# Foreign Direct Investment Determinants and Oman vision 2040

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**ABSTRACT**

The main role of FDI in the developing countries is achieving rapid economic growth. Determinants of Foreign Direct Investment were investigated by many researchers who found that it depends on the host country characteristics. This study aims to investigate the key determinants of FDI flows to Oman and examine the relationship of FDI with forecasting and causality relationship. The research hypothesis is based on examining Oman's FDI determinants which are Trade Openness, Inflation rate and GDP growth. The study's analysis depends on Vector autoregressive model (VAR), Granger causality and IRF. The simultaneous equations of capturing the FDI relationship with its determinants by 3SLS model are tested. The study found that export and import negatively influence FDI inflows to Oman at lag 2. In contrast, inflation and GDP growth positively influence FDI inflows to Oman at lag 2. Also, the degree of causality indicated that export, import and inflation rate are granger cause of FDI as well as GDP growth is a granger–cause of export. Furthermore, FDI, Export, and inflation rate are granger causes of Import and FDI, while Export, Import and GDP growth are granger causes of inflation Rate. The study is concluded by recommending the government to maintain the stability of country openness' factors and reform process of macroeconomic policies to ensure its stability towards achieving the target of FDI contribution in GDP by 2040.

**Key Words:**

Foreign Direct Investment, Oman Vision 2040, Determinants, Sultanate of Oman

**INTRODUCTION**

The Sultanate of Oman has fairly good record of attracting the RO $15.4$ billion of Foreign Direct Investment (FDI) flows in the year $2020$ (NCSI,$2021$). FDI flows are reported at $4.48$ percent of GDP. The FDI flows primarily directed towards oil and gas extraction activities and followed by manufacturing activities. Oman Vision $2040$ targeted to increase the percentage of FDI flows from current level to $7$ percent of GDP by $2030$ and $10$ percent by $2040$. Needless to say that policymakers are aware of the fact that the FDI flows can play a critical and important role in achieving economic growth, creation of job opportunities, diversifying the economy, and continuing the sustained path of economic development and towards achieving the objectives of the vision $2040$. The objectives can be achieved provided the constraints and barriers in attraction of FDI flows need to be removed. The developed and less−developed countries have the highest attraction of Foreign Direct Investment flows where developing countries are working to overcome attracting FDI barriers by many development strategies. The economic theory suggests that developed countries attract FDI through high−technology production while developing countries depend on low labor wages and low−technology production (Botrić, V. & Škuflić, L., $2006$). The main role of FDI in

developing countries is achieving rapid economic growth. FDI carries on many benefits to the host country in addition to the economic growth such as supplying capital, technology, management resources, and creation of employment opportunities to citizens. Oman vision $2040$ focuses on economic diversification and human resources development in which the FDI plays a major role. Oman is one of the countries which are heavily depending on Oil income and due to oil prices' fluctuations since $2015$ and Covid$-19$ pandemic, Oman's economy was influenced negatively. Recently, Oman's economy faced many challenges and consequences because of Covid$-19$ and low economic growth such as the shut-down of SMEs, layoffs, employee income decrease, Cutoff government expenses, etc. Oman's government is working hard to get out of this crisis by searching for solutions to enhance the economy as it is considered the engine of many sectors. Foreign Direct Investment has been investigated by many researchers who found that determinants of FDI depend on the host country's characteristics. Barring few exceptions, the literature or the research on the role and impact of FDI flows in Sultanate of Oman is restricted to establishing the relationship of FDI flows to several variables[1].

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[1] such as market size, inflation rate, corruption index, innovation, trade openness, exchange rate, corporate governance, economic and political stability, purchasing power, cost of doing business, natural resources, government expenditures, economic growth, financial, management and marketing factors.

By the second quarter of 2020, Oman had an FDI of RO 15.44 million by an increase of 13.2 percent compared to 2019 where FDI flow reached RO 13.642 million. The highest FDI inflow share was from the United Kingdom of RO 7,808.3 million, followed by the United States of America (RO 1,818.9 million), United Arab Emirates (RO 1,265.2 million), Kuwait (RO 933.5 million), China (RO 848.5 million) Bahrain (RO 436.1 million), Qatar (RO 404.8 million), India (RO 317.5 million and Netherlands (RO 337.4 million). FDI in Oman focuses on oil and gas extraction activities which acquired RO 9.89 billion while the manufacturing sector falls to RO 1.55 billion comparing to RO 1.64 billion in 2019 (Oman Observer, 2021). In 2019, the FDI inflow percentage of GDP in Oman reported at 4.48% comparing to 4.12% in 2017 (Trading Economics, 2021). Oman Vision 2040 targets to increase the percentage to 7% by 2030 and 10% by 2040. Table 1 (in appendices) shows the total Foreign Investment in Oman by Industry as per the report published by the Central Bank of Oman in 2019. Earlier studies on FDI in Oman focused on opportunities, challenges, factors influencing FDI, factors influencing FDI promotion, the importance of FDI to Oman economy, and the impact of FDI on economic growth (Omer A., Devesh s. & Shaukat M. (2017); Dalwai T., Mohammadi S. & Chugh G. (2014); Pauceanu A. (2016); Omer A. & Abdel-Gadir S. (2015);

Hussein M., Ahmed S. (2019). These studies have tried to study the factors responsible for FDI partially by examining the influence of some factors on FDI. Pauceanu A. (2016) has studied the determinants of FDI flows to Oman but the study focused on the Dhofar region as well as analyzing the Foreign Investment Promotion in which identified some determinants by using data throughout 1980-2003. According to the above, The literature justified the importance of investigating the determinants of FDI flows due to the importance and role of FDI in economic growth. The Micro and Macro economic factors having significant relationship with each other's. They are influencing each other directly and indirectly and one may be a cause of other variables. Inflation rate for example has a significant relationship with many other variables such as interest rate, exchange rate, wage rate, trade openness etc. Furthermore, Trade Openness has significant relationship with import and export rates. Also, FDI is better for economy development and growth. (Walsh & Yu, 2010) In this vision, this study aims to investigate the key determinants of FDI flows to Oman and examine the relationship of FDI and its determinants with forecasting and causality relationship. The FDI flows are critically linked with the cost-related factors, the investment environment improving factors, macro-economic factors, and the development strategy. The

research hypothesis of this study is built by examining Oman's FDI determinants which are Trade Openness, Inflation rate and GDP growth by adopting a distinguished method to fill the gap exciting in the literature review in Oman context. The literature shows strong empirical evidence of the selected variables for this study in influencing many country-level and macroeconomic factors. The distinguished contribution of this study is the forecasting model of FDI flows in Oman context through VAR model. This forecasting model (VAR) is a very helpful tool in describing the dynamic behavior of economic factors and time series. The casualty in the other hand is very useful to identify the causes factors toward achieving the desired changes in FDI flows. Impulse-response also strengthening the study outcomes by describing the reaction of FDI as a response to any changes of selected factors in a function of time. The hypothesis is critical play of an important role and can highly impact the objectives of the 2040 vision. The study significantly stands on supporting policy and decision-makers by identifying the most critical factors to attract more FDI, it's relationship and causality to improve FDI flow to match the 2040 targeted ratio of 10 percent of GDP.

