection between Saudi Arabia's exports and economic growth. Real GDP, real government spending, and real exports were employed in the study. More specifically, contemporary econometric methods included the Granger test among others were used to analyse the link of exports and economic growth in Saudi Arabia over a long and short terms. The results indicated that, over the long term, economic growth had a major impact and had a favourable association with other factors. It was therefore determined that exports support economic growth.

The dataset of 45 developing nations, which included exports from around 33 nations between 1981 and 1997, was used by Cuaresma and wars (2005) to evaluate the theory that exports in technologically intensive sector had larger potential for favourable growth. The study's estimating techniques included the Random Effects Model (REM) and Instrumental variables, but the results based on these techniques supported the idea that exports may have an effect on economic growth

Keong et al, (2005) did an analysis of export-driven growth in Malaysia from 1961 to 2002. The researchers used various estimation methods which include the Granger causality, Autoregressive and the distributed lag method. The results of the study demonstrated and concluded that export drives economic growth in Malaysia from 1961 to 2002. Findings from their study confirm with idea implied in the absolute advantage theory that economic growth would be determined by goods exported as a result of trade.

Moreover, using quarterly time series data, Tuncer (2002) examined the dynamic relationship between GDP, exports, imports, and investment in Turkey for the years 1980 – 2000 using Vector Auto regression model (VAR) and the Ganger Causality Test as the estimate approaches. The results revealed that there is a causal relationship between GDP and exports and investment but not between exports and GDP. Study's findings shows that exports does not contribute to economic growth over the years under consideration. Feraro (2008), who claimed that exports from developing nations will have a positive impact on the global

economy, pointed out to the Dependency theory in his argument that the results of this study are compatible with the idea.

Sentsho (2002) used annual time-series data from 1976 to 1997 in Botswana to evaluate the ELG hypothesis. He runs a regression using the ordinary least square (OLS) approach and came to the conclusion that exports have a long-term beneficial impact on economic growth.

Additionally using yearly data for the years 1968 to 1996, Qarn and Suleiman (2001) examined a study on export-led growth theory for nine nations including Algeria, Egypt, Morocco, Tunisia and Turkey. GDP, exports and imports were among the variables utilised in the analysis of yearly data using vector autoregressive models. The findings from their study revealed that exports have no significant impact on economic growth of those countries.

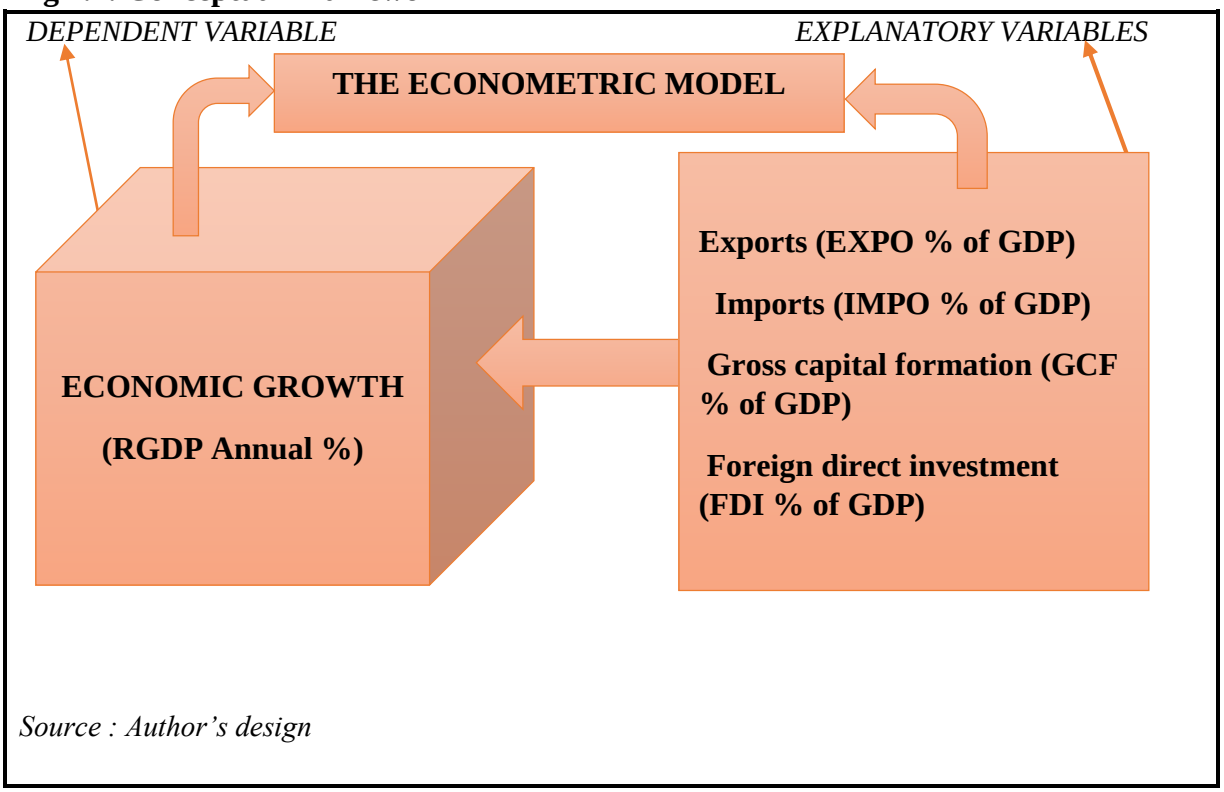
2.3 Gap analysis

As indicated in the empirical literature above, most of the studies conducted did not use the ordinary least square (OLS) method of estimation. Most of the studies utilised the Granger causality test, vector Auto- regression model (VAR) and the Autoregressive Distributed lag (ARDL) in their analysis of exports and economic growth in developing nations. As such this study will cover this gap by using the ordinary least square method in making economic analysis. The study is different from other studies due to the choice of explanatory variables. This research will go a step further by incorporating exogenous variable: imports (IMPO), foreign direct investment (FDI) and domestic investment (gross capital formation) GCF, to also test their statistical significance and contribution to economic growth in Zimbabwe. This research will be conducted using time series data from 1990 to 2020 hence the timeframe will distinguish this study from, Chigusiwa et al, (2011) and from Bonga et al, (2015) who did researches on exports and economic growth in Zimbabwe and their timeframe ranged from 1977 to 2006 and 1975 to 2013 respectively.

2.4 conceptual framework

A conceptual framework examines the connections between several concepts or how they relate to a specific phenomenon. It looks at how the exogenous factors, in this case (gross capital formation, foreign direct investment, imports and exports) and the endogenous variable (economic growth) interact.

Fig 2.4: Conceptual Framework



Source : Author's design

Note: some of the variables used in designing the above conceptual framework were adopted from the model used by Hemazawi and Umotoni, (2021)

2.5 Chapter summary

This chapter dealt with various literature, both theoretical and empirical which are linked to exports and economic growth in developing nations, Zimbabwe included. The empirical literature of the study showed that exports have positive contributions to other developing nations, whilst having negative contributions to other developing countries as well. This research is going to utilise ordinary least square (OLS) method to analyse the contribution of exports to economic growth in Zimbabwe from 1990 to 2020. The following chapter (III) will look at the methodology of the study.

CHAPTER III

RESEARCH METHODOLOGY

3.0 Introduction

The act of gathering and analysing data to address a research topic or test a hypothesis is referred to as research methodology, according to Ingwenagu (2006). Surveys, interviews, experiments, and statistical analysis are just a few of the techniques used. Time series regression will be applied in an effort to investigate how exports contribute to economic growth in Zimbabwe. All of the variables that will be included in the model of this study are yearly dataset. The design of the model, its specification, the rationale of the variables, the diagnostic tests, and the data sources will all be covered in this chapter.

3.1 Theoretical model

A theoretical model is a framework or a set of assumptions used to explain a phenomenon or to make predictions about future events. It is often used in scientific research to test hypothesis and theories. The theoretical model used in this study is based on ***neoclassical growth theory***, which is a theory of economic growth that was developed by Robert Solow in 1956. The theory states that economic growth is determined by the accumulation of physical capital and technological progress. The equation for neoclassical growth theory is given as follows:

Y = f (K, L, A) where Y is total output, K is capital, L is the amount of labour and A is the level of technology. The above equation can be expanded by additional of the variables such as X for exports and M for imports hence the equation can be rewritten as follows: Y=f (K,L,A,X,M) . Finally this equation can be presented in a linear multiple regression form as follows.

$$Y = \beta_0 + \beta_1 K + \beta_2 L + \beta_3 A + \beta_4 X + \beta_5 M + \mu$$

Where β_0 is a constant and β_1 , β_2 , β_3 , β_4 and β_5 are parameters of coefficients and μ is the error term.

