A CAUSAL RELATIONSHIP BETWEEN FOREIGN DIRECT INVESTMENT, EXPORT AND ECONOMIC GROWTH IN THE ISLAMIC MEMBERS IN G-20 AND EUROPEAN UNION, A COMPARATIVE STUDY

PhD THESIS

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A dissertation submitted in partial satisfaction of the requirements for the degree of doctor of philosophy in Economics

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ÖZET

G20'DEKİ İSLAM ÜLKELERİNDE VE AVRUPA BİRLİĞİ'NDE DOĞRUDAN YABANCI YATIRIM, İHRACAT VE EKONOMİK BÜYÜME ARASINDAKİ NEDENSEL İLİŞKİLER, KARŞILAŞTIRMALI BİR ÇALIŞMA

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Bu çalışmanın amacı, ekonomik büyüme, Doğrudan Yabancı Yatırım (DYY), ihracat gibi ekonomik değişkenler arasındaki ilişkinin analizi yoluyla 1981-2015 döneminde G-20'deki İslam ülkeleri ile Avrupa Birliği ülkeleri arasında ekonomik karşılaştırmalar yapmaktır. Ayrıca, bu tür değişkenlerin üç İslam ülkesinde ekonomik büyüme üzerindeki etkisi, zaman serileri kullanılarak vaka çalışmaları olarak incelenmiştir. Buna ek olarak, 12 Avrupa Birliği ülkesinin panel verileri örnek olarak kullanılmıştır. Bu amaca ulaşmak için, 1981 yılından 2015 yılına kadarki çalışma döneminde tarihsel bir bakış takip edilmiştir. Hem yıllık verilerin hem de istatistiksel yaklaşımın yanı sıra, zaman serilerinin birim kök testleri (ADF, PP, KPSS), Paseran tarafından geliştirilen yatay kesit bağımlılığı testi, panel birim kök testleri, Johansen eşbütünleşme testi, vektör otoregresif model (VAR), tam düzeltilmiş en küçük kareler (FMOLS), dinamik en küçük kareler (DOLS) ve Granger nedensellik testi uygulanmıştır. Çalışmada ekonomik değişkenler arasındaki nedensellik ilişkisini incelemek için veriler, A grubu (Üç İslam ülkesi) ve B grubu (On iki Avrupa ülkesi) ile ilgili olarak IMF ve Dünya Bankası gibi uluslararası kuruluşlardan alınmıştır. Sonuçlar, (A) ve (B) grubundaki değişkenlerin eşbütünleşik olduğunu göstermiştir. Ek olarak, doğrudan yabancı yatırım ve ihracatın ekonomik büyüme üzerinde uzun dönemde pozitif bir etkisi olmuştur. DYY ve ihracat, Avrupa Birliği ülkelerinde ekonomik büyüme ile pozitif ilişkilidir. Ayrıca, Granger nedensellik testlerinin sonuçları, DYY ile GSYİH arasında kısa dönemli çift yönlü bir nedensellik ve (A) grubunda DYY'den ekonomik büyümeye doğru tek yönlü bir nedensellik ortaya koymuştur.

Anahtar Kelimeler: Zaman serileri, Birim kök testleri, (VAR) Modeli, Ekonomik büyüme, (VEC) Modeli, G(20) grubu, Granger Nedensellik testi, tek yönlü nedensellik olduğunu ortaya koymaktadır.

ABSTRACT

A CAUSAL RELATIONSHIP BETWEEN FOREIGN DIRECT INVESTMENT, EXPORT AND ECONOMIC GROWTH IN THE ISLAMIC MEMBERS IN G-20 AND EUROPEAN UNION, A COMPARATIVE STUDY

