THE CAUSAL RELATIONSHIP AMONG FINANCIAL DEVELOPMENT, TRADE OPENNESS, AND ECONOMIC GROWTH IN ZAMBIA (1965 – 2011)

By

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A dissertation submitted to the University of Zambia in partial fulfillment of the requirements of the degree of Master of Arts in Economics

THE UNIVERSITY OF ZAMBIA

LUSAKA

2014
DECLARATION

I, Chibvalo Zombe, declare that this dissertation:

(a) Represents my own work;
(b) Has not previously been submitted for a degree at this or any other University;
(c) Does not incorporate any published work or material from another dissertation.

Signed …………………………………

Date ……………………………………
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ABSTRACT

The aim of this study was to investigate the causal relationship among financial development, trade openness, and economic growth in Zambia from 1965 to 2011. To fully understand this relationship, two measures of financial development were used: broad money and domestic credit to the private sector, each as a ratio of gross domestic product (GDP). In this regard, two models were developed for each indicator. Using Augmented Dickey-Fuller (ADF) and Phillips-Perron (PP) stationarity tests we found that all the variables were integrated of order one. Furthermore, Johansen’s test for cointegration indicated that the variables in each model had one cointegration relationship. Therefore, the vector error correction model (VECM) was employed to examine the short-run and long-run dynamics among the variables in each model. The results indicate that relationship among financial development, trade openness, and economic growth is sensitive to the financial development indicator chosen.

In the short run, we found that economic growth and trade openness Granger cause financial development. This result was obtained when using domestic credit to the private sector as an indicator of financial development. Moreover, using the same indicator, we found a unidirectional relationship running from trade openness to financial development, though in a negative way. Using broad money as an indicator of financial development, we found no causal relationship among financial development, trade openness, and economic growth.

In the long run, we found that financial development and trade openness cause economic growth when broad money is used as an indicator of financial development. On the other hand, we found that economic growth and trade openness cause financial development when domestic credit to the private sector is used as a measure of financial development. However, in both cases, the causal link was found to be weak suggesting that Zambia’s financial sector is still in its infancy stage and exhibits some characteristics of financial repression. Furthermore, Zambia’s trade policies thus far have not contributed much to economic growth.

On the policy front, it is important for policy makers in Zambia to pursue policies that further open up the economy to international trade with caution. This is because trade openness hinders the growth of domestic credit to the private sector in the short run. Notwithstanding, some degree of openness to international trade is also important since trade openness and economic growth jointly increase the supply of domestic credit to the private sector. Therefore, the focus of trade policy should be on finding the appropriate degree of trade openness that will support domestic credit to the private sector given the rate of economic growth.

In the long run, policy makers should consider policies that increase broad money and trade openness as they are important factors in promoting economic growth. With high economic growth rates coupled with increased international trade it is envisaged that domestic credit to the private sector will increase.
DEDICATION

To my wife, family and friends for their continued support
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<th>Description</th>
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<tbody>
<tr>
<td>ADF</td>
<td>Augmented Dickey-Fuller Unit Root Test</td>
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<td>AIC</td>
<td>Akaike Information Criterion</td>
</tr>
<tr>
<td>BOZ</td>
<td>Bank of Zambia</td>
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<td>DBZ</td>
<td>Development Bank of Zambia</td>
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<td>EIF</td>
<td>Enhanced Integrated Framework</td>
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<td>FDI</td>
<td>Foreign Direct Investment</td>
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<td>FINDECO</td>
<td>Financial Development Corporation</td>
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<td>FPE</td>
<td>Final Prediction Error</td>
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<td>FSAP</td>
<td>Financial Sector Assessment Programme</td>
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<td>FSDP</td>
<td>Financial Sector Development Plan</td>
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<tr>
<td>GATT</td>
<td>General Agreement of Trade and Tariffs</td>
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<td>GDP</td>
<td>Gross Domestic Product</td>
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<tr>
<td>GRZ</td>
<td>Government of the Republic of Zambia</td>
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<td>HQIC</td>
<td>Hanna and Quinn Information Criteria</td>
</tr>
<tr>
<td>IMF</td>
<td>International Monetary Fund</td>
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<td>MMD</td>
<td>Movement for Multiparty Democracy</td>
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<td>MSMEs</td>
<td>Micro Small and Medium Enterprises</td>
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<td>NBFIs</td>
<td>Non-Bank Financial Institutions</td>
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<tr>
<td>NSCB</td>
<td>National Savings and Credit Bank</td>
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<tr>
<td>OPEC</td>
<td>Oil Producing and Exporting Countries</td>
</tr>
<tr>
<td>PIA</td>
<td>Pensions and Insurance Authority</td>
</tr>
<tr>
<td>PP</td>
<td>Phillips-Perron Unit Root Test</td>
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<tr>
<td>R&amp;D</td>
<td>Research and Development</td>
</tr>
<tr>
<td>SAPs</td>
<td>Structural Adjustment Programmes</td>
</tr>
<tr>
<td>Abbreviation</td>
<td>Description</td>
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<tr>
<td>SBC</td>
<td>Schwartz Bayesian Information Criterion</td>
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<td>SEC</td>
<td>Securities and Exchange Commission</td>
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<tr>
<td>UNIP</td>
<td>United Independence Party</td>
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<tr>
<td>VAR</td>
<td>Vector Autoregressive Model</td>
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<td>VECM</td>
<td>Vector Error Correction Model</td>
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<tr>
<td>WB</td>
<td>World Bank</td>
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<tr>
<td>ZEIB</td>
<td>Zambia Export and Import Bank</td>
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<td>ZSIC</td>
<td>Zambia State Insurance Company</td>
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<td>ZNBS</td>
<td>Zambia National Building Society</td>
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CHAPTER ONE

1 Introduction

1.1 Background to the Study

Zambia, like other developing countries has been in search of channels through which it can achieve sustainable economic growth. This is with the belief that sustainable economic growth is a vehicle through which a nation can achieve human development. Various economists suggest a number of factors that can promote economic growth of which financial development and trade openness have been highlighted. However, in the literature, there is no consensus on the direction and impact of financial development and trade openness on economic growth.

The debate on the relationship between financial development and economic growth has remained inconclusive. One argument, known as the supply-leading hypothesis, proposes that financial development propels economic growth. This argument was first introduced by Bagehot (1873) who observed that financial development had played a critical role in the industrialisation of England. Schumpeter (1911) also showed that a well – functioning banking system has the ability of stimulating technological innovation in the economy by identifying and funding those entrepreneurs with the best chances of successfully implementing innovative products and production processes. It was from this background that MacKinnon (1973) and Shaw (1973), in their respective papers, pointed out that liberalisation of the financial system is vital for the growth of the economy. Their argument is that government restrictions on the banking system such as interest rate ceiling, high reserve requirements, and directed credit programmes hinder financial development and reduce output growth. This finance-led growth hypothesis has been supported by a voluminous body of empirical evidence such as Levine (1997), and Rajan and Zingales (1998) among others.
However, not all economists are in agreement with the finance-led growth hypothesis. Some have subscribed to the demand-following hypothesis which claims that economic growth leads to the development of the financial system. In line with this view, Robinson (1952) asserted that finance follows where there is enterprise. This was also supported by Kuznets (1955) who argued that financial markets begin to grow as the economy approaches the intermediate stage of the growth process and develop once the economy becomes matured. Thus, the followers of this growth-led finance hypothesis claim that higher economic growth rates have the ability to stimulate demand for certain financial instruments which lead to an expansion of the financial sector as it endeavors to provide those instruments (Levine, 1997; Romer, 1990). Empirically this hypothesis has been supported by Agbetsiafa (2003); Waqabaca (2004); and Odhiambo (2004) among others.

Other economists argue that there is a feedback effect in the finance-growth nexus. In this case, it is believed that financial system’s development leads to economic growth which later feeds into the development of the financial system (Patrick, 1966; Lewis, 1955). The empirical works that suggest this hypothesis include Greenwood and Jovanovich (1990); Wood (1993); Greenwood and Bruce (1997); and Luintel and Khan (1999).

On the other hand, Chandavarkar (1992) has argued that some development economists such as Lucas (1988) do not recognise the importance of financial development in the process of economic growth. They argue that the finance-growth debate is insignificant and have often expressed their skepticism by just ignoring it.

Like the finance-growth nexus, the debate on the actual direction and impact of trade openness on economic growth is inconclusive. Traditionally, it is believed that the openness of an economy to international trade, coupled with increased investment in human and physical capital and the rate of population growth, is one of the key determinants of economic growth (Bergheim, 2005). Countries that successfully participate in international trade open themselves to foreign direct investment (FDI) and
attract foreign workers tend to post higher economic growth than countries that do not attract foreign workers tend to post higher economic growth than countries that do not
Bergheim (2005). The supporters of this proposition explain how increased trade can boost growth by frequently drawing inspiration from the standard neoclassical model of international trade. Smith (1776) and Ricardo (1817) showed that two countries with absolute and comparative cost advantages can benefit from trade if each country specialises in producing the good that it can manufacture at a relatively lower cost. This boosts the total number of manufactured goods that both countries can consume, and higher consumption means higher welfare. However, Bergheim (2005) has contended that a higher level of welfare is not synonymous with higher gross domestic product (GDP). This is because countries are limited to the same production capacities both in autarchy and under free trade. Furthermore, Bergheim (2005) showed that the channel through which trade promotes growth is outside the precincts of the neoclassical model. He argued that trade promotes growth through the transfer of technology and institutional improvements.

Other studies have shown that trade openness can be injurious to economic growth. It is argued that increased participation of an economy in international trade exposes it to increased competition which decreases the expected profits. This in turn discourages innovation by domestic firms (Sarkar, 2008). Moreover, openness may reduce long-run growth if an economy specialises in sectors with dynamic comparative disadvantage or in which technological innovations or learning by doing are exhausted. Thus, if protection encourages investment in research-intensive sectors, this intervention could facilitate economic growth in the long run (Lucas, 1988; Yanikkaya, 2003). For instance, Yanikkaya (2003) showed that trade barriers were positively and, in most specifications, significantly associated with growth especially for developing countries.

Having considered the debate concerning the finance-growth and trade-growth nexuses, it is imperative to consider how financial development and trade openness are linked, as this is critical in understanding the relationship among financial development, trade openness, and economic growth. In the literature, Huang and Temple (2005) noted that finance and trade are linked at least in two ways: the supply side and the demand side.
Rajan and Zingales (2003) supported the supply-side hypothesis by considering how interest groups, especially the vested interests of incumbent industrialists and financial intermediaries worried by the threat of entry, have strong incentives to resist financial development. However, these incentives are weakened as a country becomes more open to foreign competition or international flows of capital. In this view, goods market openness can improve the supply of external finance, because it aligns the interests of the economically powerful groups more closely with financial development.

From the demand-side perspective, Svaleryd and Vlachos (2002) supported this view by using the role of risk diversification. According to them, as the economy opens up to trade, it exposes itself to greater risk through external shocks and/or foreign competition. In this case, it is believed that new demands will be created for external finance. As a result, firms will need financial instruments and institutions that are able to provide appropriate insurance and risk diversification arising from cash flow problems and external shocks.

The interaction between financial development and trade openness described above subsequently allows for more channels to economic growth. On one hand, it is claimed that if finance is related to trade openness in such a way that it encourages trade openness, it may subsequently foster economic growth when the trade-led growth hypothesis holds. Correspondingly, economic growth may also trigger a country's level of trade openness, for example, with shifts in production and demand patterns as well as increased levels of international integration that accompany national industrialisation experiences (Gries et al., 2008). On the other hand, if trade openness is related to finance in such a way that it stimulates financial development, it may promote economic growth where financial deepening is found to enhance growth. Correspondingly, economic growth may in turn propel financial development of a country (Gries et al., 2008). Moreover, it has been argued that both financial development and trade liberalisation policies reduce inefficiency in the production process and positively influence economic growth. This argument is strengthened by the
belief that economic growth rates in countries with liberalised trade and financial services outperform those with restrictive financial and trade policies (Yucel, 2009).

From the foregoing arguments, it can be seen that the interaction among financial development, trade openness, and economic growth is vital. Understanding this interaction is important for policy makers in developing countries like Zambia. This research therefore seeks to investigate the causal relationship among financial development, trade openness, and economic growth in Zambia. Our motivation to investigate this relationship is because despite its emerging importance in literature, no study has been done to understand this relationship in Zambia.

1.2 Overview of the Financial and Trade Policies in Zambia

Zambia was one of the few economies in Africa with a relatively healthy economy at independence in 1964. According to Andersson and Kayizzi-Mugerwa (1999), Zambia had one of the highest rates of economic growth in sub-Saharan Africa (SSA). The average annual GDP growth rate between 1965 and 1974 was 3.9 percent and average GDP per capita was United States of America Dollars 585, or US$ 585. During the same period, the current account surplus stood at 3 percent of GDP (see Table 1.1 below). During the first four years of independence, Zambia pursued free market-oriented policy framework with little public sector participation.
Table 1.1: Selected Macroeconomic indicators

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<tr>
<td>GDP growth (annual %)</td>
<td>3.9</td>
<td>-0.7</td>
<td>0.53</td>
<td>1.6</td>
<td>0.47</td>
<td>5.5</td>
<td>6.5</td>
</tr>
<tr>
<td>GDP per capita (constant 2000 US$)</td>
<td>585</td>
<td>516</td>
<td>443.8</td>
<td>402</td>
<td>340.7</td>
<td>372</td>
<td>443.9</td>
</tr>
<tr>
<td>Inflation, consumer prices (annual %)</td>
<td>6</td>
<td>14</td>
<td>21</td>
<td>76</td>
<td>72</td>
<td>15.7</td>
<td>6.4</td>
</tr>
<tr>
<td>Current account (% GDP)</td>
<td>3</td>
<td>-11</td>
<td>-13</td>
<td>-14</td>
<td>-5.1</td>
<td>-6.9</td>
<td>1.1</td>
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Source: Author’s own calculations from World Bank’s world development indicators (WDI) and Zambia’s central statistical office database.

It is worth noting that the Zambian economy, inherited by the Zambian government, at independence was copper-dependent. Copper accounted for over 90 percent of foreign exchange earnings and 40 percent of gross domestic product (GDP) in 1964. The level of industrial development was very low with manufacturing contributing only 6.3 percent to GDP while employing about 1800 people (Andersson and Kayizzi-Mugerwa, 1999). Therefore, in order to restructure the economy and increase the sources of foreign exchange earnings, the government adopted new economic policies that were aimed at diversifying the economy into agriculture and industrial development beginning in 1968 (Mudenda, 2009). These policies were stipulated in many government policy documents such as the White Paper Outline of the government’s Industrial Policy (1964, 1966); the First National Development Plan (1966-1970); the Mulungushi Declaration (1968); and the Second National Development Plan (1972-1976).

At the core of this economic transformation was the socialist philosophy of humanism which sort to address the political and economic inequalities in the country (Mudenda, 2009). It was believed that the free market orientation was inefficient and would not be able to accelerate economic transformation and industrialisation.
Therefore, the government introduced the state-led import substituting industrialisation strategy as well as extensive government controls over resource allocation. This was done directly through the budget support and indirectly through the trade policy. Brownbridge (1996) notes that foreign owned companies were nationalised and administrative controls were imposed over foreign exchange, imports, prices, and interest rates. Moreover, Andersson and Kayizzi-Mugerwa (1999) note that government nationalisation saw the expansion of the public sector’s share of capital investments from US$ 180.4 million (or 42.3 percent) between 1954 and 1964 to US$ 281.8 million (or 67.7 percent) between 1966 and 1970.