The historical record is replete with examples of multiple regression models that were utilised by various authors in performing econometric regression analysis of their studies. This research adopted a multiple regression model that was used by Hemzawi and Umotoni (2021). These authors used OLS method in analysing the impact of exports and imports on economic growth in Rwanda using time series data from 2006-2020. The multiple linear regression used by these researchers is given as shown below.

$$\boldsymbol{GDP = \beta_0 + \beta_1 cap + \beta_2 lab + \beta_3 imp + \beta_4 exp + \beta_5 tech + \mu}$$

Where

GDP is Gross Domestic Product of country

Cap is Capital

Lab is Labour,

Exp is Exports of goods and services

Imp is Imports of goods and services.

Tech is technological progress

Coefficient $\boldsymbol{\beta_0}$ is constant and $\boldsymbol{\beta_1 \ldots\ldots \text{up to } \beta_5}$ are coefficients of explanatory variables is $\boldsymbol{\mu}$ an Error term

3.2 Model specification

In order to better explain the relationship between a groups of variables, Gujarati (2004) defined model specification as the process of choosing the right form of a statistical model. Choosing the best model for the research topic and the data analysis is a crucial phase in the research process. An effective economic model includes a dependent variable as well as two or more independent variables. This study's primary objective is to analyse how exports have influenced economic growth in Zimbabwe from 1990 to 2020. The model used in the study was adopted from the model used by Hemzawi and Umotoni (2021). However, in order to create a more complete model and to account for other variables' effects on economic growth, the researcher also included other variables. The following model was created to fulfil the researcher's desired goal.

$$\boldsymbol{RGDP = \beta_0 + \beta_1 EXPO + \beta_2 FDI + \beta_3 GCF + \beta_4 IMPO + \mu}$$

Where:

RGDP = real gross domestic product (a measure of economic growth)

EXPO = exports of goods and services

FDL = foreign direct investment

GCF = gross capital formation (proxy for total investment)

IMPO = imports of goods and services

$\boldsymbol{\mu}$ = error terms (it captures other variables that impact economic growth which are not included in the model)

Coefficient $\boldsymbol{\beta_0}$ is the intercept *(*constant) and $\boldsymbol{\beta_1}$ ……Up to $\boldsymbol{\beta_4}$ are coefficients of the model.

3.3 Variables Justification

The dependent variable of the model is real gross domestic product (*economic growth measure*) and the explanatory variables are exports, foreign direct investment, gross capital formation (*a measure of investment*) and imports.

3.3.1 Economic growth (RGDP)

This was calculated using real gross domestic product (GDP), which is an inflation-adjusted assessment of the total value of all goods and services generated in the nation over a specific time period. It is a crucial metric of economic growth and is used to gauge a country's economic output. For instance, it shows that the country's economy is expanding if the real GDP rises from one year to the next. This variable was used by Kumar (2015) to analyse India's exports and economic growth. As a result, it was determined that using this variable in this investigation is economically justified. Additionally, it is noted that the most insightful indicator of economic growth is real GDP.

3.3.2 Exports (EXPO)

Exports are crucial to global trade since they refer to products and services produced in one nation and sold to another. This variable is the main focus of the study. Exports are important for economic growth since they provide a source of revenue for the economy's development. The researcher can learn more about how exports have contributed to Zimbabwe's economic progress over the past three decades by analysing them. As a result of his research, Krisha

(2009) came to the conclusion that exports had a favourable effect on the growth of the Indian economy. Based on these findings, we anticipate that this study will show good outcomes; however, the results might differ depending on how much Zimbabwe exports are, on the global market.

3.3.3 Foreign direct investment (FDI)

Foreign direct investment is when a company or individual from one country invests in a company or enterprise in another. Examples of foreign direct investment include buying stock in a foreign company, establishing a subsidiary there, and purchasing real estate abroad. A country's economy relies heavily on foreign direct investment as a source of funding and as a catalyst for economic expansion. According to Mankiw (2005), foreign direct investment helps the economy expand favourably. This suggests a positive relationship between foreign direct investment and economic growth.

3.3.4 Gross capital formation (GCF)

This variable is used as a stand-in for investment in Zimbabwe's economy. The total amount spent on capital goods like buildings, machinery, and equipment is known as gross capital formation. The building of a new factory, the acquisition of new equipment, and the expansion of an existing enterprise are examples of gross capital formation. As a result, gross capital creation (investment) is a significant variable in the econometric model discussed above since it supports economic growth.

3.3.5 Imports (IMPO)

Imports are products and services that are made in one nation and bought by another. Automobiles, electronics, machinery, and other equipment that may not be made domestically are examples of imports. This variable is crucial to the above model since imported machinery is critical to the productive sector of the economy and so helps the economy advance economically.

3.3.6 Error term (μ)

This variable captures other variables that impact economic growth, but they are not included in the model. According to Gujarati (2009), μ term shows the excluded variables that have an impact on the endogenous variable of the model. Those errors arises due to lack of data, omission of variables and error of measurement.

Table 3.1: the expected signs of the explanatory variable of the model

Exogenous variable	***Sign expected***	***Economic perspective***
Exports	Positive/ negative	An increase in exports leads to an increase in economic progress. ***Ceteris paribus***
Foreign direct investment	Positive	More investment, leads to more national output.
Imports	Negative/ positive	Imports are withdrawals from the economy hence leads to retard growth, ***Ceteris paribus***.
Gross capital formation	Positive	Investment leads to more economic activities.

Source: own design based on author's perspective and theoretical aspects

3.4 Estimation Method

The researcher is going to utilise Ordinary Least Square (OLS) method of estimation to estimate the econometric model of this study. The OLS method was developed by the mathematician Carl Friedrich Gauss in 1809. The OLS method of estimation is a statistical technique used to estimate the parameters of a linear regression model and it is used to estimate the coefficients of the linear regression equation, which can then be used to make predictions about dependent variable. This method has certain assumptions which must be taken into consideration and these include linearity assumption, homoscedasticity assumption, normality assumption and the absence of multicollinearity, Gujarati (2009). The researcher choose this method over other methods in econometrics literature because of its favourable advantages which includes being simple and straightforward method of estimating parameters, it is computationally efficient and can be used to estimate large datasets and it produces unbiased and consistent estimates of the parameters.

3.5 Diagnostic tests

When estimating econometric models, researchers frequently run into a number of issues, necessitating the use of diagnostic tests. The model needs to be appropriately stated and produce stability findings that can be applied to future forecasting. In light of this, various tests, including the stationary test and model specification test, will be carried out as described below.

3.5.1 Model specification test

The most important test is this one, which verifies the validity and applicability of the entire model. The accepted model must be valid in order to produce good results. The validity of the model will be examined using Ramsey's Reset by the author. When the probability value produced from the Ramsey's Reset test is higher than 0.05(5%), the model is deemed to be valid.

3.5.2 Normality test

The form of the distribution is described by the statistical concept of normality. It is crucial to research since it determines whether the data is appropriate for particular statistical tests. To check for normality, the researcher uses the Jacque-Bera (JB) test. Skewness and kurtosis are the two measurements used in the JB test. A totally symmetric residual will have a skewnes of zero. Skewnes describes how symmetric the residuals are around zero. Kurtosis, which measures how peaky a distribution is, has a value of 3 for a normal distribution.

3.5.3 Unit root test

In order to prevent regression analysis with non-stationary variables, this test is run to determine whether the model's variables are stationary. Time series data are considered stationary, according to Gujarati (2004), if both the mean and variance remain constant across time. The unit root test is carried out by the researcher using the enhanced Dick Fuller (ADF) test.

3.5.4 Cointegration test for exports and economic growth

Cointegration test is used to determine if two or more time series are related. This is important because if two series are related, they may have a long-term relationship that can be used to

forecast future values. Cointegration tests can also be used to identify and measure the strength of the relationship between two series. This is useful for understanding the underlying dynamics of the series and for developing trading strategies. In this research, the Jahansen Cointegration test is going to be used to determine if there is cointegration between exports and economic growth.

