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THE IMPACT OF BUSINESS FORMALIZATION ON ECONOMIC GROWTH IN ZIMBABWE (1990-2020)

BY

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DECLARATION FORM:

I declare henceforth this research project being my own original effort, different from other work studies unauthorised or acknowledged. The research has never been handed over to anyone before under another alias and all acknowledgements have been made to the contributions of others where appropriate.

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DEDICATION:

I dedicate this dissertation to the Almighty, my family and everyone who encouraged me. I am humbles and driven by the faith you all have in me.

ABSTRACT:

The research assess' the impact of business formalization on economic growth in Zimbabwe utilizing time series data for period 1990-2020. The effect of a composed business formalization function; turnover for business registration, cost of formalization, timeframe for formalization and incentives for formalization to Gross Domestic Product were assessed, using the Ordinary Least Squares (OLS) regression technique (GDP= f(business formalisation)).

The results suggest that timeframe for formalisation has a constraining effect on Growth Domestic Product, whilst turnover for business formalization, cost of formalisation and incentives for formalisation are found to have a positive impact on the growth of the economy that is a rise of the gross domestic product. Ceteris paribus the impact of business formalization was deemed positive to economic growth.

ACKNOWLEDGEMENTS:

Greater thanks to the Lord Almighty who is the strength and foundation of my knowledge.

This study would not have been a success without professional guidance from my supervisor, Dr Damiyano who extended his helping hand throughout the study project. I would like to extend my gratitude to him for sparing time to help me complete this dissertation despite his busy schedule. May he always be blessed.

My recognition goes to my friend, family and colleagues who embraced me throughout this research project.

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Chapter I

Introduction and Background to the Study

1.0 Introduction

Growth in the gross domestic figures adjusted for inflation (GDP_{real} or RGDP) regards to be one major primary aims that every developing economy focuses on. Companies that are formalized contribute significantly to the gross domestic product, and every government wishes for the informal businesses to become formalized. One of the primary reasons why governments aim to bring businesses into the formal system, according to the World Bank (2018), is to broaden and expand the tax base. This allows the government to pay for infrastructure development, security, and other social commitments. In most African countries, the informal economy barely adds to GDP, and the large informal sector presence is claimed to have a progress hindering effective on domestic income (Sebele-Mpofu & Msipa, 2020; Makochekanwa, 2020; Meagher, 2018).According to Nikoloski and Zylfijaj, and Tournois (2020), they contend that from a policy perspective, the informal sector is a complex phenomenon as informal businesses provide jobs and help alleviate for people in transition economies.

When Zimbabwe received independence in 1980, the informal sector employed most effective 10% of the workforce; this number went up to 20% by 1986/1987; and 27% by 1991. Since then, catalysts such as changes in socioeconomic and political instability have escalated the informal economy in Zimbabwe. This leaves a gap in knowledge about the true impact of business formalization, which can be filled by the research. The main aim of this study is to look into the impact of business formalization on Zimbabwe's economic growth.

1.1 Background of the Study

As governments worldwide aim for the growth of their economies, business formalization has become one of the most vexing issues. Many countries are trying hard to formalize informal enterprises so that their contributions to GDP can be counted. Formalization of the economy, according to Foridi, Deena, and Wagner (2021), entails placing businesses under government

regulation and subjecting them to production tax regulations. In line with the 2018 Survey of the economy, formalization involves businesses guaranteeing a kind of social security for their workforce and when they become part of the tax net of the nation (Muchichwa, 2022).

Zimbabwe's economy has experienced significant decline over the years. According to Woyo (2018) and Groves (2009), the land reform initiative caused a massive economic disaster in Zimbabwe. As a result, between 2000 and 2009, the country saw a severe reduction in agricultural production (one of its primary economic pillars at the time), as well as food production and all other sectors. Farmers were unable to get loans for capital improvement because of the collapse of the banking enterprise. Food production ability declined 45% in 2005, production output fell 29% in 2006, and unemployment rose to 80% in 2007. Previous studies entail that, the fall of Zimbabwe's economy mostly comes from inadequate monetary policies and fiscal policies' failure to control the deficit of the budget (Nyoni, 2018). COVID–19 pandemic onset, mixed with persistent drought, led to a 10% drop in GDP adjusted for inflation in 2020. Also in the same year, there was a sharp increase in Inflation, making an average of about 622.8% rising from 226.9% recorded in 2019. Foreign exchange reforms had been applied in June 2020 and it decreased the inflation rate, by then it had an annual rate 0f 838% in July. Zimbabwe's economic system changed into a disaster prior to the COVID–19 pandemic, declining by 6.0% in 2019. (African Development Bank Group, 2022).

Meanwhile, the number of informal enterprises has increased in recent decades, outnumbering the number of formal businesses each year. According to Nelson and De Bruijn (2005), an increase in informalized businesses is a sign that a government has failed to provide an environment conducive for small-scale enterprise development because informal businesses operate largely outside the government's control." The increasing stake on informal enterprises in an economy limits international institutions' and donors' efforts. In their study of 20 developing nations, Heintz and Pollin (2005) found that increased economic growth can slow the rate of informalization, but it cannot create an environment where formalization falls on its own. The diagram below shows the Zimbabwean economic growth rate from 2011 to 2020 and the trend clearly shows a decrease in economic growth yet we have also noticed a sharp increase in operating informal businesses in the same years.

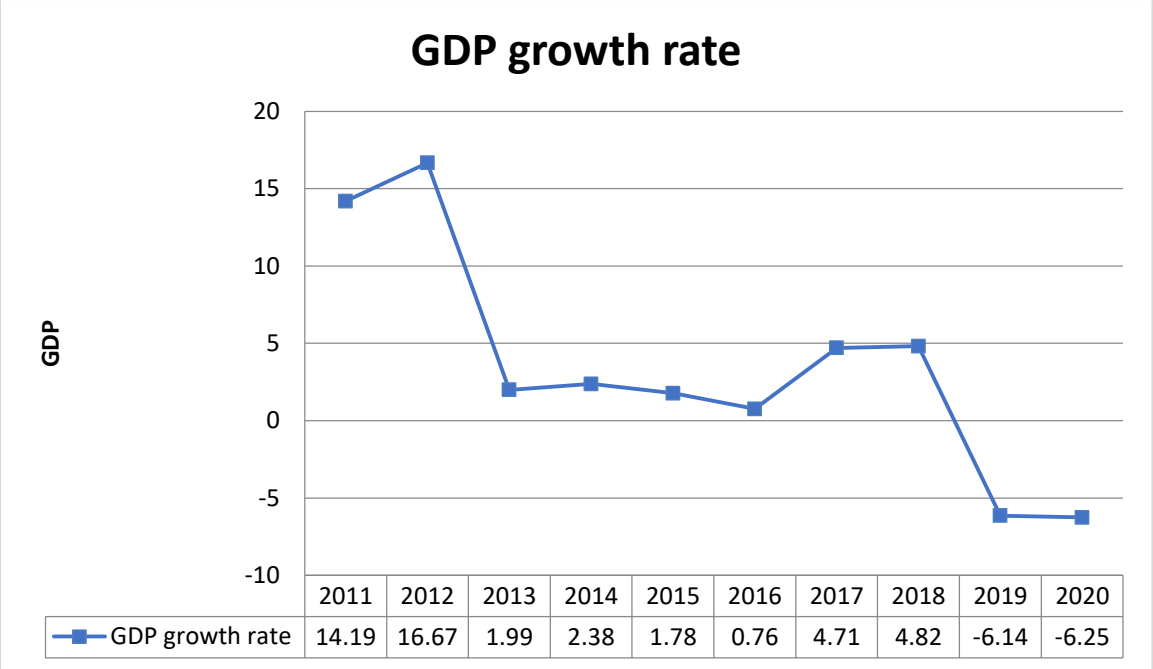


Fig 1. 1: Zimbabwe GDP Growth rates 2011-2020.

(Source, Zimbabwe Statistical Agency, 2020)

Small businesses, street sellers, shoe repairers, and other forms of relatively small and difficult to tax groupings were assumed to make up the informal sector in the past years. Even so, currently the trends indicate that professional workforce which consists of auditors, doctors, attorneys, instructors, statisticians, just to mention a few, are involved within Zimbabwe's informal sector (Chekenya, 2017). This complex assumption has for long affected policy makers' perceptions of towards the informal economy. While analyzing motivations of unregistered entrepreneurs, Williams (2015) argues that it has grown to be an increasingly commonplace to differentiate between 'necessity' entrepreneurs who're pushed into entrepreneurship because different options are unavailable or unsatisfactory and 'opportunity' entrepreneurs who do so voluntarily.

The government's efforts to get many businesses to formalize and enter the formal sector have had some successes in recent years, according to reports. Also, according to the World Bank (2021), 126087 new businesses incorporated in Zimbabwe between 2011 and 2020. (Fig 2.2). More than 5640 firms were registered in Zimbabwe in 2021 alone (LEDRIZ, 2021). Immediately, the informal sector employs 85% of the country's workforce (World bank, 2021). The majority of authors who operate in the informal sector think that businesses' choose to stay in this sector because the management (entrepreneur) believes the benefits of

informality outweigh the costs (Rahou and Taqi, 2021). The diagram below shows a rise of formalized businesses in Zimbabwe.

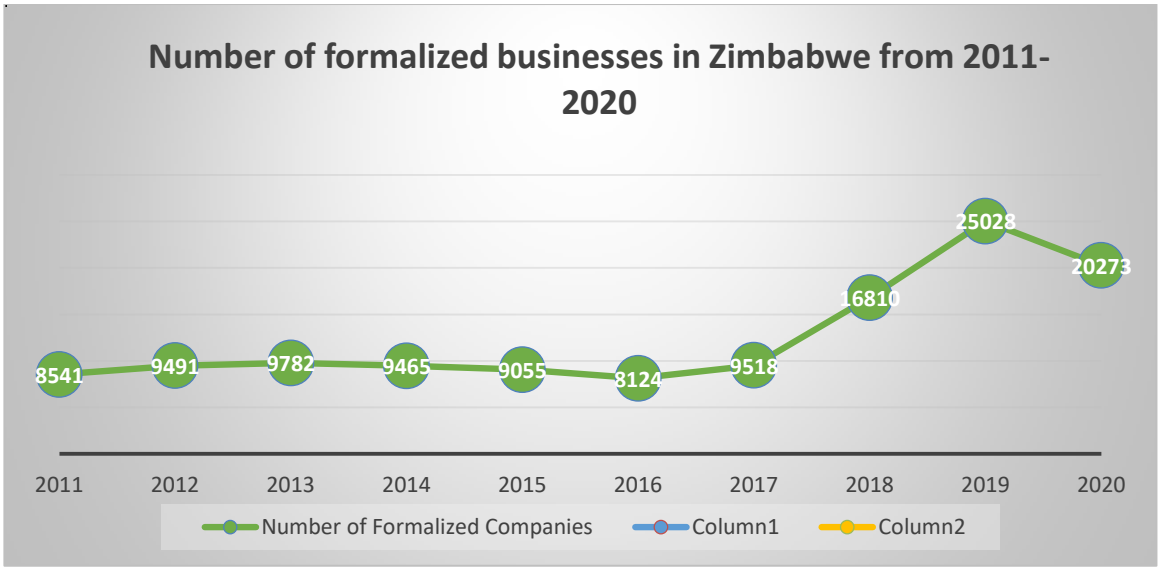


Fig 1. 2: Number of formalized businesses in Zimbabwe from 2011-2020

(Source: World bank, 2021)

Despite a rise in the number of businesses that have formalized, the news, academic research, and fiscal reports in Zimbabwe continue to focus on the economic crisis. Although the idea of formalizing Zimbabwe's informal sector is not new, this article claims that despite how much is known about it, there is still a lot more to learn. Other studies on business formalization and economic growth have been mentioned in this article. However the most of them have concentrated on small and medium-sized businesses (SMEs) (Murekachiro 2013; Fredrick, 2013).

Others have noted the effect of formalization on the growth of an economy in terms of environmental perception after years of doing business in the same place and industry (Rohadin &Yanah 2019). However, the researcher noted a scarcity of studies about direct impact of business formalization on the growth of economies, particularly in Zimbabwe, according to the literature. Every day, a large number of new and formal firms are registered, and the general public, policymakers, and lawmakers are uninformed of the effects of these formalized businesses on the country's economic progress. This research tries to fill the gap of enlightening the decision makers on how exactly business formalization impacts economic growth of a nation especially in the case of Zimbabwe.