1.2.1 Financial Sector Reforms

Prior to 1968, Zambia’s financial sector was largely based on the market system. The sector was however dominated by foreign-owned financial institutions, serving the credit needs of foreign and expatriate businesses. For example, the banking sector was dominated by Barclays bank which started operating in 1918, Standard Chartered bank which commenced operations in 1906, and ANZ Grindlays bank (now Stanbic Bank) which launched its operations in 1956 (Maimbo and Mavrotas, 2003). Therefore, the government saw it prudent to embark on policy changes in the financial sector. According to Brownbridge (1996), financial policies consisted of three main strands: nationalisation of foreign financial institutions, establishment of government owned banks and development finance institutions, and administrative controls over interest rates and, to a smaller extent, loan allocation. The sole purpose of these policies was to enable the government exercise control over the financial system, and to ensure that credit allocation was more supportive of the government’s overall economic strategy.

The implementation of the financial policies saw all non-bank financial institutions (NBFIs) nationalised and merged to form state-owned financial institutions. The three private building societies were merged to form the Zambia National Building Society
(ZNBS) and all insurance companies were merged to form the Zambia State Insurance Corporation (ZSIC). However, except for one, none of the commercial banks was nationalised. This is because the owners of the foreign banks threatened to withdraw their expatriate management and the Zambian government was not confident that it could manage the banks without them. Other state-owned banks and NBFIs were set up to serve various purposes in the economy; for example, in 1987 the Zambia Export and Import Bank (ZEIB) was established to supply trade finance (Harvey, 1993). In addition, development finance institutions were also set up to provide concessional and/or long term finance to priority sectors with funds mobilised from the government or external sources. To further advance the agenda of financial repression, the government restricted the entry of non-bank financial institutions into the industry (Financial Sector Development Plan, 2004). The Financial Development Corporation (FINDECO) was also formed to look after the interests of the state in financial institutions the government acquired. This set the stage for government’s control of the financial sector.

Furthermore, interest rates, beginning mid-1960s, were set administratively by the Bank of Zambia (BOZ). In this vein, the Bank of Zambia maintained a policy of low interest rates in order to minimize borrowing costs. For example, until 1984 commercial bank deposit rates were held within a range of 3.5 percent and 8.5 percent and lending rates between 7 percent and 13 percent (Musokotwane, 1997). In addition, a preferential rate was stipulated for agricultural lending from 1978. Nominal rates were generally held below the rate of inflation, which averaged 10 percent during the 1970s and 20 per cent during 1980-84 (Brownbridge, 1996).

However, from the mid-1980s both inflation and nominal interest rates rose sharply. In fact, the inflation rate rose higher than nominal interest rates making real interest rates to be negative. The government temporarily adopted the International Monetary Fund’s (IMF) stabilisation programmes between 1985 and 1987 which saw the decontrol of

1 Nederland commercial bank
interest rates and introduction of a Treasury bill auction system. As a result, lending rates rose sharply thereafter, reaching about 30 percent in 1986 (Brownbridge, 1996). However, this was also accompanied by high inflation rates making real interest rates to remain negative. Interest rate controls were re-imposed in 1987 following the breakdown of an IMF’s adjustment programmes, and held below 20 per cent for the remainder of the decade. The government adopted a new IMF’s adjustment programme in 1989 under which interest rates were again raised, although they remained far below prevailing inflation rates which by this time had reached levels in excess of 100 per cent per annum. During the 1990s interest rates were again raised and then liberalised (Mulaisho, 1994).

The government did not directly set administrative controls on the commercial banks’ allocation of credit to priority sector. Instead, the foreign exchange rate controls provided a powerful way of allocating credit in the economy. Given the constraints of foreign exchange availability, firms who had excess foreign exchange were deemed creditworthy compared to those who did not have (Brownbridge, 1996).

The Zambian private sector first entered the banking industry in 1984 with the formation of Meridien Bank. The first local banks in Zambia were established during a period when financial policies were not particularly conducive to private sector investment in banking. This was because interest rates were tightly controlled, which together with high reserve requirements, depressed profit margins, and bank licenses were very difficult to obtain (Brownbridge, 1996).

Economic performance during the financial repression period was very poor: annual GDP growth rate reduced from 3.9 percent between 1965 and 1974 to -0.7 percent between 1975 and 1980. The current account went from a surplus between 1965 and 1974 to a deficit of 11 percent of GDP between 1975 and 1980 (Table 1.1). The financial infrastructure including regulatory and supervisory, payments and settlement, credit information bureau, asset and collateral registry, and credit contract and
bankruptcy legal systems were either non-existent or remained underdeveloped (Mwenda and Mutoti, 2011).

Consequently, the condition of many state-owned financial institutions was unsound by many standards resulting from: high intermediation costs due to overstaffing, large number of loss-incurring branches, poor governance with low quality banking services, accumulation of non-performing loans and inadequate market capitalisation. In addition to the poor performance in terms of capital adequacy and solvency, profitability, asset quality and liquidity of virtually all state-owned financial intermediaries deteriorated (Mwenda and Mutoti, 2011). In order to remove these distortions and spur economic growth, the Movement for Multi-Party Democracy (MMD) government embarked on a wide range of reforms in the early 1990s to strengthen the financial system and provide an adequate macroeconomic environment.

In its quest to liberalise the financial sector, the government undertook many measures which include: removal of interest rate controls and credit supply ceilings; and the adoption of the Treasury bill auction system to facilitate liquidity control and financing of government needs without resorting to monetisation of the fiscal deficit (Bwalya, 2001). By 1994, the government had removed virtually all exchange controls, eliminated multiple exchange rates, and shifted to market determined exchange rates. In addition, the government undertook a number of financial infrastructure and institutional reforms including the formulation of the Banking and Financial Services Act (BFSA) of 1994. Further reforms included the adoption of indirect and market based instruments of monetary policy (Mwenda and Mutoti, 2011).

After the liberalisation of the financial sector, a number of successes have been underscored. The number of commercial banks and non-bank financial institutions has increased and two more regulatory bodies have been established in addition to the Bank of Zambia. The two regulatory bodies are the Securities and Exchange Commision (SEC) and the Pensions and Insurance Authority (PIA).
The Bank of Zambia (BOZ) was established in 1964 as the central bank of Zambia. It is charged with the responsibility of formulating and executing monetary and supervisory policies, with the ultimate objective of achieving price and financial systems stability. Apart from serving as a banker, fiscal agent and adviser to the Government, the BOZ is also a banker for all commercial banks. The BOZ currently derives its mandate from the BOZ Act of 1996 and the Banking and Financial Services Act, 1994 as amended. As at 31st December 2011, the Bank of Zambia was regulating and supervising 19 commercial banks, 9 leasing companies, 1 development finance institution, 3 building societies, 32 microfinance institutions, 1 savings and credit institution, 55 bureaux de change and 1 credit reference bureau (BOZ annual report, 2011).

The PIA was established in 1997 with the mandate of enforcing two pieces of legislation, namely, the Pension Scheme Regulation Act No. 28 of 1996 and the Insurance Act no 27 of 1998 (formerly Chapter 392 of the laws of Zambia). The authority regulates and supervises the pensions and the insurance sectors. As at 31st December 2011, the authority was regulating and supervising 228 pension schemes, 2 re-insurers, 11 general insurers, 6 long-term insurers, 1 re-insurance broker, 41 insurance brokers, 275 insurance agents, 10 insurance claim agents, 2 loan adjusters, 3 insurance risk surveyors, 7 motor assessors (PIA annual report, 2011).

The SEC was established in 1993 and is responsible for the supervision and the development of the capital market as well as the licensing, registration, and authorisation of financial intermediaries, issuers of debt and equity instruments, and collective investment schemes respectively. The aim of the Commission is to promote and maintain a strong and facilitative regulatory framework that ensures the orderly development of an innovative and competitive capital market for the secure, fair, efficient and transparent issuance and trading of securities (Banda, 2011).

To measure how the financial depth has evolved over time, before and after the financial liberalisation of the early 1990s, we take two financial development indicators
namely: domestic credit to private sector (dcps) and broad money (broadm), each as percentage of GDP. The trends in these indicators are given in figure 1.1 below.

![Figure 1.1: Financial Depth indicators between 1970 and 2010](source: World Bank’s world development indicators, 2011)

Figure 1.1 above shows that the broadm rose from 24.6 percent in 1970 to 33 percent in 1983. This was because the negative real interest rates obtaining in this period was not sufficient enough to deter the holding monetary assets. In addition, foreign exchange controls prevented the major institutional actors in the economy (most of which were the parastatals) from holding foreign currency as a substitute for domestic financial assets (Adam, 1995). The period between 1984 and 1994 saw broadm declined from 32 percent to 12.1 percent respectively. This could have been due significant negative real interest rate, resulting from high inflation rates averaging about 102 percent, deterring the holding of monetary assets. From 1995, broadm has been rising steadily as shown in the figure, indicating that the financial system is deepening.

Moreover, figure 1.1 shows that dcps followed the same pattern as broadm. It can be seen that between 1970 and 1982, the private credit as a percentage of GDP was

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2 See Figure 1.3
steadily rising. However, from 1983 to 1993, dcps followed a downward trend. From 1994 to date, dcps has shown some slight improvement in its movements. This slight improvement in the allocation of credit to the private sector is synonymous to the deepening of the financial sector.

Analysing the movements of the financial depth indicators reveals that the degree of financial depth still remains way below the historical high levels reached during the period before the reforms, that is, 1970 to 1991. In line with this, the Financial Sector Assessment Programme (FSAP) report of 2003 reveals that financial depth in Zambia is still very shallow and that private credit to GDP ratio is one of the lowest in sub-Saharan Africa (SSA). This has been accentuated by the low access to financial services by micro small and medium entrepreneurs (MSMEs) (Mwenda and Mutoti, 2011).

Following these weaknesses in the financial system, the Government of Zambia launched the Financial Sector Development Plan (FSDP) in 2004 which is a comprehensive strategy to build and strengthen the financial sector infrastructure. It aims at building a stable, market-based financial system that will support efficient resource mobilisation necessary for economic diversification and sustainable growth. The FSDP is being implemented in two distinct phases with each phase running for five years. The first phase focused on improving market knowledge of the financial sector, improving the institutional and regulatory framework, and defining priorities for interventions in the second-phase (Fin-Mark Trust, 2006).

After the implementation of phase one of the FSDP, there still remain challenges in the financial sector. Fin-Mark Trust (2006) report reveals that the levels of access to financial services in Zambia are the lowest in SSA. Additionally, whereas access comes mainly from the banking sector in these countries, in Zambia access comes from banks, formal non-bank financial institutions (NBFIs) and informal financial institutions combined.
1.2.2 Trade Liberalisation

Zambia’s trade policy has largely followed the political and the economic environment. Between 1964 and 1975 when the government pursued free market-oriented policies, trade policy was liberal. Copper was virtually the only source of foreign exchange, and accounted for nearly half of government’s revenue. Agriculture was also identified as potential source of foreign exchange earnings but was neglected (GRZ, 1984).

In 1973, the Oil Producing and Exporting Countries (OPEC) announced a 400 percent oil price increase. This event as noted by Seshamani (1992) had adverse effects on Zambia’s foreign reserves which dwindled as she tried to cover her oil import bills. To make matters worse, the oil crisis did not spare the countries which imported Zambia’s copper and as a result, the demand for copper declined leading to the fall in the copper prices in 1975. This commodity price crisis worsened Zambia’s balance of payment position which went into a deficit. Furthermore, the terms of trade fell to 54 percent relative to 1974 and government revenues dropped to less than one – fifth of the previous level, and its budget went into deficit, equivalent to 24 percent of GDP relative to the 1974 budget surplus (GRZ, 1984). These undertakings in the economy revealed the weaknesses in the internal structure of the economy including, among other things, the failure of the policies to bring about fruitful diversification through agriculture to cushion the effects of the collapse of copper prices and institution failures coupled with economic mismanagement (Bwalya, 2001; Lungu, 1998).

In response to the situation, government in 1975 adopted direct quantitative controls on trade, to restrict the importation of certain goods especially those goods competing with local manufacturing industries, as an instrument of determining macroeconomic balances. This took the form of the tariff structure meant to facilitate the building of a domestic import-substitution manufacturing sector (Musonda and Adams, 1999). The country had high tariffs that varied between 0 percent for intermediate goods and 150 percent for final goods. Essential consumer goods and some capital and heavy
intermediate inputs had lower tariffs while consumer durables had higher nominal 
tariffs of between 50 percent and 100 percent (Mudenda, 2009).

In addition to the tariff structure, the government adopted quantitative restrictions as a 
means of maintaining external balance by influencing the level of imports. Import bans 
were introduced on commodities while foreign exchange was administratively allocated 
to firms as a way of controlling and protecting the domestic industry (Mudenda, 2009). 
The allocation of foreign exchange was done on a firm-by-firm and product-by-product 
basis by the Ministry of Commerce and Industry while the Bank of Zambia’s Foreign 
Exchange Allocating Committee had the power to determine the firms which got it. 
Furthermore, exporters were required to obtain export licenses to be able to export. This 
was done through the export licensing unit at the Ministry of Community and Industry.

The effectiveness of the trade policy in Zambia, between post-independence and pre-
1990, reforms was hampered by a number of factors. Firstly, the licensing of exporters 
through cumbersome procedures meant increased cost of doing business. Secondly, 
Zambia’s access to both regional and overseas markets was disrupted by the war in the 
neighbouring country, Rhodesia (Zimbabwe), which had its borders with Zambia 
closed. In addition, the economic sanctions against apartheid South Africa implied 
reduced trade between Zambia and South Africa. This implied reduced usage of the 
Durban port which was a cost effective route to the major trading partners in 
Europe. The cost and reliability of transportation due to route reorientation to Tanzania 
impacted negatively on Zambia’s overseas exports (Mudenda, 2009). Furthermore, the 
lack of foreign exchange by many firms meant that they were unable to purchase inputs 
and capital equipment and spares. This restricted their production capacity 
(Seshamani, 1988). The lack of access to export credit insurance and the focus on 
import-substitution industries forced firms to focus on satisfying the domestic market 
before exporting. Furthermore, the manufacturing sector depended on imported 
machinery and raw materials, thus aggravating the balance of payment position of the 
country.
Due to the happenings in the economy, the UNIP government adopted the structural adjustment reforms to liberalise its trade in the early 1980s. The main focus of these reforms was the auction of the foreign exchange. In addition, Import licenses were made freely available while protection was now to be provided only through tariffs. Moreover, most quantitative restrictions on imports were removed (Mudenda and Ndulo, 2004). However, the reforms did not yield expected results in resuscitating the economy but brought about adjustment costs which became unbearable resulting into social protests and unrest (Bwalya, 2001). For this reason, the government abandoned the International Monetary Fund (IMF) and World Bank (WB) reform packages to pursue the “growth from own resources” programme, between 1987 and 1989 (Seshamani, 1992). However, faced with a decline in copper production, mounting debt, and broad based freeze on multilateral and bilateral aid, government had to go back to the IMF/WB programmes (Seshamani, 1992). Notwithstanding, the implementation of IMF/WB reform policies brought about devastating effects on the economy with food inflation rates rising to alarming levels (Bwalya, 2001).

In the early 1990s, the MMD government with support from many stakeholders hastily adopted the IMF/WB economic reforms enshrined in the Structural Adjustment Programmes (SAPs). The reforms included: removing exchange controls, reducing import duties, eliminating import and export license requirements, abolishing export bans and introducing a number of export incentives, removing subsidies, and decontrolling prices (Mudenda, 2009).