3.5.5 Stability test

To evaluate the model's stability over time, a stability test is a statistical procedure. In research, it is crucial since it aids in figuring out whether the model's predictions hold up over time. If the estimated model can be applied to forecasting, it must pass a stability test. When a model is stable or convergent, factors acting on the model will cause it to return to its long-term equilibrium path after a short-term perturbation, making the model forecasting-friendly. To assess the stability of the model, the researcher will run the cumulative-sum-of-residuals (CUSUM) test.

3.5.6 Autocorrelation

A statistical phenomenon known as autocorrelation occurs when the values of a variable at various times in time are associated with one another. When conducting research, it is crucial to check for autocorrelation because, if ignored, the model can produce unreliable results. The Breush-Godfrey Serial Correlation LM test will be used in this study to analyse the autocorrelation of variables.

3.5.7 Heteroscedasticity

A statistical phenomenon known as heteroscedasticity occurs when the variance of the regression model's residuals does not remain constant for all values of the independent variables. Incorrect data transformation is one of the factors that contribute to heteroscedasticity, and estimating a model while heteroscedasticity is present will invalidate the t- and f-tests. ARCH will be used in this study to check the model’s variables for heteroscedasticity.

3.5.8 Multi-collinearity

A statistical phenomenon known as multi-collinearity occurs when there is a strong correlation between two or more predictor variables. The use of lag variables and an over-determined model where the model contains more explanatory variables than there are observations, are two of the econometric issues that contribute to this issue. Gujarati (2004) asserts that estimate of a model in the presence of multi-collinearity causes a broader confidence range and unreliable outcomes. A correlation matrix will be used to detect the presence of multi-collinearity of explanatory variables of the model.

3.9 Sources of data

For the model's aforementioned variables, this study uses time series data. All the variables for the model , namely real gross domestic product (RGDP in %), exports(EXPO % of GDP),foreign direct investment(FDI% of GDP), imports (IMPO % of GDP) and gross capital formation(GCF % of GDP) were extracted from World Bank . To account for the dependability of the data used in this research, a rigorous comparison of data was done. The data used spans three decades, from 1990 to 2020.

3.10 Chapter summary

This study's methodology, model definition, justification of the variables, and detection test on several econometric problems were all provided in this section. The chapter's major goal was to lay the groundwork for how data analysis and presentation will be done in the following chapter.

CHAPTER IV

DATA ANALYSIS AND RESULTS PRESENTATION

4.0 Introduction

This chapter applies the approach outlined in the previous chapter to derive the empirical findings from the estimates and the results are presented in the form of tables and figures. Descriptive data, regression results, specification of model, diagnostic tests, and the results' interpretation are all presented in this chapter. E-Views 7.1 statistical software was used for all data analysis.

4.1 Descriptive data analysis

Table 4.1: descriptive data

	RGDP	EXPO	FDI	GCF	IMPO
Mean	1.020342	30.40792	1.270206	12.89281	38.53231
Median	1.439600	31.83480	1.086300	13.14608	36.51953
Maximum	21.45210	43.39310	6.940100	23.72906	68.05479
Minimum	-17.66890	19.16020	-0.139000	1.525177	22.79241
Std. Dev.	8.847257	7.162534	1.300618	6.137212	9.558869
Skewness	0.049818	-0.122328	2.677101	-0.089687	0.967147
Kurtosis	3.069116	1.803047	12.69154	2.072806	4.287930
Jarque-Bera	0.018993	1.927882	158.3499	1.151989	6.975336
Probability	0.990549	0.381387	0.000000	0.562145	0.030572
Sum	31.63060	942.6455	39.37640	399.6772	1194.502
Sum Sq. Dev.	2348.219	1539.057	50.74819	1129.961	2741.159
Observations	31	31	31	31	31

Source: Author's computation

4.1.1 Interpretation of the variable Economic growth (RGDP)

There are 31 observations in the study, and the dependent variable real gross domestic product (RGDP), a measure of economic growth, has a three-decade range of -17.66890 to 21.45210 and is positively skewed with a skewness value of 0.049818. The term "skweness" describes the residuals' degree of symmetry with respect to zero, therefore a totally symmetric residual will have a skweness value of zero Due to the fact that RGDP's skewness value of 0.049818 is almost exactly equal to zero, and the data set is absolutely symmetric. The RGDP has a kurtosis

value of 3.069116, indicating that the dependent variable is normally distributed. Kurtosis measures how peaky the distribution is, and its value should be 3.

4.1.2. Interpretation of the variable Exports (EXPO)

This research's main explanatory variable exports, has a range of 19.16020 to 43.39310 over the last three decades. These exports have a negative skewed value of -0.122328, but since this value is near to zero, it can be inferred that exports are totally symmetric.

We find that the exports and real gross domestic product (RGDP) data for this research are normally distributed because the jarque bera probability values for these variables are 0.381387 and 0.990549, respectively, which are both above the threshold of 0.01

4.1.3. Interpretation of other variables of the model

FDI has a skewness value of 2.677101, which is not particularly close to zero, and a kurtosis value of 12.69154. There is a strong evidence that FDI is not regularly distributed given that its jarque bera probability value is 0.000, which is less than 0.01. Both the GCF and IMPO have a negative and positive skewedness, respectively. The kurtosis for IMPO is 4.287930 and for GCF is 2.072806 correspondingly. The jarque bera probability values for GCF and IMPO, respectively, are 0.562145 and 0.030572, respectively. These values are both more than 0.01 and demonstrate the regularly distributed nature of GCF and IMPO.

4.2 Model testing

4.2.1 Stationary tests

This is an essential aspect in time series data analysis, the table below shows unit root test at level using ADF.

Table 4.2: unit root at level

THE VARIABLE	ADF STAT	CRITICAL VALUES			ADF P-VALUE	DECISION
		1%	5%	10%		
RGDP	-3.168195	-3.670170	-3.670170	-2.621007	0.0321	Stationary at 10%
EXPO	-2.378451	-3.670170	-2.963972	-2.621007	0.1560	Not stationary
FDI	-4.297037	-3.670170	-2.963972	-2.621007	0.0021	Stationary
GCF	-1.641761	-3.670170	-2.963972	-2.621007	0.4496	Not stationary
IMPO	-2.797503	-3.670170	-2.963972	-2.621007	0.0706	Stationary at 10%

Source: Author's computation using ADF results at level

For ADF criteria, a variable is deemed stationary if its probability value is less than 0.01, 0.05, or 0.1 (critical values). Based on the results at level point, it can be shown that only FDI is stationary at all critical values because its ADF probability value is less than all the critical values shown in the table above, at 0.0021. RGDP and IMPO are both 10% stationary. The researcher took things a step further and tested RGDP, IMPO, EXPO, and GCF at first difference with the goal of attaining good stationary at all crucial values listed on the ADF. The findings are shown in the table below

Table 4.3: unit root results at first difference

THE VARIABLE	ADF STAT	CRITICAL VALUES			ADF P-VALUE	DECISION
		1%	5%	10%		
RGDP	-6.496833	-3.679322	-2.967767	-2.622989	0.0000	Stationary
EXPO	-5.416246	-3.689194	-2.971853	-2.625121	0.0001	Stationary
GCF	-4.876438	-3.679322	-2.967767	-2.622989	0.0005	Stationary
IMPO	-8.292281	-3.679322	-2.967767	-2.622989	0.0000	Stationary

Source: own computation using ADF results at first difference

As indicated on the above results, all the variables are now stationary at first difference.

4.2.2 Jahansen Cointegration test results

As alluded in chapter three, cointegration test is used to determine the long- term relationship between variables. The table below shows the cointegration test results between exports and economic growth.

Table 4.4: Cointegration results

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	1.000000	1026.996	15.49471	0.0001
At most 1 *	0.248963	8.302723	3.841466	0.0040
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				

Source: Author's computation

The above results were tested using the Jahansen Cointegration test. The results in the table show that the p-values are 0.0001 and 0.0040 which are less than 0.05 therefore we reject the null hypothesis and conclude that exports and economic growth are cointegrated. More so, the model show that there are 2 equations which are cointegrating implying that there is long term relationship between exports and economic growth.

4.2.3 Ramsey Reset Test

This test is run to see if the model is appropriately stated because using an incorrectly specified model while performing regression might lead to inaccurate results and poor economic policy decisions.