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This study aimed to compare the economies of the Islamic countries in the G-20 and the European Union countries during the period from 1981 to 2015 through the analysis of the relationship between the economic variables, including economic growth, foreign direct investment (FDI), and exports. The effect of such variables on the economic growth in three Islamic countries as case studies was also investigated using the time series. In addition, the panel data in the case of 12 European Union countries as a sample was used. Accordingly, a historical view from 1981 until 2015 was followed during the study period. In both cases of annual data as well as statistical approach, multiple tests including unit-roots of time series (ADF, PP, KPSS), Paseran test "cross-section dependence test", panel unit root tests, Johansen's co-integration test, Vector Error Correction Model (VAR), Fully Modified Least Squares Test (FMLS), Dynamic Least Squares Test (DOLS), and Granger causality test were applied. The data were obtained from international institutions such as the IMF and the World Bank and divided into two groups (three Islamic countries and twelve European countries) to estimate the causality relationship between the economic variables studied. The results showed that the variables in groups (A) and (B) were co-integrated. Additionally, FDI and exports have a positive long-run effect on economic growth. FDI and exports were positively correlated to economic growth in EU countries. Moreover, the results of Granger causality tests revealed a short-run bidirectional causality between FDI and GDP and a unidirectional causality running from FDI to economic growth in the group (A).

Keywords: Time series, Unit roots tests, (VAR) Model, Economic growth, (VEC) Model, G (20) group, Granger Causality test.

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ALI OMAR MOHAMED ASSOUDANI

08/02/2022

STATEMENT OF COMPLIANCE WITH ETHICAL PRINCIPLES AND RULES

I hereby truthfully declare that this thesis is an original work prepared by me; that I have behaved in accordance with the scientific ethical principles and rules throughout the stages of preparation, data collection, analysis and presentation of my work; that I have cited the sources of all the data and information that could be obtained within the scope of this study, and included these sources in the references section; and that this study has been scanned for plagiarism with “scientific plagiarism detection program” used by Anadolu University, and that “it does not have any plagiarism” whatsoever. I also declare that, if a case contrary to my declaration is detected in my work at any time, I hereby express my consent to all the ethical and legal consequences that are involved.

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ALI OMAR MOHAMED ASSOUDANI

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SYMBOLS AND ABBREVIATIONS

GGDP	: Growth rate of gross domestic production (% of GDP).
Exports	: Exports of goods and services.
FDI	: Foreign direct investment, net inflows.
GDP	: Gross Domestic Product.
FDI	: Forging Direct Investment.
EX	: Exports.
DI	: Domestic Investment.
R & D	: Research and Development.
MNCs	: Multinational corporations.
FPE	: Final Prediction Error.
AIC	: Akaike Information Criterion.
SC	: Schwarz Information Criterion.
HQ	: Hannan-Quinn information criterion.
PLS	: Profit & Loss Sharing.
CO2	: Carbon dioxide.
WTO	: World Tread Organization.
ADF	: Augmented Dickey-Fuller test.
PP	: Philips Perron test.
KPSS	: The Kwiatkowski, Phillips, Schmidt, and Shin test.
LSDV	: Least Square Dummy Variable.
FMLS	: Fully Modified least squares test.
DOLS	: Dynamic Least Squares Test.

UN	: The United Nations.
EU	: The European Union.
TFP	: Total-Factor Productivity.
UNCTAD	: The United Nations Conference on Trade and Development.
OPEC	: The Organization of Petroleum-Exporting Countries.
OECD	: The Organization for Economic Co-operation and Development.

CHAPTER 1

1. INTRODUCTION

The world economy attracted great interest in Foreign Direct Investment (FDI) and international trade between countries during the last years of the twentieth century. This was done through accelerated growth in the size of foreign direct investment, especially in the context of economic globalization. The 1990s also saw noticeable movements of the elements of production outside the borders of countries in the way of gains and profit-making, in addition to the role of multinational corporations in their ability to move foreign direct investments between the beneficiary countries. These exchanges also included the movement of capital and skilled and trained labor, which were led by the advanced capital economies at the same time. Some developed countries have become amongst the top-ranked in both importing and exporting investments.

It became clear through economic literature that the concept of foreign direct investment means that a particular institution or company invests in projects outside the borders of the country of origin of that company. The aim is to achieve a certain profit for this company through trading operations outside the country. This benefit may also be divided between the company and the host country of foreign direct investment. Starting from here, foreign investment can be divided into different types, including the establishment of a project in full or participation in the shares of a certain company with fixed capital. The IMF states that 10% of the total shares of the company is sufficient to qualify as foreign direct investment, considering participation in the decisions issued by this company.