Figure 1.2 below shows the trends of the degree of openness of Zambia’s economy from 1964 to 2010. As shown in the figure, Zambia’s degree of openness was highest in 1964 and 1967 when the sum of exports and imports as a percentage of GDP was 100 percent. However, there was a slight decline to about 93.7 percent in 1968. This fall continued and as such in 1971 it was 82 percent. In 1973 to 1975 there were some signs of improvements as the degree of openness increased from 83 percent to 95.8 percent respectively. From 1976 to 1991, the degree of trade openness had exhibited a
downward trend with only slight improvements in 1980 and 1986 as shown in the figure.

![Figure 1.2: Degree of openness given by (Exports+Imports) % of GDP 1964 to 2010](image)

Source: World Bank’s world development indicators (2011)

After the implementation of trade liberalisation policies in 1992, the degree of openness reduced from 84.4 to 62.5 percent in 1998 (see Figure 1.2 above). The stabilisation measures undertaken caused the exchange rates to appreciate which caused problems for Zambia’s exporters, including the copper industry. Moreover, the substantial decline in metal prices in the 1990s continued to affect the trade sector of the economy. However, from 1998, the economy’s openness to trade has been rising steadily hitting 81 percent and 79 percent in 2004 and 2010 respectively (see Figure 1.2 above). These improvements can be attributed to the increase in the demand for copper and subsequent increase in its prices. Other factors include: macroeconomic stability resulting from low Inflation and interest rates, and stable exchange rates. In addition, the country has been able to boost non-traditional exports such as the tourism and agricultural sectors though much needs to done to have these sectors contribute significantly to the country’s foreign exchange earnings (Balat, 2008).
1.3 Statement of the Problem

Mackinnon (1973) and Shaw (1973) showed that the development of financial intermediaries cause economic growth and not vice versa. They support financial sector liberalisation as opposed to financial repression. They argue that government restrictions on the banking system slow down the process of financial development and consequently reduce economic growth. Thus, financial development is expected to positively impact on economic growth through the roles it plays in the economy. According to Merton and Bodie (1995), the primary role of the financial system is to facilitate the allocation of resources, across space and time, in an uncertain environment. To be able to perform this role and promote economic growth, the financial sector should execute the following functions: (1) facilitate the trading, hedging, diversifying, and pooling of risk (2) allocate resources (3) monitor managers and exert corporate control (4) mobilize savings, and (5) facilitate the exchange of goods and services (Levine, 1997). Chimobi (2010) has identified two distinct but yet complementary channels through which financial development promotes economic growth: the accumulative channel and the allocative channel. The accumulation channel emphasises the finance-induced positive effects of physical and human capital accumulation on economic growth. The allocation channel focuses on the rising efficiency of resource allocation which is caused by financial deepening and subsequently enhances growth.

Similarly, the proponents of the trade-led growth hypothesis argue that economies that open to international trade are able to achieve more growth than those that are closed (Bergheim, 2005). Thus, they support trade liberalisation policies. It is believed that increased trade enhances export earnings, promotes industrialisation, and encourages diversification of the economy (Mudenda and Ndulo, 2004). This view has been supported by the endogenous growth theory which is typically based on models of endogenous technological change. The theory shows that trade openness provides access to imported inputs embodying new technology, raises the returns on innovations of domestic producers by increasing the effective size of the market they face, and
facilitates a country’s specialisation in research-intensive production. Thus, a more open economy faces more competition from its trading partners which stimulates productivity, and this kindles economic growth (Romer, 1989).

It was because of the above discussed benefits of financial and trade liberalisation that the IMF and World Bank advocated for financial and trade reforms in the early 1980s. In this regard, many developing countries implemented both financial and trade sector based reforms with the view to achieving sustainable economic growth. Zambia under the political leadership of the UNIP government adopted these reforms in the early 1980s after the oil and commodity price crises of the mid-1970s. Contrary to the expected results, the country experienced reduced output, high inflation rates and increased poverty levels, leading to food riots in the country (Bwalya, 2001; Mudenda, 2009). It is reported that the GDP growth rate fell from 6.2 percent in 1981 to -2 percent in 1983. In addition, the average annual price index increased from 37 percent in 1984 to 52 percent and 82 percent in 1985 and 1986 respectively (see Figure 1.3 below). As a result, the World Bank re-classified Zambia from middle – income country to a low – income country (Nafziger, 1993). With these happenings in the economy, the UNIP government abandoned the reforms in 1987 to pursue their “growth from own resources” programme. However, faced with a decline in copper production, mounting debt, and broad based freeze on multilateral and bilateral aid, government re-adopted the IMF/WB structural adjustment reforms. Again, contrary to the expected results, the economy suffered another economic turmoil; the inflation rate rose to about 123 percent in 1989 and in 1990 it was 106 percent. The GDP growth rates were saddening; in 1989 it grew at -1 percent and -0.5 percent in 1990 (Bwalya, 2001).

The MMD government re-implemented the economic liberalisation policies in the early 1990s. However, after liberalising the financial and trade sectors, Zambia’s economic performance has not been satisfactory. The real GDP growth rates were negative for most part of the period 1990 to 1999. And though Zambia has enjoyed positive growth rates in real GDP from 1999 to date (see Figure 1.3 below), the results are not satisfactory as they are not the results projected by the economic liberalisation theorists.
These growth rates are far below the required 10 per cent to enable Zambia meet the Millennium Development Goal (MDG) of halving extreme poverty levels by 2015 (Musonda, 2007). It is therefore important that we investigate the causal interactions among financial development, trade openness, and economic growth to be able to understand why Zambia’s economic growth has been unsatisfactory.

![Figure 1.3: Inflation and GDP growth (annual %) 1970 to 2010](image)


1.4 Research Objectives

1.4.1 General Objective

The aim of this study is to investigate the causal relationship among financial development, trade openness and economic growth in Zambia between 1965 and 2011.

1.4.2 Specific Objectives

- To determine whether trade openness and financial development have casual effects on economic growth in Zambia.
- To establish whether trade openness and economic growth have causal effects on financial development in Zambia.
• To investigate whether economic growth and financial development have causal effects on trade openness in Zambia.
• To assess whether the choice of a financial development indicator has an effect on the relationship among financial development, trade openness and economic growth.

1.5 Research Questions

1.5.1 Primary Research Question

What is the relationship among financial development, trade openness, and economic growth in Zambia for the period 1965 to 2011?

1.5.2 Secondary Research Questions

• Is there a short run or long run relationship among financial development, trade openness and economic growth?
• Is there causality among financial development, trade openness and economic growth?
• What is the direction of causality among the three variables?
• Does the choice of the measure of financial development affect the relationship among the three variables?

1.6 Statement of Hypotheses

➢ Trade openness and financial development have causal effects on economic growth.
➢ Trade openness and economic growth have causal effects on financial development.
➢ Economic growth and financial development have causal effects on trade openness.
1.7 Rationale of Study

Based on the above arguments, many researchers have focused on ascertaining the existence and actual direction of the nexus between financial development and economic growth, and between trade openness and economic growth. In Zambia, studies have been done which have provided the proof of the existence of the link between finance and growth, and between trade and growth but they have divergent views on the actual direction of this relationship (Agbetsiafa, 2003; Banda, 2007; Odhiambo, 2008; Akinlo and Egbetunde, 2010; Longa, 2011).

However, considering just how financial development and trade openness impacts on economic growth individually is synonymous to focusing on two extremes because possible linkages between financial institutions and a country’s openness to trade exist and this further open up channels through which financial systems and real sectors may interact (Gries et. al., 2008). Several studies have been done to understand this “new phenomenon,” for example, Bojanic (2012) found a long-run equilibrium relationship, and unidirectional Granger causality running from financial development and trade openness to economic growth in Bolivia. Other studies on this relationship include: Matos (2003), Hassan and Islam (2005), Gries et. al (2008) and Yucel (2009) among others. However, no study to the best of our knowledge has been done to investigate this ‘new phenomenon’ in Zambia. Therefore, this study has been motivated and seeks to add to this body of knowledge by empirically investigating the causal relationship among financial development, trade openness, and economic growth in Zambia. This is important for policy makers in that they will know whether there is need to continue with policies that promote financial development and trade openness or to pursue other policies that lead sustainable economic growth.

1.8 Organisation of Study

The reminder of this study is organized as follows: Chapter two reviews the theoretical and empirical literature, Chapter three outlines the methodology and estimation
techniques, Chapter four presents an analysis, presentation, and discussion of results while Chapter five presents the conclusion, recommendations for policy makers and limitations of the study.
CHAPTER TWO

2 LITERATURE REVIEW

2.1 Review of Theories

The importance of economic growth in the development process of a country cannot be overemphasised. In this regard, there is a growing body of literature that seeks to explain the determinants of economic growth. In the recent past researchers have noted that financial development and trade openness are also important factors of economic growth. For this reason, in this section we review theories that seek to explain the relationship among financial development, trade openness and economic growth. We start with financial development theories, particularly McKinnon – Shaw theory, which seeks to explain the relationship between financial development and economic growth. We then consider international trade theories that seek to explain the relationship between trade openness and economic growth. Lastly, we present growth theories which help us understand how financial development and trade openness relate with growth.

2.1.1 Financial Development Theories

2.1.1.1 McKinnon – Shaw Theory

McKinnon (1973) and Shaw (1973) contended that repressive practices like interest rate ceilings, directed credit, high reserve requirements, and discriminatory taxation of the financial sector would adversely affect efficiency and growth of the economy. In this case, their view was that financial liberalisation would lead to higher welfare. In McKinnon’s analysis this effect occurred through the complementarity between money balances and physical capital. In his model self-finance is the only means to invest in physical capital. Given the lumpy nature of physical capital, entrepreneurs would accumulate money balances to acquire physical capital. An increase in the real bank deposit rate of interest would enhance the inducement for this accumulation, and thus
promote acquisition of physical capital and promote growth. In Shaw’s analysis this outcome is caused by the debt intermediation effect. Higher real interest rates would lead to higher savings rates and higher inflow of savings into the organized intermediation. This would enhance growth through a higher level of investment and greater efficiency of the investment channeled through the intermediary due to cost reductions afforded by economies of scale, risk reduction, information gathering and matching varying liquidity and denomination preferences (Mwenda and Mutoti, 2011).

The basic argument made by McKinnon – Shaw is illustrated below.

**Figure 2.1: MacKinnon-Shaw Model**

![Real Interest Rate](image)

Figure 2.1 above shows that a real deposit interest rate ceiling at \( r' \), below the market clearing rate \( r^* \), imposed through a fixed nominal rate and steady inflation, would reduce savings and investment from \( I^* \) to \( I' \) which is disintermediation. If the loan interest rate is allowed to be above the market clearing rate, at \( r'' \), there would be a deadweight welfare loss captured by the triangle ABC. Furthermore, the high interest on
loans would lead to an adverse selection problem by attracting a disproportionately large number of projects high expected return but risky.

On the other hand, if the loan rate of interest is also restricted to \( r' \), there would be an excess demand for loanable funds (CE), which would lead to rationing by, in all likelihood, arbitrary and inefficient means. Market signals conveyed by the interest rate about the true scarcity of capital in the economy would thus be suppressed. Some of the low return projects represented by the line DE which did not come forth at the higher market clearing rates, would now be sanctioned. Banks would not be inclined to finance risky but potentially high return projects since they would be unable to charge higher interest rates for riskier loans. The deadweight losses would even be higher than ABC. In this scenario, financial liberalisation marked by an increase in the real interest rate to \( r^* \), immediately raises savings and investment, and eliminates the allocative inefficiency caused by repression. Subsequently, the economy grows faster and savings function shifts to the right over time from S to S’, eventually leading to a lower real interest rate and higher investments.

2.1.2 International Trade Theories

2.1.2.1 Theory of Protectionism

The theory of protectionism has its roots in Mercantilism of the 17th and 18th centuries. It argues that the only way for a nation to become richer was to restrict imports and stimulate exports (Salvatore, 1983). Thus according to this school of thought, a nation would benefit from trade if and only if it was able to import cheap raw materials and export final goods that receive a much higher price so that a country can have a trade surplus (Bjornskov, 2006). The resulting trade surplus would be settled by an inflow of gold and silver into a country which in turn would make the recipient nation richer and more powerful. Therefore, the government had to stimulate the nation’s exports and discourage and restrict imports (particularly the import of luxury consumption goods). However, since all nations could not simultaneously have a trade surplus, and the
amount of gold and silver was fixed at any particular point in time, one nation could only gain at the expense of other nations. Therefore, the mercantilists argued that the state should exercise much control over all economic life, chiefly through corporations and trading companies (Salvatore, 1983).

Hamilton (1791) argued against free trade based on the self-sufficient industry whose evolution from the ground of infant industry should be ensured by the system of grants and subsidies. In his view, governments ensure temporary protection of a domestic industry from foreign competition, and these industries may increase the volume of production and consequently produce as cheap as foreign competition due to it. List (1841) advocated for the excitation of trade protectionism on grounds of the different level of maturity of international exchange participants. This different level influences their mutual trade, especially in the country’s transformation process between levels of maturity. If an industry is situated on the infant industry level, it cannot be exposed to foreign competition because its production would be driven out by more advanced foreign producers and consequently the evolution of the industry to the superior level of maturity would be made impossible. According to List, it is necessary to first build a large market, in which the industry will achieve economies of scale and become more competitive. Thereafter, the domestic market can be open to foreign competition.

2.1.2.2 Classical Theory of International Trade

2.1.2.2.1 Absolute Advantage Hypothesis

As noted above, the Mercantilists believed that a nation can only gain from trade at the expense of another nation. However, Smith (1818) refuted this claim and advocated for free trade. He argued that trade between two nations is based on absolute advantage. According to him, when one nation is more efficient than (or has an absolute advantage over) another in the production of one commodity but is less efficient than (or has an absolute disadvantage with respect to) the other nation in producing a second commodity, then both nations can gain by each specializing in the production of the
commodity of its absolute advantage and exchanging part of its output with the other nation for the commodity of its absolute disadvantage. By this process, the resources of both nations are utilized most efficiently and the output of both commodities will rise. The increase in the output of both commodities measures the gains from specialization in production available to be divided or shared between the two nations through trade (Salvatore, 1983).

Absolute advantage theory, however, can only explain a very small part of world trade today, such as some of the trade between developed and developing countries. Most of world trade, especially trade among developed countries, cannot be explained by absolute advantage (Salvatore, 1983).

2.1.2.2 Comparative Advantage Hypothesis

The failure of absolute advantage hypothesis to explain trade among the developed countries led to the development of another theory of trade, the law of comparative advantage. Ricardo (1817) argued that even if one nation is less efficient than (has an absolute disadvantage with respect to) the other nation in the production of both traded goods, there is still a basis for mutually beneficial trade. The first nation should specialise in the production of and export the commodity in which its absolute disadvantage is smaller (this is the commodity of its comparative advantage) and import the commodity in which it’s absolute disadvantage is greater (this is the commodity of its comparative disadvantage) (Salvatore, 1983). In addition, Irwin (2009) argued that even if a developing country lacks an absolute advantage in any field, it will always have a comparative advantage in the production of some goods, and will trade profitably with advanced economies.