1.2 Statement of the Problem

Within the Zimbabwean economy, the matter of informalized business enterprises has become of serious concern, as the informal economy employs approximately 85% of the workforce, despite unpredictable economic growth, the closure of some businesses and a low GDP per capita. The difference widening in-between the government and operators reduces opportunities for a connection between public and private sectors that benefits both, impacting GDP and overall economic development. On the other hand, as a country that relies significantly on the informal sector for survival, it has never been obvious whether the informal or formal sectors are significant enough for stable economic growth, or whether starting a business and formalizing it ensures Zimbabwe's stable economic growth. If the problem is not solved, it will have far-reaching economic effects, necessitating further investigation. To close the existing gap, the researcher will undertake a research, working on the impact of business formalization on economic growth in Zimbabwe.

1.3 Objectives of the study

1. To determine the impact of business formalization on economic growth.

2. To establish the relationship of business formalization and economic growth.

3. To examine the factors that determines business formalization, in the case of informal business owners.

1.4 Research questions

1. What is the impact of business formalization on economic growth?

2. What is the relationship of business formalization and economic growth?

3. What causes informal business owners to formalize their businesses?

1.5 Research Hypothesis

H0 Business formalization has no impact on economic growth

H1 Business formalization has an impact on economic growth

H2 There is a strong relationship between business formalization and economic growth

1.6 Justification of the study

Researches on impact of business formalisation have been done by different scholars but most of them did not focus extensively in the case of Zimbabwe a country that has had multiple currencies and is in the process of readopting its original currency. Most researchers focused on Small to Medium Enterprises and big Businesses but this research will go deeper to look at the informal and new businesses being formalised and how they can impact the growth of an economy especially focusing on the Zimbabwe's case. Issues of Cost of Formalisation as well as the registration timeframe will be implicitly expagorated and dissected to clearly outline how business formalisation impacts economic growth.

All economies aim for economic growth and the issue of formalisation has never been explained to a certain extent how it affects economic growth. Incentives offered by governments as well as the availability of information to the business' has been identified by some authors as key variables in figuring out the impact of business formalisation on thr growth of an economy, thus the researcher also aims to clearly illustrate if these variables truly impact economic growth through business formalisation.

1.7 Significance of the study

This research could be valued by numerous stakeholders as outlined below.

1.7.1. To the researcher

The study will broaden research and analytical expertise of the researcher due to the exposure they will experience by reading and evaluating other researches.

1.7.2. To the government

The government and policy makers may use the findings of this study through its recent information on how the current policies of business formalization affect economic growth and will help them set up new policies to increase economic growth.

1.7.3. To the general public

The general public may also benefit from the study outcomes as they can acquire knowledge of what affects their daily economic lives, hence be able to nurture good attitudes for sustainable development. Also, those who will desire to venture into business may benefit

through the guidance of this study as they will get enlightened on the importance of business formalization.

1.7.4. To University and academia

This study could also be valuable in the academic fraternity as researchers and students may make use of this study's outcomes to base future related studies as this study' results outcomes will add to the existing body of literature.

1.8. Assumptions

Assumptions are untested thoughts that one has without even recognizing them. The conclusions were made on the data which the researcher managed to find, therefore assumed that

I. The data was right to use.
II. Data collected was accurate and could be used to make recommendations.

1.9. Delimitations

1. The research proposal drew conclusions from secondary data sources collected from the economic performances of Zimbabwe.
2. The research was restricted to the economy of Zimbabwe only.
3. The researcher assumed collection of data only from the world bank, Zimbabwe company registry, trade economics and African economic outlook.
4. The researcher only used four independent variables to the dependent variable GDP.

1.10. Limitations

1. Data availability- The researcher struggled to access data from the period 2007 to 2010 where there were rapid changes in policies and extremely high inflation which may have been difficult to keep record track for the data on the websites.
2. Time constraints- The time factor for the needed study constrained the researcher into going deeper into the research; hence there is a need for more researches into this topic for beneficiaries' sake.
3. The research methodology- the used research design does not include other qualitative variables which may impact formalization. Further researches may try and look into

the qualitative factors like the ruling party love or hate with may affect the decision to formalize for economic growth.

1.11. Definition of terms

- ✓ Economic growth- the increase in real GDP
- ✓ Formalization- the process of registering or regulating a business under the registry of Zimbabwe.
- ✓ Informal business- The unregulated businesses operating in Zimbabwe.
- ✓ Formal business- Regulated or registered businesses operating in Zimbabwe.

1.12 Chapter Summary

Chapter 1 of this study provided an overview of the study and provided background information on the impact of business formalization on economic growth. It also highlighted the problem statement, study objectives and questions, hypothesis, background of the research, assumptions, definition of words, research limitations, and delimitations. The next chapter will dwell on literature review.

CHAPTER II

LITERATURE REVIEW

2.0 Introduction

Chapter two's main goal is to provide an evaluation of literature at the notions of business formalization and economic growth written through different authors. It includes evaluation of theoretical and empirical literature from previous investigations. Its aim is to elevate cognizance approximately how business formalization would possibly have an effect on a country's economic growth. The first section is constructed on an evaluation of the theoretical literature on business formalization and economic growth. Within the second section, the empirical literature on business formalization and economic growth is highlighted.

2.1 Key Variables of the Study

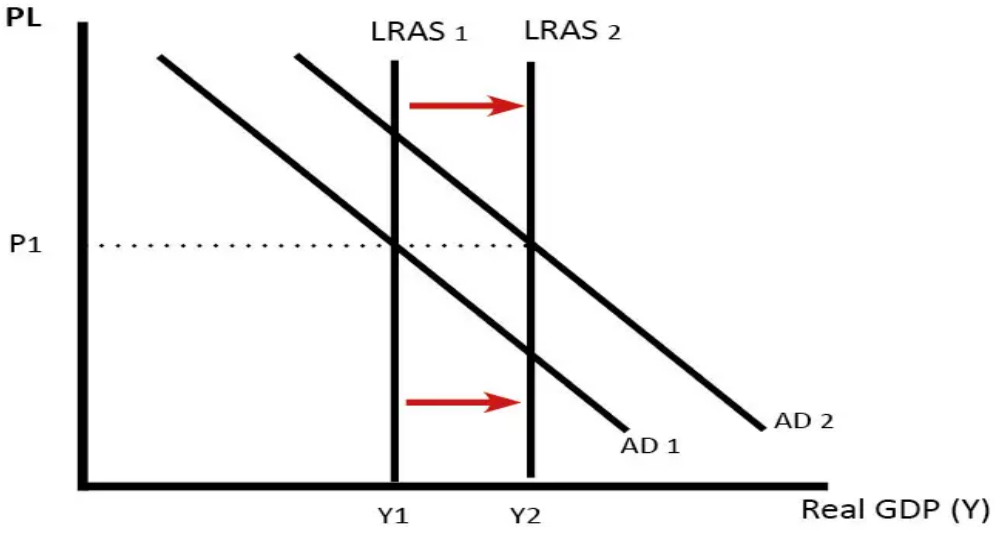
2.1.1 Economic Growth

When people's real income improves. The ratio between their income and the price of what they can buy rises as well, making products and services more affordable and people less poverty stricken (World in Data, 2022). Economic growth is defined as the rise in national output and revenue (Lewis 2013). Economic growth is fueled by means of growing call for and greater productivity. A rise in summation demand equals (C+I+G+X-M) that is, personal-consumption, business-investment, government-expenditure and net exports (Acemoglu, 2012). The growth or development of the GDP_{real} value of a nation's goods and services after some time is referred to as "growth of the economy." Growth traditionally quantified by means of statistics as percentage rise in GDP_{real} or actual national income increase is commonly calculated in actual means, this is, inflation-adjusted means, to save policy makers from the distracting result of inflation at the prices of the services and goods produced (Bjork, 1999). National income increase is measured through the economy's income accounting. Growth of the economy is defined by Hanushek & Woessmann (2020) as the annual percentage change in gross domestic product (GDP), which takes under consideration all the benefits and drawbacks of that measure. The GDP to population ratio is broadly used to examine countries' economic growth rates (consistent with-capita income). GDP is the dependent variable in this study.

Fig 2. 1: Economic growth

shows (a) the long-run economic growth diagram as well as (b) the causes of economic growth as postulated by Pettinger (2019)

(a) **Long-run economic growth diagram**



(b) Causes of Economic Growth

Fig 2. 2 Causes of economic growth

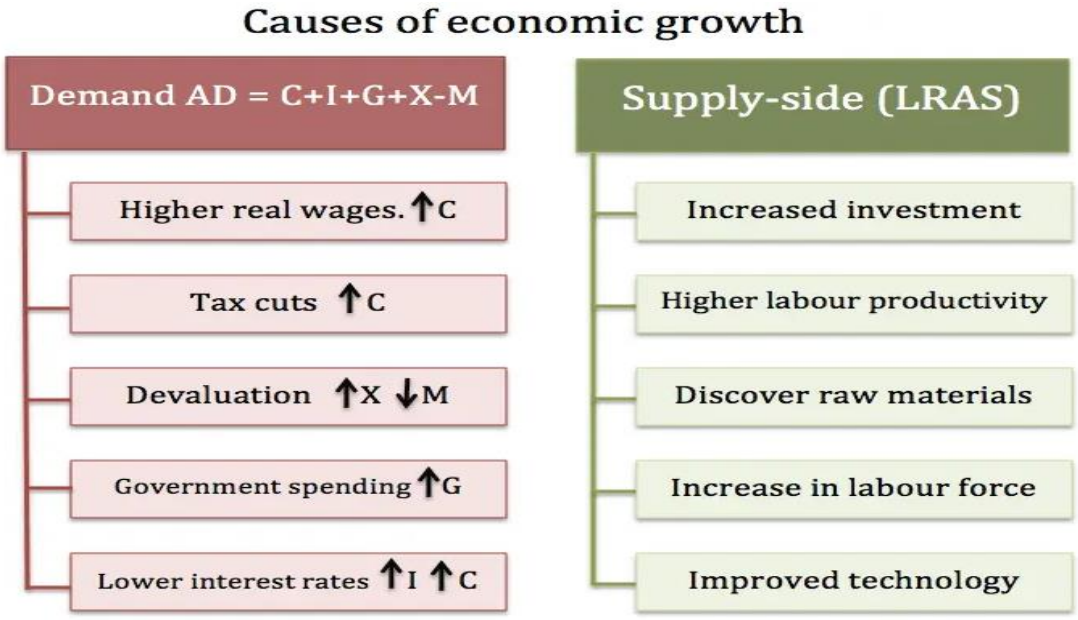


Fig 2.2 *Diagram illustrating long-run increase in GDP and causes of economic growth. (Source: Pettinger, 2019)*

2.1.2 Formalization

The process of integrating formally non-compliant businesses into registered or state-sanctioned enterprises such as tax rolls and property registries is referred to as formalization" (Piza, 2018). The International Labour Organization (ILO) defines formalization as the process of registering a business with a government agency and organizing employees into worker groups and/or trade unions. Beyond the mainstreaming of economic activity in the informal economy into the formal sector, it also considers reduction of decent work deficits. A wide range of policies and activities directed at the informal economy are currently available. The most common policy-making method is business formalization (Round and Williams, 2007). Methods of formalizing businesses, ranging from enhanced loan availability, business development services and training, may be beneficial to unregistered firms. Other efforts strive at strengthen linkages between the informal and formal economies (Floridi, Demena, and Wagner, 2020). Economic growth, creation of employment, productivity of labor, social protection and working environment are all seen to be boosted by formalization (ILO, 2015; Tijdens et al., 2015; Gatti et al., 2014, Fajnzylber et al., 2011). On the other side, the underground sector is linked to institutions of low-quality..

2.2 Theoretical Framework

2.2.1 Theories of Economic Growth and Business Formalization

2.2.1.1 Classical Growth Theory

In accordance with the classical' Growth Theory, a nation's growth would downshift as numbers of people increase and resources become short in supply. This is a suggestion of classical' theory economists' belief that a temporary increase in GDP_{real} per capita ultimately leads to an explosion of population, which will limit a nation's resources and in the end results in a decreased GDP_{real}. As an outcome, the country's economy will grow in a slow rate (stagflation).