**LITERTURE REVIEW**

Many researchers investigated the determinants of foreign direct investment and found that the determinants factors depend on the host company's characteristics (Botrić, V. & Škuflić, L., 2006; Mottaleb, K. 2007; Demirhan E. & Masca M., 2008). According to Mottaleb, K (2007), the main role of FDI in developing countries is achieving rapid economic growth. Although most of the developing countries are trying to increase their FDI inflows by adopting a liberal trade policy or providing investments incentives, not all of them success in this quest. By investigating the factors influencing FDI inflow in the developing countries using data for 60 low-income and lower-middle income countries, Mottaleb, k (2007) found that countries who have high GDP, high GDP growth rate, friendly business environment and modern infrastructure could successfully attract FDI.

Demirhan E., Masca M. (2008) conducted a cross-sectional econometric model to identify FDI factors inflows by using data of 38 developing countries throughout 2000-2004. The study used independent factors for FDI which are GDP growth rate, inflation rate, telephone mainlines per 1,000 people, labor cost, degree of openness, risk, and corporate top tax rate. The study showed that GDP growth rate, availability of telephone main lines, and degree of openness have a positive

sign to FDI inflows. On the other hand, inflation and tax rates have negative sign to FDI inflows. However, the study found that Labour cost and risk are not significant to FDI inflows. Recently, Asiamah, M., Ofori, D. & Afful, J. (2019) examined the determinants of FDI in Ghana throughout 1990 and 2015. Their analysis indicates that both in the long-run and short-run inflation rate, exchange rate, and interest rate have negative effect on FDI flows. Furthermore, there is a positive effect on FDI by gross domestic product, electricity production, and telephone usage (TU). Çeviş, İ, & Çamurdan, B. (2007) studied the economic determinants of FDI inflows. The study used data from 17 developing countries from 1989 to 2006. The study found that the main economic determinants of FDI inflow are inflation rate, interest rate, growth rate, and trade (openness) rate. Botrić, V., Škuflić, L., (2006) stated that FDI inflows determinants in the host country may be grouped into three main categories which are economic policy, performance, and attractiveness. In Oman context, Omer A., Devesh s. & Shaukat M. (2017) found that market size, inflation rate, corruption index variable, and freedom of trade index are the most important variables motivating FDI in Oman. The study argued that FDI flows increase as there is a low inflation rate and corruption freedom index. Furthermore, Trade freedom and GDP per capita have a positive influence on FDI

inflows in Oman. According to Dalwai T., Mohammadi S. & Chugh G. (2019), innovation, trade openness, exchange rate, inflation rate, and corporate governance does not have any impact on FDI. This study was depending on 2007 − 2016 data which was examined through pooled regression analysis. Pauceanu A. (2016) examined the factors related to foreign investment promotion within Dhofar Governorate. The study found that factors that motivate foreigners to invest are Economic and political stability, high purchasing power, big market size, and low cost of doing business. The study indicates that Oman's government offers many incentives to promote foreign investment such as lower tax rates, free zones, business incubators, etc. Omer A. & Abdel−Gadir S. (2015) studied the foreign direct investment in Oman throughout 1980–2013 to investigate the motives and determinants of FDI in Oman. The study analysis used Cointegration and vector error correction model (VECM) approach. The study found that Oman's FDI flows are positively influenced by market size and natural resources. On the other hand, it is influenced negatively by the inflation rate and degree of openness. Furthermore, the study used the Granger causality test and found that FDI flows to Oman are characterized by market−seeking and resource−seeking motives. Hussein M. & Ahmed S. (2019) used many variables to explain FDI in Oman for

the period 1994-2014. The study focused to find out the relationship between FDI and economic growth by using multiple regression analysis. The study found that FDI has a great positive impact on economic growth. Also, there is a bidirectional relationship between FDI and GDP. Al Shubiri F. (2016) utilized the data for the period of 2005-2014 to examine the influence of economic, financial, management and marketing factors on FDI in Oman. The study used Pearson correlation and a linear regression test to examine the relationship and found that there is a statistically significant relationship and impact of GDP annual growth, fiscal balance, and investment expenditure, income velocity of broad money, and trade balance on foreign direct investment. On the other hand, there is a low significance of bank deposits on foreign direct investment.

Salma, Hasan and Sultana (2020) identified the factors that influence GDP growth in Bangladish by conducting analyses on data from the World Bank Development Indicator (WDI). The researchers conducted multiple stepwise linear regression in the analysis. The results showed that out of 1433 factors, only six factors are significantly correlated with GDP per capita which are merchandise trade, gross domestic savings, gross savings, final consumption expenditure, foreign direct investment and net income from abroad. Barro, R. J. (1999) analyzed the

determinants of GDP growth in panel of countries and suggested that GDP growth

is linked positively with rule of law and investment ration, while it is linked negatively

with government consumption and inflation rate. Furthermore, it increases with the

increase in trade openness.

Many researchers found that Trade openness has a significant positive impact on

FDI. Economies with liberal trade relationships are usually able to attract more

investors. Frankel and Romer $(1999)$ analyzed the differences in economic growth

in $150$ countries and found that opening the economy could result in providing

products and services more efficiently by shifting production to economies with

comparative advantages and therefore increase the standards of living. When

countries trade more, citizens can get higher incomes, which will make their lives

better. Peizhi and Bangash $(2020)$ analyzed the effect of trade openness in $10$

emerging economies using data for the period $1997 - 2018$ through random effect

technique and found that it has a major positive impact on the amount of FDI

flowing into these economies. They argued that the FDI inflows could increase if

the trade openness was accompanied with friendly business environment, existence

of big consumption market, proper infrastructure, liberal global trade policies and

weak currency. Based on the above, countries who wish to have more FDI inflows

should adopt an open policy with tax incentives, removal or reduction of tariff barriers, improved infrastructure, flexible policy schemes and stable microeconomics. Brahim and Souria (2017), using a Structural Equation Model basing on the path analysis, concluded that the size of the market as long as trade openness have direct effect on FDI inflows in Africa. Selimi, Sadiku and Sadiku (2016) analyzed that trade openness has a significant positive effect on increasing the economic growth of Macedonia. The results were obtained though analyzing the data for the period 1998 − 2015 by using Johansen co−integration to check the relationship's nature while using Granger causality test to identify the direction of causality. Lal (2017) asserted that FDI was promoted in India, China and Mexico by using export−processing zones (EPZs). The case of India clearly shows that openness is vital for encouraging FDI inflows. When India liberalized importing in 1992, it resulted in a noticeable increase in FDI. Foreign investors believed that it is a sign that India can be their choice of investments. Degree of trade openness in an economy is assessed by the share of imports and exports in GDP. Multinational corporations (MNCs) with export goals locate their supply chains in countries with more open economy as having higher trade barriers increase the cost of their export operations (Jadhav, 2012).