Ricardo based his law of comparative advantage on a number of simplifying assumptions: two nations and two commodities, free trade, perfect mobility of labor within each nation but immobility between the two nations, constant costs of production, no transportation costs, no technical change, and the labor theory of value.
Salvatore (1983) argues that all assumptions can be easily relaxed except the labor theory of value which states that the value or price of a commodity depends exclusively on the amount of labor time spent on the production of the commodity. This implies that either labor is the only factor of production or is used in the same fixed proportion in the production of all commodities and is homogeneous. Since neither of these assumptions is true, the labor theory of value must be rejected. This is because there is usually some possibility of substitution between labor, capital and other factors in the production of most commodities. Additionally, labor is not homogeneous but varies greatly in training, productivity and wages. As such, the law of comparative advantage cannot be explained by the labor theory of value. Therefore, Salvatore (1983) suggests that the law of comparative advantage would be better explained by the opportunity cost theory which is more acceptable.

Salvatore (1983) explains the law of comparative advantage by using the opportunity cost theory. According to this theory, the cost of the commodity is the amount of the second commodity that must be given up to release just enough resources to produce an additional unit of the first commodity. No assumption is made about labor being the only factor of production or homogeneous nor is it assumed that the cost or price of the commodity depends on or can be inferred exclusively from its labor content. Consequently, the nation with the lower opportunity cost in the production of a commodity has a comparative advantage in that commodity.

According to classical economists, comparative advantage was based on the difference in the productivity of labor which is the only one factor of production considered among trading nations, but they provided no explanation for such difference in productivity. The factor intensity and factor abundance introduced by Heckscher (1919) and Ohlin (1933) goes beyond that by extending and attempting to examine the basis for comparative advantage and the effect that trade has on factor earnings in the two nations (Salvatore, 1983).
Heckscher (1919) and Ohlin (1933) based the comparative advantage theory on number of assumptions: two nations, two commodities (X and Y) and two factors; both nations use the same technology; X is labor intensive and Y is capital intensive in both countries; constant returns to scale and incomplete specialization in both commodities in two nations; equal taste and perfect competition; perfect mobility of factors within each country but no international factor mobility; no transportation costs; and free flow of trade. With the stated assumptions, Heckscher-Ohlin showed that a nation will export the commodity whose production requires the intensive use of the nation’s relatively abundant and cheap factor and import the commodity whose production requires the intensive use of the nation’s relatively scarce and expensive factor. Hence, the relatively labor-rich country exports the relatively labor-intensive commodity and imports the relatively capital-intensive commodity (Salvatore, 1983).

The factor abundance and factor intensity proposed by Heckscher-Ohlin explains comparative advantage. The difference in relative factor abundance and prices is the cause of the pre-trade difference in relative prices between two countries. The difference in relative factor and commodity prices is translated into a difference in absolute factor and commodity prices between the two nations. It is the difference in absolute commodity prices between the two nations that is the immediate cause of trade (Salvatore, 1983).

The basic conclusion of the classical theories of trade is that there are clear efficiency benefits from trade that results in more products, and not only more of the same products, but greater product variety. An even greater benefit may be more efficient investment spending that results from firms having access to a wider variety and quality of intermediate and capital inputs. By enhancing overall investment and facilitating innovation, trade can bring about sustained higher growth (McDonald, 2009).
2.1.3 Growth Theories

2.1.3.1 Neoclassical Growth Model (Solow Growth Model)

Classical growth theories such as the Harrod - Domar model, developed by Harrod (1939) and Domar (1946), suggested that in order to achieve sustained economic growth, countries must save and invest a certain proportion of their GDP. The more they can save and invest, the faster they can grow. However, the Harrod – Domar model did not explicitly show how other sources of growth such as labor force growth and technological progress determine growth. For this reason, Solow (1956) developed a growth model, known as the traditional neoclassical growth model, that sought to understand how the savings rate, labor force growth, and technological progress affect growth and the reasons why countries in different geographical areas grew at different rates. In his quest to understand the growth process he assumed diminishing returns to capital and constant returns to scale in the production process.

The main conclusion of Solow’s growth theory is that permanent increases in saving rates have no permanent effect on income growth rates. An increase in the savings rate only leads to capital accumulation by raising capital stock to levels that are more than what is needed to equip new workers with the same amount of capital as existing workers have. The increased capital per worker also increases output per worker. However, this increase in the output growth rate is temporary due to diminishing returns to capital assumed by Solow. To post sustained growth rates, Mayer (1996) points out that an economy needs to have population growth rates that offset the decreasing returns to the accumulation of capital, or if the marginal productivity of capital is constantly shifted upwards by technical progress. Therefore, a key determinant of long run growth rate is technical progress which Solow assumed to be exogenous.

In the context of our study, the Solow growth model is not sufficient in explaining how financial development and trade openness relate with economic growth. This is because the theory does not explain the determinants of technical progress which is one of the major factors in the growth process. According to Todaro and Smith (2012), technical
progress is responsible for roughly 50 percent of historical growth in the industrialised nations. Therefore, in the next section, we consider the endogenous growth model that seeks to explain determinants of technical progress.

2.1.3.2 Endogenous Growth Model

Contrary to the neoclassical growth model where the steady – state growth rate is exogenous, the endogenous growth theory assumes it is endogenous and thus seeks to find the channels through which it can be influenced. It suggests that there are basically two channels through which the steady – state growth rate can be made endogenous (that is, can be determined by factors within the domestic economies); first, the technological progress in the economy can be changed by changing the share of the economy’s resources dedicated to research and development (R&D). Second, if the constant returns apply to the factors of the production that can be accumulated, that is, physical and human capital, then the steady – state growth rate will be affected by the rate at which those factors are accumulated (Dornbusch and Fisher, 2005).

New growth models differ as to what mechanism is employed to make the impact of technical progress on growth endogenous. For example, Romer (1986) in his model emphasises that the stock of knowledge of a firm increases in proportion to the firm's expenditure on R&D while spillovers from these private investments increase public knowledge. Romer made technological change endogenous by arguing that long-term growth is driven primarily by the creation of new knowledge by forward-looking and profit-maximising private agents. Contrary to Arrow (1962) who reasons that technological progress is a function of physical capital accumulation Lucas (1988) argues that the level of technology in the economy can be increased through investment in human capital rather than physical capital. The model focuses on general skills and in particular those which cannot be separated from the worker who has acquired them. Knowledge grows with the time spent on education and the efficiency with which this time is translated into human capital. This efficiency is associated with different factors
depending on whether education is understood as schooling or as learning-by doing Mayer (1996).

Endogenous growth models provide a more rigorous and convincing conceptual framework for analysing how international trade and financial sector development promote economic growth. According to Grossman and Helpman (1991), analysing the ways in which trade openness and financial development affect investment in innovative activities gives important insights on economic growth. The efficiency of technological knowledge, for example, can be seen as an increasing function of openness due to knowledge spillovers from foreign countries. Moreover, demand expansion through trade liberalisation encourages the development of innovations and thus the R&D activity (Romer, 1990). Finally, as far as R&D is a risky activity it becomes possible to evaluate the effects on the investment in new and highly risky projects in the presence of efficient and possibly fully integrated financial markets. Effective financial institutions allow improvements in the process of collecting information on the efficiency of investment projects and/or entrepreneurs’ ability (Greenwood and Jovanovich, 1990). In addition, financial institutions permit, through financial integration, a more adequate diversification of risk, promoting investment into high yield and highly risky activities (Feeney, 1994). In their paper, Rivera-Batiz and Romer (1991) concluded that both trade and financial liberalisation along with investment in human as well as physical capital augment GDP growth.

2.2 Review of Empirical Studies

With the unresolved questions surrounding the existence and direction of the relationship between financial development and economic growth, and between trade openness and economic growth, in recent years researchers have shifted their attention to ascertaining the causal relationship among financial development, trade openness, and economic growth. In this regard, a number of studies have been done to better understand this “new phenomenon” in economics. However, as in the case of other economic phenomena, a large pool of studies that have been undertaken so far have
given different conclusions on the existence and direction of this relationship. This section will therefore review cross country and country specific studies that have been done on the subject.

Bordo and Rousseau (2011) studied the linkages between financial development, international trade, and long-run growth using time series data since 1880 for seventeen now-developed “Atlantic” economies and a set of cross-country and dynamic panel data models. They found that finance and trade reinforced each other before 1930, but that these effects did not persist after the Second World War. Moreover, they found that financial development had positive effects on growth throughout the sample period, while trade affected growth strongly and independently after 1945. They attributed the rising importance of trade in explaining growth to major, post-World War II, changes in tariffs and quantity restrictions associated with the General Agreement on Trade and Tariffs (GATT), the establishment of the European Common Market, and the gradual elimination of capital controls after 1973. The findings are robust to the use of ‘deep’ fundamentals such as legal origin and indicators of the political environment as instruments for financial development and trade. Financial development, however, is more closely linked to these fundamentals than trade.

Kim et al. (2012) investigated the interactions among economic growth, financial development, and trade openness through simultaneous equation systems. The identification and estimation of the systems relied on the methodology of identification through heteroskedasticity. The empirical results showed that each of the three variables interacted in important ways. When controlling for the reverse causation, trade promotes economic growth in high-income, low-inflation, and non-agricultural countries but has a negative impact on growth in countries with the opposite attributes. Similarly, when accounting for the feedbacks from growth, banks and stock markets have different impacts on economic growth. While banking development is detrimental to output growth, stock market development is more favorable to growth in high-income, low-inflation, and non-agricultural countries. The data also revealed coexistence of a positive effect of financial development on trade and a negative effect
of trade on financial development in poorer countries. In richer countries, financial
development stimulates trade openness whereas trade has an ambiguous impact on
financial development.

Gries et. al (2008) investigated the direct and indirect causal interactions between
financial deepening, trade openness, and economic growth for 13 Latin American and
Caribbean countries. Using a rather general approach to identify indicators for financial
deepening and to detect Granger causality within a vector autoregressive (VAR) or
vector error correction model (VECM) framework, they found almost no evidence for
the popular hypothesis of finance-led growth. Evidence of bi-directional finance-growth
causality was stronger but mostly unstable in the long run. Most results indicated a
demand-following or insignificant relationship between finance and growth in Latin
America. This finding seems to be consistent with the weakness and deficiencies of the
region's financial systems. In addition, there was no evidence that finance indirectly and
unilaterally induces growth via the channel of trade openness. Thus, policies that
prioritise financial and trade liberalisation cannot be supported by this study. Instead, a
holistic policy approach seems to be preferable that promotes the determinants of both
real sector growth and financial development.

Ginebri et al. (2007) investigated the relationship between financial development, trade
openness, and economic growth in a vector autoregressive (VAR) framework using two
sample countries (Italy and Spain). By estimating and identifying the co-integrating
vectors in those two countries, they discovered a complementary relationship between
financial development and trade openness. Furthermore, by the identification of a
structural VAR and the analysis of the impulse response functions, they were able to
detect the complementary relation not only in the long period but also in the short-run.
In effect, when a positive exogenous shock is given to trade openness, the financial
system receives an impulse to grow as well. This means that trade liberalisation not
only encourages growth directly but also could have an “indirect” effect by fostering
financial development with a growth effect of its own.
In the above studies the investigation of the relationship among financial development, trade openness, and economic growth was done on a cross country level. The results are different based on the methodology used and the type of countries included in the studies. It should also be noted that cross country studies tend to hide country specific factors that might influence economic relationships. Therefore, it is important to also consider country specific studies. In considering country specific studies, we isolate studies done in Europe, Asia, South America, and Africa. This will help us understand the results from these studies better.

Jenkins and Katircioglu (2010) in their study employed the bounds test of co-integration and Granger causality to investigate the long-run equilibrium relationship and the direction of causality among financial development, international trade, and real income growth for the Cypriot economy. The results of the study reveal that financial development, as measured by broad money (M2), international trade, and real income growth are co-integrated. On the other hand, Granger causality test results suggest that in Cyprus the growth in real income stimulates the growth of international trade (both exports and imports) and the growth of money supply. Moreover, growth in imports of goods and services also stimulates a growth in exports of goods and services of Cyprus. This result indicates the importance of capital inflows in Cyprus that plays a major role in financing the investments mainly in the tourism sector. As a final point, the results of this study revealed that the supply-leading, the export-led growth, and the import-led growth hypotheses were not confirmed by this study whereas the demand-following hypothesis can be justified for the Cypriot economy when M2 measure of money supply is under consideration.

Yucel (2009) investigated the causality relations between financial development, trade openness, and economic growth (GDP) for the Turkish economy. He used time series and recently developed econometric techniques namely the Augmented Dickey-Fuller (ADF) for unit root, Johansen and Juselius (JJ) for cointegration, and Granger causality test for causal relationships. The findings of the study showed that while trade openness has a positive effect, financial development has a negative effect on growth. The
Granger causality test results revealed the presence of bi-causal relationship between financial development, trade openness, and economic growth indicating that economic policies aimed at financial development and trade openness have a statistically significant impact on economic growth.

Soukhakian (2007) investigated the causal relationship between financial development, trade openness, and economic growth in Japan covering the period 1960-2003. The results suggest that a long-run equilibrium relationship exists between financial development, trade openness, and economic growth in Japan except between domestic credit, trade, and growth. The results of Granger causality tests suggest that financial development as proxied by broad money gives causation to economic growth that supports the supply-leading growth hypothesis for the Japanese economy and support the growth-driven trade hypothesis, which claims that economic growth causes “more efficient imports and exports” for Japan.


Hassan and Islam (2005) examined whether financial development and openness to international trade can play any positive role in reducing poverty in Bangladesh through their growth enhancing effect. The paper takes for granted that growth reduce poverty and makes econometric test to ascertain whether financial development and trade openness cause growth. Standard Granger causality test was employed for this purpose. Variables were found first difference stationary without having any co-integrating relationship as reported by Johansen co-integration test. As such Granger causality test
was carried out in first difference VAR. The paper did not find any causal relationship between trade openness and growth, and financial development and growth. This implies that financial development and trade openness do not reduce poverty through their effect on growth. However, bi-directional causal link evidenced between financial development and trade openness indicates that these two can contribute to poverty reduction directly through their mutual effect on each other.

Matos (2003), using the Granger non-causality test in a vector autoregressive (VAR) context, studied the causal relations between financial development, exports, and economic growth in Brazil from 1980-2002. The results indicated bi-directional effects between financial development and growth and also between growth and exports. However, the non-causality null hypothesis could not be rejected in the case of the relation between financial development and exports.

Bojanic (2012) analysed the relationship among economic growth, financial development, and trade openness using annual time-series data for Bolivia for the period 1940-2010. In this study, the hypothesis of a long-run relationship between these variables was tested using bivariate co-integrated systems. Furthermore, causality tests utilising standard Granger regressions and error correction models were carried out to determine the direction of causality between indicators of financial development and economic growth, and economic growth and trade openness. The empirical results demonstrate that there is indeed a long-run equilibrium relationship, and that unidirectional Granger causality runs from the indicators of financial development and trade openness to economic growth.

Chimobi (2010) examined the causal relationship among financial development, trade openness, and economic growth in Nigeria for the period 1970-2005. The econometric methodology employed was co-integration and Granger causality test. The stationarity properties of the data and the order of integration of the data were tested using both the Augmented Dickey-Fuller (ADF) test and the Phillip-Perron (PP) test. The variables tested stationary at first differences. The Johansen multivariate approach to co-
integration was applied to test for the long-run relationship among the variables but there were no co-integrating relations between growth, trade openness, and the three measures of financial development (domestic credit provided by the banking sector, private credit to the private sector, and money supply). The Granger-causality empirical findings suggest that trade openness and financial development do have causal impact on economic growth; equally growth has causal impact on trade and financial development, implying support for growth-led trade but no support for trade-led growth. Domestic credit provided by the banking sector, private credit to the private sector and broad money, as percentages of GDP showed no causal impact on economic growth rather economic growth was seen to necessitate these credits and the supply of money. Also, money supply was the only instrument of financial development that was found to cause trade openness.