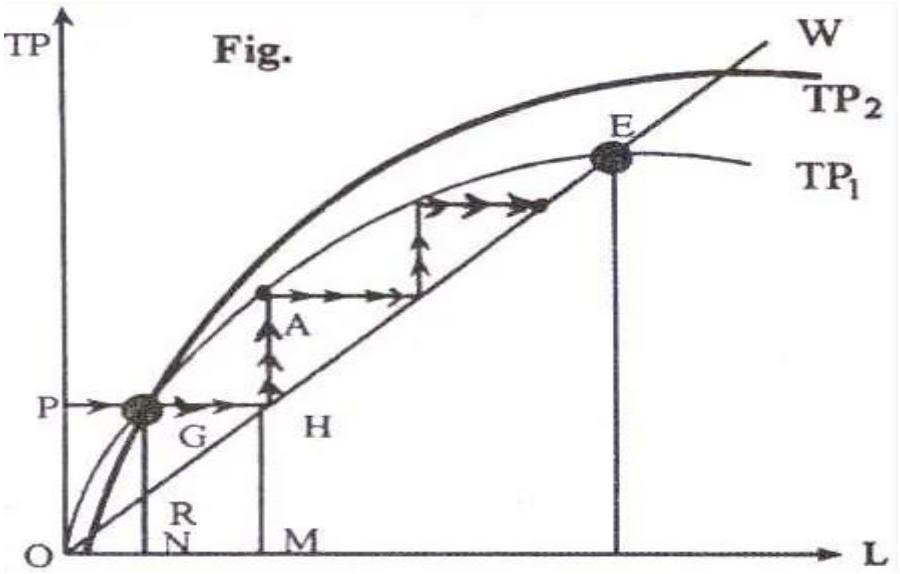


Fig 2. 3: The Classical Growth Theory

The graph above illustrates overall production on the y-axis and labor on the x-axis. Total subsistence wages are shown by the OW curve. When the population (labor) level is ON and the production level is OP, the per capita wage is represented by NR. The profit or surplus, as a result, is RG. As an outcome of the excess, the capital production process begins. The demand for labor rises as the curve approaches GH, resulting in an increase in summation of wages. Total population or total manpower will increase as the curve approaches OM if the total population remains constant at ON and earnings exceed subsistence wages, i.e., NG > NR. As an outcome of population expansion, surplus can emerge.

The economy continues to progress in this form until it gets to point E, as indicated by the arrow. A situation in which wages and total output are equal and no surplus can be generated is referred as a stagnant situation. Classical economists, in contrast, believe that through technological advancement, the function of production will shift higher, as illustrated by the TP2 line. According to the Classical Growth Theory, "economic stagflation can be delayed but not eliminated." Others, on the other hand, have criticized classical growth theory for being technologically illiterate and calculating total wages incorrectly.

2.2.1.2 Neoclassical Growth Model

The Neoclassical growth theory is an economic growth model that explains how three economic elements, labor, technology and capital have interaction to supply to produce a stable growth of the economy. The Solow-Swan growth theory is the most primary and common variation of the neoclassical growth model. The short-run period economic equilibrium, in keeping with the theory, is the end result of variable proportions of labor a**n**d capital in the production procedure. In accordance with the hypothesis, technological change has a huge effect on economic general system's functioning. The 3 variables required for growing economy are outlined in neoclassical growth concept. The theory, on the other hand, emphasizes that intervening time, or short-run period equilibrium, differs from long-run period equilibrium and does not necessitate any of the 3 factors (corporate Finance Institute, 2022). Accumulation of capital in the economy and the way individuals utilize it, is vital for determining the growth of an economy, according to the neoclassical growth model's production function. In the end, in accordance with the hypothesis, technology boosts labor productiveness, boosting typical production by enhancing labor efficiency. As a conclusion, the neoclassical growth model production function is used to evaluate a nation's economic growth **a**nd equilibrium. Within the neoclassical growth model, the general production function takes the following shape:

Y = AF (K, L)

Where Y represents income (or GDP), K represents capital, L represents the amount of unskilled labor in the economy, and A is the determinant degree of technology. The production function of an economy is frequently re-stated as Y = F (K, AL) because of the dynamic interaction between labor and technology. This states that technology augments labor and that worker productivity is dependent on technological level. Output as a function of growth, Growth rate of output in steady-state equilibrium, increased steady-state per capita income, and Long-term growth rate are all key conclusions of the neoclassical Model of Growth.

2.2.1.3. Endogenous Growth Theory

In Accordance with the Endogenous Growth Theory, growth of an economy is internally generated in nations, that is, via endogenous causes instead of exogenous ones. The theory is different from the neoclassical growth model that entails that external forces such as

technological advancement, among other factors, are the primary sources of economic growth. Endogenous Growth Theory has important policy implications. (1) If government policies aim at increasing market competition and increasing production and process innovation, they can assist to increase the economy's growth rate. (2) Capital expenditure in the industries of knowledge, such as of health, education and telecommunications yields increasing returns to scale. (3) Expenditure in research and development by the private sector is a vital source of technological progress for the nation.

2.2.2 Theories of Business Formalization/Informalization

In the literature, there are three primary viewpoints of informality, which are dual, legalist, and exit views. These are the three types of models that explain why businesses and individuals continue to work in the underground economy in agreement with La Porta and Shleifer (2008, 2014). The rational exit model and exclusion model are two classical theoretical traditions. A third paradigm holds that the informal and formal sectors are two distinct parts.

2.2.2.1. Exclusion model

Regulations that are excessively burdensome lead to informality (Rothenberg et al, 2016). A large number of prospective firms are kept out or limited by government rules (De Soto, 1989, 2000). Formal financial institutions may be lacking to provide proper financial services to informal sector enterprises, reducing their ability to receive loans for expansion. The informal sector, according to this concept, represents "untapped reservoir of entrepreneurial energy" (Rothenberg et al, 2016) that may be released by lowering entry barriers, cutting red tape, and strengthening legal frameworks. "Missing middle" story is frequently related with the informality exclusion theory (Tybout, 2000; Hsieh and Olken, 2014). If enterprises are held back by costly rules, there may be a significant pool of unregistered businesses clustered at the formality threshold, resulting in what they refer to as a “U-shaped” business size distribution. Increasing formalization would be done by lowering registration and compliance expenses (Rothenberg et al, 2016).

2.2.2.2 Rational exit model

The model affirms that informality is the sensible reaction to excessive unclear gains and high costs of regulation. The hypothesis, which has been linked to Maloney (2004) and Levy (2008), contends that, “enterprises leave the formal economy only when costs of formality

outweigh the advantages.) individuals and firms should compare the advantages of formality, such as increased access to skilled labor, formal financial services (banks), government contracts, courts and reduced risks of informal payments to government officials, to the costs of formality, such as tax official payment, registration costs and compliance costs with various business regulations, such as labor laws, before deciding to formalize (Rothenberg et al, 2016). According to this hypothesis, noncompliance with tax rules and other regulations may result in tax benefits, lower pay rates, and other cost savings for informal sector businesses. In this approach, increasing the benefits of formality and better enforcing registration requirements is the proper solution to promote more formality. Cost reduction and more enforcement could help level the playing field and boost economic growth.

2.2.2.3. Dual Economy Model

La Porta and Shleifer (2014) noticed that, formal and informal businesses are significantly different and informality poverty's by-product (Rothenberg et al, **2**016). According to the model, informal businesses are often tiny, not sufficient, and led by less educated business owners, resulting in less productivity and henceforth inability to compete in the formal economy. As a result, the informal economy is separated from the formal economy. Dualists believe that the formal sector and the informal sector are completely separate, and that the development of the economy will modify the informal economy or cause it to be taken up into the official system. (Zylfijaj et al, 2020). Furthermore, in the dual (or exclusion) analysis, underground firms are part of a subsistence sector and would be incapable of surviving in the formal sector, which they do not threaten (Amadou, 2018; La Porta & Shleifer, 2014).

2.2.3. The Impact of Business Formalization on Economic Growth

Fostering the formalization and expansion of micro, small, and medium-sized firms, as well as enhancing labor protection for all employees, particularly those in insecure occupations, are all part of Goal 8 on decent work and inclusive growth (UN SDGs, 2015). The effect of business formalization on economic growth has been extensively researched. Formalization is highly recommended as a huge benefit to business advancement and performance, according to Xheneti, Madden, and Karki (2019). Furthermore, various governments launched a slew of initiatives aimed at encouraging certain segments of the informal sector to grow their potential and legitimize their players and activities (Assenova and Sorenson, 2017).

Formalization aids in the creation of better (desirable) jobs, the expansion of the tax base, which may result in reduced rates, and the improvement of investment (Mavura, 2021).

The ultimate goal of business formalization initiatives, according to the International Labor Organization (ILO), is to reduce poverty, create more and better jobs, and address marginalization of the vulnerable ones to the most serious decent work deficits in the underground economy, such as migrants, women, older people, young people, indigenous and HIV/AIDS patients, tribal peoples and people living with disabilities. Allowing shadow economy activities to drown out formal sector production and distribution of goods and services, according to some research, is bad for economic growth due to the distortions that informality introduces into the regular economy (Carasso & Jappelli, 2013; Esaku, 2021). For governments and society, formalization of micro, small, and medium-sized businesses goes hand in hand with a favourable business climate, economic development, and better working conditions (Xheneti et al, 2019; ILO, 2017). It also increases tax revenues, which are necessary to pay for public goods and services (Ibid). "Encourage formalization and expansion of micro, small, and medium-sized businesses in order to ensure sustainable and fair growth," (Kundt, 2017). Rogan (2019) questions the value of the growth implications approach and its relevance in nations with the greatest informal sector. These include developing economies in Asia, the Caribbean, Latin America, and Sub-Saharan Africa, where the informal economy is fueled by survival and bad economic conditions. Schneider & Buehn, 2018; Medina & Schneider, 2018). As a result, the relationship between formalization and growth may no longer be applicable in this case. In line with this, Kundt (2017a:8) says that empirical data proving "that formalization can in fact lead to increased profitability, high earnings, more investments, and labour contracts" varies by business features and size, with medium-sized businesses benefiting the most. In accord, Sebele-Mpofu (2021) notes that the relationship between informal sector formalization and growth gains is "perhaps the least investigated in the tax literature, and the disparities in the concluding studies necessitates additional study."

According to Esaku (2021), there is evidence to assume that a large shadow economy is harmful to economic growth for a variety of reasons. To begin, the shadow economy's detrimental influence on economic growth derives from the reasons why businesses operate underground. One of the reasons why firms operate underground has been highlighted as the burden of greater taxes imposed by governments. Many experts, however, feel that when firms disguise their operations, tax authorities have a hard time estimating their tax due,

which has an impact on revenue collection. Lower tax income affects the delivery of public goods and services, thereby jeopardizing economic growth (Esaku, 2021; Keho, 2017; Esaku & Krugell, 2020). Many academics, on the other hand, have argued over the link between business formalization and economic growth (as discussed in the subsequent section).

Other studies have looked at the elements that formalization needs to have a positive influence on economic growth, such as governance and politics. According to Smith (1776) and Ricardo (1817)'s Ricardian equivalence theory, governments are wasteful and unproductive. They deprive private entrepreneurs of the cash required to foster economic growth by encouraging production and trade. As a result, even when economic benefit is anticipated, undesirable government involvement may prevent the economic progress envisaged from business formalization. Academics reaffirm that "government and taxes are mutually reinforcing," according to Sebele-Mpofu (2021), quoting Everest-Phillips & Sandall (2009:1) “How taxes are raised has an impact on the development of effective governmental institutions, as well as the dynamics of the investment climate and economic growth."

2.2.4 The Relationship of Business Formalization and Economic Growth

The link between business formalization and the growth of economies has remained a vexing question and perplexing phenomena. Various development agenda frameworks, like the Addis Ababa Action Agenda (Kundt, 2017), as well as international agencies .like the International Monetary Fund and the World Bank, have advocated for formalizing informal economic activity (Spotlight, 2012; IMF, 2018). Informal enterprises make up the bulk of micro and small businesses in countries that are developing. Because of their importance to the private sector and potential contribution to economic growth, governments and politicians are taking initiatives to formalize informal companies. Despite these efforts, it appears that policies encouraging corporate formalization are not yielding the anticipated benefits (Floridi et al., 2020). The shadow economy, often known as the informal economy, offers a consistent source of revenue and capital for the production and delivery of goods and services that would otherwise be accessible to businesses and people in the formal sector (Mugoda et al. 2020; Schneider 2005).

