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Effects of Monetary and Fiscal Policies on Foreign Direct Investment in Mozambique during the period 2005-2015

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WORKING PAPER

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Abstract

The study aims to analyse the effects of monetary and fiscal policies on foreign direct investment in Mozambique. This is accomplished emphasizing the effect of money supply, lending rate, treasury bills rate, inflation rate, taxes, and government expenditure on foreign direct investment. Implicitly the critical question raised in this study is: what are effects of monetary and fiscal policies on foreign direct investment inflows in Mozambique? The study utilises quarterly macroeconomic data from 2005 to 2015. The methodology draws upon unit roots and Johansen testing for cointegration using a vector error correction model to explore the dynamic relationship of short and long run effects of the independent variables on the dependent variable. All variables are nonstationary at level but when converted into first differences they become stationary. The findings of this study suggest that all the independent variables except money supply have effects on foreign direct investment inflow in Mozambique. Whereas the lending rate, Treasury bill rate, and government expenditure have a negative and significant effect on foreign direct investment, while the inflation rate and tax revenue have a positive and significant relationship with the foreign direct investment. This means that the decisions of monetary and fiscal policies can affect the foreign direct investment either negative or positively. Thus, if the target is to attract foreign direct investment the Bank of Mozambique should be overly concerned with the interest rate (lending rate, Treasury bill rate), and on other sight governmental authorities should take into consideration how available funds are spent on development issues such as education, health, water, electricity, infrastructures, transport and telecommunications.

I. Introduction

Ordinarily, monetary policy refers to the measures that the Central Bank of Mozambique (Bank of Mozambique) uses to influence the demand and supply of credit in the economy to achieve the broad objectives of macroeconomic policy. Therefore, these measures can be achieved through the operationalization of the tools of monetary policy to alter money supply, as well as the level and structure of interest rates and other conditions, such as changes in Gross Domestic Product and commercial bank capital or liquidity, which affect credit supply in the economy. Moreover, the Bank of Mozambique's objectives, as most central banks in the world, are price stability and inflation control aimed at promoting economic growth and development, exchange rate stability, safeguarding the balance of external payments, and maintaining financial stability and poverty reduction. In addition, the key tools of monetary policy being used to achieve these objectives are interest rates and reserve ratio.

Furthermore, fiscal policy refers to the government's measures regarding the use of taxation and government spending to regulate the level of economic activity, as well as the use of key tools to influence the level, composition, and direction of government spending or taxation. Also, fiscal policy includes key tools that are used to measure the government expenditure and tax.

Monetary and fiscal policies are conceptually distinct, with different objectives, and instruments. Through the monetary policy, the Bank of Mozambique focuses on a strategy involving aggregate demand management and exchange rate management in order to control the level of economic activity and employment. The bank also uses the same system to ensure the attraction of foreign direct investment; through fiscal policy, the government of Mozambique offers incentives to foreign investors in the form of tax breaks and explicit (or implicit) subsidies, in order to attract foreign direct investment into the economy.

This research intends to analyse the effects of monetary and fiscal policies on foreign direct investment inflows in Mozambique for the period 2005 to 2015.

1.1. Statement of the Research Problem

One of the most common motives for the multinationals invest abroad are macroeconomics policies at home countries. And this can be made through the instruments

of monetary policy, incentives offered by the host Government and Government exerting influence that is restrictive in nature. For example, since 1984 when Mozambique has sought to adopt a free market policy, the country began to undertake a series of reforms in her monetary and fiscal policies in order to influence the economic activity and also increase the participation of Mozambique in the global economy through foreign direct investment attraction. As a result of these reforms and the re-establishment of peace and security, the Foreign Direct Investment (FDI) inflows began to pick up.

According, to figure 1, Mozambique's FDI inflows (BoP, US$ million) increased from US$ 347 million in 2002 reaching a value of US$ 476 million in 2004. Nevertheless, in 2005 the FDI inflows registered a reduction and stayed in a margin of US$ 108 million.

However, from 2005 to 2013 the average FDI inflows (BoP, US$ million) increased steadily from US$ 108 million to US$ 6,175 million, which was the highest amount of inflow in Mozambique's history. But from 2013 to 2015 the FDI inflows (BoP, US$ million) dropped significantly from US$ 6,175 million to US$ 3,771 million.

Figure 1: Total FDI inflows in Mozambique (BoP, US$ Million): 2002 – 2015
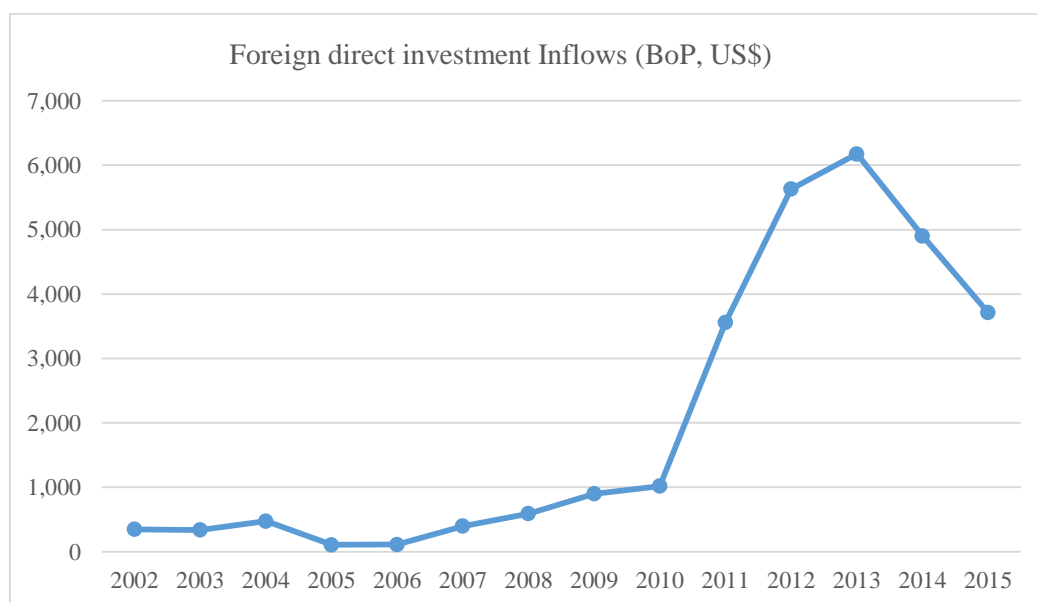
Source: own calculation based on the data of balance of payment provided by the Banco de Moçambique (2002-2015) available on http://bancomoc.mz/fm_pgLink.aspx?id=222

From the analysis of previous researches on the relationship between the variables of monetary policy and foreign direct investment the findings are mixed. With respect to

interest rate, the findings are inconclusive. Whereas some show that interest rate had a positive impact on FDI others found that interest rates had no significant impact on FDI inflow (Chingarande 2011). Money supply had a positive effect on foreign direct investment (Olweny and Chiluwe 2012) while Fischer (2013) observed that periods of high inflationary pressures are associated with substantial reduction in foreign direct investments.

In terms of the relationship between the variables of fiscal policy and foreign direct investment, empirical findings indicate that the effect of government expenditure on FDI is ambiguous, and can either crowd-in or crowd-out the foreign direct investment (Hermes and Lensink 2001). The crowding-out effect occurs when the foreign direct investment falls off because of the rise in government expenditure, while crowding-in refers to an increase in foreign direct investment due to the rise in government expenditure. In relation to the tax's effect on the foreign direct investment, findings portray mixed results. Boskin and Gale (1986) found a positive effect of taxes on FDI, while Shah and Slemrod (1990) observed that taxes had a negative impact on foreign direct investment.

Based on this understanding, it is clear that the macroeconomic policies decision can affect FDI. Therefore it is important to understand the dynamics of monetary and fiscal policies effects on foreign direct investment in Mozambique. To accomplish emphasizing effects this study will decompose and analyse the effects in Money supply, lending rate, Treasury bill rate, inflation rate, tax revenue, and government expenditure. The effects of these variables on foreign direct investment is estimated through long run relationship. Implicitly the critical question raised is: what are effects of monetary and fiscal policies on foreign direct investment inflows in Mozambique?

1.2. Objectives of the Study

1.2.1. General Objective

To analyse the effects of monetary and fiscal policies on foreign direct investment in Mozambique during the period from 2005 to 2015.

1.2.2. Specific Objectives

- To measure the effects of changes in money supply on foreign direct investment in Mozambique;

- To determine the effects of lending rate changes on foreign direct investment in Mozambique;

- To analyze the effects of changes in Treasury bill rate on foreign direct investment in Mozambique;

- To evaluate the effects of inflations on foreign direct investment in Mozambique;

- To demonstrate the effect of tax revenue on foreign direct investment in Mozambique; and

- To calculate the effect of government expenditure on foreign direct investment in Mozambique.