Awojobi and Katircioglu (2011) examined a possible linkage among financial development, trade liberalisation, and economic growth in Nigeria. For this purpose, the time-series econometric methodology of co-integration and Granger causality test were used to analyse data for period between 1960 and 2009. The results suggest that a long-run equilibrium relationship exists between real income and its determinants, namely international trade and financial development. The Granger causality test results also revealed causalities among these variables both in the short-term and the long-term of the Nigerian Economy.

Kenani and Fujio (2012) investigated the dynamic causal relationship between financial development, trade openness, and economic growth in Malawi in trivariate (VAR) model. Three alternative measures of financial development: money supply, liquid liabilities, and private sector credit were employed to determine the impact of different aspects of financial development on economic growth. The Johansen co-integration tests results indicate a long-run positive relationship between financial development, trade openness and economic growth. The Granger causality test results based on VECM shows that financial development has a unilateral causal effect on economic growth in the short-run; while financial development and trade openness have a short-
run bidirectional relationship depending on financial development measure. However, the findings indicate that the indirect causal effect that financial development has on economic growth through trade openness depends on financial development measure.

The above country specific study results differ and therefore cannot be generalised. This is because the existence and direction of causality may differ depending on the methodology and indicators of financial development and trade openness used. Further differences may arise from different economic sizes of the countries, the level of financial development and trade openness, and the outcomes of the economic liberalisation policies. Moreover, countries pursue different economic policies, and have different prudential and regulatory frameworks; these may consequently have a bearing on the final results obtained.

As it has been noted earlier, there have been no studies undertaken in Zambia to understand the relationship among financial development, trade openness, and economic growth. The studies done so far only investigated the relationships between financial development and economic growth, and between international trade and economic growth. For example, on the finance-growth nexus, Akinlo and Egbetunde (2010) examined the long-run causal relationship between financial development and economic growth for ten countries in sub-Saharan Africa. He found that in Zambia, economic growth Granger causes financial development. Longa (2011) investigating the same relationship found that financial development does not Granger cause economic growth in the short-run. In the long-run, he found weak causality from economic growth to financial development. In addition, Banda (2007) found that the supply-leading argument is stronger than demand-following argument implying that financial development causes economic growth in Zambia. Although, Longa (2010) and Banda (2007) included trade openness as a variable in their analyses, it was included as a control variable and hence neglected to thoroughly investigate the link that exists among financial development, trade openness, and economic growth.
On the trade and growth nexus, there are very few studies that have been done to understand this relationship. For example, Musonda (2007) sought to investigate the validity of the export-led growth hypothesis in Zambia. Her findings suggest that exports cause economic growth.
CHAPTER THREE

METHODOLOGY

3  Introduction

This chapter presents the methodology used in the study. We first present the model specification, econometric approach and estimation procedure, cointegration tests, and Granger causality tests. Thereafter, a description of data sources and definition of variables is also presented.

3.1  Model Specification

In ascertaining the causal relationship among financial development, trade openness, and economic growth in Zambia, we employed a multivariate time series model specified by Chimobi (2010):

\[ GR_t = f (FD_t, TO_t) \] \hspace{1cm} 3.1

Which indicates that economic growth (GR) is a function of financial development (FD) and trade openness (TO). Furthermore, equation 3.1 can also be expressed in a natural log – linear form as follows:

\[ \ln GR_t = \alpha_0 + \alpha_1 \ln FD_t + \alpha_2 \ln TO_t + \epsilon_t \] \hspace{1cm} 3.2

Where:
GR is the growth of real GDP per capita, a proxy for economic growth;
FD is financial development proxied by lbroadm and ldcps;
TO is trade openness proxied by the natural log of the sum of exports and imports; divided by GDP;
t is the time trend;
\( \varepsilon_t \) is the random error term; and
\( \alpha_0 \) is the constant while \( \alpha_1 \) and \( \alpha_2 \) are the coefficients of the respective variables.

Since financial development is proxied by two indicators, we adopted two models. In each model, one indicator of financial development was employed to capture the relationship among FD, TO, and GR. In model one financial development is proxied by lbroadm while ldcps is the proxy in model two. The models are shown below:

Model One
\[
\ln GR_t = \beta_0 + \beta_1 \ln PC_t + \beta_2 \ln TO_t + \varepsilon_{2t} \tag{3.3}
\]

Model Two
\[
\ln GR_t = \gamma_0 + \gamma_1 \ln M_t + \gamma_2 \ln TO_t + \varepsilon_{3t} \tag{3.4}
\]

Where: \( \beta_0 \) and \( \gamma_0 \) are constants while the other \( \beta \)’s and \( \gamma \)’s are coefficients of the respective variables.

3.2 Econometric Approach and Estimation Procedure

3.2.1 Unit Root Tests

The importance of the stationarity of variables in a model cannot be overemphasized. In the presence of non-stationary variables Granger and Newbold (1974) warn that a researcher is in danger of producing a spurious regression. Moreover, the conventional Granger causality test based on the vector autoregressive model (VAR) is conditional on the stationarity of the variables. Hence, if the time series are non-stationary, the stability condition of VAR is not met, implying that the test statistic of the Granger causality test is invalid. In this case, cointegration test and vector error correction model (VECM) are recommended to investigate the relationship between non-stationary variables. Awojobi and Katircioglu (2011) advise that prior to specifying a model, it is imperative to conduct stationarity test on each variable to determine the consistency of
the series, and to substantiate the auto regressive lag level of the variable. In this regard, our study employed the Augmented Dickey – Fuller (ADF) and the Phillips-Perron (PP) unit root tests to ascertain the stationarity of the variables.

The Augmented Dickey – Fuller test is an extension of the Dickey – Fuller test developed by Dickey and Fuller (1979) which solely relies of the assumption that the disturbances in the model are white noise. However, in practice it is difficult to make such an assumption hence the ADF test is usually used since it accommodates some forms of correlation.

The ADF test is based on the following model:

\[
\Delta Y_t = \mu + \beta t + \beta Y_{t-1} + \sum_{i=1}^{p} \lambda_i \Delta Y_{t-i} + U_t
\]

Where
- \( Y_t \) - is the variable in question
- \( \mu \) - is the constant term (or a drift)
- \( t \) - is the time trend
- \( p \) - is the lag order
- \( U_t \) - is the disturbance term which is assumed to be white noise.

The unit root test is carried out by testing the null hypothesis that \( \beta = \lambda = 0 \). However, in most cases, it is convenient to focus on the null hypothesis that \( \beta = 0 \) (against the alternative that \( \beta < 0 \)) and ignore the time trend, arguing that it is only a part of appropriate formulation (Greene, 2003). If we fail to reject the null hypothesis, then we can conclude that the model has a unit root and that the series is non-stationary (Greene, 2003).

To determine the lag order \( p \), the optimal lag length, we employed the final prediction error (FPE), Akaike information criterion (AIC), Hanna and Quinn information criteria.
(HQIC) and Schwartz-Bayesian information criterion (SBC) to ensure that the errors are white noise.

The Phillips-Perron (PP) test, developed by Phillips and Perron (1988), is an alternative to the Augmented Dickey-Fuller. It is a non-parametric technique of eliminating high order serial correlation in a series, and ensures that the data generating process is a simple first order autoregressive, an AR (1). It estimates the residual variance by employing the widely used Newey-West method of correcting the autocorrelation.

Both ADF and PP tests are tailored towards the establishment of possible presence of unit roots; that is, non stationarity of variables (Awojobi and Katircioglu, 2011).

3.2.2 Cointegration Tests

The basic idea behind cointegration is that if, in the long-run, two or more series move closely together, even though the series themselves are trended, the difference between them is constant (Chimobi, 2010). Moreover, the cointegration test enables us to ascertain the long – run equilibrium relationships among the variables, since the difference between them is constant. A lack of cointegration suggests that such variables have no long-run relationship (Greene, 2003).

To test for cointegration, we use Johansen’s (1988) methodology because of its intrinsic advantages that outperform the other test suggested by Engel and Granger (1987). Johansen’s methodology is able to estimate and test for the presence of multiple cointegrating vectors. Furthermore, the test enables the researcher to test restricted versions of the cointegrating vectors and the speed of adjustment parameters (Greene, 2003).

We start the Johansen (1988) test by considering the autoregressive vector of order $p$ or $\text{VAR} (p)$ as shown by Awojobi and Katircioglu (2011):
\[ X_t = \mu + \Pi_1 X_{t-1} + \Pi_2 X_{t-2} + \cdots + \Pi_p X_{t-p} + \epsilon_t \] \hspace{100pt} 3.6

Where

\( X_t, X_{t-1}, \ldots, X_{t-p} \) are vectors of current and lagged values of the \( n \) variables (GR, TO, and FD) which are assumed to be I(1) in the model;

\( \Pi_1, \ldots, \Pi_p \) are matrices of coefficients with \( n \times n \) dimensions;

\( \mu \) is a vector containing deterministic terms (intercept and/or trend); and

\( \epsilon_t \) is a vector of random errors.

The number of lagged values, in practice, is determined in such a way that error terms are not significantly auto-correlated. Adding \( X_{t-1}, \ldots, X_{t-p} \) and \( \Pi_1 X_{t-2}, \ldots, \Pi_{p-1} X_{t-p} \) to both sides of equation 3.6 and rearranging the terms, we obtain the VECM model of the following form:

\[ \Delta X_t = \mu + \Gamma_1 \Delta X_{t-1} + \Gamma_2 \Delta X_{t-2} + \cdots + \Gamma_{p-1} \Delta X_{t-p+1} + \Pi X_{t-1} + V_t \] \hspace{100pt} 3.7

Where

\( \Gamma_i = -(I - \Pi_i - \cdots - \Pi_1); \) \( i = 1, 2, \ldots, p-1; \)

\( \Pi = -(I - \Pi_i - \cdots - \Pi_1); \) and

\( I - \) is an identity matrix.

The rank of the matrix of coefficients \( \Pi \) shows the number of long-run cointegrations between the variables of the system. Johansen and Juselius (1990) have shown that three possible cases can arise when one considers the rank of \( \Pi \).

1. If the rank \( (\Pi) = n \) meaning that \( \Pi \) is full rank, then any linear combination of I(1) series is stationary.
2. If the rank \( (\Pi) = 0 \), that is, \( \Pi \) is a null matrix, then there is no cointegration. Although a long-run relationship seems to be unlikely, a short-run relationship may be identified by the first differences.
3. If \(0 < \text{rank } (\Pi) < n\), then there are matrices \(\alpha\) and \(\beta\) with \((nxr)\) dimension, so that it is possible to represent \(\Pi = \alpha \beta^\prime\). Matrix \(\beta\) is called the “cointegrating matrix” whereas matrix \(\alpha\) is referred to as the “adjustment matrix” or the “feedback matrix”. Matrix \(\beta\) has the property of transforming \(\beta^\prime X_t\) into a stationary process even though \(X_t\) is not in the equilibrium relationship. The rank of \(\Pi\) gives the number of cointegrating relationship(s) (that is, \(r\)) which is determined by testing whether its eigenvalues \((\lambda_i)\) are statistically different from zero. Johansen (1988) and Johansen and Juselius (1990) propose that using the eigenvalues of \(\Pi\) ordered from the largest to the smallest is for the computation of the trace statistics. The trace statistic test \(\lambda_{\text{trace}}\) is estimated with the following equation:

\[
\lambda_{\text{trace}} = -T \sum_{j=r+1}^{p} \ln(1 - \lambda_j)
\]

As stated earlier, our study has adopted two models where in each model one of two proxies of financial development is used to investigate the relationship among financial development, trade openness, and economic growth. The models are shown below.

**Model one:**

\[
\Delta \text{rgdp}_t = \gamma_1 + \sum_{i=1}^{p} \gamma_{1i} \Delta \text{rgdp}_{t-i} + \sum_{i=1}^{p} \gamma_{12i} \Delta \text{open}_t + \sum_{i=1}^{p} \gamma_{13i} \Delta \text{broad}_t + \eta_1 \text{ECT}_t + \nu_1
\]

\[
\Delta \text{broad}_t = \gamma_2 + \sum_{i=1}^{p} \gamma_{21i} \Delta \text{broad}_{t-i} + \sum_{i=1}^{p} \gamma_{22i} \Delta \text{rgdp}_t + \sum_{i=1}^{p} \gamma_{23i} \Delta \text{open}_t + \eta_2 \text{ECT}_t + \nu_2
\]

\[
\Delta \text{open}_t = \gamma_3 + \sum_{i=1}^{p} \gamma_{31i} \Delta \text{open}_{t-i} + \sum_{i=1}^{p} \gamma_{32i} \Delta \text{rgdp}_t + \sum_{i=1}^{p} \gamma_{33i} \Delta \text{broad}_t + \eta_3 \text{ECT}_t + \nu_3
\]

**Model two**
\[
\Delta \text{rgdpc}_t = \phi_1 + \sum_{i=1}^{p} \beta_{1i} \Delta \text{rgdpc}_{t-i} + \sum_{i=1}^{p} \beta_{12i} \Delta \text{ldcps}_{t-i} + \sum_{i=1}^{p} \beta_{13i} \Delta \text{ldopen}_{t-i} + \Theta_1 \text{ECT}_{t-1} + \hat{U}_{1t} \tag{3.10.1}
\]

\[
\Delta \text{ldcps}_t = \phi_2 + \sum_{i=1}^{p} \beta_{21i} \Delta \text{ldcps}_{t-i} + \sum_{i=1}^{p} \beta_{22i} \Delta \text{rgdpc}_{t-i} + \sum_{i=1}^{p} \beta_{23i} \Delta \text{ldopen}_{t-i} + \Theta_2 \text{ECT}_{t-1} + \hat{U}_{2t} \tag{3.10.2}
\]

\[
\Delta \text{ldopen}_t = \phi_3 + \sum_{i=1}^{p} \beta_{31i} \Delta \text{ldopen}_{t-i} + \sum_{i=1}^{p} \beta_{32i} \Delta \text{rgdpc}_{t-i} + \sum_{i=1}^{p} \beta_{33i} \Delta \text{ldcps}_{t-i} + \Theta_3 \text{ECT}_{t-1} + \hat{U}_{3t} \tag{3.10.3}
\]

Where;

\(\zeta\)'s and \(\Phi\)'s contain exogenous elements such as time trends and intercept terms from models one and two respectively;

\(p\) indicates the number of lags of the regressands as well as the regressors in any given equation;

\(\gamma\)'s and \(\beta\)'s are the coefficients of the variables in the respective models;

\(\nu\)'s and \(\hat{U}\)'s represent white noise error terms that are independent of the history of the variables in the VECM;

\(\Delta\) is the difference operator;

\(\text{ECT}_{t-1}\) - the error correction term lagged one period; and

\(\text{lrngdpc, ldcps, lbroadm, lopen}\) are as defined above.

### 3.3 Granger Causality

In this study, we are concerned with ascertaining whether the lagged values of each variable on the right hand side of each equation adds more information in explaining the variable on the left hand side obtained from its own lagged values. Therefore, the Wald test was employed to assess the significance of the coefficients of the lagged variables. 