There are some macroeconomic factors that influence the trade openness. Tahir, Hasnu and Ruiz Estrada, (2018) examined these factors using a sample of the members of The South Asian Association for Regional Cooperation (SAARC) for the period 1971 − 2011. They found that the factors are capital, per capita GDP, labor force and exchange rate. There is a positive relationship between investing in physical and human capital, and trade openness. They proved that enhancing openness is supporting the progress of capital in the long term, both physical and human. The results showed that the higher the per capita GDP, the higher the trade openness. On the other side, there is a negative relationship between the level of labor force development and skills and the trade openness level. Finally, stabilizing the exchange rate is crucial for the sustainable trade openness in any economy. The more volatile the exchange levels, the less confidence international traders have in the economy, which may disrupt the trade openness. Governments should enhance their level of trade openness by properly managing the mentioned macroeconomic factors.

Inflation rates fluctuations create obstacles to reach stability in the worldwide economy; therefore, many countries implement inflation policies to secure price stability. According to Musarat et.al. (2021) each of interest rate, wage rate, money

supply, exchange rate, trade openness and more factors should be considered while evaluating the impact of inflation rate on an economy. A study conducted by Alshams et. al. (2015) about UAE economy illustrated that inflation rates would have either negative or positive impact on economic growth rates and FDI roles in a country, that's only if inflation rates are not exceeding a certain percentage. Besides that, foreign investors will be interested to invest in a country where clear information about people purchasing power is provided, so governments should ensure that inflation rates are stable, and the provided information is up-to-date. In order to secure inflation rates stability and promote consumers' confidence toward future purchase power, Central Banks should make inflation expectations available for different market players. There are various ways to conduct inflation expectations; one of these ways is to analyze pervious and present rates and forecasting future data (Mohanty, 2012). A study conducted in Amman stock market about the impact of several factors influencing levels of FDI in the country presents the relationship between inflation rates and FDI. High inflation rates can reduce the number of foreign investors in the country. Foreign investors avoid dealing with countries with high inflation rates, because this can possibly present a disruption in the economic system (Qaraan, 2020).

Čaklovica and Efendic (2020) provided an empirical analysis of inflation determinants of in 28 European countries by using dynamic panel method. They argued that the determinants are divided into two groups, (1) structural variables, such as the unemployment rate, real wages' growth and (2) institutional variables, including Oil and food prices. Madito and Odhiambo (2018) conducted a study to identify the determinants of inflation in South Africa using quarterly data for the period 1970 − 2015 using Error Correction Model (ECM) modelling techniques. The study found that there is a positive relationship between inflation expectations, labor costs, government spending and price of import and inflation rates. While there is negative relationship between GDP, exchange rates and inflation.

Most countries face a challenge to determine and implement the exchange rate policy towards enhancing its currency value within the global economy. Countries differ between fixed and flexible exchange rates preferences according to given conditions. As determined by a study conducted in Harvard University by Cooper,R. (2017) economies are not able to promote a fixed exchange rate with free movement of capitals and independent monetary policy because that will allow other countries monetary conductions to play a role on impacting the country's monetary policy. Therefore, flexible exchange rates are more preferred in many countries.

Flexible exchange rates enhance economic stability through facilitating economic outputs and inflation management. Moreover, research by Kisu, S (2010) stated that highly developed markets have better economic performance by managing the flexible exchange rates system. The closer these countries are moving toward flexible rates, the higher development levels they can reached. However, the framework of the country's monetary policy should be used to determine the most applicable exchange rate regime according to its macroeconomic structure. Kosteletou and Liargovas (2000) had an equation module to examine the impact of flexible exchange rate on FDI in a many industrial countries. The results showed that flexible exchange rate (ER) can encourage the FDI inflow. Exchange rate regime didn't show any direct influence on the level of foreign direct investment. This is according to Barnor, Nketiah-Amponasah & Nyarko (2010)'s research. Moreover, Moraghen, Seetanah & sookia (2019) did an analysis on 101 studies about the impact of exchange rate on FDI and found that the exchange rate impact level is low if property rights, trade openness and human capital are in high levels. Adding to that, they suggested countries should report estimation choices, specifications, and analyzing sensitivity to reach better level of impact on FDI.

Political stability is the political regime's ability to overcome catastrophes and to be resilient while facing any undesirable circumstances and national disputes by peaceful means only, as violence is one of the qualities of the instable systems. Generally, people prefer the stable political systems as they provide the safety and growth. ( Abdulrahman & Saif, 2019) They analyzed the relationship between political stability, absence of terrorism/ violence and FDI in the Arab countries and found it to be positive. FDI flows are more in the stable Arab countries

In their study, Brahim and Souria (2017) found that political stability has a positive impact on African FDI. On the other hand, in study of political stability as a determinant of FDI. On the other hand, Cieślik & Gurshev (2020) disagreed with the fact that the realtionship is positive, as they argued that there is no relationship between the two vaiables in the case of the Ukranian economy. They concluded that reducing entry barriers can be more effective in attractive foreign investments. Zablotsky (1996) noted that the relationship between political stability and FDI should be understood in both ways. Instability of the political systems results in uncertain economic conditions, which consequently negatively affect securing intellectual property rights and economic growth. The instability may demotivate the MNCs to remain or invest in such economies, which leads to negative FDI flows.

Political stability is a major perquisite for developed countries to attract developing economies' FDI flows. They prefer to invest in countries with reliable and secure political systems. The same applies to developing economies (Groznykh, Mariev, Plotnikov, & Fominykh, 2020) if they wish to attract FDI from developed countries. It is necessary to have a secure and stable political regime to become attractive for the investors. (Groznykh, Mariev, Plotnikov, & Fominykh, 2020)

In the same regard, Arab, Abdulrahman and Saif (2020) argued that Arab countries should pave the way for foreign investment inflows and sustain national investments inside the countries by creating an attractive environment by enhancing the political stability, reducing violence and by waging a war against terrorism.

FDI determinants are market size, inflation rate, corruption index, innovation, trade openness, exchange rate, corporate governance, economic and political stability, purchasing power, cost of doing business, natural resources, government expenditures, economic growth, financial, management and marketing factors. The study focuses on examining trade openness including imports and exports rates, inflation rate and GDP growth as determinants of FDI in Oman. Other variables are excluded from examination such as exchange rate market size, corruption index, innovation, corporate governance, economic and political stability, purchasing power, cost of doing business, natural resources, government expenditures, economic growth, financial, management and marketing factors. These excluded factors were examined already in other studies. The selected factors have direct

and indirect significant relationship with FDI in Oman. According to literature analysis, the selected variables has relationship with many micro and macroeconomic variables. To summarize, trade openness is affected by physical and human capital, per capita GDP, labor force and exchange rate. Determinants of inflation rate are unemployment rate, real wages' growth, oil and food prices, inflation expectations, labor costs, government spending, price of import, GDP and exchange rates. GDP growth is determined by group of factors including merchandise trade, gross domestic savings, gross savings, final consumption expenditure, foreign direct investment and net income from abroad. The determinants of FDI are summarized in the following figure (figure 1).