While some studies say that a greater shadow economy is harmful to the growth of economies, others claim that it is good (Esaku, 2021). For example, La Porta and Shleifer (2008) shows that informal sector businesses provide a source of income for the

impoverished. Vulnerable individuals of communities can better their condition by participating in the production and distribution of products and services as a source of income. Similarly, Nabi and Drine (2009) discovered that growing informality can lead to economic growth through increasing output levels that feed into the formal sector. The expansion has been related to government inefficiencies and the official sector's failure to create enough employment to accommodate the rising and often inexperienced labor force (Esaku 2019a, 2020b).

Despite the fact that informal enterprises produce less for the economy, operating with less capital, and employing the bulk of the unskilled workforce, they play an important role in creating employment and money for society's impoverished and most vulnerable members (ILO 2002; Mugoda et al., 2020). Informal sector incomes move into the formal sector, improving production and productivity, and so enhancing economic growth. The informal sector, according to Floridi et al. (2021), is not only a large part of the economy, but also a complicated policy phenomenon. On the one hand, informal companies offer jobs and allow people in developing countries to overcome poverty. Informal businesses, on the other hand, reduce state income and discourage fair competition by avoiding taxes (Chen, 2012). "Formalization may aid informal employees by giving access to social safety, more appropriate contracts, greater remuneration, and decreased vulnerability in the case of unemployment or retirement," according to Kundt (2017).

Numerous studies have stressed the necessity for firms to become more formalized for their own advantage. According to the International Labor Organization (ILO), enterprise formalization improves formal firms by minimizing unfair competition from informal businesses. Businesses that are formalized have access to capital, business development services, and technology while also reducing their risk of regulatory fines. The importance of neoclassical theory in this context cannot be overstated. Dieng (2021), on the other hand, claims that west African countries' large amount of the wealth comes from the informal sector. According to him, the informal sector in Burkina Faso generated 50.41% of GDP in 2011, 54.2% in Benin, and 44.9% in Senegal in 2011. Informal entrepreneurs engage in a variety of activities. Some people like to formalize their businesses in the long run, while others choose to keep things more informal (Ibid). According to Rogan (2019), a total of 61% of the world's labor force is employed in the informal sector, with SSA and East Africa accounting for 89% and 92% of the IS workforce, respectively, according to the International

Labour Organization (ILO). These activities account for a considerable portion of GDP in developing countries and SSA.

Others say that rather than attempting to legitimize informal enterprises, it is more appropriate to simply include them in the tax rate, as Zimbabwe did in 2005 when it imposed a presumptive tax (Dube & Casale, 2019; Sebele-Mpofu & Mususa, 2019). Moving along the "informality spectrum" might help small informal enterprises enhance their performance, productivity, profitability, growth, survival, and job creation capabilities if they can't withstand plain formalization (Sebele-Mpofu, 2021; Benjamin & Mbaye, 2020). They should be taxed without being forcibly formalized; else, their survival may be compromised.

The literature reviewed in this and the previous section revealed a wide range of opinions on formalization and economic growth, prompting further research; consequently, the current research is required to fill this gap. While some researchers have found a positive relationship between the size of the shadow economy and economic growth, their reasons aren't always as simple.

The belief that the informal (shadow) economy contributes to the growth of the economy appears to be suggested. The researcher investigates if formalization has an impact on economic growth as well as whether the null hypothesis, that formalization has no effect, is correct. As a result, this research is necessary to determine whether the shadow economy hinders or promotes economic growth. We test the premise that, all else being equal, a larger shadow economy slows economic development.

2.2.5. Factors That Determine Formalization

The corpus of literature on the factors that impact informal business formalization has been expanded with new additions. Businesses determine whether or not to formalize their activities depending on the costs and benefits of doing so, according to one widely held position (Maloney 2004; Rocha, Ulyssea & Rachter, 2018). The aforementioned rational exit models, which imply that informality is a natural response to high regulatory costs and uncertain rewards, support this approach. If company registration is the result of a cost-benefit analysis, minimal gains associated with formalization may clarify the persistence of informal enterprises and the restricted effects of formalization regulations (Floridi et al, 2021). Cling, Razafindrakoto, and Roubaud (2012) agree, adding that a business' decision to formalize or not formalize can be explained by a variety of factors, including unawareness of

legal obligations, the main reason for starting a business (whether by choice or necessity), corruption protection, expected market access and larger business orders, or access to a better location.

Indeed, according to Amadou (2018), businesses that opt to formalize may have different underlying elements than those that do not, such as the ability of the owner, business techniques, or corporate preferences, than those that do not. According to Esaku (2021), the challenges associated with the complex registration system and costly formalization legislation are a critical factor in determining the rate of business formalization. It's important to note that in Africa, high production costs, a slew of levies impacting formal operations, and excessive tax rates, combined with expensive infrastructure, large capital expenses, and excessive formal wages, are regarded to be the drivers of businesses into the informal sector (Benjamin & Mbaye, 2020; Mbaye & Benjamin, 2017). In accord, Zylfijaj et al (2020) stated that the expenses of being informal may exceed the gains of being formal due to costly administrative processes for license permits and access to finance, as well as tax administration that is difficult. Bribery is far more common in transition economies with more stringent regulations (Ibid).

Many governments and authorities have become aware of the benefits of formalization and are supporting it through a variety of actions ranging from streamlined registration procedures to increased law enforcement (Floridi et al, 2020). (i) Cost-cutting and procedure simplification (ii) benefit increases, and (iii) greater enforcement and police visits are the three policy approaches that these programs take. Public education and awareness campaigns are used to supplement some therapies. One interventionist strategy is to de-regulate the formal economy (Mbaye & Benjamin, 2017). This is based on the assumption that market overregulation causes informal entrepreneurship (De Soto, 1989, 2001), and the goal is to deregulate the formal economy so that all operations are carried out in the now-dubbed "informal" manner, but they are not "informal" because they adhere to the restrictions that remain in place. However, some evidence suggests that decreasing regulation does not result in the formalization of informal businesses (Ku, 2014; Williams, 2013, 2014).

Business culture, particular business features, institutional structure, market conditions, expenses of doing business, labor skills, and other factors, according to the World Bank (2020), all influence a business' decision to formalize. "The legal, economic context, regulatory and policy frameworks, as well as some micro level factors what determine

business formalization such as low education, discrimination, poverty, and, as previously mentioned, lack of access to economic resources, property, financial and other business services, and markets, all contribute to informality " according to ILO (2022).

2.3 Empirical Review

Sizable figures of empirical researches have been reviewed by this research on the business formalization and economic growth.

2.3.1. Floridi et al. (2021): "The Benefits of Formalization Policies!" "A meta-analysis of the advantages of policy-induced formalization versus self-initiated formalization."

Overall, this research shows that formalization benefits enterprises just little. Effects, on the other hand, take longer to manifest, which could be due to the excessive formalization costs. Policy persuaded formalization is associated with excessive advantages, while self-persuaded formalization is associated with average benefits, according to the study. However, their study didn't consider the potential benefits to governments of implementing such a comprehensive formalization system.

2.3.2. The relationship between the shadow economy anf economic growth: Johnson, Kaufmann, and Shleifer (1997)

The study was conducted in 25 countries in transition. According to the findings, shadow economy activities are harmful to the growth of the economy. Elgin and Birinci (2016), on the other hand, investigated the impact of underground activity on long run growth of economies in a sample of one hundred and sixty-one nations from 1950 to 2010. These researchers identified what they call, "inverted-U" connection between the informal economy and growth of the economy, indicating that economies with a small sized or large sized informal sector experienced slower growth of the economy than those within a moderate underground sector. To add on, the GDP level of a nation has a considerable influence on this connection. It is suggested that nations with greater income level expand at a faster rate than those with lower income levels. Some of Johnson et al's findings are compatible with the exclusion model, which pointed to a "U-shaped" connection between the informal economy and the growth of the economy (Rothenberg et al, 2016).

Schneider (2012) estimates that informal businesses account for 30 to 35 percent of overall GDP in Sounth America and Asia, more than 40 percent in Sub-Saharan Africa. Others, on

the other hand, have observed more moderate effects (de Mel et al, 2013) it was discovered that, “a counted number of businesses registered as a result of the incentives at hand and also that the fast in growth amongst them appeared to gain.”

Other empirical studies have revealed details regarding the factors that influence formalization.

2.3.3. Dieng (2019): formalization of enterprises in Senegal, Benin and Burkina Faso: segmentation approach to informal entrepreneurs.

Dieng (2019) explored factors that influence formalization in Benin, Senegal, and Burkina Faso. The determinants of firm productivity, access to business premises and business desire all played a role in the likelihood of being formal in the three countries studied. Only in Benin do firm age, ICT availability, and the average time of social service interruption have positive impact on the formalization of businesses. Just Senegal had a significant average level of education among its workforce. Furthermore, we discovered that in none of the countries investigated, if the sex of the business owner has any effect on the likelihood of having a registered business. Both Senegal and Benin have major activity in this industry. As of the business size, it was significant in Burkina Faso and Senegal.

2.3.4. Krstic and Schneider (2015): formalizing the shadow economy in serbia: policy measures and growth effects.

The effects of formalizing Serbia's shadow economy yielded a variety of results. They came to the following conclusions, (1) the formal and shadow economies can be substitutes for each other, any rise in the underground economy reduces the numbers of the formal sector; (2) the number in the formal sector remains unchanged. The underground sector economy raises the country's aggregate economic activity lastly, (3) the informal economy plays a part to the growth of the formal economy it’s influence can be multiplied. This investigation's mixed findings support Sebele-and Mpofu's Esaku's (2021) theoretical assumptions (2021).

2.3.5. Bjrnskov & Foss (2016): institutions, entrepreneurship and economic growth: what do we know and what do we still need to know

They discovered substantial evidence in support of the assumption that formalizing businesses has positive long run economic ramifications for example in productivity, growth and wealth, comparable to Johnson et al findings. Institutions can boost entrepreneurial activity and orient it toward productive rather than wasteful endeavors. It is unclear however, which institutional variables are more important in obtaining these favorable results. They did conclude, however, that they were optimistic about increase in this specialty as high quality data became more widely accessible and social science experts increasingly opened up the black box of interfirm mechanisms, most probable of collaborative study projects spanning disciplines and fields, as other scholars have suggested.

2.4. The research gap

Previous research on business formalization has mostly been done in other countries, but little has been done in Zimbabwe, despite the fact that Zimbabwe is a country that has seen serious economic policy changes due to time inconsistency policy making, has used a variety of currencies due to high economic instability, and has seen a rise in the figures of business registrations, despite the fact that the economy continues to struggle.

In addition, the researcher noted that, while company formalization has been studied, the concerns of bureaucracy contributing to the time taken to register a business, the costs of formalization, and the incentives for formalization have been overlooked as issues that affect the formalization process.

As a result, the researcher hopes to fill in this knowledge gap by determining the impact of business formalization on economic growth in Zimbabwe. As a result, the current research looked into how business formalization impacts economic growth.

2.5. Conclusion

Many studies have concentrated on the benefits of formalization to the success of the individual business that formalizes rather than the larger picture of its impact on economic growth, according to the literature evaluated for this study's objectives. Other available research represent two areas of expertise namely, policy persuaded moves via field trials and reforms, as well as self-persuaded formalization independent of outside interference, but none

on the effect on economic expansion, creating a gap in literature. The various viewpoints and arguments on growth gains are far more complicated, contradictory, and ambiguous. The differences are clear, leading to the question of whether formalization has an impact on the growth of an economy, which this research seeks to answer. Data gathered thus far is far from conclusive.

2.6 Chapter Summary

This chapter looked at other researchers' work on the study's factors. The researcher provided an overview of the key variables, reviewed numerous related theories, discussed both empirical and theoretical writings in line with the study's three objectives and the hypothesis to be tested linking ideologies and findings, and identified loopholes in the literature that this research aims to fulfill. The econometric methodology utilized in this research is discussed in the next chapter.