Table 4.5: Ramsey reset results

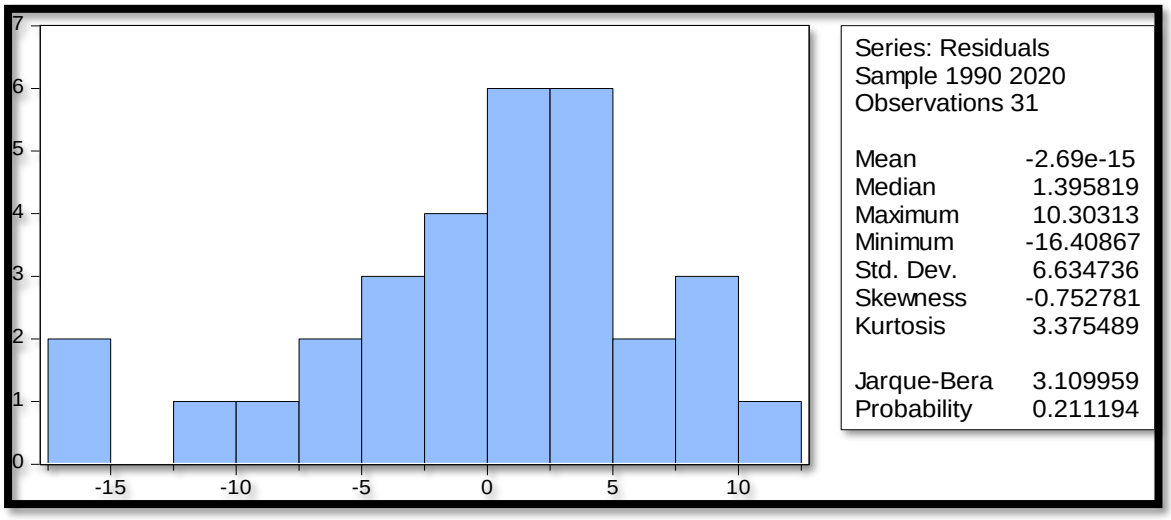
	Value	Degree of freedom	Probability
t-statistic	2.017704	25	0.0545
F-statistic	4.071130	(1, 25)	0.0545
Likelihood ratio	4.676962	1	0.0306

Source: Author's computation

The probability value is 0.0545, as mentioned above, and since it is more than 0.05, the model is statistically accurately specified. This indicates that the model is suitable for data analysis, making it appropriate for economic interpretation and decision-making.

4.2.4 Normality test

Fig 4.1 Histogram results



Source: Author's computation

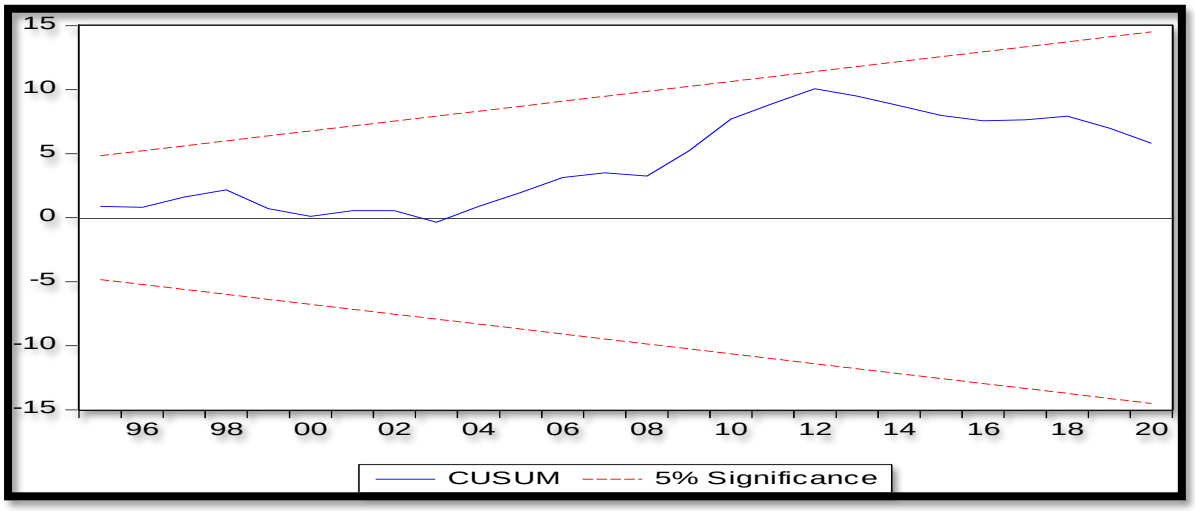
The kurtosis value is nearly 3 (3.375489), and the Jarque bera value is 3.109959 with a probability of 0.211194, which is greater than 0.1, as indicated on fig 4.1 above. Thus, it can be inferred from these findings that the residuals are normally distributed

4.2.5 Stability test results

One of the most crucial tools employed by economists is forecasting, which is utilized for planning, budgeting, and policymaking.

As a result, the researcher uses the CUSUM test to assess the model's fitness for long-term forecasting.

Fig 4.2: CUSUM test results.



Source: Author's computation

The graph shows that the model is not blowing out outside of the 5% bounds (dotted red lines). The model is along the long-run equilibrium path (bold black line), which indicates that it is extremely helpful for forecasting.

4.3 Diagnostic tests

4.3.1 Multi-collinearity

This is one of the issues that researchers encounter while performing data analysis; to determine whether there is a high degree of connection between the explanatory variables of the model, researchers employed the correlation matrix.

Table 4.6: multi-collinearity results

	EXPO	FDI	GCF	IMPO
EXPO	1.000000	0.136536	0.061360	0.495901
FDI	0.136536	1.000000	0.102672	0.266815
GCF	0.061360	0.102672	1.000000	-0.217363
IMPO	0.495901	0.266815	-0.217363	1.000000

Source: Author's computation

The results shown in the table above demonstrate that none of the explanatory variables used in the model have a strong correlation with one another. Since all values are below 80% (0.80),

it follows that the variables are not multi-collinear and that the OLSE for the model will be stable and robust. However, there is a high correlation between EXPO and IMPO for the model's explanatory variables, with a value of 0.495901, or roughly 50% but still it is considered free from multicollinearity since it is way less than 80%.

4.3.2 Heteroscedasticity

Time series data are frequently subject to an unequal variance scenario, which prevents the data from being homoscedastic. Heterescedasticity problem-affected economic model estimation, analysis, and interpretation have disastrous effects on the formulation of policy. The effects of a model with heteroscedasticity include invalid hypothesis testing (t-test and f-test), OLS estimates that are no longer BLUE, and hence ineffective regression prediction. The model's heteroscedasticity was tested in the study using the ARCH approach.

Table 4.7: heteroscedasticity results.

Heteroskedasticity Test: ARCH			
F-statistic	1.527290	Prob. F(1,28)	0.2268
Obs*R-squared	1.551741	Prob. Chi-Square(1)	0.2129

Source: Author's computation

The fact that the F-statistic probability value (0.2268) is higher than the R^2 probability value (0.2129) and that the F-statistic P-value (0.2268) is higher than 0.1 provides strong support for the conclusion that the data used to generate the model do not exhibit heteroscedasticity.

4.3.3Autocorrelation

This problem if not dealt with has serious consequences to economic data analysis. In the present of positive autocorrelation, OLS standard errors will be biased downwards. This will lead to an increase in the probability of type 1 error.

Table 4.8: Autocorrelation results

Breusch-Godfrey Serial Correlation LM Test:			
F-statistic	1.770914	Prob. F(2,24)	0.1917
Obs*R-squared	3.986543	Prob. Chi-Square(2)	0.1362

Source: Author's computation

As shown from the results presented above, F- stat probability value is greater than the R^2 probability value and also both these values are greater than 0.1. Therefore there is a strong evidence of concluding that the data used in this research is not suffering from autocorrelation.