**Inflation Rate**
- Unemployment Rate
- Real Wages' Growth
- Oil And Food Prices,
- Inflation Expectations
- Labor Costs
- Government Spending
- Price Of Import
- Gdp
- Exchange Rates

**Trade Openness**
- Physical And Human Capital
- Per Capita GDP
- Labor Force
- Exchange Rate

**GDP Growth**
- Merchandise Trade
- Gross Domestic Savings
- Gross Savings
- Final Consumption Expenditure
- Foreign Direct Investment
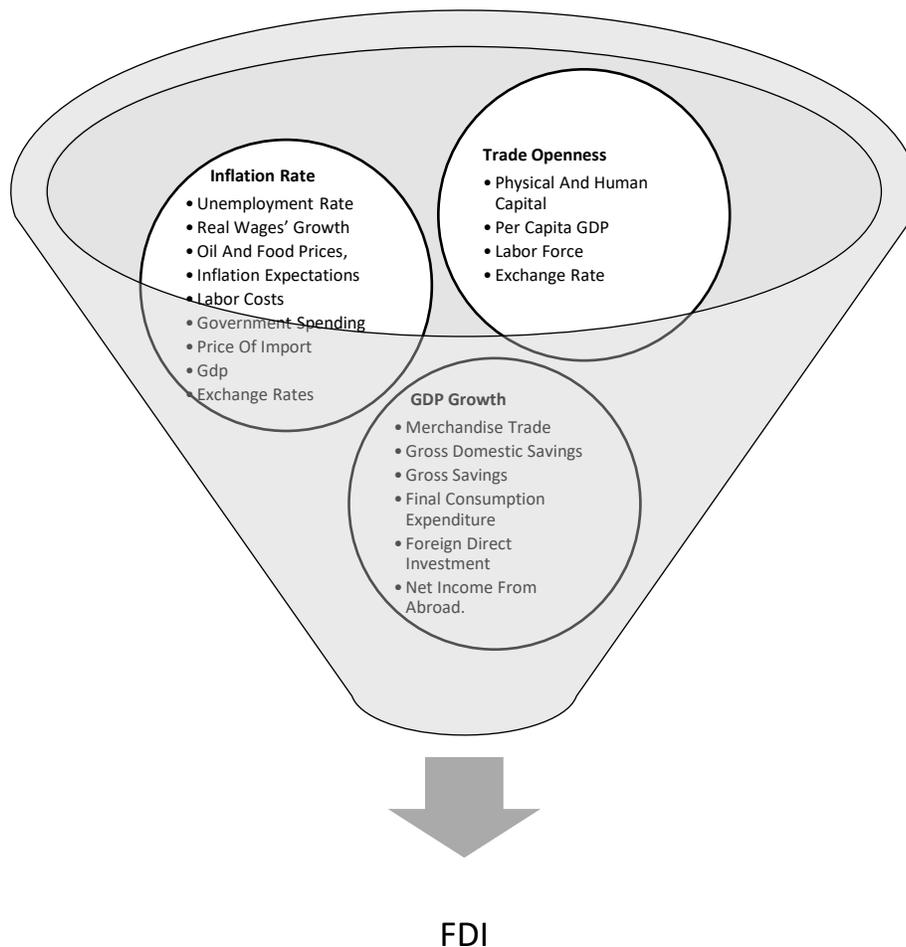- Net Income From Abroad.

FDI

Figure 1: Theoretical framework of FDI determinants (Source: Authors)

## RESEARCH METHODOLOGY

This study's analysis depends on Vector autoregressive model (VAR). Many researchers applied VAR model due to its ability to forecast the current and future changes by using historical data of the series. (Vujanović, Casella, & Bolwijn, 2021; Liu & Lee, 2020; Wijeweera & Mounter, 2008; Sayed, 2018; Turolla & Margrido, 2011) It is very useful model for multivariate time series. The idea of univariate autoregression is extended through VAR model to kk time series regressions as well as the values of all kk series showed as regressors (The Pennsylvania State University, 2021). One of the main advantages of using VAR model in analysis is useless of identifying the endogenous variables and exogeneous variables as it considered all as endogenous variables (Triacca U., 2021). Furthermore, the Granger causality applied for the purpose of identifying which variables have predictive content to forecast the determinants of FDI flows (Granger, C. 1969). Granger causality is very helpful to define the direction of

possible causality among a set of variables (Johansen, S. 1995). The assumption of VAR model variables is stationary and ergodic (Johansen, S. 1995). According to the earlier literature, determinants of FDI flows are impacted through four main categories which are: (1) the cost related factors, (2) the investment environment improving factors, (3) macro-economic factors and (4) the development strategy. The research hypothesis of this study has been built by examining Oman's FDI determinants which are Trade Openness, Inflation rate and GDP growth. The simultaneous equations of capturing the FDI relationship with its determinates is determined by 3SLS model. Hausman test result found that fixed effects regression is appropriate for this study. The study model is presented in equation 1 with fixed effect. The variables description and data source are presented in table 2 (in appendices).

Equation 1: $FDI_t = \beta 0 + \beta_1 Inflation_t + \beta_2\ GDP\ Growth_t + \beta_3 Import_t + \beta_4 Export_t + \alpha_t + e$

**THE RESULTS**

**Time Series Unit Root Test**

Time series unit root test is for analyzing the stationarity of the data in a time series. It is checking the stochastic trend of a time series data. Issues such as Spurious regressions and Errant behavior can appear with existence of unit roots as well as

unpredictable systematic pattern. The Dickey Fuller Test used for this purpose (Glen, 2016). Table 3 (in appendices) shows the result which indicated that variables data are stationary at first level as the p-value is less than $0.05$ for all variables. The lag-order selection statistics for VARs has been applied to pre-estimation command before performing Johnson Co-integration test. Table 4 (in appendices) shows that the likelihood-ratio and AIC selected four lags whereas FPE, HQIC and SBIC has selected zero lags model. (Lutkepohl, 2005)

The cointegrated variables of the study model analyzed by Johnson Co-integration test. Johansen's test uses the maximum likelihood estimates approach to evaluate a cointegrating relationship validity as well as finding the number of relationships. (Wee & Tan, 1997) Table 5 (in appendices) shows the result of Johansen tests for cointegration. The result indicates that there is one or fewer cointegrating equation as the trace statistic at r = 0 of $98.6109$ is greater than critical value of $68.52$. Similarly, at r = 1 the trace statistic ($17.581$) is greater than critical value of $47.21$. Additionally, Max statistic is more than critical value at r = 0 and r = 1. According this result, the Vector Auto regression can be performed.