CHAPTER III

RESEARCH METHODOLOGY

3.0 Introduction

The econometric model that was used to figure out the impact of business formalization on the growth of the economy is the subject of this chapter. The researcher began by outlining the model specification and explaining the model selection. She then went on to explain why the variables in the model were chosen. The diagnostic tests used to examine the variables prior to regression analysis were also addressed in the chapter. Finally, the chapter discussed the types of data that would be used in the study as well as how the data would be gathered.

3.1 Model Specification

To find out the impact of business formalization on the growth of the economy, this study had to make use of a Time Series data from including the real GDP, turnover for business registration, cost of formalization, time frame for business formalization and incentives for formalization for the period 1990 – 2020. As alluded by Florid et al (2020) and Zylfijaj et al (2020) that administration costs in formalizing, the formalizing process (lengthy) have an effect on the desire of an organization to formalize or not. Thus, the study's function form of the econometric model is:

GDP= f (TFBR, COF, TFF, IFF) (1)

The model in Equation (1) depicts that the Gross domestic product (GDP) is a function of business formalization, which has variables that include, TFBR (Turnover for business registration) and other variables like COF (Cost of Formalization) TFF (Time Frame for Formalization) and IFF (Incentives for Formalization). The model of Equation (1) is thus specified in its econometric form and becomes:

$$GDPt = \beta_o + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \varepsilon \quad (2)$$

Where the βs are coefficients and the X1 to X5 are the variables.

Taking the logarithm on both side of Equation (2), it will become:

$$\log GDPt = \beta_o + \beta_1 \log X_1 + \beta_2 \log X_2 + \beta_3 \log X_3 + \beta_4 \log X_4 + \varepsilon$$

Where;

X_1= Turnover for business registrations (TFBR), X_2= Cost of Formalization (COF), X_3= Time Frame for Formalization (TFF), X_4= Incentives for Formalization (IFF)

X_1 will be measured by the statistics of the number of successfully registered businesses from the specified timeframe. X_2 will be the total cost for the required procedures in order for a business to get formalized. X_3 will be measured using the average number of working days that one can take to register a business alone, or using agents. X_4 will be measured using the value of the benefits, incentives or the opportunities open for every formalized business as comparing to the informal sector.

Because we are using time series data for model estimation in order for the researcher to estimate both our short and long run connection between our variables of interest, the researcher utilized the Auto-regressive Distributed Lag (ARDL) co-integration technique by Usaini et al., (2020) and Guza et al., (2018). The ARDL co-integration technique is accustomed to identify the long-run relationship in-between series with various integration orders (Pesaran et al, 2001). Parameterized result provides short-run dynamics and long-run connection of the key variables.

3.2 Justification of Variables

3.2.1 Dependent Variable (Real GDP)

Pettinger (2019) proposed that, "a rise in GDP_{real}, which translates to a rise in the worth of national expenditure/national output" defines the rise of an economy. The growth of an Economy is a key macroeconomic objective since it permits for high living standards, employment creation and more tax revenues. Growth of the Economy, job creation, labor productivity, working conditions, and social protection are all thought to benefit from business formalization (ILO, 2015; Tijdens et al., 2015). As a result, RGDP was selected as the dependent variable in this research because it is the one that changes as a result of the independent factors' modification.

3.2.2 Independent Variables

3.2.2.1. Turnover for business registrations

The high turnover of business registrations encourages other enterprises to formalize, as business environment policies are based on the number of formalized versus informal businesses. According to many studies, as businesses formalize, the government should have a larger tax base, resulting in greater government expenditure, which leads to an increase in GDP, indicating economic progress.

3.2.2.2. Cost of Formalization (COF)

The cost of formalization has been identified as one of the determinants of company formalization in a number of studies. According to Schneider (2012), some businesses are hesitant to formalize because of the expenditures they will certainly incur in the process; as a result, they choose to avoid that burden. According to Kundt (2017), the expenses of registering may be regarded as outweighing the benefits of formalization by informal enterprises, causing them to remain informal. As a result, the cost of company formalization has an impact on the rate of formalization, and thus on the growth of an economy.

3.2.2.3 Time Frame for Formalization (TFF)

As Zylfijaj et al (2020) points out, the registration process, which includes the time constraint, can either encourage or discourage enterprises from formalizing. Many governments and authorities have become aware of the benefits of formalization, according to Floridi et al. (2020), and as a result, they encourage it through a number of interventions ranging from simplified registration procedures and registration time to increased enforcement of the law.

3.2.2.4. Incentives for formalization

Many studies have long identified incentives for business formalization as a factor that influences the formalization of large-scale company undertakings. Dieng (2019), who looked into the factors that drive formalization, found that incentives for business formalization are another factor that influences formalization, thus also affecting economic progress.

3.3 Diagnostics Tests

3.3.1 Unit Test

Before focusing on the connection between business formalization and growth of the economy, the study looks into the variables' stationarity. The unit root test is essential for determining the stationarity of a time series. To see if the variables return to their long-run values, it's critical to check the time series' stationarity (Mdingi, 2020). The unit root test is required because the variables must be of integration order zero and one, I(0) and I(1), or a mixture of both, as the study uses the auto-regressive distributed lag (ARDL) model.

3.3.2 Co-integration

In this section of the study, co-integration tests are used to determine the steady state equilibrium between business formalization and economic growth. Co-integration is seen when the linear combination of two non-stationary variables is stationary. Using co-integration, the research recovers long-run information that was lost during the differentiating step, which combines short-run dynamics within long-run steady state equilibrium. To test for the presence of a long-run connection, the research has typically used Granger (1981), Engle and Granger (1987), Johansen and Juselius (1990), and the ARDL limits testing approaches. The Johansen co-integration test was utilized in this investigation because it works well with multivariate models.

3.3.3 Heteroskedasticity Test

The homoscedasticity assumption, which stipulates that the error term has a constant variance, is broken by heteroskedasticity (Rigobon, 2003). Simply expressed, heteroskedasticity occurs when an independent variable affects the disturbance term. The confidence interval widens when there is heteroskedasticity, and the t and F tests produce incorrect results. Although easy solutions exist, the answer will be Weighted Least Squares (WLS) or General Method of Moments (GMM) in this case. In this research, the Breusch-Pagan-Godfrey (BPG) test is employed to look for heteroskedasticity. The following is the Breusch-Pagan-Godfrey test hypothesis: H0: There is no heteroskedasticity. H1: There is heteroskedasticity present. The null hypothesis of no heteroskedasticity is not rejected at the 5% level of significance. At the 5% level of significance one does not reject the null

hypothesis of no heteroskedasticity error terms if the probability value of the BPG test statistic is in excess of 0.05.

3.3.4 Serial correlation

Serial correlation is the degree of correlation between two consecutive time intervals. In a time series, it evaluates the relationship between the lagged version of a variable's value and the original version. As a result, to avoid using a model with auto-correlation, the researchers used the Breusch-Godfrey (BG) Serial Correlation test for BG serial correlation. The serial correlation test's H0 hypothesis is that there is no serial correlation. H1: There is a serial correlation. At the 5% level of significance, the null hypothesis of no serial correlation is not rejected if the p value is greater than 0.05. Otherwise, auto-correlation would be expected to have an impact on the model.

3.5.5 Normality Test

To see if the disturbance component has a mean of zero and constant variance, the Jarque-Bera normality test is utilized. The research looks at the null hypothesis that the disturbances are spread evenly, as well as the alternative hypothesis that they are not evenly distributed. We do not reject the null hypothesis of normal distribution if the probability value of the Jarque-Bera statistic is greater than 0.05.

3.4 Data

Annual time series data for Zimbabwe is utilized in this study, it spans the years 1990 to 2020. The study's duration is determined by the quantity and quality of data available. The World Development Indicators (World Bank), Trading Economics, OECD, and Zimbabwe Company Registrations were used to compile the data for this study. Despite the lack of data on company formalization, the study made extensive attempts to obtain more data from different sources aiming to increase the number of observations.

3.5 Chapter Summary

The study's econometric approach was described in chapter 2. It explained model specifications and justified model selection. Then she went on to explain why the variables in

the model were chosen. The diagnostic tests used to examine the variables prior to regression analysis were also addressed in the chapter. Finally, the chapter discussed the types of data that would be used in the study as well as how the data would be gathered.

CHAPTER IV

DATA PRESENTATION, INTERPRETATION OF RESULTS AND DISCUSSION

4.0 Introduction

This chapter contains findings of estimations on the topic under consideration, as well as an economic interpretation of the findings. The descriptive statistics are presented first, followed by the diagnostic test results such as the unit root test, multicollinearity test, heteroskedasticity test, serial correlation, and normality tests. The regression analysis was carried out, and the estimation method used was OLS. This chapter also includes the regression results. E-views 7 was used for all econometric processes. H0: business formalization impacts economic growth; H1: business formalization has no impact on economic growth.

4.1 Data presentation

4.1.1 Descriptive Statistical Summary

Table 4.1 shows a descriptive abstract for all the variables utilized in this study's econometric model.

	Observations	**Min**	**Max**	**Mean**	**Standard. Deviation**	**Variance**	**Skewness**	**Kurtosis**
GDP	31	4.41	20.55	10.72161	5.616949	31.550	1.737035	1.737035
TFBR	31	1635.00	25028.00	6786968	5395.815	29114819.232	1.890089	46.417080
COF	31	120.00	300.00	211.6129	63.72319	4060.645	-.003088	1.789786
TFF	31	29	36	31.54839	2.681277	7.18125	1.074138	2.202298
IFF	31	1.11	5.78	2.577097	1.120813	1.256	0.830385	3.284272

Table 4. 1: Descriptive statistical summary

Table 4.1 provides the descriptive statistics of variables utilized in the study for the period 1990 to 2020. It contains 31 observations for each variable, making a total of 155 observations for all the variables. A standard deviation (or σ) is a measure of data dispersion in proportion to the mean whilst the minimum and maximum help to detect outliers in the data. Most variables did not deviate much from their mean while the highest standard

deviation was found in turnover for business registration (5395.81497), while the incentives for formalization(IFF) had the smallest deviation (1.12081). Thus, most data is clustered around the mean. Almost all the variables are positively skewed except for cost of formalization which is negatively skewed. A positive mean with a positive skew is preferable than a negative mean with a positive skew (Delle Monache, 2021).

4.1.2. Unit Root Test

In order to avoid a regression that's spurious, Augmented Dickey-Fuller (ADF) test was utilized to check if variables contain stationarity. We reject the null hypothesis that the series is non-stationary in favor of stationarity if the estimated Augmented Dickey-Fuller statistic is greater than the critical value. The ADF was carried out using EViews and results are reported in table below:

Table 4. 2: Augmented Dickey-Fuller Test Results

Variable	**t-ADF Statistic**	**Critical level**	**Probability**	**Order of Integration**
GDP	-0.217055	-2.963927*	0.9258	I (1)
TFBR	-0.052544	-2.963972	0.9459	I (1)
COF	-1.587219	-2.963972	0.4766	I (1)
TFF	-5.506270	-2.998064	0.0002	I (0)
IFF	-2.426878	-2.963972	0.1432	I (1)

From the table 4.2, all the variables except the Timeframe for formalization (TFF) are not stationary, meaning they have a unit root, so we cannot reject the null hypothesis that there is a unit root. These variables had to be differenced once to make them stationary.

4.1.3 Diagnostic Tests

4.1.3.1. Multicollinearity test

A pairwise correlation test was used with a correlation matrix to look for correlations between the variables in the model. The estimated parameters may have erroneous signs due to multicollinearity. The correlation test is especially important since it helps us to evaluate

which variables should be kept in the model and which should be removed based on their correlation statistic. The variables are highly connected if the correlation static is more than 0.80. (Gujarati, 2004). The table below shows results of the correlation matrix on stationary variables.