The volume of foreign direct investment, as reported by international investment and development institutions, exceeded 1 trillion USD internationally during the early 20th century. While the volume of foreign direct investment at the beginning of the last century was close to 16 billion USD, it reached 60 billion USD by the middle of the last century. The main reasons for the growth in foreign direct investment are the international movements of investments in general and the restructuring of international institutions through the application of merging and acquisition policies among the investing countries. Consequently, the rate of growth

in foreign direct investment increased between 2015 and reached 38% since the beginning of the global economic crisis in 2008 (UN, 2016).

In general, the economies of developing countries are suffering from instability, lack of international competitiveness, and weak export capacity as a result of the reduced volume of production and the quality of services provided, as well as the significance and accelerating changes in the world economy in many areas, which determine the rates of economic growth as a result of the international volatility of large economies in developed countries. Consequently, this may lead to the disruption of the development plans of these countries, which may ultimately lead to the final goal of sustainable development and the possibility of local economies' integration into the global economy. Therefore, developing countries are earnestly seeking to be recognized as members of international organizations such as the World Trade Organization (WTO) to get even more advantages. These countries seek to increase the trade between them and the developed countries through the restructuring of their local economic sectors and the establishment of an infrastructure that can take part in all economic sectors in the country to increase their economic growth rates. Therefore, they need to allow international companies (foreign investors) to participate in the process of promoting the local economy and covering the deficit (money, services, production, and new technology) through foreign direct investment. This will provide them with a great opportunity in the process of training and development of manpower in the country and will ensure high employment rates by introducing new and advanced production methods and improving the quality of services. Public investments play an important and effective role in increasing the productive capacity of the economy and enhancing productivity through the implementation of new investment operations and localization of foreign concepts in general (IMF, 2018).

While foreign investments are so attractive to receiving countries, they sometimes cause instability and show destructive effects. One good example is the 2008 economic crisis, which originated in the United States and propagated all over the world. From time to time, there may be some fluctuations in growth rates in industrialized countries as well as in "developing" consumer countries. This fluctuation leads to the emergence of economic crises, which in turn lead to the decline of the economy. This may lead to the bankruptcy of some small companies

or banks that cannot compete. The bankruptcy of some small companies or banks that cannot compete. Productivity or services that provide excessive services risk remaining in the market. As was the case in the 2008 financial crisis and the so-called "mortgage crisis" that led to a disruption of the global economy. This serious phase of the global economy began in the United States in 2004 when Wall Street banks decided to grant high-risk "mortgage" loans to low-income people so that the second party could buy housing. As a result of the new situation, this led to higher foreclosure rates in the United States and, as a result, higher prices for individuals who were unable to overcome their daily payments and bank obligations. This led to the inability of the bank to provide liquid money because of the suspension of their borrowing clients' payment of the monthly installments payable by them. This resulted in the emergence of the real estate mortgage problem. This matter reflects the inability to make savings and investments for fear of fluctuations that may take place through the decision of investment of their funds. Whereas the trading-off of the payment deficit, at that time caused the original amount to reach almost 55 trillion USD by the stock exchange committee, which exceeded in reality 60 trillion USD. That was more than four times the total amount of American debts to corporations and real estate mortgages for general circulation. In addition, these transactions lack organization. In most cases, contracting was concluded via telephone without documents. This is the basic issue from which the world financial crisis emerged (Austin Murphy, 2009).

On the other hand, foreign direct investment for the host developing countries, which cannot provide the financial resources for the targeted projects, is an interesting means of achieving the objectives. This may be advantageous compared to loans from international organizations and other countries to remedy the gap between savings and investment. In particular, they may overcome the indebtedness problem within the framework of the difficult conditions of foreign loans. The study period was extended between 1981 and 2015. The annual data for this period is obtained for different economic variables for Islamic countries in the G-20 and European Union countries.

This study is organized as follows into three chapters: The first chapter briefly introduces the study subject, hypotheses, methodology, and a review of the previous studies on the topic. The second chapter presents the theoretical aspect of foreign

direct investment and some economic theories in this field. In addition, the situation of foreign direct investments in the investing countries and many developed countries are being investigated. The role of foreign direct investment in increasing the production rate is discussed in detail. The economic variables including foreign direct investment, exports, and Gross Domestic Product (GDP) which are reflected in the economic growth rate, are evaluated for many countries, including the USA, China, India, Japan, European Union countries, OPEC, and OECD members.