**Vector Autoregression**

The Vector Autoregression (VAR) model adopted to analyze and assess the current variable observations with past observations of itself as well as other variable past observations. It is distinguished by allowing feedback to be among model variables (Erica, 2021). Table 6 & 7 (in appendices) shows the result of Vector Autoregression. The result indicates that model equations are statically significant except export equation as p value is more than $0.05$. Additionally, the result shows that export and import are influencing negatively the FDI with coefficient value of ($-0.13378$ and $-0.06968$) respectively) at lag $2$. In contrast, inflation and GDP growth are influencing positively the FDI with coefficient value of ($0.268383$ and $0.180826$) respectively at lag $2$. The VAR model stability has been analyzed by performing Eigenvalue stability condition. The result indicates that all eigenvalues lie inside the unit circle of less than $1$. The residuals diagnostics of estimated model result presented in figure $2$ which clearly indicates that residuals are within error mean. Furthermore, the result of Lagrange-multiplier test confirmed that estimated model has no autocorrelation at lag order as p-value is greater than $0.05$.
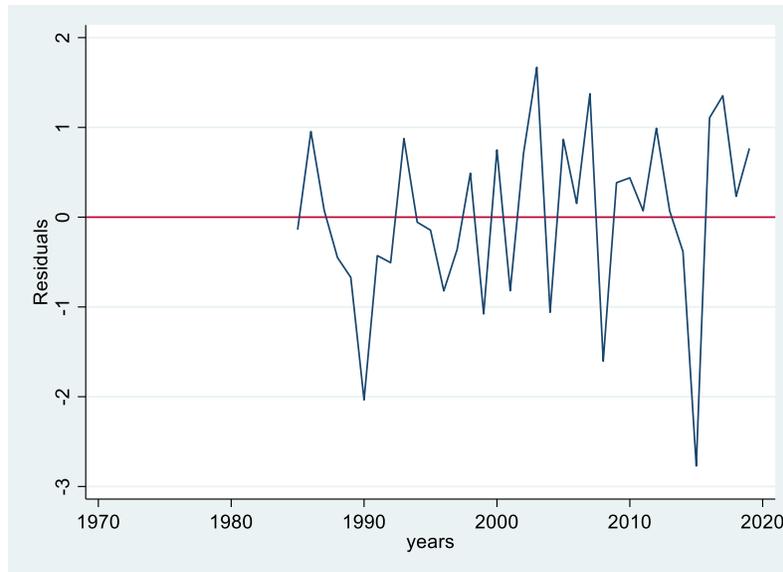
Figure2: The residuals diagnostics of estimated model

**Granger causality test**

The Granger causality performed to identify the helpfulness of one variable Granger-cause another variable (Erica, 2021). Table 8 (in appendices) shows that export, import and inflation rate are a granger cause of FDI as p-value are less than 0.05. Also, GDP growth is a granger cause of export. Furthermore, FDI, Export, and inflation rate are granger cause of Import. Finally, FDI, Export, Import and GDP growth are granger cause of inflation Rate.

**Impulse-response function (IRF)**

Impulse-response function (IRF) used to identify and describe the reaction of a dynamic system as a response to any external change in a function of time. (United Nations, 2021) Figure 3 shows that a one SD shock to Export, import and inflation temporarily increases FDI. This positive response gradually declines until $2^{nd}$ period when its hits it's steady value. between $5^{th}$ and $9^{th}$ period, a fluctuation in positive and negative regions. Beyond period $9^{th}$, FDI rises above its steady state value and remains in the positive region.
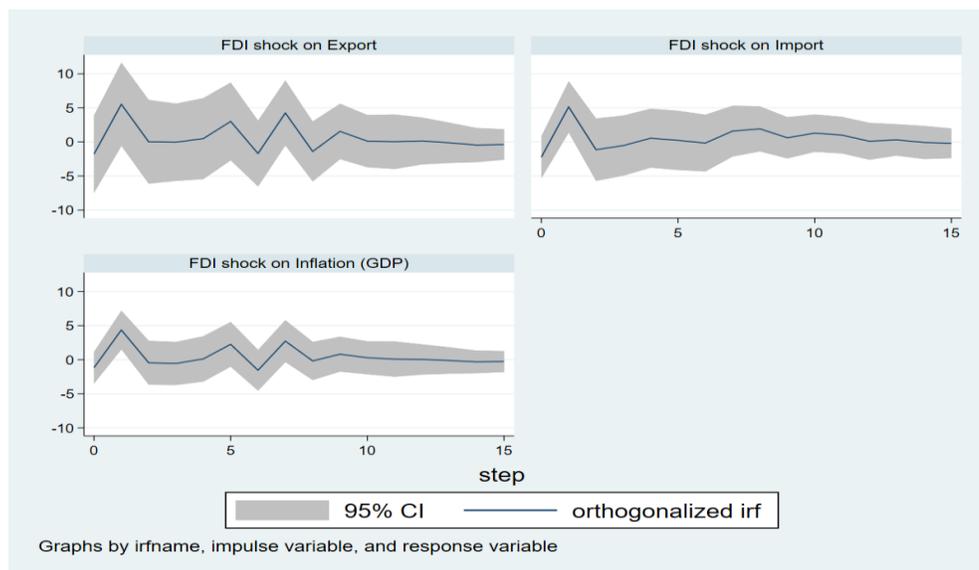


Figure 3: FDI shock on Export, Import and Inflation Rate variables

Figure 4 shows that a one SD shock to Export temporarily decrease GDP growth. This negative response gradually decreases until 2nd period when its hits it's steady value. Between 3rd and 9th period, a fluctuation in positive and negative regions. Beyond period 9th, export rises above its steady state value and remains in the positive region.