1.3. Importance and Findings

The analysis of the effects of monetary and fiscal policies on foreign direct investment has been discussed in the literature that address economic development and FDI. The following points give the importance of this study.

1) There are few literature related econometric analyse of the effect of monetary and fiscal policies on foreign direct investment addressed to Mozambique;

2) The Bank of Mozambique and the Government play an important role in influencing Mozambican`s economic environment through the monetary and fiscal policies, respectively. An analysis focused on the effects of this policies on FDI is important because FDI is the engine for economic growth and development. Increases on FDI can increase the production, productivity and employment opportunities, and also provides technological skills and innovations in techniques, encourages the local enterprise and increase government revenue. Thus, understanding the relationships between the independent variables (money supply, lending rate, Treasury bill rate, inflation, taxes and government expenditure) and FDI inflows in Mozambique can help the policymakers to formulate appropriate policies to attract the foreign direct investment. This will consequently stimulates the economic growth and development.

The findings of this study suggest that all the independent variables except money supply have effects on foreign direct investment inflow in Mozambique. Whereas the lending rate, Treasury bill rate, and government expenditure have a negative and significant effect on foreign direct investment, inflation rate and tax revenue have a positive and significant relationship with the foreign direct investment.

The rest of the study is organised as follows: Section II gives an overview of Mozambique in terms of location, population and size, monetary and fiscal policies, investment framework, as well as the evolution of foreign direct investment in the country. Section III presents the concept and theories of foreign direct investment as well as the succinct literature review of the effect of the monetary and fiscal policies on foreign direct investment. This is followed by a discussion regarding the data and methodology utilised in this study in the Section IV. Thereafter, Section V is devoted to the reporting and interpreting the estimation results obtained from the empirical analysis. Finally, section VI presents the conclusions and a few implications of the estimation results.

II. Mozambique's Overview

2.1. Position, Size and Population

Mozambique is located on the east coast of Southern Africa. The country is located on latitude 18° 15' south and longitude and 35 ° 00' east, with a total area of 801,590 km^2, of which land constitutes 784,090 km^2 and inland water 17,500 km^2. The country is bordered by Tanzania to the north, Zambia and Malawi to the northwest, Zimbabwe to the west, South Africa and Swaziland to the southwest, and the Indian Ocean (Mozambique Channel) to the east.

With a population of 25.7 million[1], Mozambique gained its independence from Portugal in 1975. From 1977 to 1992, the country was devastated by a civil war. By the time of the General Peace Accords of 1992, the country ranked among the poorest in the world, with social, economic, and physical infrastructure completely destroyed.

Nevertheless, in 1987 with the support of the World Bank and International Monetary Fund, Mozambique adopted the Economic Recovery Plan (ERP). The basic elements of this plan were economic reforms with a focus on stabilization of the economy, liberalization of external and internal trade, privatization and setting of up a modern judicial system, and the banking system. These objectives were reinforced in 1990 by legislation and the enactment of a new constitution with provisions for a market - based economy, multiparty political system, and free elections. These reforms have been remarkably successful as evidenced by the economy and social indicators. Since 1993, the country has seen an annual average economic growth rate of about 7.8 percent[2], which in turn promotes investor confidence leading to increased investment by both locals and foreigners.

2.2. Monetary and Fiscal Policies

In the early 1990s, the Bank de Mozambique took over the control of monetary aggregates and strengthened indirect instruments of monetary control through the overall

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[1] Instituto Nacional de Estatísticas (2016) "Statistical Yearbook 2015," Mozambique.
[2] Cruz, A. and Mafambissa, F. (2016) "Industries without smokestacks: Mozambique country case study", *WIDER* Working Paper no. 2016/158. < https://www.wider.unu.edu/sites/default/files/wp2016-158.pdf>, accessed February 7, 2017.

thrust of monetary policy. In the 1990s, the bond market was introduced, following which interest rates were fully liberalized in 1994, and barriers to entry to the financial sector were removed. The interbank money market was introduced in 1997. The monetary policy in Mozambique is based on the law 1/92, the Bank de Mozambique organic law, and the medium and long term strategy (BM 2007a).

Fiscal policy was initially focused on strengthening resource mobilization through tax reform and improved efficiency in tax administration, while at the same time making government expenditure more effective. In 1999, the value added tax (VAT) was introduced followed by a new and more transparent income tax code in 2003. In 2005, the revenue authority (Autoridade Tributaria Moçambicana) was established, and it marked a new phase of reforms to improve direct taxation and to reduce distortions and tariff barriers.

2.3. Investment Framework

Overall, the investment framework in Mozambique was governed by the Investment Law No. 3/93, dated June 24, 1993, and its related regulations governing national and foreign investment. However, this law was replaced by Decree No. 43/2009 in August 2009, which provided new regulations to the Investment Law. Thus the objectives of the Investment Law are:

- Establishment of the Centre for Investment Promotion (CPI) as a one-stop shop for investors;
- Simplification of company licensing processes;
- New labour laws to make the labour market more flexible and to reduce labour related costs;
- Strengthening investor protection;
- Provisions for the free movement of capital;
- Revised tax codes, including major concessions for large-scale projects and mining sector reforms.

All these regulations are in line with the Economic Recovery Plan and the then Constitution 1990. This constitution reflected the will of the government to conduct open economic policy without making distinctions based on the investors' origin and to provide

all investors with equal rights and obligations. Among others, the Investment Law offers protection guarantees and includes provisions for the resolution of disputes.

For investment promotion, the Centre for Investment Promotion (CPI) took over the operations of the national investment promotion agency in 1992 (replacing the earlier Office for Promotion of Foreign Investment).

In August 2009, Decree 43/2009 created GAZEDA, the Special Economic Zones Office. Both, CPI and GAZEDA are responsible for implementing the 2008-2012 and 2013-2017 Strategies for improving the business environment. These Strategies follow in the steps of the 2008 Decree on Simplified Licensing and share the latter's objective of simplifying and improving the processed involved in doing business. In 2009, the Code of Fiscal Benefits additionally harmonised investment incentives, although some specific sectors continued to operate under separate benefit laws. More recently, in 2013, CPI elaborated a national investment promotion strategy together with other sector-specific investment promotion agencies (including CEPAGRI for agriculture and INATUR for tourism).

2.4. Evolution of Foreign Direct Investment Inflow in Mozambique

Due to reforms and the re-establishment of peace and security, the FDI inflows began to pick up. Annual FDI inflows averaged $386 million during 2002-2004, but in 2005 the FDI inflows registered a reduction and stayed in the margin of $108 million. During the period from 2006-2013, the trend was increasing on an average of $2,298 million per year and reached a historical high of $6,175 million in 2013 (Figure 2).

Controversially, because of the political instability allied with the sizeable drop in commodity prices in the international markets (especially aluminium and coal) and the subsequent drop in foreign reserves flowing into the country, the trend of growth was reverted, and the FDI inflow declined from US$6,175 million in 2013 to US$3,711 million in 2015 (Figure 3).

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Figure 2: Evolution of Mega-projects in Mozambique
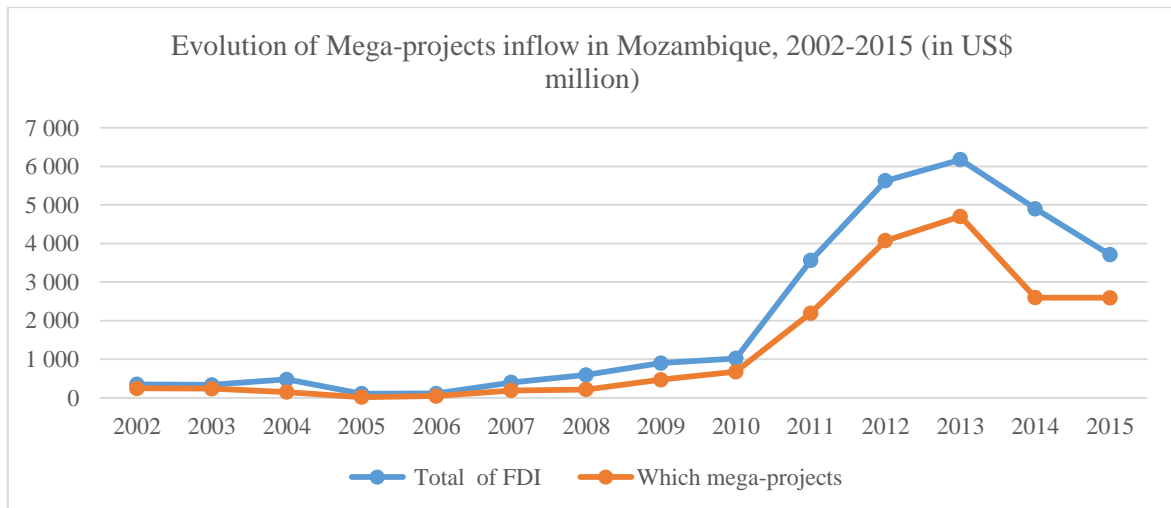
Evolution of Mega-projects inflow in Mozambique, 2002-2015 (in US$ million)

Source: own calculation based on the data of balance of payment provided by the Banco de Moçambique (2002-2015)

An important factor in Mozambique's success story and quick recovery has been the role of large-scale investments in the mega-projects (Figure 2). The mega-projects are responsible for the dramatic increase in FDI inflows, contributing more than 70%.