The third chapter starts with the analytical aspect of the study by analyzing the time series for group A and panel data in the European Union countries. The effect of economic variables, including foreign direct investment and export volume, on the Gross Domestic Product (GDP), which represents the economic growth rate, was evaluated through statistical studies using EViews software in order to know the relation between such variables over the specified study period. Subsequently, a comprehensive comparison between the two groups is provided. The third chapter also includes the details of study findings and recommendations.

1.1. Research Problem

This research deals with the theoretical aspects of the subject and then focuses on the practical evaluation of the data. A comparative analysis of relevant data for Islamic countries members of the G-20 and European Union countries was used to study the economies with a high export rate. Moreover, it discusses the relationship between economic growth and FDI and the volume of exports in three Islamic countries that host a high level of FDI (Turkey, Saudi Arabia, and Indonesia) and the European Union countries. Among these three countries, Saudi Arabia depends mostly on exports of raw materials. Whereas, for Turkey, Indonesia, and some European countries, the structure of exports is basically different where diversified exports of goods and services are available. Achieving substantial economic growth requires the implementation of a set of policies and economic arrangements to increase the export power of countries. In the eighties of the past century, with the rapid and large development of the superpowers, financial and monetary policies were reformed and modified to attract more FDI.

This investigation was carried out using data sets from the study variables spanning the years 1981 to 2015. From here, the interesting objectives of the current study were to find answers to the following listed research problems:

- Does foreign direct investment promote economic growth in Islamic countries?
- Does foreign direct investment promote exports in Islamic countries?
- Does economic growth affect foreign direct investment in Islamic countries?
- Does economic growth promote exports in Islamic countries?
- Do exports affect economic growth in Islamic countries?
- Do exports affect foreign direct investment in Islamic countries?
- Does foreign direct investment affect economic growth in the European Union countries?
- Does foreign direct investment affect exports in the European Union countries?
- Does economic growth affect foreign direct investment in the European Union countries?
- Does economic growth affect exports in the European Union countries?
- Do exports affect economic growth in the European Union countries?
- Do exports affect foreign direct investment in the European Union countries?

1.2. Study Hypotheses

According to the above-mentioned research problems about the causality relation between the economic variables, including gross domestic product, direct foreign investment, and export volume, the study supposes the following hypotheses:

- First Hypothesis: There is a bidirectional relationship between economic growth and FDI in Islamic countries from 1981 to 2015.
- Second Hypothesis: There is a bidirectional relationship between economic growth and exports in the Islamic countries from 1981 to 2015.

- Third Hypothesis: There is a bidirectional relationship between the FDI and exports in the Islamic countries from 1981 to 2015.
- Fourth Hypothesis: There is a bidirectional relationship between economic growth and FDI in the European Union countries from 1981 to 2015.
- Fifth Hypothesis: There is a bidirectional relationship between economic growth and exports in the European Union countries from 1981 to 2015.
- Sixth Hypothesis: There is a bidirectional relationship between the FDI and exports in the European Union countries from 1981 to 2015.

1.3. Research Methodology

1.3.1. Study of an individual case of the economies

This economic research includes the study of multiple individual cases to obtain an accurate evaluation of the local economic status in those countries. The methods and strategies to attract FDI differ from one country to another because a variety of economic policies have been followed to achieve different economic objectives.

We will use econometric theories and models to investigate the study variables. The obtained time series data for group A was subjected to the following tests: Firstly, unit root (ADF, PP and KPSS) tests to check if the series is stationary or not; Secondly, Johansen's co-integration test to search for the possible interrelation of variables; Third, the Vector Error Correction Model (VEC) is used to examine the short- and long-run relationships between variables, and finally, the Granger Causality/Block Exogeneity Walt test is used to examine the causal effect between variables.