Figure 4: GDP Growth shock on Export

Figure 5 shows that a one SD shock to Export temporarily increases Import. This positive response gradually declines until 2nd period when it hits the negative region. between 3rd and 9th period, a fluctuation in positive and negative regions. Beyond period 9th, FDI rises above its steady 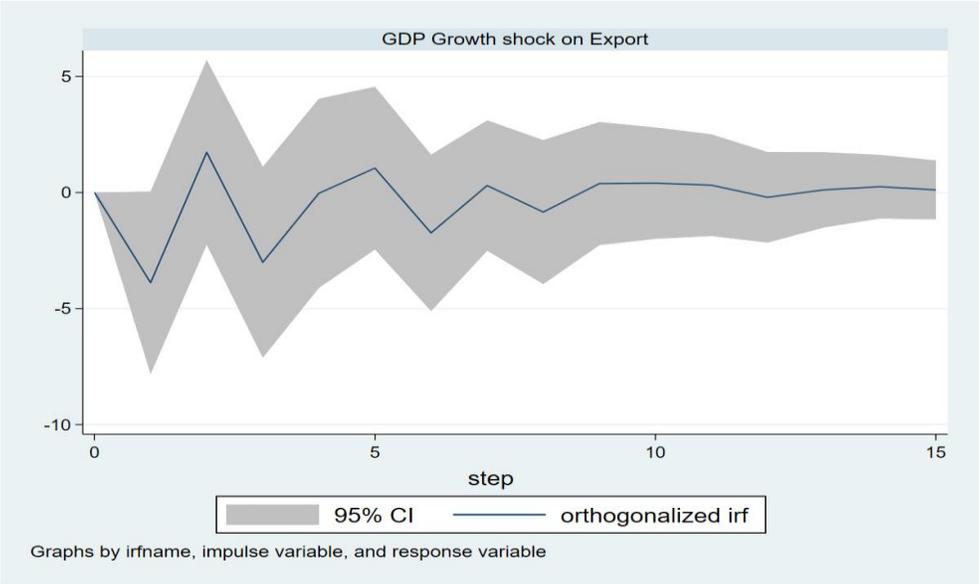state value and remains in the positive region. Furthermore, a one SD shock to FDI temporarily maintain within steady state value of import. A negative response gradually increases between 2nd and 3rd periods. Beyond 3rd period, import rises above its steady state value and remains in the positive region. In contrast, a one SD shock to inflation temporarily decrease Import. This negative response gradually increases until 2nd period when its hits it's steady value. between 3rd and 9th period, a fluctuation in positive and negative regions. Beyond period 9th, import rises above its steady state value and remains in the positive region.

Figure 5: Import shock on Export, FDI and Inflation Rate variables

Figure 6 shows that a one SD shock to Export temporarily increases Inflation rate. This positive response gradually declines until 3rd period when its hits it's steady value. between 4th and 10th period, a fluctuation in positive and negative regions. Beyond period 10th, inflation rises above its steady state value and remains in the positive region. Furthermore, a one SD shock to FDI temporarily maintain within steady state value of inflation rate with slight increases until period 4th. Beyond 4th period, inflation remain within its steady state value in the positive region. Also, a one SD shock to GDP growth temporarily decreases inflation. This negative response gradually decreases until 2nd period when it hits its steady value. Beyond 3rd period, inflation rate rises above its steady state value and remains in the

positive region. Finally, a one SD shock to import temporarily decreases inflation. This negative response gradually decreases until 2nd period when it hits its steady value and start influencing positively. between 4th and 9th period, a fluctuation in positive and negative regions. Beyond 10th period, inflation rises above its steady state value and remains in the positive region.
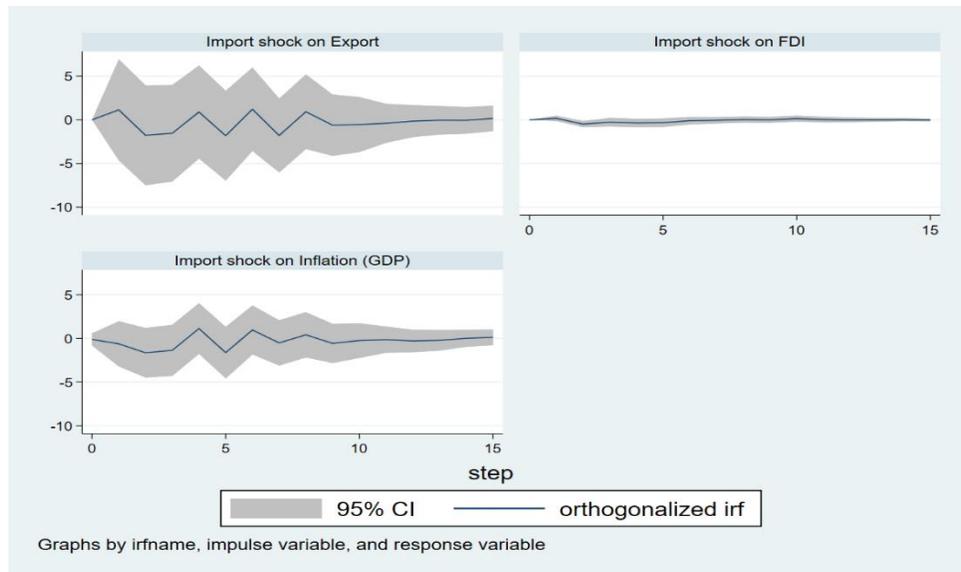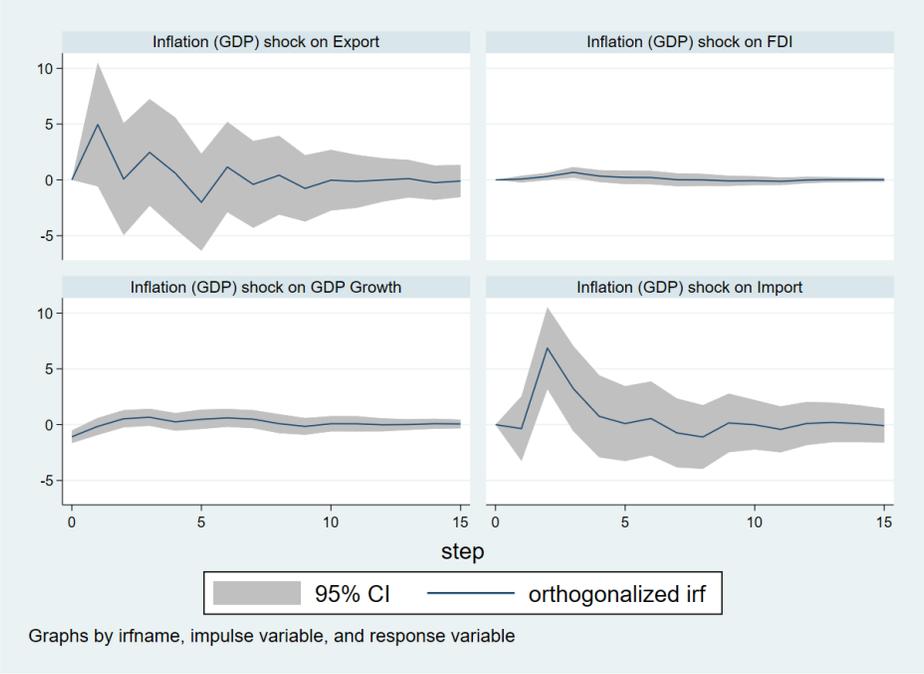