4.4 Regression results

Table 4.9: Regression results

Dependent Variable: RGDP

Method: Least Squares

Date: 04/04/23 Time: 15:51

Sample: 1990 2020

Included observations: 31

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-4.928541	7.235583	-0.681153	0.5018
EXPO	-0.617027	0.213591	-2.888832	0.0077
FDI	0.863197	1.054020	0.818957	0.4203
GCF	0.818255	0.225071	3.635539	0.0012
IMPO	0.339075	0.169953	1.995115	0.0566

R-squared	0.437620	Mean dependent var	1.020342
Adjusted R-squared	0.351100	S.D. dependent var	8.847257
S.E. of regression	7.126850	Akaike info criterion	6.912306
Sum squared resid	1320.592	Schwarz criterion	7.143594
Log likelihood	-102.1407	Hannan-Quinn criter.	6.987700
F-statistic	5.058017	Durbin-Watson stat	1.690042
Prob(F-statistic)	0.003765		

Source: Author's computation

Although the variables in the model were predicted to have statistical significance, FDI turned out to be negligible because their probability values exceeded 1%, 5%, and 10%. However, the results show that imports, gross capital formation, and exports all have statistically significant effects on economic growth. The author's primary goal was to analyse how exports contributed to economic growth; as a result, he did not place much emphasis on including

additional independent or explanatory variables in the model because exports are statistically significant at all levels (1%, 5%, and 10%

The explanatory variables in the model only explain around 44% of variations in RGDP, as shown by the R^2 value of 0.437620, while the remaining 56% is explained by additional factors that are not included in the model and they are captured by the error term. This modest explanatory power is supported by the fact that the author did not include any more independent variables in the model because the study's primary goal had been determined to be sufficiently statistically significant. Since it exclusively explains variances in regression, Achen (1982) disapproved of the usage of coefficient of determination. Mayer (1975) further suggested that in the event that R^2 is low, the model's goodness of fit would be determined by F-static and F-probability values.

The model does not exhibit autocorrelation since the DW statistic value is almost equal to 2, which is 1.690042. The model is appropriately stated and suitable for statistical and economic interpretations because the probability of the F-statistic is 0.003765 and it is statistically significant at all levels (1%, 5%, and 10%).

4.4.1 Interpretations and analysis

Estimation Command:
==========
LS RGDP C EXPO FDI GCF IMPO

Estimation Equation:
==========
RGDP = C (1) + C (2)*EXPO + C (3)*FDI + C (4)*GCF + C (5)*IMPO

Substituted Coefficients:
==========
RGDP = -4.92854076179 - 0.617027076926*EXPO + 0.863197222316*FDI + 0.818254936204*GCF + 0.33907501586*IMPO

Source: *own computation using E- views 7*

The model with its coefficients obtained from OLS as presented on the table 4.8 is given as follows: **RGDP = -4.929-0.617*EXPO +0.863*FDL + 0.818*GCF +0.339*IMPO**

Note: all variables are measured in percentage and the coefficient are rounded to 3 decimal place.

Exports (EXPO)

The probability value of exports is 0.0077 which is less than all significant levels (1%, 5%and 10%), hence exports are statistically significant at all significant levels. It is therefore concluded that exports are a significant contributor of economic growth for the past three decades (1990-2020). Chigusiwa et al. (2011) found exports as a contributor to economic growth in study that was carried out in Zimbabwe using data from 1977 to 2006. This means that the results from this research are in line which other past studies. However for the purpose of policy making, it is essential to analyse whether exports contributed positively or negatively to economic growth for the past three decades. This is shown by the coefficient value (- 0.617) and it means that exports contributed negatively to Zimbabwe's economic growth for the period analysed in this research.

The coefficient value is interpreted as follows: *1% increase in exports results in 0.617% decrease in RGDP (economic growth)*. The results can be justified by the nature of Zimbabwe's exports. Most of Zimbabwe's exports are primary products like gold, platinum, nickel, unprocessed tobacco, and other unfinished commodities. This means that there is huge loss of revenue generated hence results in negative contribution to economic growth. This situation is in line with the **dependency theory** presented in chapter two, which brings the idea that developing nations export primary products that generate little revenue, hence results in negative contribution of exports to economic growth.

Corruption has had a detrimental effects on the export sector and economic growth in Zimbabwe from 1990 to 2020. According to Transparency International (1999), Zimbabwe is ranked as one of the most corrupt countries in the world. Corruption has led to decrease in government revenue particularly from the mineral exports sector, funds are often diverted away from the public services into the pockets of corrupt officials. This has resulted in a decrease in the quality of public services, such as healthcare and education, which has further hindered economic growth in Zimbabwe.

Foreign direct investment (FDI)

The probability value for FDI is 0.4203 which is above all significant level (1%, 5%and 10%). This shows a strong evidence that FDI is statistically insignificant in explaining changes of RGDP, hence FDI is not a contributor of economic growth for the past three decades (1990-2020).

Gross capital formation (GCF)

The probability value for GCF (investment) is 0.0012, hence GCF is a statistical significant contributor of economic growth in Zimbabwe for the past three decades. The coefficient for GCF is 0.818, which is interpreted as follows: 1*% increase in GCF results in 0.818% increase in RGDP (economic growth).* The result are in line with expectation made in chapter 3, therefore an increase in investment results in an increase in output.

Imports (IMPO)

The probability value for imports is 0.0566 and it is statistically significant at 10%, hence imports are regarded as contributors of Zimbabwe's economic growth for the past three decades (1990-2020). The coefficient value for imports is 0.339 which means that: *1% increase in imports results in 0.339% increase in economic growth*. Most of goods that are being imported by the government of Zimbabwe are capital goods like machinery and other equipment that aid production capacity of the nation.

4.5 Chapter summary

This chapter dealt with presentation of results and their interpretations. Descriptive data, diagnostic results and regression results are all presented in this chapter. All the results presented in this chapter were computed using E –views 7.1 statistical software. The following chapter will look at recommendations and conclusion of the study based on the empirical finding presented in this chapter.

CHAPTER V

SUMMARY, CONCLUSION AND POLICY RECOMMENDATIONS

5.0 Introduction

An overview of the findings from this investigation is given in this chapter. In light of these facts, the chapter one objectives are assessed, and a choice regarding whether to reject or accept the null hypothesis is offered. This section also includes suggestions for further research and policy proposals.

5.1 Summary of the study

The major objective of this research was to analyse the contribution of exports to economic growth in Zimbabwe from 1990- 2020. The author was motivated to pursue this research due to decrease of economic growth in Zimbabwe. The economy of Zimbabwe and citizens of this nation are suffering from a number of economic problems. Some of the problems being faced include low income (which leads to poor standard of living), lack of employment, poor health system and a number of dilapidated sectorial units. However the researcher have noted that Zimbabwe is a nation with vast resource endowments which ranges from fertile soil and vast deposits of mineral resources like gold , diamond , nickel , copper , among other . These resources are key in terms of boosting exports and economic progress of the nation, then *why is it that a nation that is so rich with those resources is still ranged among the poorest nations in the region?* This is one of the reasons which have heightened the researcher's interest to carry out this study.

Chapter one of this study provided the objectives of the study , chapter two unpacked various literature of the study , chapter three dealt with the research methodology and chapter four presented the regression results of the model used in this study. The findings of this research revealed that exports offer a statistical significant contribution to economic growth in Zimbabwe. Based on the results obtained in chapter four, it can be concluded that exports have a negative contribution to economic growth in Zimbabwe from 1990-2020. The results from cointegration test shows that there is long - term relationship between exports and economic growth.

In addition, the results also revealed that gross capital formation and imports have a positive contribution to economic growth for the period analysed, whilst foreign direct investment showed an insignificant result in terms of contributing to economic growth from 1990-2020.

5.2 Conclusion

The major objective of this study was to analyse the contribution of exports to economic growth in Zimbabwe from 1990-2020. The outcome from regression analysis indicated that exports have a negative contribution to economic growth in Zimbabwe for the period analysed. 1% increase in exports results in 0.617% decrease in RGDP (economic growth). Cointegration results revealed that there is a long term relationship between exports and (RGDP) economic growth. Export-led growth bring in the idea that economies should focus on increasing exports as a way to stimulate economic growth. It is therefore imperative that the government of Zimbabwe should adopt strategies for exports promotion since exports are an injector to the economy and there are capable of boosting economic growth of an economy through revenue generation and employment creation among other strategies. The outcome of this research provides an evidence of rejecting null hypothesis presented in chapter one (exports have a positive contribution to economic growth in Zimbabwe from 1990- 2020) and conclude that exports have a negative contribution to economic growth in Zimbabwe from 1990- 2020 (thus accepting the alternative hypothesis).

5.3 Policy recommendations

The findings from this research indicated that exports are statistically significant at all levels (1%, 5%, and 10%) and they have a negative contribution to economic growth in Zimbabwe for the period analysed (1990-2020).

Based on the findings from this study presented above, it is therefore imperative to make the following recommendations on what should be done to resuscitate Zimbabwe's export sector and economic growth.

Value addition and beneficiation of natural resources and primary products

The government of Zimbabwe should adopt strategies for value addition of resources like gold, nickel and other primary products. This should be done so that the goods exported will have high monetary value and competitiveness on the international market. As a result of value

addition and beneficiation of natural resources and primary products, the export sector of the Zimbabwean economy is expected to contribute positively to economic growth in Zimbabwe and the economy will perform better in term of economic growth.