In terms of sectorial distribution of FDI inflows, Figure 4 shows that the majority of the investments is allocated to the mining sector so the drastic decline of FDI during the period 2014-2015 is attributed to this sector.

Figure 3: Sectorial Distribution of FDI

Sectorial Distribution of FDI in Mozambique (2002-2015)
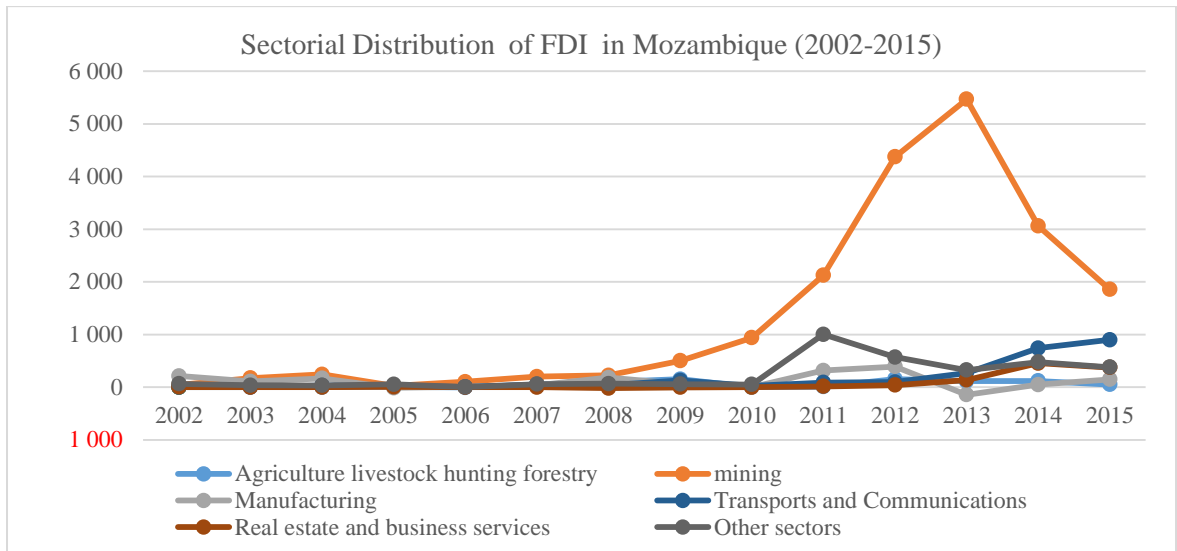
Source: own calculations based on the data of balance of payment provided by the Bank of Mozambique (2002-2015)

The second and third major investments are allocated to transports and communications, and real estate and business services sectors, respectively. The two sectors reached a historical high in 2015, with transports and communications at US$899 million and real estate and business services at US$373 million.

III. Literature Review

Previous studies related to concepts and theories of FDI and the effects of monetary and fiscal policies on FDI inflows are summarized in this chapter. This chapter can provide a better understanding of foreign direct investment, as well as the relationships between the dependent variable and independent variables (money supply, lending rate, Treasury bill rate, inflation rate, taxes, and government expenditure).

3.1. Concepts and theories of FDI

Generally, the foreign direct investment is defined based on two different perspectives: microeconomic and macroeconomic.

In the microeconomic perspective, foreign direct investment can be defined as investment undertaken by a firm resident of one economy in a company resident in another economy, with the objectives of obtaining and sustaining a lasting interest (profit) in the enterprise and to exercise a significant degree of influence in its management[3]. Thus, management and voting rights are granted to the investors if they own at least 10 percent of the original shares, undertaken with the objective of establishing a lasting interest in the country, a long-term relationship, and a significant influence on the management of the firm (Patterson et al 2004).

On the other hand, from the macroeconomic point of view, foreign direct investment can be understood as a particular type of capital flows across borders, from countries of origin to host countries, and the data are found in the balance of payments. The variables of interest are capital flows and stocks, revenues obtained from investments. Thus, this

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[3] Moffett, M.H., Stonehill, A.I. & Eitheman, D.K., (2009) "Fundamentals of Multinational Finance." Boston: Addison Wesley, 3rd edition.

study used the macroeconomic perspective to analyse the effect of monetary and fiscal policies on foreign direct investment inflows in Mozambique.

The formulation of a proper explanation of FDI was attempted in the 1960s. Further, with the increasing role of multinationals, academicians attempted to integrate their activities with the theories of FDI (Rayome and Baker 1995). Since then, these theories have highlighted different factors governing the international movement of capital. Some theories have considered market imperfections as the reason for FDI flows while others have considered oligopolistic and monopolistic advantages. There are also FDI theories that relate FDI to international trade.

3.1.1. Production Cycle Theory of Vernon

Production cycle theory developed by Vernon in 1966, defended the existence of four stages of production cycle: innovation, growth, maturity, and decline. According to Vernon, in the first stage, the companies create new innovative products for local consumption and export the surplus in order to serve foreign markets also. Per this theory, in this stage of the production cycle, manufacturers have an advantage by possessing new technologies. As the product develops, the technology becomes known. When the home market is saturated, the product is exported to other countries. At the later stage, when the new product reaches maturity and loses its uniqueness, competition from similar rival products becomes more intense. At this stage, producers would then look for lower cost foreign locations.

This theory shows how market seeking and cost reduction motives of companies lead to FDI. It also explains the behaviours of MNCs and how they take advantage of different countries that are at different levels of development.

3.1.2. The Theory of Exchange Rates on Imperfect Capital Markets

Itagaki (1981) and Cushman (1985) analysed the influence of uncertainty as a factor of FDI. Initially, the foreign exchange risk was analysed from the perspective of international trade and the only empirical analysis made by Cushman showed that real exchange rate stimulated FDI while a foreign currency appreciation reduced FDI. However, the currency risk rate theory could not explain simultaneous foreign direct investments between countries with different currencies.

3.1.3. The Internalisation Theory

Hymer's (1976) pioneering study on the growth of transnational companies and their motivations for achieving foreign direct investment identified two major determinants of FDI as the removal of competition and the advantages which some firms possess in a specific activity.

He developed the concept of firm-specific advantages and demonstrated that FDI took place only if the benefits of exploiting firm-specific advantages outweighed the relative costs of the operations abroad. The multinationals appear due to the market imperfections that lead to a divergence from perfect competition in the final product market. Hymer has discussed the problem of information costs for foreign firms with respect to local firms, different treatment of governments, currency risk. The result meant the same conclusion: transnational companies face some adjustment costs when investments are made abroad. Hymer recognized that FDI is a firm-level strategy decision rather than a capital-market financial decision.

3.1.4. The Eclectic Paradigm OLI

The eclectic paradigm theory developed by Dunning (1977, 1981) is a mixture of Hymer's explanations and various other theories of direct foreign investments. According to this theory, there are three determinants of foreign direct investment:

1) Ownership advantages: this refers to intangible assets which are exclusive possessions of the company and may be transferred within transnational companies at low costs (e.g., technology, brand name, benefits of economies of scale). The advantage gives either higher incomes or reduced costs. But, the cost of operating at a distance has additional costs, therefore, to successfully enter a foreign market, a company must have certain characteristics (i.e. property competences or the specific benefits of the company) that would triumph over operating costs on a foreign market (Dunning, 1973, 1980, 1988).

There are three types of specific advantages:

a) Monopoly: advantages in the form of privileged access to markets through ownership of limited natural resources, patents, and trademarks.

b) Technology: knowledge broadly defined to contain all forms of innovation activities.

c) Economies of large size such as economies of learning, economies of scale and scope, greater access to financial capital.

2) Location or country specific advantage: when the first condition is fulfilled, the company must use some foreign factors in connection with its native Firm-Specific Advantages to earn full rents on these firm specific advantages. Location advantages of different countries are the key factors for determining who will become host countries for the activities of transnational corporations. The specific advantages of each country can be divided into three categories:

a) The economic benefits consist of quantitative and qualitative factors of production, costs of transport, telecommunications, market size, etc;

b) Political advantages include common and specific government policies that affect FDI flows;

c) Social advantages include the distance between the home and host countries, cultural diversity, attitude towards strangers, etc.