Here, we test the null hypothesis that each variable on the right hand side does not
Granger cause the respective variable on the left hand side. If the null is rejected, then we accept an alternative hypothesis that the variable in question Granger causes the respective variable on the left hand side. Following Gujarati (2003), the Granger causality test involves estimating the following pair of regressions:

\[ \Delta GR_t = \sum_{i=1}^{p} \alpha_i \Delta FD_{t-i} + \sum_{i=1}^{p} \gamma_i \Delta GR_{t-i} + U_{1t} \]

\[ \Delta FD_t = \sum_{i=1}^{p} \tau_i \Delta GR_{t-i} + \sum_{i=1}^{p} \varphi_i \Delta FD_{t-i} + U_{2t} \]

Where

GR and FD are as defined above;
\[ \alpha, \gamma, \tau, \text{ and } \varphi \] are coefficients of the respective variables; and
\[ U_{1t} \text{ and } U_{2t} \] are error terms which are assumed to be uncorrelated.

Three cases of causality can be distinguished from equations 3.11.1 and 3.11.2 above.

(a) Unidirectional causality from FD to GR is indicated if the estimated coefficients of the lagged FD in equation 3.11.1 are statistically different from zero (or \( \sum_{i=1}^{p} \alpha_i \Delta FD_{t-i} \neq 0 \)) and the set of estimated coefficients of the lagged GR in equation 3.11.2 are not statistically different from zero (or \( \sum_{i=1}^{p} \gamma_i \Delta GR_{t-i} = 0 \)). Conversely, a unidirectional causality from GR to FD is indicated if the estimated coefficients of the lagged GD in equation 3.11.2 are statistically different from zero (or \( \sum_{i=1}^{p} \tau_i \Delta GR_{t-i} \neq 0 \)) and the set of estimated coefficients of the lagged FD in equation 3.11.1 are not statistically different from zero (or \( \sum_{i=1}^{p} \alpha_i \Delta FD_{t-i} = 0 \)).

(b) Feedback, or bi-directional causality, is achieved when the sets of FD and GR coefficients are statistically significantly different from zero in both regressions.

(c) Independence is suggested when the sets of FD and GR coefficients are not statistically significant in both regressions.
The idea behind the Granger causality results discussed in this section can be generalised to regressions containing more than two variables.

### 3.4 Data and Definition of Variables

#### 3.4.1 Definition of Variables

**Real GDP per capita (rgdpc)**

This is defined by the natural log of real GDP per capita (lrgdpc). It is measured by the total market value of all final goods and services produced within the borders of an economy, regardless of who owns the assets or the nationality of the labor used in producing that output divided by the total population. Increase in this ratio indicates increase in the output of the nation. Therefore, increase in the level real per capita GDP is used as a proxy for economic growth consistent with Hassan and Islam (2005); Banda (2007); Longa (2011); Chimobi (2010); and Das and Rishi (2010) among others.

**Financial development indicators**

In the literature, financial development is defined as the improvement in quantity, quality and efficiency of financial intermediary services. This process involves the combination of many activities and institutions. Given that it cannot be captured by a single measure, we adopted two commonly used measures of financial development, namely: the ratio of broad money to GDP (broadm) and the ratio of domestic credit to the private to GDP (dcps) consistent with Calderon and Liu (2002); Chimobi (2010); Awojobi and Katircioglu (2011); and Soukhakian (2007) among others.

**Log of broad money as a ratio of GDP (lbroadm)**

lbroadm equals the natural logarithm of the sum of currency outside banks; demand deposits other than those of the central government; time, savings, and foreign currency deposits of resident sectors other than the central government; bank and traveler’s
checks; and other securities such as certificates of deposit and commercial paper divided by GDP. Therefore, this indicator measures the degree to which money is accepted and used as a medium of exchange, a unit of account, and a store of value. Lbroadm is a key contributor to financial development in an economy, especially in developing countries. Furthermore, Liu et al (1997) argues that Lbroadm reflects the true size of the real size of the financial sector. Therefore, a higher Lbroadm ratio implies a larger financial sector and greater financial intermediary development. This indicator is assumed to be positively related to economic growth Levine (1993). In the literature, this measure has been widely used by Jenkins and Katircioglu (2010); Soukhakian (2007); and Chimobi (2010) among others.

**Log of domestic credit as a ratio of GDP (ldcps)**

Ldcps equals the natural logarithm of the ratio of the value of credits by financial intermediaries to the private sector to GDP. This measure excludes credits issued by the central bank and development banks. Furthermore, it excludes credit to the public sector and cross claims of one group of intermediaries on another. Ldcps is also a broader measure of financial intermediary development since it includes all financial institutions, not only commercial banks (Beck et al., 1999). Since the private sector invests funds in more productive projects, the higher the value of Ldcps indicates efficiency in resource employment, and the higher will be the expected future growth rates (Osinski, 2000). Thus, it is expected that dcps positively affects economic growth. This indicator has been widely used in literature by Awojobi and Katircioglu (2011); Chimobi (2010); and Soukhakian (2007) among others.

**Trade openness (open)**

Prabirjit (2007) notes that increased trade openness is often considered in the sense of an increase in the size of the country’s trade sector in relation to total production. In

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3 World bank definition
fact, increasing trade openness often reflects the success of trade liberalisation policies. Moreover, this proxy represents the technology spillover dimension of openness. Openness to trade facilitates access to the technological information in the world (Grossman and Helpman, 1992). Therefore, it is assumed that trade openness positively affects economic growth. Studies that have used this indicator include: Bordo and Rousseau (2011); Matos (2003); Hassan and Islam (2005); and Soukhakian (2007).

The definition of trade openness is broad and encompasses many dimensions. According to Sachs and Warner (1995) a country that has opened to international trade should not have any of the following five conditions: non-tariff barriers (NTBs) covering 40 percent or more of trade; average tariff rates of 40 percent or more; a black market exchange rate that is depreciated by 20 percent or more relative to the official exchange rate, on average; a socialist economic system; and a state monopoly on major exports. For the purpose of this research, we will measure trade openness by the natural logarithm of the ratio of the sum of exports and imports to GDP (lopen) consistent with Daniels and Vanhoose (2009). It is a preferred measure of the degree of trade openness in literature.

3.4.2 Data Description and Sources

This study utilised annual time series data from 1965 to 2011, a sample size of 47 observations. Our sample size is sufficient and long enough to capture the long-run relationship among the variables and ensure the quality of the analysis as suggested by Hakkio and Rush (1991). All our variables were expressed in natural logarithms in order to include the proliferate effect of time series and to reduce the problem of heteroskedasticity (Gujarati, 2003). The data on broad money and domestic credit to the private sector each as a ratio of GDP, trade openness, and real GDP per capita were obtained from the 2012 World Bank’s world development indicators (online). This source has been used by many researchers such as Banda (2007), Awojobi and Katircioglu (2011), and Atif et al. (2010) among others. Real GDP per capita was
measured in constant 2000 US dollar prices. Data analysis was done using Eviews and Stata versions 6.0 and 11.2 respectively.
CHAPTER FOUR

PRESENTATION AND DISCUSSION OF THE EMPIRICAL ANALYSIS

4 Introduction

This chapter presents and analyses the empirical results of the relationship among financial development, trade openness, and economic growth in Zambia. Sections 4.1 to 4.5 present the econometric results while section 4.6 discusses the results.

4.1 Unit Root Test Results

It is well documented that before any analysis is done on time series data there is need to check whether the underlying variables are stationary. This is because analysis of non-stationary variables leads to spurious regression as discussed in the methodology section. If the variables are found to be non-stationary, then they have to be differenced to ensure stationarity. The number of times a variable is differenced to make it stationary is its order of integration. To test for stationarity, we employed the Augmented Dickey-Fuller (ADF) and the Phillips-Perron (PP) unit roots tests as they are widely used in literature. Our variables of interest are lrgdpc, lbroadm, ldcps, and lopen. The results of the unit root tests are presented in table 4.1 below.
Table 4.1: Unit Root Test Results in Levels and First Differences

<table>
<thead>
<tr>
<th>Variable</th>
<th>Augmented Dickey-Fuller (ADF)</th>
<th>Phillips Perron (PP)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Levels</td>
<td>1st difference</td>
</tr>
<tr>
<td></td>
<td>LL t – stat</td>
<td>LL t – stat</td>
</tr>
<tr>
<td>Lrgdpc</td>
<td>0</td>
<td>-1.891</td>
</tr>
<tr>
<td>Lbroadm</td>
<td>0</td>
<td>-2.392</td>
</tr>
<tr>
<td>Ldcps</td>
<td>0</td>
<td>-2.250</td>
</tr>
<tr>
<td>Lopen</td>
<td>0</td>
<td>-2.842</td>
</tr>
</tbody>
</table>

* indicate level of significance at 1%. LL stands for the lag length. t – stat stands for test statistic. I (d) stand for the order of integration. 1st difference stands for the first difference.

Table 4.1 above shows that the results from the ADF and PP tests indicate that all the variables were non-stationary at their levels but stationary after the first difference at 1 percent level of significance. This implies that all the variables were integrated of order one.

Having found that all our variables were integrated of the same order, Johansen’s test for cointegration was employed to ascertain whether the variables were co-integrated.

### 4.2 Cointegration Test Results

As noted in the methodology section above, the test for cointegration is used to investigate the existence of a long-run equilibrium relationship among variables that are integrated of the same order. Since all the variables are integrated of order one, the Johansen’s cointegration test was employed. Given that this study used two models to investigate the relationship among financial development, trade openness, and economic growth, the cointegration test was applied to the respective set of variables in each model. The results of the test are presented in tables 4.2 and 4.3 below.
4.2.1 Cointegration Test Results for Model One

Table 4.2: Johansen’s cointegration test using the Trace and Maximum Eigenvalue statistics for Model One

<table>
<thead>
<tr>
<th>Trace Statistic Test</th>
<th>Maximum Eigenvalue Test</th>
</tr>
</thead>
<tbody>
<tr>
<td>H₀</td>
<td>H₁</td>
</tr>
<tr>
<td>r = 0</td>
<td>r &gt; 0</td>
</tr>
<tr>
<td>r ≤ 1</td>
<td>r &gt; 1</td>
</tr>
<tr>
<td>r ≤ 2</td>
<td>r &gt; 2</td>
</tr>
</tbody>
</table>

** indicate 5% level of significance. r stands for the hypothesised number of cointegrating relationships. H₀ stands for the null hypothesis. H₁ stands for the alternative hypothesis.

Table 4.2 above shows the results of the Johansen’s cointegration test performed on lrgdpc, lbroadm, and lopen in model one. The trace statistic indicates that we rejected the null hypothesis of no cointegration among the three variables but failed to reject the null hypothesis that there was at most one co-integrating relationship among the variables at 5 percent level of significance. Similarly, the maximum eigenvalue statistic shows that we rejected the null hypothesis of no cointegration but failed to reject the null hypothesis of one cointegration relationship among the variables at 5 percent level of significance. Based on the results from the trace and maximum eigenvalue statistics, we concluded that there was one co-integrating relationship among lrgdpc, lbroadm, and lopen.
4.2.2 Cointegration Test Results for Model Two

Table 4.3: Johansen’s Cointegration test using the Trace and Maximum Eigenvalue statistic for Model Two

<table>
<thead>
<tr>
<th>H\textsubscript{0}</th>
<th>H\textsubscript{1}</th>
<th>Eigenvalue</th>
<th>Trace statistic</th>
<th>H\textsubscript{0}</th>
<th>H\textsubscript{1}</th>
<th>Eigenvalue</th>
<th>Maximum eigenvalue statistic</th>
</tr>
</thead>
<tbody>
<tr>
<td>r = 0</td>
<td>r &gt; 0</td>
<td>0.493</td>
<td>44.746**</td>
<td>r = 0</td>
<td>r = 1</td>
<td>0.493</td>
<td>30.584**</td>
</tr>
<tr>
<td>r ≤ 1</td>
<td>r &gt; 1</td>
<td>0.218</td>
<td>14.162</td>
<td>r ≤ 1</td>
<td>r = 2</td>
<td>0.218</td>
<td>11.072</td>
</tr>
<tr>
<td>r ≤ 2</td>
<td>r &gt; 2</td>
<td>0.066</td>
<td>3.090</td>
<td>r ≤ 2</td>
<td>r = 3</td>
<td>0.066</td>
<td>3.090</td>
</tr>
</tbody>
</table>

** indicate 5% level of significance. r stands for the hypothesised number of cointegrating relationships. H\textsubscript{0} stands for the null hypothesis. H\textsubscript{1} stands for the alternative hypothesis.

Table 4.3 above shows the results of the Johansen cointegration test performed on lrgdpc, ldcps, and lopen, in model two. The trace statistic indicates that we rejected the null hypothesis of no cointegration among the three variables but failed to reject the null hypothesis that there was at most one co-integrating relationship at 5 percent level of significance. The maximum eigenvalue statistic indicates that we rejected the null hypothesis of no cointegration among the three variables but failed to reject the null hypothesis of one cointegration relationship among the variables at 5 percent level of significance. Based on the results from the trace and maximum eigenvalue statistics, we concluded that there was one co-integrating relationship among lrgdpc, ldcps, and lopen.

4.3 Vector Error Correction Model

Having established the long-run equilibrium relationship among the variables in the two models, the VECM was estimated. The VECM is used to analyse the short-run relations among the variables and the adjustment mechanism that take place to restore long-run equilibrium when the variables digress from it. One critical aspect to consider before estimating the VECM is the number of lags to include in the model. In this regard, we conducted a test to ascertain the optimal number of lags to include in each model. The
results showed that the final prediction error (FPE), Akaike’s information criterion (AIC), and Hanna and Quinn’s information criteria (HQIC) chose three lags while Schwartz-Bayesian information criterion (SBC) chose one lag in both models hence we used three lags in our VECM estimation to ensure that the errors are white noise. Before presenting the results from the VECM, we first present the results from diagnostic tests.

4.3.1 Diagnostic Tests

The diagnostic tests included checking the stability of the VECM which provides an indication of whether the number of the co-integrating equations is mis-specified or the equations, which are assumed to be stationary, are not stationary. Further diagnostic tests included the Lagrange-multiplier (LM) test for autocorrelation and Jarque-Bera test for normality of the residuals of the equations in the VECM. The null hypothesis of the LM test is that of no autocorrelation in the residuals. The Jarque-Bera test has a null hypothesis of normality of the residuals. The LM test was done up to the third lag. The diagnostic results are presented below.