Invest in Infrastructure

The government of Zimbabwe should invest in infrastructure such as roads, railways, ports, airports to improve the efficiency of trade. This will make it easier for businesses to export their goods and services, thus increasing exports and economic growth.

Provide Export Subsidies

The government of Zimbabwe should provide export subsidies to local business to encourage them to export their goods and services. This will help businesses to increase their exports and stimulate economic growth.

Diversification of the export base

For the export sector to contribute positively to economic growth, there must be export diversification in Zimbabwe. Therefore the government of Zimbabwe should adopt policies that are meant for expanding the exports sector through boosting the capacity utilisation of manufacturing industries.

Eradication of corruption

Corruption is a major threat not only to the export sector of the economy, but to all sectors and it is the major impediment to achieve the desired level of economic growth in Zimbabwe. The government of Zimbabwe must put tight policies to curb corruption in all sectors of the economy.

Improve Access to Finance

The government of Zimbabwe should improve access to finance for local businesses to help them to increase their exports and economic growth. This can be done by providing access to low- interest loans, grants and other financial incentives

Strengthen Intellectual Property Rights

The government of Zimbabwe should strengthen intellectual property rights to protect local businesses from foreign competitors. This will help the Zimbabwean businesses to remain competitive and increase their exports.

Promote Foreign Direct Investment.

The government of Zimbabwe should promote foreign direct investment to attract foreign businesses to invest in the country. This will bring in additional capital and expertise, which can be used to increase exports and economic growth.

Stabilisation policies

Policy makers in Zimbabwe should implement sound macroeconomic policies to stabilise the economy and to promote production of quality products for both domestic and international market.

Reduce tariffs and trade barriers

The government of Zimbabwe should reduce tariffs and other trade barriers to increase exports and economic growth. This would make it easier for Zimbabwean businesses to export their goods and services to other countries, thus increasing their revenue and stimulating economic growth.

5.4 Suggestion for further study

The model used in this research did not includes other variables that influence economic growth such as inflation, interest rates and government expenditure. Other researchers should also use different method of estimation from the one utilised in this study, and they should also use a different period to conduct a similar study.

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APPENDICES

Appendix 1: dataset utilised

Period measured in years	Real GDP % (annual growth)	Exports of goods and services % of GDP	Gross capital formation % of GDP	Foreign direct investment % of GDP	Imports of goods and services % of GDP
1990	6.9886	22.8668	17.3764	-0.139	22.79241
1991	5.5318	23.8835	19.1034	0.0323	27.16808
1992	-9.0156	27.2273	20.23726	0.2214	36.48528
1993	1.0515	30.7196	22.77489	0.4259	32.44745
1994	9.2352	34.6	23.72906	0.5028	36.51953
1995	0.158	38.2363	19.66019	1.6551	40.92045
1996	10.3607	36.1301	18.54194	0.9459	35.93955
1997	2.6806	37.5953	18.1339	1.5839	44.60979
1998	2.8852	43.3931	20.75046	6.9401	45.12096
1999	-0.8178	37.4086	14.39628	0.8603	33.51408
2000	-3.0592	38.1598	13.56942	0.3468	35.90766
2001	1.4396	34.9589	10.26647	0.0561	32.93896
2002	-8.894	31.8348	5	0.4084	34.97255
2003	-16.9951	32.3971	7.999999	0.0663	38.05493
2004	-5.8075	34.4698	4.509115	0.1499	41.56981
2005	-5.7111	33.5486	1.525177	1.7862	42.49509
2006	-3.4615	35.9562	1.571161	0.7348	46.86448
2007	-3.6533	37.7854	7.109753	1.302	46.38753
2008	-17.6689	41.4668	5.127906	1.1686	68.05479
2009	12.0196	19.4775	12.7468	1.0863	42.30094
2010	21.4521	29.6409	18.7633	1.018	53.4833
2011	14.6202	34.8008	17.38777	2.4415	54.66573
2012	15.7449	25.1633	9.856977	2.0441	48.99928
2013	3.1967	21.9878	9.209479	1.9541	36.66874
2014	1.4845	20.9301	9.639224	2.4252	33.74147
2015	2.0236	19.1602	10.03564	1.9997	37.58864
2016	0.901	19.9435	9.861371	1.6693	31.27549
2017	4.0803	19.6589	9.700147	1.7469	30.37081
2018	5.0099	26.164	14.14831	2.1017	28.3863
2019	-6.3324	27.1635	13.79935	1.1428	25.52411
2020	-7.817	25.917	13.14608	0.699	28.73355

Source: World Bank development indicators (WBDI)

Appendix 2: descriptive statistics

	RGDP	EXPO	FDI	GCF	IMPO
Mean	1.020342	30.40792	1.270206	12.89281	38.53231
Median	1.439600	31.83480	1.086300	13.14608	36.51953
Maximum	21.45210	43.39310	6.940100	23.72906	68.05479
Minimum	-17.66890	19.16020	-0.139000	1.525177	22.79241
Std. Dev.	8.847257	7.162534	1.300618	6.137212	9.558869
Skewness	0.049818	-0.122328	2.677101	-0.089687	0.967147
Kurtosis	3.069116	1.803047	12.69154	2.072806	4.287930
Jarque-Bera	0.018993	1.927882	158.3499	1.151989	6.975336
Probability	0.990549	0.381387	0.000000	0.562145	0.030572
Sum	31.63060	942.6455	39.37640	399.6772	1194.502
Sum Sq. Dev.	2348.219	1539.057	50.74819	1129.961	2741.159
Observations	31	31	31	31	31

Appendix 3: Regression results

Dependent Variable: RGDP

Method: Least Squares

Date: 04/04/23 Time: 15:51

Sample: 1990 2020

Included observations: 31

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-4.928541	7.235583	-0.681153	0.5018
EXPO	-0.617027	0.213591	-2.888832	0.0077
FDI	0.863197	1.054020	0.818957	0.4203
GCF	0.818255	0.225071	3.635539	0.0012
IMPO	0.339075	0.169953	1.995115	0.0566

R-squared	0.437620	Mean dependent var	1.020342
Adjusted R-squared	0.351100	S.D. dependent var	8.847257
S.E. of regression	7.126850	Akaike info criterion	6.912306
Sum squared resid	1320.592	Schwarz criterion	7.143594

Log likelihood	-102.1407	Hannan-Quinn criter.	6.987700
F-statistic	5.058017	Durbin-Watson stat	1.690042
Prob(F-statistic)	0.003765		

Appendix 4: Autocorrelation computed results

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	1.770914	Prob. F(2,24)	0.1917
Obs*R-squared	3.986543	Prob. Chi-Square(2)	0.1362

Test Equation:
Dependent Variable: RESID
Method: Least Squares
Date: 04/04/23 Time: 15:56
Sample: 1990 2020
Included observations: 31
Presample missing value lagged residuals set to zero.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	2.669855	7.192036	0.371224	0.7137
EXPO	-0.035185	0.209135	-0.168239	0.8678
FDI	0.448165	1.079748	0.415065	0.6818
GCF	-0.078492	0.228400	-0.343661	0.7341
IMPO	-0.026843	0.166105	-0.161599	0.8730
RESID(-1)	0.155827	0.205744	0.757383	0.4562
RESID(-2)	-0.372550	0.213390	-1.745865	0.0936

R-squared	0.128598	Mean dependent var	-2.69E-15
Adjusted R-squared	-0.089252	S.D. dependent var	6.634736
S.E. of regression	6.924492	Akaike info criterion	6.903686
Sum squared resid	1150.766	Schwarz c riterion	7.227489
Log likelihood	-100.0071	Hannan-Quinn criter.	7.009238
F-statistic	0.590305	Durbin-Watson stat	2.008043
Prob(F-statistic)	0.734805		

Appendix 5: Heteroscedasticity results

Heteroskedasticity Test: ARCH

F-statistic	1.527290	Prob. F(1,28)	0.2268
Obs*R-squared	1.551741	Prob. Chi-Square(1)	0.2129

Test Equation:
Dependent Variable: RESID^2
Method: Least Squares
Date: 04/18/23 Time: 10:53
Sample (adjusted): 1991 2020
Included observations: 30 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	52.95189	14.47339	3.658569	0.0010
RESID^2(-1)	-0.227285	0.183912	-1.235836	0.2268