3) Internalisation: when the first two conditions are met, it must be profitable to the company the use of these advantages, in collaboration with at least some factors outside the country of origin (Dunning, 1973, 1988).

This third characteristic of the eclectic paradigm OLI offers a framework for assessing different ways in which the company will exploit its powers from the sale of goods and services to various agreements that might be signed between the companies. The more cross-border market internalisation benefits are high, the more the firm would want to engage in foreign production rather than offering this right under franchise.

The theory shows that OLI parameters are different from company to company, depend on context, and reflect the economic, political, and social characteristics of the host country. Therefore, the objectives and strategies of the firms, the magnitude and pattern of production will depend on the challenges and opportunities offered by different countries.

3.2. Relationship between Monetary Policy and Foreign Direct Investment

Monetary policy is one of the principal economic management tools that central banks use to shape economic performance. The monetary authorities can affect output and

foreign direct investment through the control of monetary policy targets such as interest rates, quantity of money, and mandatory reserve (Kahn 2010).

According to Bernanke and Gertler (1995), there are three different channels through which monetary policy can affect the foreign direct investment:

1) Balance sheet channel - focuses on monetary policy effects on the liability side of the borrowers' balance sheets and income statements, including variables such as borrowers' net worth, cash flow, and liquid assets;

2) Bank lending channel - centres on the possible effect of monetary policy actions on the supply of loans by depository institutions;

3) Finally, the credit channel - looks at the effects of monetary policy on the market frictions which create a spread between a firms' internal and external financing sources (external finance premium).

Therefore, for this study, the analysis of the effects of monetary policy on foreign direct investment was drawn considering the variables money supply, interest rates, and inflation rate.

3.2.1. Effects of Money Supply on Foreign Direct Investment

Monetary policy contraction or expansion typically affects the money supply through the monetary transmission mechanism where money supply (M2) composed of cash and quasi-cash, call, savings and time deposits as well as certificates of deposits are manipulated by central banks. Through the use of several toolkits inclusive of central bank lending, open market operations, quantitative easing, cash reserve ratio, and liquidity ratio requirements, monetary policy can effect desired changes in monetary aggregates. Where monetary policy affects deposits, it is said to influence financial intermediary's liabilities side of the balance sheet. Whilst monetary policy that affects cash/ reserves works on the asset side of the financial intermediary's balance sheet to inject or absorb liquidity from the economy.

An increase in the money supply enhances the national economic position, which ultimately attracts further foreign direct investment (Resende 2008). This is consistent with Harford's (2005) argument that the liquidity position of the economy positively affects the aggregate level of FDI. From a theoretical viewpoint, an increase in national

liquidity should attract further FDI inflows, given that the cost of financing in the host country is expected to be cheaper.

In the same line of thought, Olanipekun and Akeju (2013) found that one unit change in money supply causes an increase in capital accumulation in 0.80 changes, implying that money supply has positive relationships with foreign direct investment.

3.2.2. Effect of Interest Rates on Foreign Direct Investment

The Keynesian and Monetarists views on interest rates dominate the debate on whether changes in interest rates have an impact on investment. One school avers that it has minimal impact on investment while the other school suggests that changes in interest rates have a significant effect on investment. Smith (1996) offers another significant viewpoint when she avers that the real interest rate is the price at which the supply of and demand for capital are equated where capital is supplied via saving, and is demanded for investment.

While the Keynesian school of thought believes that interest rate is primarily a monetary phenomenon that is determined by the supply of and demand for money, the Monetarists defend that interest rates are a function of the real economy determined by the supply and demand for loanable funds, a market which reflects actual opportunities and constraints in the investment sector.

The Keynesian school's changes in interest rates have minimal impact on investment and the demand for investment funds is interest inelastic. They envision that increased money supply lowers the interest rate, stimulating investment, employment, and hence gross domestic product, that leads to multiple rounds of increased spending and increased real income.

However, the Monetarists' changes in the interest rates causes far-reaching effects on investment. In this case, the demand for investment finance is interest elastic. The monetary school sees changes in the money supply as stimulating new and the old investment on real and financial assets, consumption goods, as well as investment goods.

Empirical evidence indicates that the interest rate has a negative effect on foreign direct investment because the decrease in interest rate creates the appropriate economic environment that prompts private sector to invest in the services sector by reducing the private sector's cost of production and hence raises the profitability of the private fixed investment in this sector. Using error correction model, Gaiotti and Generale (2001)

estimated the effect of interest rate on investment in Italy and they found a negative and significant effect, the elasticity was less than one (equal to -0.46) in absolute value.

It is clear that interest rates affect investment decisions and the critical ones in the case of Mozambique are deposit rate, bank lending rate, and Treasury bill rate. Therefore, this study will focus on the effects of the last two rates (bank lending rate and Treasury bill rate) on foreign direct investment.

3.2.3. Effects of Inflation rate on Foreign Direct Investment

The effects of inflation on economic development in general and specifically, on foreign direct investment, have been a major source of debate in economic and business literature. While some authors claim positive effects of inflation on FDI, others hold that inflation and FDI move in opposite directions so that, rapid increases in the rate of inflation bring about low FDI levels. For example, Byrne and Davis (2004) argued that higher rates of inflation tend to reduce the real rate of return on investments, leading to lower rates of investment. On the same token, Valadkhani et al (2009) using a threshold regression model did a study involving the asymmetric effect of inflation on real investment in Iran during the period 1960-2008. They found that real gross domestic product (GDP), openness, and inflation can influence investments asymmetrically. Moreover, they found that an annual inflation rate exceeding a threshold of 11.9% would have a negative effect on investment and an inflation rate below this threshold would raise aggregate prices, which in the long run, is likely to boost investments.

On the contrary, Srinivasan (2011) defends a positive and significant relationship between inflation and foreign direct investment. In his study about the determinants of foreign direct investment in selected South Asian Association for Regional Cooperation (SAARC) countries over the period 1970-2007, he found that states with higher inflation had higher price levels. According to him, this leads to an increase in the production activities of the host country and attracts investments from foreign firms, which consequently leads to an increased expected level of profitability. On the same token, Atesoglu (2005) found a positive relationship between inflation and foreign direct investment.

3.3. Relationship between Fiscal Policy and Foreign Direct Investments

Fiscal policy is a major tool of governments to effect changes in their economies, therefore, the way it is formulated and implemented has a great effect on the ability to attract foreign direct investment in the economy. The fiscal policy is concerned with taxes and government expenditure as reflected in the nation's budget, and both can affect the decision of FDI.

3.3.1. Effects of taxes on Foreign Direct Investment

Tax incentives are one of the major determinants of foreign direct investment. Many developing countries determine their tax rate and tax incentive packages (tax holidays, credits, etc.) in order to attract foreign direct investment. However, the results of research on the effect of tax as major determinants of foreign direct investment have caused controversy. Boskin and Gale (1986) studied the effects of tax policy on the international location of investment. They found that tax policies such as Accelerated Cost Recovery System (ACRS) and the Investment Tax Credit (ITC) in the short run after tax rate-of-return have positive effects on new investment and stimulate both domestic fixed investment and attract additional investment from abroad.

Taylor (2000) and Kumar (2002) found a positive effect of investment incentives and a negative impact of performance requirements imposed by the host country on inward FDI flows. Baum and Koester (2011), in their study about the impact of fiscal policy on economic activity over the business cycle, found that the fiscal multiplier resulting from an increase in taxes and social security contribution is -0.66.

3.3.2. Effects of Government Expenditure on Foreign Direct Investment

There are two categories of government expenditure: development and non-development expenditures, and the effect of government expenditure on foreign direct investment vary according to the category. Development expenditures mainly focus on infrastructure, health, and education and this investment can reduce costs of production of firms and consequently crowding in foreign direct investment. However, non-development expenditures as debt charge, social security can cause crowding in the foreign direct investment in terms of budget deficits, future taxes, and no complementary effect on investment. There is no consensus in terms of the effect of government expenditure on

foreign direct investment. For example, Edwards (1990) and Ancharaz (2002) reported government expenditure crowding out the foreign direct investment into host economy. The reason for negative effect is because a higher level of government expenditure can create opportunities for misuse of funds by government officials.

On other hand, Goodspeed et al. (2007) and Samargandi et al. (2015) found that government expenditure can cause crowding in the foreign direct investment since a higher level of government expenditure should translate into provision of more public goods, especially in education, health care, and infrastructure that should encourage production and growth. In another perspective, Wang (2005) using co-integration model analysed the effect of the government expenditure on the private sector of investment in Canada during the period 1961 to 2000. He found that government expenditure on health and education have a positive impact while expenditure on infrastructure has negative effects on private investment while other government expenditure has negative insignificant effects.