Figure 6: Inflation Rate shock on Export, FDI, GDP Growth and Import variables

**CONCLUSION & RECOMMENDATION**

The study aims to investigate the key determinants of FDI flows to Oman and examine the relationship of FDI and its determinants with forecasting and causality relationship. The study used Trade Openness, Inflation rate and GDP growth which has strong empirical evidence in literature in influencing FDI flows as well as causes of doing changes in several country-level and macroeconomic factors. The study methodology depended on Vector Autoregression model to investigate the FDI determinates and describing the dynamic behavior of economic factors and time series. Also, The Granger Causality utilized to identify the causes factors of attracting FDI flows to Oman as well as Impulse-response to describe the reaction of FDI flows as a response to any changes in the used factors in a function of time. The Johansen results for cointegration indicated that there is a cointegrating equation. Also, The result shows that GDP growth and inflation rate positively influence FDI inflows to Oman at lag 2. This means that any increase in GDP growth and inflation will affect positively in FDI rate into GDP in Oman (GDP growth = 18.08% and inflation rate= 26.83%). The literature supported the positive contribution of GDP growth in attracting more FDI flows but Oman's historical data indicated positive relationship with inflation rate in which many studies found that

inflation has negative impact in attracting more FDI. Inflation rate is associated with many factors such as interest rate, exchange rate, wage rate, trade openness etc. in which the policy makers may review the policy direction of controlling the inflation rate in Oman. In contrast, export and import negatively influence FDI inflows to Oman at lag $2$. This means that any increase in import and export will affect negatively in FDI rate into GDP in Oman (Export = $-13.378$ % and Import = $-6.968$ %). This refers that Oman's historical data leads to negative relationship of trade openness with FDI flows. This result against the literature in which the trade openness has a positive relationship with FDI. The degree of causality results indicated that export, import and inflation rate are granger causes of FDI. This refers that Trade Openness and Inflation rate are contributing in changing FDI flows to Oman. This is leading that enhancement of FDI flows can be achieved through improving the contribution of Trade openness and Inflation rate. Also, GDP growth is a granger cause of export. This means that can be enhance export through improving GDP growth. Furthermore, FDI, Export, and inflation rate are granger cause of Import. This means that Import can be enhanced by enhancing the contribution of FDI, Export, and inflation rate. Additionally, FDI, Export, Import and GDP growth are granger cause of inflation Rate. The IRF results indicated that

changes in Export, import and inflation temporarily increases FDI. This positive response gradually declines until 2nd period then a fluctuation in positive and negative regions between 5th and 9th periods and beyond period 9th, FDI rises above its steady state value and remains in the positive region. Since, the empirical results indicate that export, import and inflation rate factors are determinants and causes in attracting FDI flows in Oman in the short and the long run. The government needs to maintain the stability of country openness and reform the process of macroeconomic policies to ensure its stability. The decision-makers are required to reform Export, import and inflation rate policies' direction due to its role in improving FDI inflows in both the short and the long runs. This study has several limitations which are mainly related to non-availability of some variables data and time. In the future research, it is recommended to carry the analysis in quarter series to enhance the accuracy of forecasting. Also, including additional factors which might affect the used factors in this study such as market size, corruption index, purchasing power and cost of doing business.

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# Appendices

## Table1: Total Foreign Investment in Oman by Industry

| Rank | Industry (Mn. R.O.) | 2017 | 2016 | 2015 | 2014 | 2013 |
|------|---------------------|------|------|------|------|------|
| 1 | Oil and Gas Exploration | 6,125.5 | 5,267.2 | 4,124.0 | 5,230.2 | 4,724.0 |
| 2 | Financial Intermediation | 4,799.9 | 4,822.1 | 4,192.4 | 4,053.6 | 3,900.3 |
| 3 | Manufacturing | 2,878.2 | 2,948.8 | 3,106.0 | 3,161.2 | 3,528.4 |
| 4 | Real estate − Renting and Business activities | 694.1 | 676.9 | 594.5 | 568.8 | 520.6 |
| 5 | Transport − Storage & Communication | 622.1 | 661.3 | 608.6 | 603.3 | 563.6 |
| 6 | Trade | 390.3 | 362.9 | 393.9 | 363.2 | 351.6 |
| 7 | Electricity and Water | 263.9 | 184.9 | 184.1 | 274.2 | 286.1 |
| 8 | Construction | 244.5 | 218.7 | 261.6 | 272.2 | 297.6 |
| 9 | Hotels and Restaurants | 199.0 | 203.8 | 169.9 | 259.8 | 127.0 |
| 10 | Other | 105.5 | 74.5 | 290.4 | 67.8 | 52.2 |

| Total | | 16,323.0 | 15,420.8 | 13,925.4 | 14,854.4 | 14,351.4 |
|---|---|---|---|---|---|---|

**Table 2:** The variables description and data source

| | | Variables | Acronyms | Description | Source |
|---|---|---|---|---|---|
| Dependent Variable | | Foreign Direct Investment | $FDI_t$ | Refers to % of GDP | World Bank (Data Bank) |
| Independent Variables | Trade Openness | Export Merchandise | $Export_t$ | Refers to Total trade growth rates of Export Merchandise | |
| | | Import Merchandise | $Import_t$ | Refers to Total trade growth rates of Import Merchandise | |
| | Inflation rate | | $Inflation_t$ | Refers to Inflation, GDP deflator (annual %) | |
| | GDP Growth | | $GDPgrowth_t$ | Refers to GDP growth (annual %) | |
| Control Variables | Time fixed effects | | $\alpha_t$ | Refers to Time fixed effects | |
| | Error term | | $\varepsilon$ | Refers to Error term | |

## Table 3: Dickey−Fuller test for unit root

| Number of obs: 43 | | | | | |
| --- | --- | --- | --- | --- | --- |
| Variables | Test Statistic | 1% Critical Value | 5% Critical Value | 10% Critical Value | MacKinnon approximate p−value for Z(t) |
| FDI Z(t) | −4.519 | −4.159 | −3.504 | −3.182 | 0.0014 |
| Trade Openness (Export) Z(t) | −6.662 | −4.251 | −3.544 | −3.206 | 0.000 |
| Trade Openness (Import) Z(t) | −5.305 | −4.251 | −3.544 | −3.206 | 0.0001 |
| Inflation Z(t) | −6.359 | −4.159 | −3.504 | −3.182 | 0.000 |
| GDP Growth Z(t) | −5.444 | −4.159 | −3.504 | −3.182 | 0.000 |

## Table 4: lag−order selection statistics for VARs

| Sample: 1985 − 2019 | | | | Number of obs | = | 35 | |
|---|---|---|---|---|---|---|---|
| lag | LL | LR | DF | P | FPE | AIC | HQIC | SBIC |
| 0 | −567.986 | − | − | − | 1.1e+0$^{*}$ | 32.7421 | 32.818* | 32.964* |
| 1 | −547.115 | 41.741 | 25 | 0.019 | 1.5e+08 | 32.978 | 33.4382 | 34.3112 |
| 2 | −517.942 | 58.346 | 25 | 0.000 | 1.3e+08 | 32.7396 | 33.5833 | 35.1837 |
| 3 | −487.121 | 61.642 | 25 | 0.000 | 1.2e+08 | 32.4069 | 33.6342 | 35.962 |
| 4 | −461.809 | 50.62* | 25 | 0.002 | 2.0e+08 | 32.389* | 33.9998 | 37.0551 |