R-squared	0.051725	Mean dependent var	43.43175
Adjusted R-squared	0.017858	S.D. dependent var	67.71994
S.E. of regression	67.11255	Akaike info criterion	11.31496
Sum squared resid	126114.7	Schwarz criterion	11.40837
Log likelihood	-167.7244	Hannan-Quinn criter.	11.34484
F-statistic	1.527290	Durbin-Watson stat	1.981957
Prob(F-statistic)	0.226788		

Appendix 6: multi-collinearity results

	EXPO	FDI	GCF	IMPO
EXPO	1.000000	0.136536	0.061360	0.495901
FDI	0.136536	1.000000	0.102672	0.266815
GCF	0.061360	0.102672	1.000000	-0.217363
IMPO	0.495901	0.266815	-0.217363	1.000000

Appendix 7: unit root test for RGDP at level using ADF
Null Hypothesis: RGDP has a u `nit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=7)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-3.168195	0.0321
Test critical values:	1% level	-3.670170	
	5% level	-2.963972	
	10% level	-2.621007	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(RGDP)
Method: Least Squares

Date: 04/18/23 Time: 11:07
Sample (adjusted): 1991 2020
Included observations: 30 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
RGDP(-1)	-0.537275	0.169584	-3.168195	0.0037
C	0.212953	1.491113	0.142815	0.8875

R-squared	0.263884	Mean dependent var	-0.493520
Adjusted R-squared	0.237594	S.D. dependent var	9.248399
S.E. of regression	8.075321	Akaike info criterion	7.079843
Sum squared resid	1825.903	Schwarz criterion	7.173256
Log likelihood	-104.1976	Hannan-Quinn criter.	7.109726
F-statistic	10.03746	Durbin-Watson stat	1.925857
Prob(F-statistic)	0.003690		

Appendix 8: unit root test for RGDP at first difference

Null Hypothesis: D(RGDP) has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=7)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-6.496833	0.0000
Test critical values:	1% level	-3.679322	
	5% level	-2.967767	
	10% level	-2.622989	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(RGDP,2)
Method: Least Squares
Date: 04/18/23 Time: 11:10
Sample (adjusted): 1992 2020
Included observations: 29 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(RGDP(-1))	-1.219764	0.187748	-6.496833	0.0000
C	-0.561251	1.738149	-0.322902	0.7493

R-squared	0.609876	Mean dependent var	-0.000959
Adjusted R-squared	0.595427	S.D. dependent var	14.69781
S.E. of regression	9.348689	Akaike info criterion	7.374821
Sum squared resid	2359.746	Schwarz criterion	7.469118
Log likelihood	-104.9349	Hannan-Quinn criter.	7.404354
F-statistic	42.20884	Durbin-Watson stat	2.031993

Prob(F-statistic)	0.000001

Appendix 9: unit root test for IMPO at level using ADF

Null Hypothesis: IMPO has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=7)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-2.797503	0.0706
Test critical values:	1% level	-3.670170	
	5% level	-2.963972	
	10% level	-2.621007	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(IMPO)
Method: Least Squares
Date: 04/18/23 Time: 11:15
Sample (adjusted): 1991 2020
Included observations: 30 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
IMPO(-1)	-0.404871	0.144726	-2.797503	0.0092
C	15.93090	5.785565	2.753560	0.0102

R-squared	0.218445	Mean dependent var	0.198038
Adjusted R-squared	0.190532	S.D. dependent var	8.268148
S.E. of regression	7.438887	Akaike info criterion	6.915660
Sum squared resid	1549.437	Schwarz criterion	7.009073
Log likelihood	-101.7349	Hannan-Quinn criter.	6.945544
F-statistic	7.826020	Durbin-Watson stat	2.376551
Prob(F-statistic)	0.009210		

Appendix 10: unit root test for IMPO at first difference using ADF

Null Hypothesis: D(IMPO) has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=7)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-8.292281	0.0000
Test critical values:	1% level	-3.679322	

5% level	-2.967767	
10% level	-2.622989	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(IMPO,2)
Method: Least Squares
Date: 04/18/23 Time: 11:17
Sample (adjusted): 1992 2020
Included observations: 29 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(IMPO(-1))	-1.433900	0.172920	-8.292281	0.0000
C	0.094854	1.426434	0.066497	0.9475

R-squared	0.718051	Mean dependent var	-0.040215
Adjusted R-squared	0.707608	S.D. dependent var	14.20495
S.E. of regression	7.681079	Akaike info criterion	6.981869
Sum squared resid	1592.972	Schwarz criterion	7.076166
Log likelihood	-99.23710	Hannan-Quinn criter.	7.011402
F-statistic	68.76192	Durbin-Watson stat	2.067476
Prob(F-statistic)	0.000000		

Appendix 11: unit root test for GCF at level using ADF

Null Hypothesis: GCF has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=7)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-1.641761	0.4496
Test critical values:	1% level	-3.670170	
	5% level	-2.963972	
	10% level	-2.621007	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(GCF)
Method: Least Squares
Date: 04/18/23 Time: 11:22
Sample (adjusted): 1991 2020
Included observations: 30 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.

GCF(-1)	-0.165923	0.101064	-1.641761	0.1118
C	1.996799	1.442313	1.384442	0.1772

R-squared	0.087811	Mean dependent var	-0.141011
Adjusted R-squared	0.055232	S.D. dependent var	3.495041
S.E. of regression	3.397150	Akaike info criterion	5.348091
Sum squared resid	323.1377	Schwarz criterion	5.441505
Log likelihood	-78.22137	Hannan-Quinn criter.	5.377975
F-statistic	2.695380	Durbin-Watson stat	1.723559
Prob(F-statistic)	0.111826		

Appendix 12: unit root test for GCF at first difference using ADF

Null Hypothesis: D(GCF) has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=7)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-4.876438	0.0005
Test critical values:	1% level	-3.679322	
	5% level	-2.967767	
	10% level	-2.622989	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(GCF,2)
Method: Least Squares
Date: 04/18/23 Time: 11:25
Sample (adjusted): 1992 2020
Included observations: 29 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(GCF(-1))	-0.931842	0.191091	-4.876438	0.0000
C	-0.197018	0.668030	-0.294924	0.7703

R-squared	0.468291	Mean dependent var	-0.082078
Adjusted R-squared	0.448598	S.D. dependent var	4.841617
S.E. of regression	3.595212	Akaike info criterion	5.463555
Sum squared resid	348.9899	Schwarz criterion	5.557852
Log likelihood	-77.22155	Hannan-Quinn criter.	5.493088
F-statistic	23.77965	Durbin-Watson stat	1.995784
Prob(F-statistic)	0.000042		

Appendix 13: unit root test for FDI at level using ADF

Null Hypothesis: FDI has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=7)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-4.297037	0.0021
Test critical values:	1% level	-3.670170	
	5% level	-2.963972	
	10% level	-2.621007	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(FDI)
Method: Least Squares
Date: 04/18/23 Time: 11:29
Sample (adjusted): 1991 2020
Included observations: 30 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
FDI(-1)	-0.777390	0.180913	-4.297037	0.0002
C	1.030181	0.330756	3.114629	0.0042

R-squared	0.397390	Mean dependent var	0.027933
Adjusted R-squared	0.375868	S.D. dependent var	1.625902
S.E. of regression	1.284495	Akaike info criterion	3.402950
Sum squared resid	46.19800	Schwarz criterion	3.496363
Log likelihood	-49.04424	Hannan-Quinn criter.	3.432833
F-statistic	18.46453	Durbin-Watson stat	2.031478
Prob(F-statistic)	0.000189		

Appendix 14: unit root test for EXPO at level using ADF

Null Hypothesis: EXPO has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=7)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-2.378451	0.1560
Test critical values:	1% level	-3.670170	
	5% level	-2.963972	
	10% level	-2.621007	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(EXPO)
Method: Least Squares
Date: 04/18/23 Time: 11:31
Sample (adjusted): 1991 2020
Included observations: 30 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
EXPO(-1)	-0.323166	0.135872	-2.378451	0.0244
C	9.976847	4.262962	2.340356	0.0266

R-squared	0.168079	Mean dependent var	0.101673
Adjusted R-squared	0.138367	S.D. dependent var	5.703439
S.E. of regression	5.294171	Akaike info criterion	6.235430
Sum squared resid	784.7908	Schwarz criterion	6.328843
Log likelihood	-91.53145	Hannan-Quinn criter.	6.265314
F-statistic	5.657027	Durbin-Watson stat	2.180166
Prob(F-statistic)	0.024446		

Appendix 15: unit root test for EXPO at first difference using ADF

Null Hypothesis: D(EXPO) has a unit root
Exogenous: Constant
Lag Length: 1 (Automatic - based on SIC, maxlag=7)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-5.416246	0.0001
Test critical values:	1% level	-3.689194	
	5% level	-2.971853	
	10% level	-2.625121	

*MacKinnon (1996) one-sided p-values.