IV. Research Methodology

Research methodology can be defined as a scientific and systematic way to solve the research problem. In fact, it can be understood as a science of studying how research is done scientifically and it comprises all operational steps of the research process (defining and redefining problems; formulating hypothesis or suggested solutions; collecting, organising, and evaluating data; making deductions and reaching conclusions; and lastly, carefully testing the conclusions to determine whether they fit the formulated hypotheses)[4]. Researchers are required to choose from a multiplicity of methods, procedures, and models of research methodology to achieve the objectives. In this section, the various steps that are usually adopted for researching the effects of monetary and fiscal policies on foreign direct investment along with the logic behind them will be listed out.

The choices and decisions regarding the procedures and methods used in this part of the research take into consideration what the previous researchers have done and what problems they have faced, in order to give the researcher better conditions to select a methodology that can provide a valid answer to the research questions. This study employs quantitative research, which involves the collection of numerical data to answer a specific research question. Besides quantitative research, this study also used the exploratory

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[4] Kothari, C.R., (2004) "Research Methodology: Methods and Technics." New Age International (P) Limited, Second Edition

research. According to Kothari (2004) the exploratory research is useful for that research which starts at formulating a problem for more precise investigation or of developing the working hypotheses from an operational point of view.

4.1. Model Specification

After presenting the findings in the economic literature, was build an empiric model to study the effects of Monetary and Fiscal Policies on FDI in Mozambique case. Thus, the basic regression equation of FDI in Mozambique is structured as follows:

$$FDI_t = \alpha + \beta_1 MS_t + \beta_2 LR_t + \beta_3 TBR_t + \beta_4 IR_t + \beta_5 TR_t + \beta_6 GE_t + \varepsilon \qquad (4.1)$$

Where:

FDI - is the net Foreign Direct investment inflows during the period t;

MS – represents the Money Supply, and it is measured by the value of the money supply, it includes notes and coins in circulation, plus the total amount of deposits in foreign and domestic currency during the period t;

LR – is the Lending Rate as measured by 1-year bank lending rate during the period t;

TBR – is the Treasury bill rate as measured by 182-days treasure bills during the period t;

IR – is the Inflation Rate as measured by the variation of Consumer Price Index (CPI) during the period t;

TR – is the Tax revenue as measured by the value of fiscal taxes, which include taxes on income and profits, taxes on goods and services, customs duties and other taxes during the period t;

GE – is the Government expenditure as measured by the value of government expenditure, includes investment expenditure (new construction, maintenance, and major repairs), current expenditure, capital expenditure, and other expenditure during the period t;

$\beta_1, \beta_2, \beta_3, \beta_4, \beta_5$, and β_6 are the partial regression coefficients for the independent variables money supply, lending rate, Treasury bill rate, inflation rate, tax revenue, and

government expenditure, respectively. Their signs reveal the direction of the relationship between the independent variable and foreign direct investment;

t – is the time as measured by quarterly from the first quarter of 2005 to fourth quarter of 2015, and

ε – is the error term.

This six independent variables (money supply, lending rate, treasury bills rate, inflation rate, tax revenue, and government expenditure), as suggested by the previous studies, can help to achieve the objective of analyse the effects of the monetary and fiscal policies on foreign direct investment inflows in Mozambique. Therefore to capture the growth effect, the variables foreign direct investment, money supply, tax revenue and government expenditure are transformed into the natural logarithm form (Katircioglu, 2010)

4.2. Hypotheses

Based on the literature review, this study founds the following hypotheses;

H_1:. According to Resende (2008), an increase in money supply enhances the national economic position, which ultimately attracts further FDI. Thus, money supply has a positive effect on FDI. In this context, in equation (4.1), it is expected that the estimated coefficient on the money supply variable (β_1) is positively signed.

H_2: Gaiotti and Generale (2001) found a negative and significant effect of interest rate on investment in Italy. As this study is focused in estimate the effects of the lending rate and Treasury bill rate on FDI, then it is expected that , in equation (4.1), the estimated coefficient on the variables lending rate and Treasury bill rate (β_2 and β_3 respectively) are negatively signed.

H_3:. Srinivasan (2011) defends a positive and significant relationship between inflation rate and FDI. In this context, in equation (4.1), it is expected that the estimated coefficient on the variable inflation rate (β_4) is positively signed.

H_4: According to Boskin and Gale (1986), tax policies have positive effects on new investment and stimulate both domestic fixed investment and attract additional investment

from abroad. Then, in equation (4.1), it is expected that the estimated coefficient on the variable tax revenue (β_5) is positively signed.

H_5: According to Samargandi et al. (2015), government expenditure can cause crowding in the foreign direct investment since a higher level of government expenditure should translate into provision of more public goods, especially in education, health care, and infrastructure that should encourage production and growth. In this context, in equation (4.1), it is expected that the estimated coefficient on the variable government expenditure (β_6) is positively signed.

4.3. Analysis Procedures

This study applied Stata, one of the most popular econometric packages, which can be used for general statistical and econometric analyses, such as cross-section and panel data analysis, time series estimation, and forecasting. In this study, Stata is used to run the estimated vector error correction model and also to check whether or not the variables are stationary and/or cointegrated. Therefore, the study employed the Augmented Dickey Fuller Test to test stationarity, Johansen Test of Cointegration to determine the order or the number of cointegrating equations among the variables, Vector Error Correction Model to find the long and short run relationships between the variables.

To avoid the problem of heteroscedasticity and to ensure accurate estimation, best results, and capture the growth effect, the variables of foreign direct investment, money supply, taxes revenue and government expenditure are transformed into the natural logarithm.

4.3.1. Augmented Dickey Fuller Test (ADF)

Stationarity is one of the assumptions of the time series regression model. According to Gujarati (2011), time series is stationary when the mean and variance are constant over time and the value of the covariance between two time periods depends only on the distance or gap between the two periods and not the actual time at which the covariance is computed. If this condition cannot be verified, then the time series is nonstationary. Empirically, a lot of studies have shown that most of the macroeconomic variables are nonstationary at level, that is why these series tend to present moments of upward and or downward trends during a sustained period of time. Nonstationarity in time series

regression analysis can lead to serious problems such as the OLS estimators biased and forecast misleading.

To examine whether or not the time series is stationary, we used the Augmented Dickey–Fuller Test. If the results show that a time series has a deterministic trend, it can be made stationary by regressing it at the time or trend variable. The ADF test is used with following regression equation:

$$\Delta Y_t = \alpha + \beta Y_{t-1} + \sum \beta_2 Y_{t-k} + \mu_t \qquad \text{(Constant \qquad only)}$$
(4.2)

$$\Delta Y_t = \alpha + \beta Y_{t-1} + T + \sum \beta_2 Y_{t-k} + \mu_t \qquad \text{(Trend \qquad and \qquad constant)}$$
(4.3)

$$\Delta Y_t = \beta Y_{t-1} + \sum \beta_2 Y_{t-k} + \mu_t \qquad \text{(No \qquad trend, \qquad no \qquad constant)}$$
(4.4)

Where: Y_t is a time series; Δ is a first difference operator; T is a linear trend; α is a constant and μ is an error term. The t ADF test the null hypothesis of unit root (nonstationarity) against the alternative hypotheses of stationarity.

The guideline is if the value of t statistics is greater (in absolute value) than ADF critical value the H_0 of a unit root can be rejected, meaning that the time series under study is stationary. On the other hand, if the value of t statistics is less than ADF critical value, we cannot reject the H_0 of a unit root, meaning that the time series is nonstationary.

However, if any variable is found to be nonstationary then the test stationarity is in its first difference form. A series is stationary at differencing "d" and denoted as I (d). Differencing of time series variables can remove the nonstationarity in the variables. Other objects remain constant on the ground that such a process involves the loss of potential long run information about the data.

4.3.2. Johansen Test of Cointegration

As mentioned before, most of the macroeconomic variables are nonstationary series and this problem may lead the conventional technique of Ordinary Least Square (OLS) to yield spurious regression or nonsense regression. But, during the process to remove the nonstationarity problem (by differencing time series variable) from the series, some

information of the data about the potential long run will be lost. Thus, if each variable achieve stationarity after first differencing then cointegration technique must be used in order to get the information about the long run relationship between the variables.

The Johansen Cointegration Test was used to check if there exists relationship between a group of variables, and this implies testing the characteristic roots or eigenvalues of the π matrix (coefficients on the lagged dependent variable). When the variables are found cointegrated it is most probable that there exists an error correction term, a representation of the dynamic system governing the joint behaviour of the variables over time (Engle and Granger 1987).

Procedures use two tests to determine the number of cointegration vectors: maximum eigenvalue test and trace test. The maximum eigenvalue statistic tests the null hypothesis of r cointegrating relations against the alternative of r+1 cointegrating relations for $r = 0, 1, 2, …, n − 1$. While Trace investigates the null hypothesis of r cointegrating relations against the alternative of n cointegrating relations, where n is the number of variables in the system for $r = 0, 1, 2, …, n − 1$. Thus, if the maximum eigenvalue statistic test shows that two or more variables are cointegreted then the null hypothesis can be rejected.