Table 4. 3: Correlation Matrix

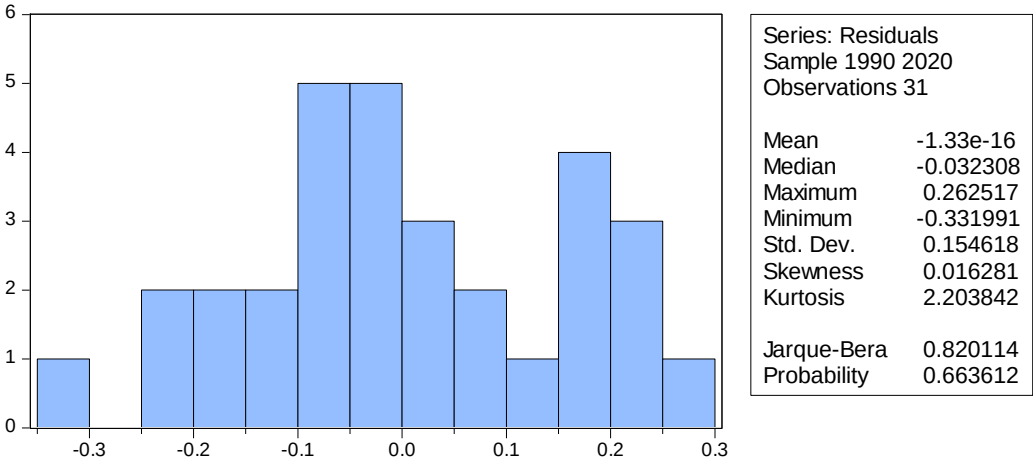
	GDP	**TFBR**	**COF**	**TFF**	**IFF**
GDP	1.000				
TFBR	0.784	1.000			
COF	0.650	0.457	1.000		
TFF	0.860	0.567	0.584	1.000	
IFF	0.591	0.579	0.532	0.486	1.000

From the results, all the partial correlation coefficients are less than absolute 0.8, except for TFF, implying that there is no serious multicollinearity. Hence, the variables are linearly independent.

4.1.3.2.. Normality test

Fig 4. 1: normality test.

In the normality test, H_0: data is normally distributed, H_1: data is not normally distributed.



We accept the null hypothesis that our data is normally distributed because our p-value is greater than 0.05.

4.1.3.3. heteroskedasticity test

If heteroskedasticity is present, OLS estimators will be linear and unbiased but not efficient. They do not satisfy the BLUE property. This is because the variance of the error term and variance of the OLS estimators are biased. H_0: no heteroskedasticity, H_1: heteroskedasticity is present in the model. Below is the test result;

Table 4. 4: heteroskedasticity test.

Heteroskedasticity Test: Breusch-Pagan-Godfrey			
F-statistic	9.936989	Prob. F(4,26)	0.0001
Obs*R-squared	18.74106	Prob. Chi-Square(4)	0.0009
Scaled explained SS	12.77750	Prob. Chi-Square(4)	0.0124

The test shows presence of heteroskedasticity where the p-value is less than 0.05 hence a need to transform the model into natural logarithm form.

Heteroskedasticity Test: Breusch-Pagan-Godfrey			
F-statistic	2.680578	Prob. F(4,26)	0.0539
Obs*R-squared	9.051491	Prob. Chi-Square(4)	0.06
Scaled explained SS	3.832508	Prob. Chi-Square(4)	0.4291

After transformation, we now accept the null hypothesis because the data has no heteroskedasticity. This is shown where the p-value is greater than 0.05.

4.1.3.4. Serial-correlation

To test for serial correlation in the model used the Breusch-Godfrey serial correlation test. H_0: No serial correlation, H_1: serial correlation is there in the model.

Table 4. 5: serial correlation

Breusch-Godfrey Serial Correlation LM Test:			
F-statistic	1.316482	Prob. F(2,24)	0.2867
Obs*R-squared	3.064694	Prob. Chi-Square(2)	0.2160

The p-value is equal to 0.2160, evidencing that the p-value is greater than 0.05 hence in this test, we accept the null hypothesis and conclude that there is no serial correlation in the specified model.

4.1.3.5. Casuality Tests

A pairwise causality between variables is done using Granger causality test to determine the direction of causality. The variables real gross domestic product, turnover for business registrations, cost of formalization, time frame for formalization and incentives for formalization of businesses.

Table 4. 6: Granger causality test

Null Hypothesis:	obs	F-Statistic	Prob.
TFBR does not Granger Cause GDP	29	5.03637	0.0149
GDP does not Granger Cause TFBR		9.97172	0.0007
COF does not Granger Cause GDP	29	2.24280	0.1279
GDP does not Granger Cause COF		3.80771	0.0366
TFF does not Granger Cause GDP	29	4.82878	0.0173
GDP does not Granger Cause TFF		1.07971	0.3556
IFF does not Granger Cause GDP	29	0.13929	0.8707
GDP does not Granger Cause IFF		1.65998	0.2112
COF does not Granger Cause TFBR	29	0.88686	0.4250
TFBR does not Granger Cause COF		0.16801	0.8463

TFF does not Granger Cause TFBR	29	8.40397	0.0017
TFBR does not Granger Cause TFF		0.45468	0.6400
IFF does not Granger Cause TFBR	29	0.10714	0.8988
TFBR does not Granger Cause IFF		1.10880	0.3463
TFF does not Granger Cause COF	29	3.80226	0.0368
COF does not Granger Cause TFF		0.21247	0.8101
IFF does not Granger Cause COF	29	1.65846	0.2115
COF does not Granger Cause IFF		1.19420	0.3203
IFF does not Granger Cause TFF	29	0.16300	0.8505
TFF does not Granger Cause IFF		2.60445	0.0947

The results from the Granger causality test shows that we reject the hypotheses that GDP does not Granger Cause TFBR, that TFF does not Granger Cause COF, TFF does not Granger cause GDP, TFF does not Granger cause TFBR and GDP does not Granger cause TFBR, because the probability values are less than the 5% significance level. It simply means that there is a unidirectional connection from GDP to turnover for business formalization, Timeframe for formalization to cost of formalization, timeframe for formalization to gross domestic product, timeframe for formalization to turnover for business registration and as well gross domestic product to turnover for business registration.

4.1.3.6 Cointergration test

Using the Johansen co-integration test, H_0: there is no co-integration in the model, H_1: there is co-integration in the model. Below are the test results;

Unrestricted Cointegration Rank Test (Trace)				
Hypothesized		Trace	0.05	
No. of CE(s)	Eigenvalue	Statistic	Critical Value	Prob.**

None *		0.689835		73.67320		69.81889		0.0238
At most 1		0.540110		39.72437		47.85613		0.2325
At most 2		0.263321		17.19810		29.79707		0.6254
At most 3		0.204257		8.335628		15.49471		0.4302
At most 4		0.057253		1.709754		3.841466		0.1910

Table 4. 7: cointergration rank test

In this model, we reject the null hypothesis and conclude that there is co-integration in the model at most 1, 2, 3 and 4. This is because the probability values are greater than 0.05 and also the p-value at none is less than 0.05.

4.1.4. Regression Analysis

Table 4. 8: Regression analysis

Variable	**Coefficient**	**Standard error**	**t-statistic**	**Probability**
Constant	-10.12850***	1.508595	-6.7138664	0.0000
log (TFBR)	0.436302	0.060764	7.180286	0.0000
log (COF)	0.032653***	0.125385	0.260424	0.7966
log (TFF)	-0.437562	0.515780	-0.84822	0.0001
log (IFF)	0.061566	0.095704	0.643291	0.5257

** 10% significant ** significant at 5% and ***significant at 1%*

R^2= 0.905

Adjusted R^2 = 0.89

D W statistic = 1.851304

F statistic = 61.89756

Probability (F-value) = 0.000000

After running the OLS regression, the model is therefore specified as:

logGDP = -10.12850 + 0.436302logTFBR + 0.032653logCOF – 0.437562logTFF + 0.061566logIFF

4.2. Interpretation of Results

All variables included in the model were of expectation that they have a significant impact in affecting economic growth. This shows that the economic growth as measured by GDP is affected by all variables included in the model. All the factors also came out as expected. The variables included in the model explain 90.5% of the change that affects economic growth as shown by R^2 while other variables that were not included in the model explain 9.5%. After correcting the degrees of freedom as shown by the adjusted R^2 it indicates that 89% of economic growth is shown by the research model, while the other factors account for 11%, indicating a good model fit. F-statistic value 61,89756 means that the main model is able to detect the economic growth and the Durbin Watson statistic 1.851304 is above 1, though in the positive auto-correlation range, it implies less serious chances of auto-correlation. The results show that the model was accurately stated and that the spurious regression was eliminated. As a result, the findings are valuable as a foundation for policy making.

4.2.1. Turnover of Formalized Business Return (TFBR)

The results indicated that TFBR (proxies by the number of businesses' registering each year) has impact on the growth of the economy of Zimbabwe, as indicated by a coefficient of 0.4363 at level significance. It simply implies that a unit rise in the TFBR ratio is associated by an rise in the level of real GDP by an estimate of 43.63%. It then means we reject the null hypothesis for the study, that business formalization has no impact on the growth of the economy. This confirms the study that was Bjrnskov & Foss (2016) found very considerable evidence supporting the premise that formalizing business activity has good long-run economic repercussions in terms of wealth, productivity, and growth, similar to Johnson et al findings. The results show that the increase in business formalization has a positive impact on economic growth and partially explains the notion in the Neoclassical Growth Model's production function that accumulation of capital in an economy and how individuals use it is vital for figuring out the growth of an economy.

4.2.2. Cost of Formalization (COF)

The results from the regression analysis indicates that that COF has a significant impact on GDP, as shown by a coefficient of 0.032653 at 5% significance level and a probability value

is 0.7966 and it means that changes in cost of formalization are associated with 3.2653% effect on the economic growth which denoted by GDP. When the cost of formalization increases, the governments get more income from the formalization process and agent tax. Also, this outcome is in line with Kundt (2017) who affirms that registration costs for business formalization have an impact on their desire to formalize, which will affect the rise in GDP in the long run.

4.2.3. Incentives for formalization (IFF)

According to the regression analysis results, a positive connection was obtained in-between IFF and GDP, also this was evidenced by a positive coefficient of 0.06156 of the factor. If incentives for formalization by businesses increase by one unit, the GDP will rise by 6.156%. The more incentives of formalization companies have, the more the economy grows in the sense that, those incentives include the ability to import certain products at 0 duty cost and the ability to export products abroad and also the ability to get business loans, which increases the exporting nation's GDP**.** The positive sign of the coefficient and the connection between IFF and GDP agrees to other preceding researches studied before, like the one that Adenugba & Dipo (2013) in Nigeria, where they figured out that non – oil exports had a contribution to the growth of the economy Nigeria even though it was below expectations. As highlighted by Kalaitzi and Chamberlain (2021) that the ability to export goods and services spur higher investment, technological advancement, and import expansions, all of which help the economy expand.

4.2.4. Timeframe for formalization (TFF)

The regression results show that the time-frame for formalization and economic growth has a negative relationship. This is evidenced by a negative coefficient of -0.4375 of the variable. This simply means that a unit increase in TFF decreases real GDP by 43.75%. This is from the context that as the time-frame for formalization increases, businesses people may find it difficult to endure the time taken by the registry in order to get their documents processed and their company registered. A shorter time-frame for registration encourages people to formalize their businesses, hence leading to a greater tax base for the government, which leads to economic growth via government expenditure.

4.3. Conclusion

Chapter 4 presents and as well as discusses the study's results. Processes from chapter three were utilized to process the data. The results backed up the idea presented in the preceding chapter. The model anticipated that all of the variables were going to have significant impact on the growth of the economy. Stakeholders will get policy proposals in Chapter 5.

CHAPTER V

SUMMARY, CONCLUSION AND POLICY RECOMMENDATIONS

5.0 Introduction.

This chapter looks on the study's summary, results and recommendations about the impact of business formalization on Zimbabwe's economic growth. The study's summary is presented first, followed by the conclusion and policy suggestions. The researcher has identified areas for further research in this study, which will be highlighted in this chapter.

5.1 Summary of the Study.

This sections summaries everything in the whole research in accordance to study objectives.

5.1.1 To determine the impact of business formalization on economic growth.

The major aim of the research focuses on study which looked at the impact of business formalization on the growth of the economy of Zimbabwe. An econometric model was utilized in the research and the study utilized an annual time series data set from 1990 to 2020. Findings from the study exhibited that turnover of formalized business registrations (as denoted by the rise in the numbers of formalizing enterprises), cost of formalization and incentives for formalization of businesses have a positive impact on the growth of an economy. This research also showed how time-frame of business formalization has a negative impact on the growth of the economy. This research found the strongest positive correlation between the numbers of businesses formalizing and economic growth (GDP) implying that the more businesses formalize, the more likely the economy of Zimbabwe grows. This satisfied the hypothesis that, strong connection in-between business formalization and the economic growth exists.