4.3.1.1 Vector Error Correction Model Stability Test

Table 4.4 below shows the results of the stability tests of model one and two. It is evident that as required there are two characteristic roots, in both models, whose value is unit and the rest less than unit. This indicates that our two models have the correct number of co-integrating equations which are stationary.
### Table 4.4: Eigenvalue stability condition for Model One and Two

<table>
<thead>
<tr>
<th>Root Modulus</th>
<th>Root Modulus</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.000000</td>
<td>1.000000</td>
</tr>
<tr>
<td>1.000000</td>
<td>1.000000</td>
</tr>
<tr>
<td>0.230341 - 0.627839i</td>
<td>0.668759</td>
</tr>
<tr>
<td>0.230341 + 0.627839i</td>
<td>0.668759</td>
</tr>
<tr>
<td>0.585964</td>
<td>0.585964</td>
</tr>
<tr>
<td>-0.421904 - 0.293859i</td>
<td>0.514156</td>
</tr>
<tr>
<td>-0.421904 + 0.293859i</td>
<td>0.514156</td>
</tr>
<tr>
<td>0.329008</td>
<td>0.329008</td>
</tr>
<tr>
<td>-0.324310</td>
<td>-0.066545</td>
</tr>
<tr>
<td>1.000000</td>
<td>1.000000</td>
</tr>
<tr>
<td>1.000000</td>
<td>1.000000</td>
</tr>
<tr>
<td>0.383855 - 0.586065i</td>
<td>0.700583</td>
</tr>
<tr>
<td>0.383855 + 0.586065i</td>
<td>0.700583</td>
</tr>
<tr>
<td>-0.074545 - 0.663982i</td>
<td>0.668153</td>
</tr>
<tr>
<td>-0.074545 + 0.663982i</td>
<td>0.668153</td>
</tr>
<tr>
<td>0.619077</td>
<td>0.619077</td>
</tr>
<tr>
<td>-0.534387</td>
<td>0.534387</td>
</tr>
<tr>
<td>0.066545</td>
<td>0.066545</td>
</tr>
</tbody>
</table>

#### 4.3.1.2 Autocorrelation Tests

Table 4.5 below shows the results for LM test for residual autocorrelation of both model one and two. The test revealed that at first, second, and third lags, we failed to reject the null hypothesis of no autocorrelation among the residuals of each model at 5 percent level of significance. Thus, we concluded that there was no autocorrelation among the residuals in each model.
Table 4.5: LM test Results for Serial Correlation

<table>
<thead>
<tr>
<th>Lags</th>
<th>Model One</th>
<th></th>
<th>Model Two</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>11.56233</td>
<td>0.2391</td>
<td>7.566673</td>
<td>0.5783</td>
</tr>
<tr>
<td>2</td>
<td>14.47536</td>
<td>0.1064</td>
<td>6.390597</td>
<td>0.7003</td>
</tr>
<tr>
<td>3</td>
<td>11.83723</td>
<td>0.2226</td>
<td>15.11266</td>
<td>0.0879</td>
</tr>
</tbody>
</table>

Test was done at 5 percent level of significance. LM – Stat stands for the LM test statistic. P – value stands for probability value.

4.3.1.3 Test for Normality

Table 4.6 below shows the results of Jarque-Bera test for normality of the residuals from model one. It is evident that we failed to reject the null hypothesis of normality of residuals of each equation as well as all the equations combined at 5 percent level of significance.

Table 4.6: Jarque-Bera Normality test results for Model One

<table>
<thead>
<tr>
<th>Equation</th>
<th>Jarque-Bera</th>
<th>Df</th>
<th>P – value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Δ(lrgdpc)</td>
<td>1.905695</td>
<td>2</td>
<td>0.3856</td>
</tr>
<tr>
<td>Δ(lbroadm)</td>
<td>1.092566</td>
<td>2</td>
<td>0.5791</td>
</tr>
<tr>
<td>Δ(lopen)</td>
<td>3.719479</td>
<td>2</td>
<td>0.1557</td>
</tr>
<tr>
<td>Joint</td>
<td>6.717740</td>
<td>6</td>
<td>0.3477</td>
</tr>
</tbody>
</table>

Δ is the difference operator. Df stands for the degrees of freedom. P – value is the probability value.
Table 4.7 below shows the results of Jarque-Bera test of normality of the residuals from model two. We failed to reject the null hypothesis of normality of residuals of each equation as well as all the equations combined at 5 percent level of significance.

**Table 4.7: Jarque-Bera Normality test results for Model Two**

<table>
<thead>
<tr>
<th>Equation</th>
<th>Jarque-Bera</th>
<th>Df</th>
<th>P – value</th>
</tr>
</thead>
<tbody>
<tr>
<td>∆(lrgdpc)</td>
<td>3.376702</td>
<td>2</td>
<td>0.1848</td>
</tr>
<tr>
<td>∆(ldcps)</td>
<td>1.189586</td>
<td>2</td>
<td>0.5517</td>
</tr>
<tr>
<td>∆(lopen)</td>
<td>2.209786</td>
<td>2</td>
<td>0.3312</td>
</tr>
<tr>
<td>ALL</td>
<td>6.776074</td>
<td>6</td>
<td>0.3421</td>
</tr>
</tbody>
</table>

Δ is the difference operator. Df stands for the degrees of freedom. P – value is the probability value.

From the foregoing, it is evident that the two models have passed all the diagnostic tests implying that we could confidently use the t -, F -, and chi – square tests to establish the significance of the coefficients of the VECM. Furthermore, the estimated coefficients of the VECM are linear unbiased and have a minimum variance in the class of all linear and unbiased estimators. If this been the case, Enders (1995) assures that we can be confident about the inferences made based on these estimates.

### 4.3.2 Coefficients of Cointegration and Speed Adjustment Parameters

Tables 4.8 and 4.9 below show the coefficients of the co-integrating vector and speed adjustment parameters of the co-integrating equation of each respective model. The speed adjustment parameter shows the rate at which the dependent variable has to adjust to its equilibrium level once it deviates from it. In theory, the adjustment parameter is supposed to be negative and significant (Gujarati, 2003). The co-integrating vector shows whether the dependent variable in the previous period was above or below its equilibrium value. If the co-integrating vector is negative, then the dependent variable
was below its equilibrium value. Thus, given a negative value of the adjustment parameter, the dependent variable would have to rise in the next period to return to its equilibrium level. If the co-integrating vector is positive, then the dependent variable was above its equilibrium value and has to fall in the next period to return to its equilibrium level (Gujarati, 2003).

Table 4.8: Coefficients of the Co-integrating Vector and the Speed Adjustment Parameters for Model One

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficients of Co-integrating vector ($\beta'$)</th>
<th>Speed of Adjustment Parameters ($\alpha$)</th>
</tr>
</thead>
<tbody>
<tr>
<td>lrgdpc</td>
<td>1.000000 (restricted)</td>
<td>-0.123940*** (0.06621)</td>
</tr>
<tr>
<td>lbroadm</td>
<td>-0.346995* (0.06425)</td>
<td>0.117689 (0.27242)</td>
</tr>
<tr>
<td>lopen</td>
<td>-1.731687* (0.14629)</td>
<td>0.654310* (0.15062)</td>
</tr>
<tr>
<td>Constant</td>
<td>-7.037381</td>
<td></td>
</tr>
</tbody>
</table>

* and *** indicate levels of significance at 1% and 10% respectively. Standard errors in parenthesis.

From Table 4.8 above, the co-integrating equation for model one can be deduced as follows:

\[
lrgdpc - 0.346995 \text{lbroadm} - 1.731687 \text{lopen} - 7.037381 = 0 \quad \ldots \ldots \ldots \ldots .4.1
\]

The coefficients of the co-integrating equation 4.1 above show the long-run elasticity of real GDP per capita as result of a change in either broad money or trade openness, ceteris paribus. From Table 4.8 above, it is seen that broad money and trade openness have positive and significant long run effect on real GDP per capita. Therefore, a 1 percent increase in broad money will increase real GDP per capita by about 35 percent, holding trade openness constant. Similarly, a 1 percent increase in trade openness will
increase GDP per capital by about 173 percent, holding broad money constant. This shows that trade openness has a greater effect on real GDP per capita than broad money.

In addition, table 4.8 indicates that the speed adjustment parameters for real GDP per capita and broad money have the correct signs, though only the one for real GDP per capita is significant at 10 percent. The significance of the speed adjustment parameter for real GDP per capita implies that in the long run, the causality runs from broad money and trade openness to real GDP per capita. Furthermore, the parameter shows that, to return to its equilibrium, real GDP per capita will adjust by 12 percent of the past year’s deviation from equilibrium. However, this speed adjustment to equilibrium is slow. The speed adjustment parameter for trade openness was found to be positive and significant at 1 percent level of significance. This implies that any disturbance in the system will result in divergence from equilibrium and the system will be unstable.

**Table 4.9: Coefficients of the Co-integrating Vector and Speed Adjustment Parameters for Model Two**

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficients of Co-integrating vector (β’)</th>
<th>Speed of Adjustment Parameters (α)</th>
</tr>
</thead>
<tbody>
<tr>
<td>lrgdpc</td>
<td>1.000000 (Restricted)</td>
<td>-0.070590 (0.05995)</td>
</tr>
<tr>
<td>Ldcps</td>
<td>-0.152916* (0.05683)</td>
<td>-0.555028** (0.29436)</td>
</tr>
<tr>
<td>lopen</td>
<td>-2.050633* (0.20445)</td>
<td>0.484804* (0.13053)</td>
</tr>
<tr>
<td>constant</td>
<td>-6.969971</td>
<td></td>
</tr>
</tbody>
</table>

* and** indicate level of significance at 1% and 5% respectively. Standard errors in parenthesis

From table 4.9 above, the co-integrating equation for model two can be deduced to be as follows:

\[
\text{lrgdpc} - 0.152916 \text{ldcps} - 2.050633\text{lopen} - 6.969971 = 0 \\
…………………………..4.2
\]
From the cointegration equation 4.2 above, domestic credit to the private sector and trade openness have positive and significant long-run effect on real GDP per capita. This implies that real GDP per capita will increase by 15 percent as a result of a 1 percent increase in domestic credit to the private sector, holding trade openness constant. Similarly, real GDP per capita will rise by 205 percent as a result of a 1 percent increase in trade openness, holding credit to the private sector constant. It is thus clear that trade openness exert a greater effect on real GDP per capita than domestic credit to the private.

Table 4.9 above further reveals that the speed adjustment parameters for real GDP per capita and domestic credit to the private sector had the correct signs (negative). However, only the speed adjustment parameter for domestic credit is statistically significant at 5 percent. This tells us that the long-run causality runs from trade openness and real GDP per capita to domestic credit to the private sector. The speed adjustment parameter for domestic credit further indicates that domestic credit to the private sector will adjust by 56 percent of the past year’s deviation from equilibrium to return to its equilibrium value. The speed adjustment parameter for trade openness is positive and statistically significant at 1 percent. This implies that any disturbance in the system will result in divergence from equilibrium and the system will be unstable.

**4.3.3 Vector Error Correction Model Estimates**

In presenting the estimates of the VECM it is important to note that the actual size of the coefficients of the variables is not necessary but the sign and their statistical significance are.

**4.3.3.1 Vector Error Correction Model Estimates for Model One**

Table 4.10 below indicates that for the real GDP per capita equation, broad money and trade openness were found to have the expected positive signs at the first and second
lags. However, only broad money was found to be significant at its second lag. This implies that only broad money exerted a positive effect on real GDP per capita.

Furthermore, the table reveals that for the broad money equation, only real GDP per capita had a positive effect on broad money at its first lag while trade openness had negative effects. Considering the variables at their second lags, trade openness had a positive effect on broad money while real GDP per capita had a negative sign. However, none of the variables had a significant effect on broad money at all the levels of significance considered.

For the trade openness equation, broad money had a positive effect on trade openness at the first lag while real GDP per capita had a negative effect. At their second lags, real GDP per capita had a positive effect on trade openness while broad money had a negative effect. Nonetheless, real GDP per capita and broad money had no significant effect on trade openness at all levels of significance considered.
Table 4.10: Estimates of the Vector Error Model for Model One

<table>
<thead>
<tr>
<th>Error Correction:</th>
<th>$\Delta(lrgdpc)$</th>
<th>$\Delta(lbroadm)$</th>
<th>$\Delta(lopen)$</th>
</tr>
</thead>
<tbody>
<tr>
<td>ECT (-1)</td>
<td>-0.123940***</td>
<td>0.117689</td>
<td>0.654310*</td>
</tr>
<tr>
<td></td>
<td>(0.06621)</td>
<td>(0.27242)</td>
<td>(0.15062)</td>
</tr>
<tr>
<td>$\Delta(lrgdpc(-1))$</td>
<td>0.032881</td>
<td>0.530601</td>
<td>-0.012156</td>
</tr>
<tr>
<td></td>
<td>(0.14376)</td>
<td>(0.59152)</td>
<td>(0.32705)</td>
</tr>
<tr>
<td>$\Delta(lrgdpc(-2))$</td>
<td>0.316847**</td>
<td>-0.412364</td>
<td>0.083743</td>
</tr>
<tr>
<td></td>
<td>(0.13875)</td>
<td>(0.57092)</td>
<td>(0.31566)</td>
</tr>
<tr>
<td>$\Delta(lbroadm(-1))$</td>
<td>0.027118</td>
<td>-0.075712</td>
<td>0.044415</td>
</tr>
<tr>
<td></td>
<td>(0.04299)</td>
<td>(0.17690)</td>
<td>(0.09780)</td>
</tr>
<tr>
<td>$\Delta(lbroadm(-2))$</td>
<td>0.080841**</td>
<td>0.020927</td>
<td>-0.143335</td>
</tr>
<tr>
<td></td>
<td>(0.04025)</td>
<td>(0.16564)</td>
<td>(0.09158)</td>
</tr>
<tr>
<td>$\Delta(lopen(-1))$</td>
<td>0.018506</td>
<td>-0.130793</td>
<td>0.548206*</td>
</tr>
<tr>
<td></td>
<td>(0.08609)</td>
<td>(0.35424)</td>
<td>(0.19586)</td>
</tr>
<tr>
<td>$\Delta(lopen(-2))$</td>
<td>0.018274</td>
<td>0.082708</td>
<td>0.050738</td>
</tr>
<tr>
<td></td>
<td>(0.08249)</td>
<td>(0.33944)</td>
<td>(0.18768)</td>
</tr>
<tr>
<td>Constant</td>
<td>-0.004974</td>
<td>0.006249</td>
<td>0.000516</td>
</tr>
<tr>
<td></td>
<td>(0.00548)</td>
<td>(0.02253)</td>
<td>(0.01246)</td>
</tr>
</tbody>
</table>

(*), ** and *** indicate level of significance at 1%, 5% and 10% respectively. Standard errors are in parenthesis
### 4.3.3.2 Vector Error Correction Model Estimates for Model Two

Table 4.11 below shows that trade openness had a positive effect on real GDP per capita both at its first and second lags. Domestic credit to the private sector had a negative effect on real GDP per capita at the first lag but had a positive effect after the second year. None of the variables had a significant effect on real GDP per capita at all the levels of significance.

For the domestic credit to the private sector equation, real GDP per capita was found to positively influence domestic credit at the first and second lags. Trade openness on the other hand had a negative influence on the latter variable both at its first and second lags. As indicated in the table, only trade openness had a significant influence on domestic credit.