4.3.3. Vector Error Correction Model

The Johansen Cointegration Test is used to check if there exists relationship among the group of variables, and this implies testing the characteristic roots or eigenvalues of the π matrix (coefficients on the lagged dependent variable). When the variables are found cointegrated it is most probable there exist an Error Correction term (EC) representation of the dynamic system governing the joint behaviour of the variables over time (Engle and Granger 1987). The vector error correction model is as follows:

$$\Delta Y_t = \alpha\beta'Y_{t-p} + \sum_{t=1}^{p-1} T \, \Delta \, Y_{t-p} + v + \delta t + e_t$$

(4.5)

Where: Δ is the first difference operator, α is the vector of adjustment parameters, β is the cointegrating vector that contains the long-run coefficients, $\alpha\beta' = \Pi$ that is the coefficient on the error-correction, v is a vector of exogenous that can be employed in the model, δ is a $K \times 1$ vector of parameters, δt is trend coefficient. For this study, the VECM will be specified as a following:

$$\Delta \log FDI_t = \alpha\gamma' \Delta \log FDI_t + \gamma_1 \Delta \log MS_t + \gamma_2 \Delta LR_t + \gamma_3 \Delta TBR_t + \gamma_4 \Delta IR_t + \gamma_5 \Delta \log TR_t$$

$$+ \gamma_6 \Delta \log GE_t + v + \delta t + \mu_t \qquad (4.6)$$

Whereas:

$\Delta \log FDI_t$ – is the first difference of log foreign direct investment at time t;

α – is the vector of adjustment parameters;

γ – is the cointegrating vector that contains the long-run coefficients;

$\alpha\gamma'$ - is the coefficient on the error-correction;

$\Delta \log MS_t$ - is the first difference of log money supply at time t;

ΔLR_t - is the first difference of lending rate at time t;

ΔTBR_t - is the first difference of Treasury bill rate at time t;

ΔIR_t - is the first difference of inflation rate at time t;

$\Delta \log TR_t$ – is the first difference of log tax revenue at time t;

$\Delta \log GE_t$ – is the first difference of log government expenditure at time t;

$\gamma_1, \gamma_2, \gamma_3, \gamma_4, \gamma_5,$ and γ_6 are the partial regression coefficients for the independent variables;

v – is a vector of exogenous that can be employed in the model;

δt - is a trend coefficient; and

μ_t – is the Error term.

The coefficients of error correction term provide long-run relationship among the time series variables. In this case, they will tell how the independent variables (log money supply, lending rate, Treasury bill rate, inflation rate, log tax revenue, log government expenditure) affect log FDI at time t. The short-run component of the model shows the dynamics of the monetary and fiscal policies over time, that is, how the independent variables at time t will affect the foreign direct investment at t+q, q=1,2,3…p.

The order of the variables in the VECM is fundamental. The foreign direct investment is first ordered because this study attempts to analyse the effect of all other variables on FDI. Therefore, testing for the effect of monetary and fiscal policies on foreign direct investment in Mozambique implies testing the hypotheses developed in section 4.2. Thus, if the coefficient of the error correction term is found to be negative and significant (less than 0.05), it mean there is stable and long run relationship among the variables.

4.3.4. Diagnostic Checking

The diagnostic checking is used to verify whether or not the estimated model is free from the econometric problems. Thus, after running the model, the researcher must conduct several hypotheses testing in order to validate the estimated model. Therefore, it is necessary to check and detect whether the model is normally distributed and free from autocorrelation.

4.3.4.1. Test for Normality

The normality test is used to check the null hypothesis that the error term of the model is normally distributed against the alternative hypotheses that the error term of the model is not normally distributed. If the error term of the model is not normally distributed, then the estimated model is biased and this can lead to use of invalid inferential statement and inaccurate predictions. Jarque-Bera Test is used to check the error term distribution.

4.3.4.2. Autocorrelation

Autocorrelation is a common problem to the analysis involving a time series data. It occurs when the value of u in one period is correlated with its value in the next period (Stock and Watson, 2013). Thus, the study used the Durbin–Watson test to check the null hypothesis that there is no autocorrelation problem in the model against the alternative hypotheses that there is autocorrelation problem in the model. If the results of the test suggest the existence of autocorrelation in a given case, then the researcher has to transform the original model to another one which does not suffer autocorrelation. It implies that the researcher must try several transformations such as the first-difference and generalized difference transformations in other to solve the problem.

4.4. Data Description

Time series data are data collected from a single entity at multiple points in time; can be daily, monthly, quarterly, or annually (Stock and Watson, 2013). It can be used to answer questions relative to dynamic causal effect between the independent variable and dependent variables, and also other questions related to economic forecasting. To analyse the effects of the independent variables on the FDI inflows in Mozambique, this study used quarterly time series data from the first quarter of 2005 to fourth quarter of 2015 which consists of 44 observations. Therefore, were obtained data on the indicators of money supply, lending rate, Treasury bill rate, inflation rate, taxes, and government expenditure from different entities. From the Bank of Mozambique (Central Bank of Mozambique), the principal sources are annual reports (2002-2016), the quarterly balance of payment statistics (2002-2016), monthly interest rates statistics (2002-2016), monthly monetary system statistics(2002-2016), monthly synthesis of the Bank of Mozambique (2002-2016), quarterly State Budget statistics (2005-2015) and the monetary policy. From Ministerio da Economia e Finanças (Ministry of Economics and Finance), the resource was the quarterly report on the implementation of the state budget (2005-2015), and monthly consumer price index statistic provided by Instituto Nacional de Estatísticas (National Statistics Institute) (2005-2016).

V. Econometric Analysis of the effect of the Monetary and Fiscal Policies on Foreign Direct Investment in Mozambique

This section presents econometrically the analysis of the effect of the monetary and fiscal policy on foreign direct investment in Mozambique. Being more specific, based on the methods mentioned in the last section we analyse the collected data in order to identify which independent variables significantly affect the FDI inflows in Mozambique. It was also necessary to figure out the relationship between the independent variables and the dependent variables, in order to fulfil the objectives and to test the hypotheses.

5.1. Unit Root Test Results

Before checking if the time series is stationary, we began to change the variables foreign direct investment, money supply, taxes and government expenditure into their respective logarithms. This was done because many economic time series exhibit growth that is approximately exponential with standard deviation approximately proportional to its level (Stock and Watson 2013). If so, the logarithm of the time grows approximately linearly and the approximation works best when the percentage change is small.

The second step involved a determination of the number of lags that can be used to estimate the model. The results of the lag length selection criteria are showed in table 1.

Table 1: Lag Length Selection Criteria

Selection-order criteria								
Sample**: 2006q2 - 2015q4**						Number of obs	=	**39**
Lag	LL	LR	df	p	FPE	AIC	HQIC	SBIC
0	64.3438				1.2E-10	-2.9407	-2.8336	-2.6421
1	304.0350	479.3800	49	0	7.4E-15	-12.7198	-11.8627	-10.3311
2	349.7590	91.4480	49	0	1.1E-14	-12.5518	-10.9448	-8.0729
3	451.5120	203.5100	49	0	1.6E-15	-15.2570	-12.9001	-8.6881
4	608.2580	313.4900*	49	0	4.5e-17*	-20.7824*	-17.6756*	-12.1234*

Note: * represents the lag order selected by the criterion (each test at 5% level)

LR: sequential modified LR test statistic

FPE: Final prediction error

AIC: Akaike information criterion

SC: Schwarz information criterion

HQ: Hannan-Quinn information criterion

All the criteria suggest the same thing, the number of lags in the estimated time series must be 4. Meaning that the number of lags that should be used to run the cointegration test is 4. Finally, it was checked if the univariate properties of all data series are determined to ascertain their degree of integration using the Augmented Dickey-Fuller (ADF) Test based on the null hypothesis that each variable has a unit root. The results are indicated in the table 2.