5.1.2 To examine the factors that determines business formalization, in the case of informal business owners.

The study also found that the factors that that determine business formalization include deregulation of the formal economy, the owner's ability, governments support, business methods or corporate preferences. The study used the Neoclassical Growth Model and Endogenous Growth Theories as guide for the research. In accordance with the findings, the

Endogenous Growth Theory and Neoclassical Growth models were highly relevant according to this study while the Classical Growth was less significant.

5.1.3 To establish the relationship of business formalization and economic growth

Lastly, the researcher also figured out that, a positive connection between business formalization and the growth of an economy. This was denoted by the regression results that have shown that as the numbers of formalized businesses continue to increase, the real GDP is most likely going to increase too. Also if the factors that discourage formalization are addressed, the impact on economic growth is also seen this was shown on the negative relationship between timeframe for formalization and GDP, this is because as the time frame increases, businesses define time as money hence may be discouraged to formalize, hence will contribute less to the tax base of the government income.

5.2 Conclusions

This section links the research questions to the conclusions found by the researcher.

5.2.1. What is the impact of business formalization on economic growth?

Fundamental focus of the research was to discover the impact of business formalization on economic growth in Zimbabwe. The research sought to test the hypothesis that business formalization has a positive impact on economic growth. Since the outcomes of the study demonstrated that business formalization has a positive effect on economic progress, we accept this hypothesis as true. This objective of the study was accomplished.

5.2.2. What is the relationship of business formalization and economic growth?

The connection between business formalization and economic growth was tested and seen to be positive. The more the businesses formalize in an economy, the real GDP is expected to increase, thus showing a positive relationship between business formalization and economic growth.

5.2.3. What causes informal business owners to formalize their businesses?

The research has shown that businesses are encouraged to formalize through increase in turnover for business registrations which then is considered when making policies for the business sector, incentives for formalization, lower cost of registration, low timeframe for registration, less regulations for formalized businesses and as well as greater benefits of registrations as compared to the informal business operations. These factors cause informal businesses to formalize.

5.3 Policy Recommendations.

The results of this research revealed a positive association between company formalization and national economic growth. As a result of this awakening, the government must

5.3.1 To determine the impact of business formalization on economic growth.

a) Devise friendly policies that encourage business formalization, such as the usage of formalization incentives. These can involve providing collateral, establishing and backing specialized company loans, or awarding grants to those that meet certain criteria, such as increasing productivity after formalization. That action could have a good impact on the number of formalized enterprises in the country, resulting in greater exports and export value, which, in turn, empowers the country through the foreign currency that enters the country and improves GDP. This also reduces the issue of shadow registered business that stop operations after registrations, leading to a distorted number of registered businesses.

5.3.2 To examine the factors that determines business formalization, in the case of informal business owners.

b) To promote incentives for formalization, the government can exercise deregulation of exports for registered companies, that is, through removal of many restrictions for the formalized businesses that endeavor to export so that they operate more freely. From

the reviewed literature, many informal SMEs trade off the costs of formalization with the benefits.

c) This is call for the government, besides deregulation to promote more businesses formalization, also to address challenges faced by informal businesses when they try to become formal. The more thriving the local businesses become, the greater their chances of expanding and employing more people, thereby improving the economy. To do away with the exportation of raw materials which are not processed.
d) Governments may also consider removing agents in the business registration system to cut down the costs and timeframe for formalization so as to encourage more businesses to formalize.

5.3.3 To establish the relationship of business formalization and economic growth

e) Zimbabwean government can both solicit foreign direct investment and establish rules that enhance value addition for formalized businesses. This helps the Zimbabwean economy grow its GDP while also increasing liquidity, all which indicates economic growth.
f) The government may encourage operations of formalized businesses through policies like the zero tax regime for newly formalized businesses and offer subsidies to newly formalized businesses, this is to avoid the issue of having idle registered companies in Zimbabwe.

5.4 Suggestions for Future Studies.

- Other variables that affect the growth of the economy, such as available capital, physical labor, land resources and technological advancement, were not included in this study. Aside from business formalization, more research into the determinants of economic growth is required.
- The qualitative elements for company formalization were also ignored in the study. This could be due to feelings of love or hate for the ruling party, in which case businesses may choose not to formalize as a means of protesting against the government.
- The study also overlooked the issue of multiple currencies and rapid changes in currency policies as factors affecting formalization in order to achieve economic growth.

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LIST OF APPENDICES:

Appendix A: Raw Data

Year	GDP (Billion USD)	GDP Growth	TFBR X_1	COF X_2	TFF X_3	IFF X_4 Billion $	AB X_5
2020	18.05	-6.25	20273	230	29	4.39	<1
2019	19.28	-6.14	25028	245	36	4.05	1
2018	18.11	4.82	16810	245	36	4.04	2
2017	17.58	4.71	9518	245	36	3.48	3
2016	20.55	0.76	8124	245	36	3.34	4
2015	19.96	1.78	9055	300	36	2.7	5
2014	19.5	2.38	9465	300	36	3.06	6
2013	19.09	1.99	9782	300	36	3.51	7
2012	17.11	16.67	9491	300	36	3.88	8
2011	14.1	14.19	8451	300	31	3.51	9
2010	12.04	19.68	7623	300	30	3.2	10
2009	9.67	12.02	7554	300	30	2.27	11
2008	4.41	-17.67	1635	200	30	1.17	12
2007	5.29	-3.65	1992	200	30	2.8	13
2006	5.44	-3.46	2033	200	30	5.78	14
2005	5.76	-5.71	2360	200	30	2.72	15
2004	5.81	-5.81	2594	200	30	2.15	16
2003	5.73	-17	2307	225	30	1.52	17
2002	6.34	-8.89	4011	225	30	2.15	18
2001	6.78	1.44	4904	225	30	1.12	19
2000	6.69	-3.06	4773	225	30	1.61	20
1999	6.86	-0.82	4891	150	30	1.94	21
1998	6.41	2.86	4998	150	30	2.01	22
1997	8.53	2.68	4986	150	30	1.92	23
1996	8.55	10.36	5239	150	30	1.88	24
1995	7.11	0.16	4681	150	30	1.81	25
1994	6.89	9.24	3886	120	30	1.94	26

1993	6.56	1.05	4001	120	30	1.79	27
1992	6.75	-9.02	2027	120	30	1.11	28
1991	8.64	5.536	3903	120	30	1.64	29
1990	8.78	6.99	4001	120	30	1.4	30

Where;

X1= Turnover of Formalized Business Return (TFBR)

X2= Cost of Formalization (COF)

X3= Time Frame for Formalization (TFF)

X4= Incentives for Formalization (IFF)

X5= Age of Formalized Business (AB)

Appendix B: Descriptive statistics

	GDP	TFBR	COF	TFF	IFF
Mean	10.72161	6786.968	211.6129	31.54839	2.577097
Median	8.530000	4904.000	225.0000	30.00000	2.150000
Maximum	20.55000	25028.00	300.0000	36.00000	5.780000
Minimum	4.410000	1635.000	120.0000	29.00000	1.110000
Std. Dev.	5.616949	5395.815	63.72319	2.681277	1.120813
Skewness	0.669083	1.890089	-0.003088	1.074138	0.830385
Kurtosis	1.737035	6.417080	1.789786	2.202298	3.284272
Jarque-Bera	4.373283	33.53965	1.891846	6.783084	3.667002
Probability	0.112293	0.000000	0.388321	0.033657	0.159853
Sum	332.3700	210396.0	6560.000	978.0000	79.89000
Sum Sq. Dev.	946.5036	8.73E+08	121819.4	215.6774	37.68664
Observations	31	31	31	31	31

Appendix C: Unit root test

Gross domestic Product (GDP)

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

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-0.217055	0.9258
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(GDP)
Method: Least Squares
Date: 06/20/22 Time: 02:25
Sample (adjusted): 1991 2020
Included observations: 30 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
GDP(-1)	-0.011685	0.053833	-0.217055	0.8297
C	0.431426	0.635769	0.678589	0.5030

R-squared	0.001680	Mean dependent var	0.309000
Adjusted R-squared	-0.033975	S.D. dependent var	1.580293
S.E. of regression	1.606914	Akaike info criterion	3.850848
Sum squared resid	72.30082	Schwarz criterion	3.944262
Log likelihood	-55.76273	Hannan-Quinn criter.	3.880732
F-statistic	0.047113	Durbin-Watson stat	1.428133
Prob(F-statistic)	0.829739		

Turnover for business registrations

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

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-0.052544	0.9459
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(TFBR)
Method: Least Squares
Date: 06/20/22 Time: 02:27
Sample (adjusted): 1991 2020
Included observations: 30 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
TFBR(-1)	-0.005186	0.098706	-0.052544	0.9585
C	575.2687	783.5381	0.734194	0.4689

R-squared	0.000099	Mean dependent var	542.4000
Adjusted R-squared	-0.035612	S.D. dependent var	2539.521
S.E. of regression	2584.344	Akaike info criterion	18.61667
Sum squared resid	1.87E+08	Schwarz criterion	18.71009
Log likelihood	-277.2501	Hannan-Quinn criter.	18.64656
F-statistic	0.002761	Durbin-Watson stat	1.676123
Prob(F-statistic)	0.958468		

Cost of formalization

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

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-1.587219	0.4766
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(COF)
Method: Least Squares
Date: 06/20/22 Time: 02:28
Sample (adjusted): 1991 2020
Included observations: 30 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
COF(-1)	-0.116572	0.073444	-1.587219	0.1237
C	28.26336	16.18607	1.746154	0.0917

R-squared	0.082547	Mean dependent var	3.666667
Adjusted R-squared	0.049781	S.D. dependent var	26.25910
S.E. of regression	25.59716	Akaike info criterion	9.387180
Sum squared resid	18346.01	Schwarz criterion	9.480593
Log likelihood	-138.8077	Hannan-Quinn criter.	9.417064
F-statistic	2.519266	Durbin-Watson stat	1.970210

Prob(F-statistic)	0.123693

Timeframe for formalization

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

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-5.506270	0.0002
Test critical values:	1% level	-3.752946	
	5% level	-2.998064	
	10% level	-2.638752	

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

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(TFF)
Method: Least Squares
Date: 06/20/22 Time: 02:29
Sample (adjusted): 1998 2020
Included observations: 23 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
TFF(-1)	-1.223486	0.222199	-5.506270	0.0001
D(TFF(-1))	1.355319	0.336015	4.033507	0.0012
D(TFF(-2))	1.128866	0.339765	3.322490	0.0050
D(TFF(-3))	1.174587	0.339967	3.455004	0.0039
D(TFF(-4))	1.163293	0.339712	3.424352	0.0041
D(TFF(-5))	1.176303	0.341014	3.449433	0.0039
D(TFF(-6))	1.119941	0.334391	3.349194	0.0048
D(TFF(-7))	1.400014	0.364851	3.837222	0.0018
C	37.04550	6.758921	5.480978	0.0001

R-squared	0.689216	Mean dependent var	-0.043478
Adjusted R-squared	0.511624	S.D. dependent var	1.845837
S.E. of regression	1.289942	Akaike info criterion	3.633244
Sum squared resid	23.29532	Schwarz criterion	4.077568
Log likelihood	-32.78231	Hannan-Quinn criter.	3.744990
F-statistic	3.880913	Durbin-Watson stat	2.004988
Prob(F-statistic)	0.013057		

Incentives for formalization

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

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-2.426878	0.1432
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(IFF)
Method: Least Squares
Date: 06/20/22 Time: 02:31
Sample (adjusted): 1991 2020
Included observations: 30 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
IFF(-1)	-0.374190	0.154186	-2.426878	0.0219
C	1.041377	0.421596	2.470082	0.0199