Table 4.11 further shows that when trade openness equation is considered, real GDP per capita was found to have a positive effect on trade openness at its first and second lags. Domestic credit to the private sector had a negative effect on trade openness at its first and second lags. As shown in the table, both real GDP per capita and domestic credit to the private sector had no significant effect on trade openness.
Table 4.11: Estimates of the Vector Error Model for Model Two

<table>
<thead>
<tr>
<th>Error Correction:</th>
<th>Δ(lrgdpc)</th>
<th>Δ(ldcps)</th>
<th>Δ(lopen)</th>
</tr>
</thead>
<tbody>
<tr>
<td>ECT (-1)</td>
<td>-0.070590</td>
<td>-0.555028**</td>
<td>0.484804*</td>
</tr>
<tr>
<td></td>
<td>(0.05995)</td>
<td>(0.29436)</td>
<td>(0.13053)</td>
</tr>
<tr>
<td>Δ(lrgdpc(-1))</td>
<td>0.030545</td>
<td>1.204878</td>
<td>0.043371</td>
</tr>
<tr>
<td></td>
<td>(0.15237)</td>
<td>(0.74822)</td>
<td>(0.33178)</td>
</tr>
<tr>
<td>Δ(lrgdpc(-2))</td>
<td>0.296950**</td>
<td>0.366669</td>
<td>0.132649</td>
</tr>
<tr>
<td></td>
<td>(0.14462)</td>
<td>(0.71017)</td>
<td>(0.31491)</td>
</tr>
<tr>
<td>Δ(ldcps(-1))</td>
<td>-0.000723</td>
<td>0.130397</td>
<td>-0.014142</td>
</tr>
<tr>
<td></td>
<td>(0.03302)</td>
<td>(0.16216)</td>
<td>(0.07191)</td>
</tr>
<tr>
<td>Δ(ldcps(-2))</td>
<td>0.028681</td>
<td>-0.411752*</td>
<td>-0.019765</td>
</tr>
<tr>
<td></td>
<td>(0.02806)</td>
<td>(0.13779)</td>
<td>(0.06110)</td>
</tr>
<tr>
<td>Δ(lopen(-1))</td>
<td>0.063781</td>
<td>-1.186805*</td>
<td>0.455694**</td>
</tr>
<tr>
<td></td>
<td>(0.09164)</td>
<td>(0.45)</td>
<td>(0.19954)</td>
</tr>
<tr>
<td>Δ(lopen(-2))</td>
<td>0.024436</td>
<td>-0.481950</td>
<td>0.009935</td>
</tr>
<tr>
<td></td>
<td>(0.09131)</td>
<td>(0.44835)</td>
<td>(0.19881)</td>
</tr>
<tr>
<td>Constant</td>
<td>-0.004583</td>
<td>0.016684</td>
<td>0.000434</td>
</tr>
<tr>
<td></td>
<td>(0.00592)</td>
<td>(0.02908)</td>
<td>(0.01290)</td>
</tr>
</tbody>
</table>

(*), ** and *** indicate level of significance at 1%, 5% and 10% respectively.
Standard errors are in parenthesis.
4.4 Granger Causality Test

Having presented the results of the VECMs for both models, it is imperative to present the Granger causality test results which show whether the variables have causal effects on each other, both individually and jointly, in the short-run. Tables 4.12 and 4.13 below present the results for models one and two respectively. Granger causality runs from rows to columns.

Table 4.12: Granger Causality Tests for Model One

<table>
<thead>
<tr>
<th></th>
<th>(\Delta (\text{lbroadm}))</th>
<th>(\Delta (\text{lrgdpc}))</th>
<th>(\Delta (\text{lopen}))</th>
</tr>
</thead>
<tbody>
<tr>
<td>(\Delta (\text{lbroadm}))</td>
<td>4.149971</td>
<td>-</td>
<td>2.924991</td>
</tr>
<tr>
<td>(\Delta (\text{lrgdpc}))</td>
<td>1.179829</td>
<td>0.060806</td>
<td>0.439680</td>
</tr>
<tr>
<td>All</td>
<td>4.296598</td>
<td>2.489194</td>
<td>3.550961</td>
</tr>
</tbody>
</table>

Table 4.12 above shows the results of the Granger causality tests for model one. As indicated in the table, we failed to reject the null hypothesis that broad money and trade openness do not Granger cause real GDP per capita either individually or jointly at all levels of significance. Similarly, we failed to reject the null hypothesis that real GDP per capita and trade openness Granger cause broad money both individually and jointly at all levels of significance. Furthermore, real GDP per capita and broad money were also found not to Granger cause trade openness both individually and jointly at all levels of significance. These results are consistent with Awojobi and Katircioglu (2010) who found that money supply deterred the causal relationship among the three variables in the short run in the case of Nigeria. On the other hand, they are contrary to Kenani and Fujio (2012) who found a causal flow from broad money and trade openness to real
GDP per capita without feedback effect, and a bi-directional causal relationship between broad money and trade openness in the case of Malawi.

**Table 4.13: Granger Causality Tests for Model Two**

<table>
<thead>
<tr>
<th>Dependent Variable</th>
<th>Δ(lrgdpc)</th>
<th>Δ(ldcps)</th>
<th>Δ(lopen)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Δ(lrgdpc)</td>
<td>-</td>
<td>2.984442</td>
<td>0.202808</td>
</tr>
<tr>
<td>Δ(ldcps)</td>
<td>1.068333</td>
<td>-</td>
<td>0.7757</td>
</tr>
<tr>
<td>Δ(lopen)</td>
<td>0.508046</td>
<td>7.214701**</td>
<td>-</td>
</tr>
<tr>
<td>All</td>
<td>1.339287</td>
<td>10.88024**</td>
<td>0.376612</td>
</tr>
</tbody>
</table>

*indicate level of significance at 5%.

Table 4.13 above shows that we failed to reject the null hypothesis that domestic credit to the private sector and trade openness do not Granger cause real GDP per capita both individually and jointly at all levels of significance considered. Furthermore, we failed to reject the null hypothesis that real GDP per capita and domestic credit to the private sector Granger causes trade openness both individually and jointly at all levels of significance. In addition, we found real GDP per capita not to Granger cause domestic credit at all levels of significance.

Table 4.13 further shows that a unidirectional causal relationship running from trade openness to domestic credit was found at 5 percent level of significance. However, the results from the VECM in table 4.11 above suggest a negative relationship between the two. This implies that trade openness stymies the growth of domestic credit to the private sector. Our result is consistent with Kim et al (2012) who found that trade has negative effects on financial development in poor countries.

Table 4.13 also shows that real GDP per capita and trade openness were found to jointly Granger cause domestic credit to the private sector at 5 percent level of significance.
This result is consistent with Chimobi (2010) in the case of Nigeria but contrary to Kenani and Fujio (2012) who found a causal link running from domestic credit to trade openness and economic growth in the case of Malawi.

4.5 Discussion of Results

Our study sought to investigate the causal relationship among financial development, trade openness and economic growth in Zambia. In this case we sought to test the hypotheses that: (1) financial development and trade openness cause economic growth, (2) financial development and economic growth cause trade openness, and (3) trade openness and economic growth cause financial development. Two measures of financial development were used: broad money and domestic credit to the private sector each as a ratio of GDP, and hence two models were developed. In model one financial development was proxied by broad money as a ratio of GDP. In model two, financial development was proxied by domestic credit to the private sector as a ratio of GDP.

The results from our analyses indicate that the causal relationship among financial development, trade openness, and economic growth in Zambia is sensitive to the choice of the financial indicator chosen. Our result is consistent with Kenani and Fujio (2012) and Soukhakian (2007). In the sections that follow, we discuss the results from each respective model.

4.5.1 Discussion of Model One Results

In ascertaining the short-run causal relationship among financial development, trade openness, and economic growth in model one, the Granger causality test was employed using the estimates from the VECM. The results in table 4.12 above indicate that financial development and trade openness do not Granger cause economic growth, both individually and jointly, at all levels of significance. Similarly, trade openness and economic growth do not Granger cause financial development, both individually and jointly, at all levels of significance. Furthermore, financial development and economic
growth were found not to Granger cause trade openness, both individually and jointly, at all levels of significance. In short, there was no evidence to support short run causality among financial development, trade openness, and economic growth in Zambia. This result is consistent with Awojobi and Katircioglu (2010) in the case of Nigeria but contrary to Kenani and Fujio (2012) who, using the ratio of broad money to GDP as an indicator of financial development, found a causal relationship running from financial development and trade openness to economic growth in Malawi.

To investigate the long-run causality, we considered the sign and significance of the speed adjustment parameters in table 4.10 above as well as the coefficients of the cointegration equation (equation 4.1 above). The results indicate that only the speed adjustment parameter for real GDP per capita was found to be significant at 10 percent. The significance of the speed adjustment parameter implies long run causality running from broad money and trade openness to real GDP per capita. Furthermore, the parameter shows that, to return to its equilibrium, real GDP per capita will adjust by 12 percent of the past year’s deviation from equilibrium. As can be noticed the 12 percent implies that the adjustment to equilibrium is slow. Our result confirms Rivera-Batiz and Romer’s (1991) view that both trade and financial liberalisation augment economic growth.

The weak causal relationship among the variables, in the long-run, points to the possibility that the financial sector in Zambia is very small to greatly contribute to economic growth. This can be attributed to low real deposit rates, income level, and real exchange rate. The other factor constraining the growth of the financial sector is the low geographical penetration of the banking sector, the largest component of the financial sector in Zambia, which affect the ease of access to finance. According to Beck et al (2007), Zambia is one of the countries with lowest geographical penetration in Africa.

Similarly, the country’s trade sector is not meaningfully contributing to economic growth. This is because Zambia, like many other developing countries, heavily depends on primary products, such as copper, for exports (Mudenda and Ndulo, 2004).
prices for primary products on the international market are, in most cases, low and unpredictable. This implies that the country does not benefit much from international trade. Other challenges that make the trade sector inefficient include: weak customs administration procedures which make the private sector fail to effectively respond to changes in the global demand pattern; and inadequate transport and communication infrastructure which increases the cost of doing business and impedes access to markets within Zambia and in neighboring countries.

4.5.2 Discussion of Model Two Results

In model two, the results from the Granger causality test in table 4.13 above indicate a short-run unidirectional causal link running from trade openness to domestic credit to the private sector. However, this relationship was found to be negative implying that trade openness stymies financial development in Zambia. This finding is consistent with Kim et al (2011) who found that trade openness hinders financial development in low-income, high-inflation, and low-governance countries. This argument fits well in the case of Zambia which is a low-income and high-inflation country.

Furthermore, Do and Levchenko (2004) showed that a country’s financial system is a source of comparative advantage and trade. This is because countries that are endowed with better financial systems will produce and export financially dependent goods. Svaleryd and Vlachos (2005) have shown that financial comparative advantage is relevant to trade patterns. This been the case, our result confirms that the Zambia’s financial system may not be its source of comparative advantage. Therefore, Openness of the economy to international trade has the ability to cause the financially intensive sectors to shrink. With the shrinkage of these sectors, demand for external finance will decrease and the domestic financial system will deteriorate. This is contrary to Svaleryd and Vlachos’ (2002) view that trade openness stimulates demands for external finance and that the establishment of financial instruments and institutions that are able to provide appropriate insurance and risk diversification arising from cash flow problems and external shocks.
Despite the result that trade openness hinders growth in Zambia, we also found that trade openness and real GDP per capita jointly promote domestic credit to the private sector. This implies that while the external sector has the ability to significantly inhibit the growth of credit to the private sector individually, it can promote it if there is economic growth in the economy.

Analysis of the long-run dynamics reveals that only the speed adjustment parameter (Table 4.11) for domestic credit to the private sector was negative and statistically significant at 5 percent. This entails that the long-run causality runs from trade openness and real GDP per capita to domestic credit to the private sector. The speed adjustment parameter further indicates that domestic credit to the private sector will adjust by 56 percent of the past year’s deviation from equilibrium to return to its equilibrium value. Nevertheless, this causal link is found to be weak. This indicates that the financial sector in Zambia is unable to greatly respond to changes in real GDP per capita and trade openness. Therefore, despite the levels of economic growth and the openness of the economy that has been witnessed so far in Zambia, credit to the private sector has remained low.

There are many reasons that can help explain the weak causal relationship among financial development, trade openness, and economic growth noted in the foregoing discussion. One of the reasons as pointed out by Mwiya (2005) could be that lenders perceive the private sector to be a credit risk, and hence lending to Government institutions which are perceived to be less credit risk. Increased credit to public sector as the ability of crowding out private sector borrowings, and consequently limit the participation of the private sector in the economy. The end result of this is that Zambia’s productive sectors, managed by the private sector, respond slowly to economic growth and international trade due to inadequate funds.

To address the situation, the donor community in collaboration with the Zambian government has introduced the aid-for-trade initiative with the Enhanced Integrated Framework (EIF) as an institutional framework for delivering it. The (EIF) is an
initiative aimed at achieving a broader objective of helping developing countries to diversify their economies away from traditional primary products, copper in the case of Zambia, for export. This is been done by providing technical assistance and the much needed financial resources to domestic firms. This is been done to help strengthen the manufacturing base of domestic firms and enable them respond to changing demands in the global market. However, as Pollen and Seshamani (2013) note, we are yet to see tangible results from this undertaking.
CHAPTER FIVE
CONCLUSION, LIMITATIONS AND POLICY RECOMMENDATIONS

5 Introduction

This chapter provides conclusion and policy recommendations. It also discusses the limitations of the study and possible areas of future research in Zambia.

5.1 Conclusion

The main objective of this study was to investigate the causal relationship among financial development, trade openness and economic growth in Zambia from 1965 to 2011. To be able to investigate this relationship real GDP per capita and the ratio of the sum of exports and imports to GDP were used as proxies for economic growth and trade openness respectively. For financial development, two proxies were used namely: broad money and domestic credit to the private sector each as a ratio of GDP. Since financial development was proxied by two indicators, two models were adopted for each indicator.

After developing the two models, we then ascertained the order of integration of all our variables. This was done using the Augmented Dickey – Fuller (ADF) and Phillips Perron (PP) unit root tests. The results from both tests indicate that all our variables were integrated of order one. This meant that we could not do any analysis on the variables in their level form as it would lead to spurious results. Therefore, there was need to consider the possible long-run equilibrium relationships among the variables in each model. In this regard, the cointegration test using Johansen methodology was applied to each model to ascertain the existence and number of long-run equilibrium relationships. In applying the Johansen cointegration test we used trace and maximum eigenvalue statistics. Furthermore, the number of lags to be included in the cointegration test was chosen using the FPE, AIC, HQIC and SBC. The FPE, AIC,
HQIC chose three lags while SBC chose one lag in both models hence we chose three lags. The trace and maximum eigenvalue statistics found one co-integrating relationship among the variables in each model.

After establishing that one co-integrating relationship existed among the variables in each model, vector error correction model (VECM) was employed in each model. From the results of the VECMs, we were interested in ascertaining the short-run and long-run dynamics of the variables in each model. The results indicate that the relationship among financial development, trade openness, and economic growth is sensitive to the indicator of financial development chosen.

In the short-run, we found that economic growth and trade openness Granger cause financial development thus supporting the growth and trade led finance hypothesis. However, this result is only obtained when using domestic credit to the private as an indicator of financial development. Additionally, using the same indicator, we found a unidirectional relationship running from trade openness to financial development. This relationship was found to be negative implying that trade openness hinders financial development. Using broad money as an indicator of financial development, we found no causal relationship among financial development, trade openness, and economic growth.

In the long-run, we found that financial development and trade openness cause economic growth when broad money is used as an indicator of financial development. This result supports the finance and trade led growth hypothesis. On the other hand, we found that economic growth and trade openness cause financial development when domestic credit to the private sector is used as a measure of financial development. However, in both cases, the causal link was found to be weak. This can be attributed to the inefficiencies and bottlenecks in the financial sector as well as the trade sector. Zambia’s financial sector as noted by Fin – Mark Trust (2006) report is still in its infancy stage and exhibits characteristics of financial repression. Furthermore, this
result also suggests that Zambia’s trade policies thus far have not contributed much to the economic growth.

5.2 Policy Recommendations

Our study highlights three important issues that are worth noting. Firstly, in the short run policy makers in Zambia should pursue policies that further open the economy to international trade with caution. This is because trade openness hinders financial development. It is our view that the government should be more concerned with financial sector reforms instead. Additionally, policy makers should focus on other growth enhancing factors which with an appropriate degree of openness of the economy will increase the supply of domestic credit to the private sector.

Secondly, in the long run there is need to consider policies that increase broad money and trade openness as they are important factors in promoting economic growth. Additionally, high economic growth rates coupled with increased international trade will expand supply of domestic credit to the private.

Thirdly, there is need to conduct a detailed study to unveil and understand the factors that weaken the causal link among financial development, trade openness and economic growth.

5.3 Limitations of the Study

The results show that the relationship among financial development, trade openness and economic growth is sensitive to the measure of financial development employed. This result needs a more detailed study on how other measures of financial development affect this relationship. We could not manage to incorporate these ourselves due to data and time constraints.
REFERENCES