## Table 5: Johansen tests for cointegration

| Trend: constant | | | Number of obs = | 35 | | |
|---|---|---|---|---|---|---|
| Sample: 1985 – 2019 | | | Lags = | 4 | | |

| Maximum rank | Parms | LL | Eigenvalue | Trace statistic | 5% Critical value | 1% Critical value |
|---|---|---|---|---|---|---|
| 0 | 80 | −511.11476 | – | 98.6109 | 68.52 | 76.07 |
| 1 | 89 | −488.98909 | 0.71757 | 54.3595*1 | 47.21 | 54.46 |
| 2 | 96 | −470.40415 | 0.65424 | 17.1896*5 | 29.68 | 35.65 |
| 3 | 101 | −464.78642 | 0.27459 | 5.9542 | 15.41 | 20.04 |
| 4 | 104 | −462.77113 | 0.10878 | 1.9236 | 3.76 | 6.65 |
| 5 | 105 | −461.80933 | 0.05348 | – | – | – |

| Maximum Rank | parms | LL | Eigenvalue | Max statistic | 5% Critical value | 1% Critical value |
|---|---|---|---|---|---|---|
| 0 | 80 | −511.11476 | – | 44.2513 | 33.46 | 38.77 |
| 1 | 89 | −488.98909 | 0.71757 | 37.1699 | 27.07 | 32.24 |
| 2 | 96 | −470.40415 | 0.65424 | 11.2355 | 20.97 | 25.52 |
| 3 | 101 | −464.78642 | 0.27459 | 4.0306 | 14.07 | 18.63 |
| 4 | 104 | −462.77113 | 0.10878 | 1.9236 | 3.76 | 6.65 |
| 5 | 105 | −461.80933 | 0.05348 | – | – | – |

## Table 6: Vector Auto Regression

| Sample: | 1985 – 2019 | | | | |
|---|---|---|---|---|---|
| | | | Number of obs | | 35 |
| Log likelihood | −461.809 | | AIC | | 32.3891 |
| FPE | 2.04E+08 | | HQIC | | 33.99982 |
| Det (Sigma_ml) | 198733.4 | | SBIC | | 37.05515 |
| Equations | Parms | RMSE | R−sq | chi2 | P>chi2 |
| FDI | 21 | 1.53257 | 0.7994 | 139.447 | 0.000 |
| Export | 21 | 27.2078 | 0.4357 | 27.02638 | 0.1345 |
| Import | 21 | 14.8554 | 0.6933 | 79.1361 | 0.000 |
| Inflation Rate | 21 | 11.1506 | 0.6861 | 76.51091 | 0.000 |
| GDPGrowth | 21 | 3.73503 | 0.6002 | 52.55045 | 0.0001 |

## Table 7: Vector Autoregression

| Variables | Coef. | Std. Err. | z | P>z | [95% Conf. Interval] | |
|---|---|---|---|---|---|---|
| FDI (dependent Variable) | | | | | | |
| Export (Independent Variable) | | | | | | |
| L1. | −0.01618 | 0.03162 | −0.51 | 0.609 | −0.07815 | 0.045796 |
| L2. | −0.13378 | 0.026082 | −5.13 | 0.000 | 0.1849 | −0.08266 |
| L3. | −0.05388 | 0.039672 | −1.36 | 0.174 | 0.13163 | 0.02388 |
| L4. | −0.00745 | 0.0501 | −0.15 | 0.882 | 0.105648 | 0.090741 |
| Import (Independent Variable) | | | | | | |
| L1. | 0.029709 | 0.020558 | 1.45 | 0.148 | 0.010583 | 0.070002 |
| L2. | −0.06968 | 0.019027 | −3.66 | 0.000 | 0.106969 | −0.03238 |
| L3. | 0.000947 | 0.031716 | 0.03 | 0.976 | 0.061216 | 0.06311 |
| L4. | 0.015772 | 0.021105 | 0.75 | 0.455 | 0.025593 | 0.057137 |
| Inflation Rate (Independent Variable) | | | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| L1. | −0.00319 | 0.076024 | − 0.04 | 0.967 | 0.152191 | 0.145819 |
| L2. | 0.268383 | 0.063726 | 4.21 | 0.000 | 0.143483 | 0.393283 |
| L3. | 0.083227 | 0.092546 | 0.9 | 0.368 | 0.098159 | 0.264613 |
| L4. | −0.02139 | 0.090102 | − 0.24 | 0.812 | 0.197983 | 0.155209 |
| GDP Growth (Independent Variable) | | | | | | |
| L1. | −0.07114 | 0.073242 | − 0.97 | 0.331 | 0.214688 | 0.072415 |
| L2. | 0.180826 | 0.078548 | 2.3 | 0.021 | 0.026874 | 0.334778 |
| L3. | −0.04155 | 0.099391 | − 0.42 | 0.676 | 0.236355 | 0.153249 |
| L4. | −0.05998 | 0.091983 | − 0.65 | 0.514 | 0.240266 | 0.1203 |
| | | | | | | |
| _cons | 1.902616 | 0.477671 | 3.98 | 0.000 | 0.966398 | 2.838834 |

## Table 8: Granger causality Results

| Equations | Excluded | chi2 | df | Prob > chi2 |
|---|---|---|---|---|
| FDI | Export | 30.725 | 4 | 0.000 |
| FDI | Import | 26.527 | 4 | 0.000 |
| FDI | Inflation rate | 21.001 | 4 | 0.000 |
| FDI | GDPGrowth | 6.6811 | 4 | 0.154 |
| FDI | ALL | 68.716 | 16 | 0.000 |
| | | | | |
| Export | FDI | 4.8983 | 4 | 0.298 |
| Export | Import | 7.4625 | 4 | 0.113 |
| Export | Inflation rate | 8.357 | 4 | 0.079 |
| Export | GDP Growth | 11.641 | 4 | 0.020 |
| Export | ALL | 24.224 | 16 | 0.085 |
| | | | | |
| Import | FDI | 16.26 | 4 | 0.003 |
| Import | Export | 13.455 | 4 | 0.009 |
| Import | Inflation rate | 19.126 | 4 | 0.001 |
| Import | GDP Growth | 4.3236 | 4 | 0.364 |
| Import | ALL | 74.26 | 16 | 0.000 |
| | | | | |
| Inflation rate | FDI | 13.827 | 4 | 0.008 |
| Inflation rate | Export | 27.525 | 4 | 0.000 |
| Inflation rate | Import | 18.538 | 4 | 0.001 |

| Inflation rate | GDP Growth | 25.549 | 4 | 0.000 |
|---|---|---|---|---|
| Inflation rate | ALL | 68.672 | 16 | 0.000 |
| | | | | |
| GDP Growth | FDI | 3.1596 | 4 | 0.531 |
| GDP Growth | Export | 2.1849 | 4 | 0.702 |
| GDP Growth | Import | 0.67288 | 4 | 0.955 |
| GDP Growth | Inflation rate | 4.0439 | 4 | 0.400 |
| GDP Growth | ALL | 31.735 | 16 | 0.011 |