Variables	Level	ADF Test Statistic	Critical Value		
			1%	5%	10%
Log foreign direct investment	I (0)	-1.579	-4.242	-3.540	-3.204
	I (1)	-3.650*	-4.251	-3.544	-3.206
Log money supply	I (0)	-2.627	-4.242	-3.540	-3.204
	I (1)	-3.780*	-4.251	-3.544	-3.206
Lending rate	I (0)	-3.010	-4.242	-3.540	-3.204
	I (1)	-3.818*	-4.251	-3.544	-3.206
Treasury bills rate	I (0)	-2.266	-4.242	-3.540	-3.204
	I (1)	-3.593*	-4.251	-3.544	-3.206
Inflation rate	I (0)	-2.528	-4.242	-3.540	-3.204
	I (1)	-3.590*	-4.251	-3.544	-3.206
Log tax revenue	I (0)	-2.917	-4.242	-3.540	-3.204
	I (1)	-3.356*	-4.251	-3.544	-3.206
Log government expenditure	I (0)	-0.834	-4.242	-3.540	-3.204
	I (1)	-3.633*	-4.251	-3.544	-3.206

Notes: * = reject the H_0 at 5% significance level

The Augmented Dick-Fuller (ADF) Test is conducted based on the equation 4.2 (trend and constant) to 4 lags. The results indicate that all variables (log foreign direct investment, log money supply, lending rate, Treasury bill rate, inflation rate, log tax revenue and log government expenditure) have a unit root meaning that they are nonstationary at level. But when they are converted to the first difference I (1) they become stationary, implying the existence of an equilibrium relationship between the variables integrated individually to the same degree. Therefore the cointegration test was applied to determine the number of cointegrating relations.

5.2. Johansen Test for Cointegration

In the present context, the Johansen Test for Cointegration determines the number of cointegration vectors among a group of variables (log money supply, lending rate, Treasury bill rate, inflation rate, log tax revenue, log government expenditure, and log foreign direct investment). The results are presented in Table 3.

Table 3: Johansen Test for Cointegration

| Trend: rtrend | | | | Number of obs = | **39** |
| Sample: **2006q2 - 2015q4** | | | | Lags = | **4** |
maximum rank	parms	LL	eigenvalue	trace statistic	5% critical value
0	7	205.7709	.	201.1037	146.7600
1	21	242.9459	0.8297	126.7537	114.9000
2	33	265.5286	0.6588	86.5882*	87.3100
3	43	283.6153	0.5774	55.4149	62.9900
4	51	298.045	0.4970	26.5554	42.4400
5	57	306.9662	0.3461	8.7131	25.3200
6	61	310.3038	0.1470	2.0378	12.2500
7	63	311.3227	0.0474		

maximum rank	parms	LL	eigenvalue	max statistic	5% critical value
0	7	205.7709	.	74.3500	49.4200
1	21	242.9459	0.8297	45.1655	43.9700
2	33	265.5286	0.6588	36.1733*	37.5200
3	43	283.6153	0.5774	28.8596	31.4600
4	51	298.045	0.4970	17.8422	25.5400
5	57	306.9662	0.3461	6.6753	18.9600
6	61	310.3038	0.1470	2.0378	12.5200
7	63	311.3227	0.0474		

Note: * denotes the number of cointegrating equations at level of 0.05 significance.

Start by testing H: r = 0, no co-integration among the variables. If it is rejected, repeat for H: r = 1. When a test is not rejected, stop testing and that value of r is used as the estimate of the number of cointegrating relations. The trace statistic test indicated that H_0: r = 2 is not rejected at 5% significance level because the trace statistic at r=2 of 86.5882 is less than its critical value of 87.31. In other words, this trace test result does not reject the null hypothesis that there are two cointegrating equations.

The maximum eigenvalue statistic test indicated the same as the trace statistic, the H_0: r = 2 is not rejected at 5% significance level because the maximum eigenvalue statistic at r=2 of 36.1733 is less than its critical value of 37.5200. The final number of

cointegrated vectors with four lags is equal to two. Since the rank is equal to 2 for both statistics, then can be conclude that there are two cointegrating equations.

Cointegration implies that a long run relationship exists between two variables which move closely together. Thus, the cointegrated variable must to be modelled in vector error correction model in order to get the dynamics of short and long run.

5.3. Vector Error Correction Model

The presence of cointegration among variables suggest the speed of adjustment from the short run to the long run equilibrium state. As the model includes six variables, the VEC would be an equation system of five equations where each variable describe the short run adjustment of that variable towards the long-run equilibrium. The results of VECM are presented in table 4.

Table 4: Long Run and Short Run Parameters

Vector error-correction model (Cointegrating Equation1)

Long run parameters	L1.							
Error correction term	-1.1758*							
	(-0.2091)							
Short run parameters	D_logFDI	D_logMS	D_LR	D_TBR	D_IR	D_logTR	D_logGE	Const
dynamic response	0.1166	-1.1256	-20.98105	3.8094	0.2064	-0.8161	-0.2474	-0.0149
	(0.1591)	(2.1003)	(12.5009)	(6.3497)	(0.0562)	(1.9792)	(1.2571)	(0.1385)
	[0.7333]	[-0.5359]	[-1.6784]	[0.5999]	[3.6718]	[-0.4123]	[-0.1968]	[-0.1076]

$*$ = reject the H_0 at 5% significance level

The table above contains the estimates of the both short-run and long-run parameters, along with their standard errors in brackets. L1 is the coefficient of the error correction term (the speed of adjustment towards long run equilibrium) in cointegrating equation 1, when the foreign direct investment is a dependent variable. The error correction model (-1.1758) is found to be   statistically significant at level of 0.05 and negatively signed, implying that there is rapid adjustment toward equilibrium following an exogenous shock and the speed at which the disequilibrium is corrected at 117.584 percent one period later

or after one quarter. Thus, the lending rate, Treasury bill rate, inflation rate, tax revenue, and government expenditure has long run effect on the foreign direct investment in Mozambique.

In terms of short run dynamics, the vector error correction model points towards changes in the variables as being D_long foreign direct investment (0.12), D_long money supply (-1.13), D_ lending rate (-20.98), D_Treasury bill rate (3.81), D_ inflation rate (0.21), D_log tax revenue (-0.82) and D_log government expenditure (-0.1). The figures in brackets are indicative of the amount of disequilibrium that is corrected each quarter by changes in the variables from the short run to the long run.

The table 5 contains the estimated parameters of the cointegrating vector for this model, along with their standard errors and the adjustment coefficients, z statistics, p-value.

Table 5: Cointegrating Equation

Cointegrating Equation1: Log likelihood = 564.4656			
Dependent variable: foreign direct invest.			
Independet variables	**Coefficient**	**t- Statistic**	**Prob.**
log money supply	-	-	-
lending rate	-9.6718	-1.4080	0.0000
Treasury bill	-8.1911	-2.9900	0.0030
inflation rate	0.2717	7.2100	0.0000
log tax revenue	21.1111	11.4700	0.0000
log government expend.	-11.5755	-9.0400	0.0000
trend	-0.8215	-14.8200	0.0000
constant	-63.0427		
observations = 39	Mean dependent var = 9.7622		
R2 – value = 0.8554	S.D. dependent var = 1.7439		
Chi2- value = 317.6715	Akaike info criterion = -19.7162		
Schwarz criterion = -12.0382	Hannan-Quinn criter. = -16.9614		

Notes: * = reject the H_0 at 5% significance level

The long-run cointegrating equation was estimated as:

$$\log FDI_t = -63.04 - 9.67 LR_t - 8.19 TBR_t + 0.27 IR_t$$

$$+ 21.11 \log TR_t - 11.56 \log GE_t - 0.82t \qquad (5.1)$$

As the target of this study is to analyse the effect of the money supply, lending rate, Treasury bill rate, inflation rate, tax revenue, and government expenditure on foreign direct investment in Mozambique during the period 2005 to 2015, the discussion is centred on the cointegrating equation 1. The coefficients of lending rate, Treasury bill rate, inflation rate, log tax revenue and log government expenditure were found to be statistically significant at 5% level of significance, in long run. However, the coefficient of money supply was not observed in the model implying that the money supply cannot explaine the foreign direct investment inflow in Mozambique.

When the variables of the estimated cointegrating vector are in logarithms, the coefficients are interpreted as long run elasticities.

5.3.1. Effects of Money Supply on Foreign direct investment

This study proposed to examine the effect of money supply on FDI under hypothesis that money supply has a positive effect on foreign direct investment in Mozambique. The results of long run relationship have shown that the money supply cannot affect foreign direct investment in Mozambique, implying that there is no causality relationship among these two variables, in other words, money supply is not a determinant to attract a foreign direct investment into Mozambique. Therefore hypothesis that money supply has a positive effect on foreign direct investment is rejected.

Money supply is composed of cash and quasi cash, call, savings, and time deposits as well as certificates of deposits as determined by central banks. As mentioned by Harford (2005), the liquidity position of the economy positively affects the aggregate level of foreign direct investment, from a theoretical viewpoint, an increase in national liquidity should attract further FDI inflows, given that the cost of financing in the host country is then expected to be cheaper. However, in this case, the measure employed did not find any effect of money supply on foreign direct investment.

5.3.2. Effects of Lending Rate on Foreign direct investment

In terms of the hypothesis that lending rate has a negative effect on FDI. The estimated model is shown that lending rate has a negative and significant effect on foreign direct investment as elaborated by theory. The coefficient of lending rate is (-9.67) implying that there is a negative relationship between lending rate and foreign direct investment. An increase of 1 percentage point in lending rate results in a decrease of 9.67 percent in foreign direct investment. This result implies that decrease in foreign direct investment occurs as a consequence of increased in lending rate. Therefore, hypothesis that lending rate has a negative effect on foreign direct investment cannot be rejected. The short run dynamics demonstrated in table 4 indicate that quarterly -20.98 percent of the exogenous shock (disequilibrium) are corrected.