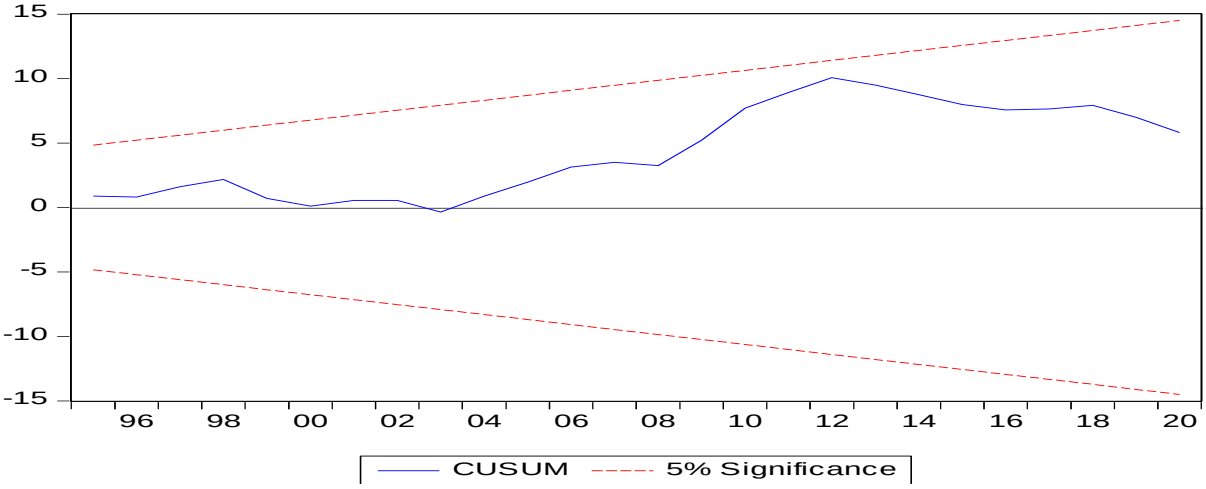
Augmented Dickey-Fuller Test Equation
Dependent Variable: D(EXPO,2)
Method: Least Squares
Date: 04/18/23 Time: 11:33
Sample (adjusted): 1993 2020
Included observations: 28 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(EXPO(-1))	-1.635627	0.301985	-5.416246	0.0000
D(EXPO(-1),2)	0.291010	0.189964	1.531922	0.1381
C	0.027841	1.062750	0.026198	0.9793

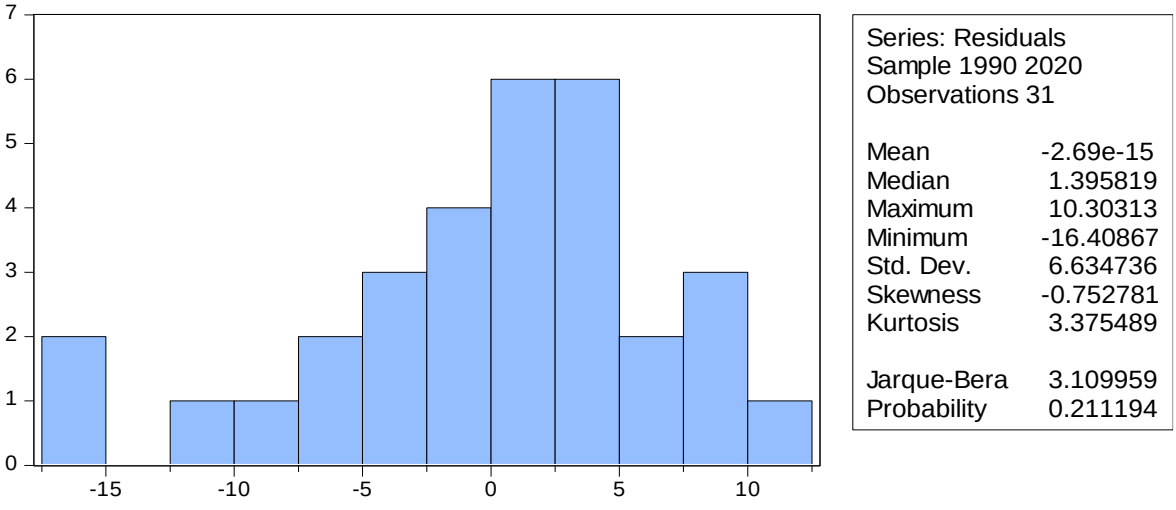
R-squared	0.667641	Mean dependent var	-0.163939
Adjusted R-squared	0.641053	S.D. dependent var	9.381077
S.E. of regression	5.620411	Akaike info criterion	6.391644

Sum squared resid	789.7254	Schwarz criterion	6.534380
Log likelihood	-86.48301	Hannan-Quinn criter.	6.435279
F-statistic	25.10997	Durbin-Watson stat	1.958520
Prob(F-statistic)	0.000001		

Appendix 16: stability test for the model using CUSUM test



Appendix 17: Normality test



Appendix 18: Ramsey reset test

Ramsey RESET Test
Equation: UNTITLED
Specification: RGDP C EXPO FDI GCF IMPO
Omitted Variables: Squares of fitted values

	Value	Df	Probability
t-statistic	2.017704	25	0.0545
F-statistic	4.071130	(1, 25)	0.0545
Likelihood ratio	4.676962	1	0.0306

F-test summary:

	Sum of Sq.	Df	Mean Squares
Test SSR	184.9361	1	184.9361
Restricted SSR	1320.592	26	50.79199
Unrestricted SSR	1135.656	25	45.42622
Unrestricted SSR	1135.656	25	45.42622

LR test summary:

	Value	Df
Restricted LogL	-102.1407	26
Unrestricted LogL	-99.80226	25

Unrestricted Test Equation:
Dependent Variable: RGDP
Method: Least Squares
Date: 04/18/23 Time: 11:46
Sample: 1990 2020
Included observations: 31

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-3.848134	6.863646	-0.560654	0.5800
EXPO	-0.567974	0.203451	-2.791695	0.0099
FDI	1.238058	1.013958	1.221015	0.2335
GCF	0.819056	0.212851	3.848018	0.0007
IMPO	0.178321	0.179388	0.994049	0.3297
FITTED^2	0.091715	0.045455	2.017704	0.0545

R-squared	0.516376	Mean dependent var	1.020342
Adjusted R-squared	0.419651	S.D. dependent var	8.847257
S.E. of regression	6.739898	Akaike info criterion	6.825952
Sum squared resid	1135.656	Schwarz criterion	7.103498
Log likelihood	-99.80226	Hannan-Quinn criter.	6.916425
F-statistic	5.338603	Durbin-Watson stat	1.571972
Prob(F-statistic)	0.001794		

Appendix 19: Cointegration test results

Date: 06/05/23 Time: 20:27
Sample (adjusted): 1992 2020
Included observations: 29 after adjustments
Trend assumption: Linear deterministic trend
Series: RGDP EXPO
Exogenous series: EXPO
Lags interval (in first differences): 1 to 1

Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	1.000000	1026.996	15.49471	0.0001
At most 1 *	0.248963	8.302723	3.841466	0.0040

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

Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None *	1.000000	1018.694	14.26460	0.0001
At most 1 *	0.248963	8.302723	3.841466	0.0040

Max-eigenvalue 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

Unrestricted Cointegrating Coefficients (normalized by b'*S11*b=I):

RGDP	EXPO
-1.39E-17	0.218353
0.140859	0.038160

Unrestricted Adjustment Coefficients (alpha):

D(RGDP)	2.906908	-4.194259
D(EXPO)	-4.579745	0.000000

1 Cointegrating Equation(s): Log likelihood 321.1814

Normalized cointegrating coefficients (standard error in parentheses)

RGDP	EXPO
1.000000	-2.13E+16
	(9.8E+07)

Adjustment coefficients (standard error in parentheses)

D(RGDP)	-2.98E-17
	(1.8E-17)
D(EXPO)	4.69E-17
	(2.2E-25)

Appendix 20: Turnitin Originality Report

Turnitin Originality Report

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