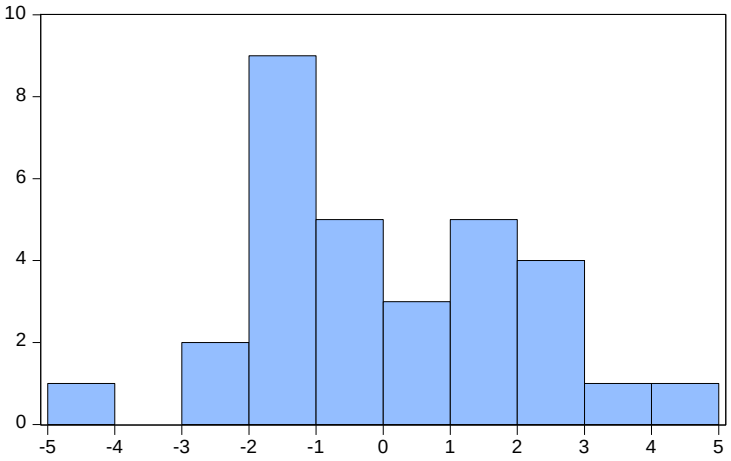
R-squared	0.173791	Mean dependent var	0.099667
Adjusted R-squared	0.144284	S.D. dependent var	0.976035
S.E. of regression	0.902881	Akaike info criterion	2.697888
Sum squared resid	22.82542	Schwarz criterion	2.791301
Log likelihood	-38.46832	Hannan-Quinn criter.	2.727772
F-statistic	5.889737	Durbin-Watson stat	1.926508
Prob(F-statistic)	0.021917		

Appendix D: Multicollinearity

Correlation matrix

	GDP	TFBR	COF	TFF	IFF
GDP	1.000000	0.784017	0.650315	0.859843	0.590540
TFBR	0.784017	1.000000	0.457411	0.566876	0.578860
COF	0.650315	0.457411	1.000000	0.583829	0.531815
TFF	0.859843	0.566876	0.583829	1.000000	0.485594
IFF	0.590540	0.578860	0.531815	0.485594	1.000000

Appendix E: Normality Test



Series: Residuals
Sample 1990 2020
Observations 31

Mean	6.33e-15
Median	-0.137000
Maximum	4.155916
Minimum	-4.670772
Std. Dev.	1.922636
Skewness	0.105062
Kurtosis	2.938466
Jarque-Bera	0.061920
Probability	0.969514

Appendix F: Heteroskedasticity

Test 1

Heteroskedasticity Test: Breusch-Pagan-Godfrey

F-statistic	9.936989	Prob. F(4,26)	0.0001
Obs*R-squared	18.74106	Prob. Chi-Square(4)	0.0009
Scaled explained SS	12.77750	Prob. Chi-Square(4)	0.0124

Test Equation:
Dependent Variable: RESID^2
Method: Least Squares
Date: 06/08/22 Time: 21:38
Sample: 1990 2020
Included observations: 31

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	8.611853	8.670250	0.993265	0.3297
TFBR	0.000800	0.000155	5.157527	0.0000
COF	-0.012439	0.012899	-0.964318	0.3438
TFF	-0.281979	0.316468	-0.891020	0.3811
IFF	0.413152	0.737537	0.560178	0.5802

R-squared	0.604550	Mean dependent var	3.577288
Adjusted R-squared	0.543712	S.D. dependent var	5.062946
S.E. of regression	3.419974	Akaike info criterion	5.443833
Sum squared resid	304.1017	Schwarz criterion	5.675121
Log likelihood	-79.37941	Hannan-Quinn criter.	5.519227
F-statistic	9.936989	Durbin-Watson stat	1.762967
Prob(F-statistic)	0.000051		

Test 2

Heteroskedasticity Test: Breusch-Pagan-Godfrey

F-statistic	2.680578	Prob. F(4,26)	0.0539
Obs*R-squared	9.051491	Prob. Chi-Square(4)	0.06
Scaled explained SS	3.832508	Prob. Chi-Square(4)	0.4291

Test Equation:
Dependent Variable: RESID^2
Method: Least Squares
Date: 06/20/22 Time: 02:34
Sample: 1990 2020
Included observations: 31

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.093218	0.211845	-0.440029	0.6636
LOG(TFBR)	0.023422	0.008533	2.744950	0.0108
LOG(COF)	-0.026971	0.017607	-1.531816	0.1376
LOG(TFF)	0.018463	0.072429	0.254907	0.8008
LOG(IFF)	-0.005998	0.013439	-0.446279	0.6591

R-squared	0.291984	Mean dependent var	0.023135
Adjusted R-squared	0.183058	S.D. dependent var	0.025804
S.E. of regression	0.023323	Akaike info criterion	-4.532088
Sum squared resid	0.014143	Schwarz criterion	-4.300800
Log likelihood	75.24736	Hannan-Quinn criter.	-4.456694
F-statistic	2.680578	Durbin-Watson stat	1.868182
Prob(F-statistic)	0.053879		

Appendix G: Serial correlation

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	1.316482	Prob. F(2,24)	0.2867
Obs*R-squared	3.064694	Prob. Chi-Square(2)	0.2160

Test Equation:
Dependent Variable: RESID
Method: Least Squares
Date: 06/08/22 Time: 21:40
Sample: 1990 2020
Included observations: 31
Presample missing value lagged residuals set to zero.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	1.026065	5.250243	0.195432	0.8467
TFBR	-4.16E-05	9.82E-05	-0.423209	0.6759
COF	-0.001152	0.007777	-0.148091	0.8835
TFF	-0.031084	0.190507	-0.163167	0.8718

IFF	0.195179	0.465318	0.419452	0.6786
RESID(-1)	0.352633	0.217946	1.617985	0.1187
RESID(-2)	-0.019325	0.220039	-0.087823	0.9307

R-squared	0.098861	Mean dependent var	6.33E-15
Adjusted R-squared	-0.126424	S.D. dependent var	1.922636
S.E. of regression	2.040554	Akaike info criterion	4.459999
Sum squared resid	99.93263	Schwarz criterion	4.783803
Log likelihood	-62.12999	Hannan-Quinn criter.	4.565551
F-statistic	0.438827	Durbin-Watson stat	1.767757
Prob(F-statistic)	0.845525		

Appendix H: Granger casuality

Pairwise Granger Causality Tests
Date: 06/08/22 Time: 21:27
Sample: 1990 2020
Lags: 2

Null Hypothesis:	Obs	F-Statistic	Prob.
TFBR does not Granger Cause GDP	29	5.03637	0.0149
GDP does not Granger Cause TFBR		9.97172	0.0007
COF does not Granger Cause GDP	29	2.24280	0.1279
GDP does not Granger Cause COF		3.80771	0.0366
TFF does not Granger Cause GDP	29	4.82878	0.0173
GDP does not Granger Cause TFF		1.07971	0.3556
IFF does not Granger Cause GDP	29	0.13929	0.8707
GDP does not Granger Cause IFF		1.65998	0.2112
COF does not Granger Cause TFBR	29	0.88686	0.4250
TFBR does not Granger Cause COF		0.16801	0.8463
TFF does not Granger Cause TFBR	29	8.40397	0.0017
TFBR does not Granger Cause TFF		0.45468	0.6400
IFF does not Granger Cause TFBR	29	0.10714	0.8988
TFBR does not Granger Cause IFF		1.10880	0.3463
TFF does not Granger Cause COF	29	3.80226	0.0368
COF does not Granger Cause TFF		0.21247	0.8101
IFF does not Granger Cause COF	29	1.65846	0.2115
COF does not Granger Cause IFF		1.19420	0.3203
IFF does not Granger Cause TFF	29	0.16300	0.8505
TFF does not Granger Cause IFF		2.60445	0.0947

Appendix I: Cointegration

Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.689835	73.67320	69.81889	0.0238
At most 1	0.540110	39.72437	47.85613	0.2325
At most 2	0.263321	17.19810	29.79707	0.6254
At most 3	0.204257	8.335628	15.49471	0.4302
At most 4	0.057253	1.709754	3.841466	0.1910

Appendix J: Ordinary Least Squares Results

Dependent Variable: LOG(GDP)
Method: Least Squares
Date: 06/20/22 Time: 02:37
Sample: 1990 2020
Included observations: 31

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-10.12850	1.508595	-6.713864	0.0000
LOG(TFBR)	0.436302	0.060764	7.180286	0.0000
LOG(COF)	0.032653	0.125385	0.260424	0.7966
LOG(TFF)	-0.437562	0.515780	-0.84822	0.0001
LOG(IFF)	0.061566	0.095704	0.643291	0.5257

R-squared	0.904967	Mean dependent var	2.246450
Adjusted R-squared	0.890347	S.D. dependent var	0.501560
S.E. of regression	0.166086	Akaike info criterion	-0.605930
Sum squared resid	0.717200	Schwarz criterion	-0.374642
Log likelihood	14.39192	Hannan-Quinn criter.	-0.530536
F-statistic	61.89756	Durbin-Watson stat	1.851304
Prob(F-statistic)	0.000000		

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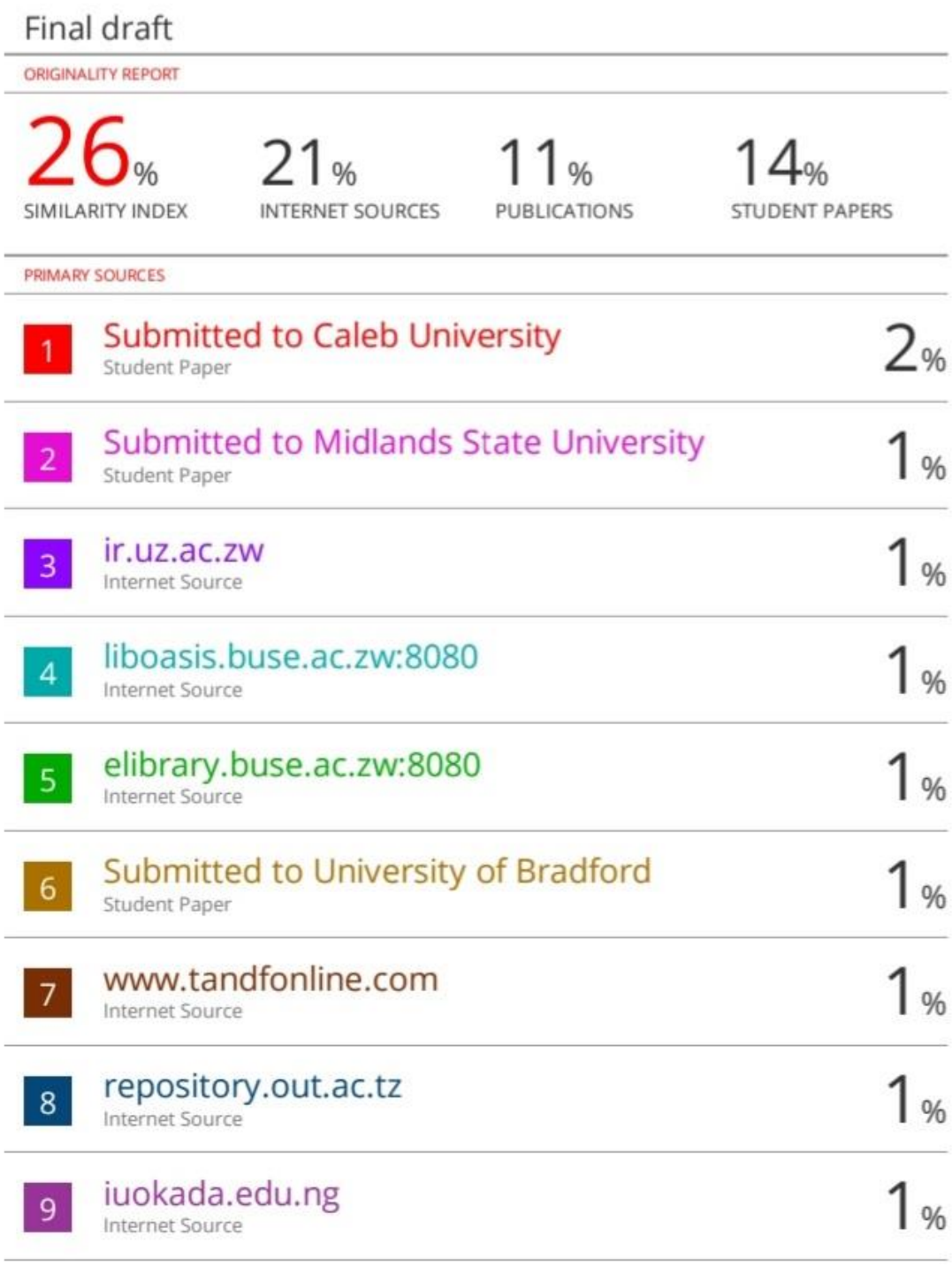

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