The existence negative relationship is consistent with other studies of Gaiotti and Generale (2001) who estimated the effect of interest rate on investment in Italy and they found a negative and significant effect.

5.3.3. Effects of Treasury bill rate on Foreign Direct Investment

As regards the hypothesis about the treasury bill, the long run relationship assessed through cointegration and error correction model was estimated as (-8.19), implying that there is a negative and significant effect running from treasury bill rate to the foreign direct investment. A 1 percentage point increase in Treasury bill rate causes a reduction of 8.19 percent on foreign direct investment. The short run dynamics proposes that a move towards equilibrium caused by the Treasury bills is 3.81.

Form Mozambican perspective, the study selected the lending rate and treasury bills to assess the effect of interest rates on foreign direct investment. The long-term effects of both lending rate and Treasury bill on foreign direct investment display the expected coefficient sign from theoretical literature. This signifies that increases in interest rates create inappropriate economic environment to foreign enterprises that would like to invest in Mozambique, because high interest rates increase the cost of production and hence reduce the profitability of the investment. Therefore the hypothesis that the interest rate has a negative effect on FDI cannot be rejected.

5.3.4. Effects of Inflation Rate on Foreign Direct Investment

In relation to the hypothesis about the inflation rate, the result of the estimated coefficient is 0.27. This means that there is a long run positive relationship between inflation rate and foreign direct investment. A 1 percentage point increase in inflation rate causes an increase of 0.27 percent on foreign direct investment. The inflation rate has a significant effect on the country's ability to attract foreign direct investment. In the short run the speed of adjustment is suggested as 0.21.

This result is consistent with the results of Srinivasan (2011), who verified that inflation is significant and has a positive effect on foreign direct investment. This suggests that higher inflation can lead to an increase in product price, which in turns decreases the demand for Metical (Mozambique's currency). Due to the depreciation of the Metical, the cost of capital is reduced and capacity to invest is increased, thus, Mozambique can attracts larger foreign direct investment.

5.3.5. Effects of Taxes Revenue on foreign direct investment

With regard to the hypothesis about taxes revenue, the result of the estimated coefficient is 21.11, implying that 1 percentage point increase in taxes revenue causes an increase of 21.11 percent in foreign direct investment inflows in Mozambique. This result is statistically significant at 0.05 level of significance. The short run dynamics show that -0.82 percent of the exogenous disequilibrium are corrected every quarter.

The positive relationship between taxes revenue and foreign direct investment is consistent with the finding of Boskin & Gale (1986), Taylor (2000), and Kumar (2002). The tax rates, tax incentive, and other benefits which the government of Mozambique provides to the multinationals have a positive effect on attracting foreign direct investment inflows.

5.3.6. Effects of Government Expenditure on foreign direct investment

Regarding the last hypothesis about government expenditure, the result shows that the estimated coefficient is -11.58, meaning that there is a negative and statistically significant effect of government expenditure on foreign direct investment in the case of Mozambique. An increase of 1 percentage point in government expenditure causes a reduction of 11.58 percent in foreign direct investment. Therefore the hypothesis that government expenditure

has a positive effect on FDI is rejected. In the short run the speed of adjustment is suggested as -0.25 percent.

This result is in agreement with the studies made by Edwards (1990) and Ancharaz (2002). They found government expenditure crowding out the foreign direct investment to host economy. This could be derived from the ineffectiveness of the Mozambican government expenditure, specifically in the priorities areas such as health, education, infrastructure, etc.

5.3.7. Effect of monetary and fiscal policies on foreign direct investment

The Table 5 shows the results of the Chi-squared test performed to test whether the independent variables have any effect on foreign direct investment. For the cointegrating equation 1, results revealed that χ^2 is 317.67, which is statistically significant at 0.05 level of significance, meaning that jointly lending rate, treasury bills rate, inflation rate, taxes, and government expenditure have significant effects on the country's ability to attract foreign direct investment.

5.4. Diagnostic Checking

The results of normality analysis performed to test check whether the error term of the model is normally distributed are contained in table 6.

Table 6: Normality Test (Jarque-Bera Test)

vecnorm, jbera

Jarque-Bera test

Equation	chi^2	Df	Prob $>$ chi^2
D_lfdi	1.8370	2	0.3992
D_lms	0.6630	2	0.7180
D_lr	0.5320	2	0.7665
D_t_bill	0.8600	2	0.6506
D_inf	0.6960	2	0.7062
D_ltax	0.4240	2	0.8090
D_lg	1.5200	2	0.4677
ALL	6.5310	14	0.9513

The results revealed that all the p-values are greater than 0.05, meaning that the residuals are normally distributed. Therefore the hypothesis that the error term of the

model is normally distributed cannot be rejected. The results of the autocorrelation analysis performed to test for the serial correlation are contained in Table 7.

Table 7: Autocorrelation Test

veclmar,mlag(4)

Lagrange-multiplier test

Lag	chi^2	df	$Prob > chi^2$
1	45.8213	49	0.60278
2	49.3716	49	0.45826
3	57.7819	49	0.1826
4	57.3182	49	0.19395

H_0: no autocorrelation at lag order

For all lag order the p-values are greater than 0.05, which reveal that there is no evidence of residuals serial correlation. Therefore the hypothesis that the no autocorrelation problem in the model cannot be rejected. The Tables 6 and 7 indicate that the estimated vector error correction model is acceptable.

VI. Conclusions and Implications

The purpose of this study was to analyse the effects of the monetary and fiscal policies on foreign direct investment inflow to Mozambique. It used the Vector Error Correction Model (VECM) estimation technique to get the long-run relationship between the independent variables – money supply, lending rate, treasury bills rate, inflation rate, taxes revenue, and government expenditure – and the dependent variable (foreign direct investment) in the Mozambican macroeconomic context.

All the variables were found to have unit root (non-stationary) at level, but when converted to first difference they became stationary. This study also revealed that, there is a long run equilibrium relationship between money supply, lending rate, treasury bills rate, inflation rate, taxes revenue, and government expenditure, and foreign direct investment in Mozambique, as shown by the trace statistic and the information criteria. The other finding was that, there exist two independent co-integrating equations (vectors) that describes this long-run equilibrium relationship between the independent variables and foreign direct investment.

In terms of the effect of the independent variable on foreign direct investment this study revealed that:

1. Unexpectedly, money supply does not affect foreign direct investment in Mozambique, meaning that the money supply is not an effective tool to use to determine foreign direct investment in the country;

2. Both lending rate and Treasury bills rate have a negative and significant effects on foreign direct investment, implying that the higher the interest rate the lesser the foreign direct investment inflows in Mozambique and vice versa. Interest rate is an effective tool that can determine the amount of foreign direct investment;

3. There is a positive, statistically significant relationship between the inflation rate and foreign direct investment. This implies that higher inflation rates can lead a rise in real foreign direct investment opportunities.

4. The existence of a statistically significant positive relationship between taxes and foreign direct investment, is because the Mozambican government offers tax incentives and others fiscal benefits to attract and stimulate foreign direct investment in the country that work on reducing unemployment;

5. The existence of a statistically significant negative relationship between government expenditure and the foreign direct investment inflow in Mozambique means that much of government's spending is allocated to non-development areas such as debt charge, social security, and others.

The findings of this study have important implications for Mozambique's economic development. First, the findings suggest that the level of interest rate (lending rate and Treasury bills rate) is something that is relevant. Therefore, Bank of Mozambique should be overly concerned with it, as the country seeks to attract and increase the foreign direct investment to the country. If the target is to attract FDI then the policymakers should reduce the interest rate.

Second implication of the finding is related to inflation rate, which in the long run leads to increase in foreign direct investment and boost economic growth. The Bank of Mozambique's objectives are price stability and inflation control. Therefore in order to attract larger foreign direct investment to Mozambique the policymakers has to increase the inflation rate and at the same time maintain price stability.

Third, the findings also suggest that the tax incentive and other benefits that the government gives to the multinationals can play important role on attract the foreign direct investment. Therefore the governmental authorities and policymakers should continue to increase their effort of provide tax incentive, remove the restrictions on the operation of foreign firms, simplification of company licensing processes and other benefits in order to attract FDI.

The final implication of the findings is related to government's expenditure, which if well allocated, actively managed, and consistently applied, could have different effects on foreign direct investment inflow in Mozambique. The governmental authorities and policymakers in their intention to increase the foreign direct investment should take into consideration how available funds are spent on development issues such as education, health, water, electricity, infrastructures, transport, and telecommunications.

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