Furthermore, the obtained panel data for group B were subjected to cross-section dependence tests (Pesaran 2004 test) and panel data unit root tests, which were followed by an adapted fixed effects model and panel co-integration tests, including Pedroni, Kao, and Johansen panel tests. In addition to the former, which depends on some of the ordinary least squares (OLS) methods, the Fully Modified Least Square Test (FMOLS) and the Panel Dynamic Least Square Test (DOLS) for the existence of panel cointegration vector tests in this study. (Mitić et al. 2017). Correspond a fully modified (FM) approach, could be used to check homogeneous

and near-homogeneous panels, which are present in the cointegration test. (Dritsaki and Dritsaki 2014). The Granger causality model has been used to discover the direction of causality between FDI, exports and economic growth.

1.3.2. Data sources

The data gathering depends on the international economic institutions specialized in the field of economy and economic development, such as the World Bank, the International Monetary Fund, the Central Banks of the countries, the Organization of Oil Exporting Countries, in addition to the Statistical European (EUROSTAT), the global economy and (www.worldcampus.psu.edu) websites, … etc. The data includes the reports issued by these international institutions during the study period.

1.3.3. Model of analysis

The data on which this study depends are some economic variables of the two economies, representing GDP (as an economic growth measure) as a subordinate variable. The independent variables are foreign direct investments and exports. The data represents the object of the study (1981–2015). Each country will be classified alone as per its annual data and will be followed by an analysis of the economic growth in (Turkey, Saudi Arabia, and Indonesia) and other European Union countries and a general comparison of the findings with each other.

1.4. Importance of the research

The importance of this research lies in the analysis of the effects expected by the reason of the causality relation between economic growth, foreign direct investment and export volume within the economies of the Islamic countries in the Twentieth Group and the European Union countries, with the view of knowing the results of this relation in the long term between the local economic variables and the extent of the change in the economic growth rates in particular and the economic growth rates in GDP in general. Also, the presentation of some economic theories on the topic of FDI. In addition to knowledge of the policies and arrangements issued by the economic authorities in the countries subject of the study due to the occurrence of economic crises.

The importance also appears to be that some of these countries depended on the production of one commodity for a long time, which is the oil commodity and its derivatives, such as the Saudi economy. Given the variables that took place in its prices, as to fluctuation of its prices, fluctuation of the demand for the same and the resulting economic and social effects on the local economy. From here, there was a pressing need to find other income sources, confirming the diversification of the production assurance of increasing income rates. Therefore, the need for the investment projects in the form of direct foreign investment to be managed by a foreign investor in order to achieve the objectives of both parties and to make good use of the advanced expertise of foreign companies in management, operation, and advanced technology. In addition to upgrading the skills needed for the economic and social development plans in these countries.

The importance sums up that the European country's economy is strong and multiple in its gross domestic income sources. It depends on the diversification of exports and is strongly linked with growth in the international markets for goods, services, and stock exchanges (stocks and securities). This, consequently, makes it more susceptible to sudden economic fluctuations. This reflects the volume of direct foreign investment from and to the Union countries. The decrease in international demand due to the world financial crisis also leads to the reduction of the local exports of some goods and services that characterize the Turkish economy by their exports or strong competition between the economic superpowers in the field of provision of such goods and services. From here, lies the necessary need to keep increasing growth rates in the local economies of the countries due to the natural increase in their population numbers. This issue necessitates the upgrading of the skills required by the programs of the socioeconomic development plans through the provision of appropriate facilities and the formulation of appropriate economic policies to ensure foreign investment in the national economy.

1.5. Literature Review

Mahmoud AL-LRIANI. (2007) examined foreign direct investment and economic growth in the Gulf Cooperation Council's six-member countries (GCC). All data for the period 1970-2004 is annual. The study found obtained from a heterogeneous panel analysis indicates bidirectional causality between FDI and

GDP in the panel of the GCC. In the long-term FDI has. A positive spill and significant effect of FDI on economic growth.

Joan O. W. KIIRU. (2014) assessed exploring the determinants and implications of FDI, Sub-Saharan Africa Case Study. The time frame for the analysis spans a period between 1988 and 2011. This research employs panel data methods and focuses on the role of economic growth and macroeconomic stability concerning the impact of resource prices. The results of the study showed that FDI does not affect household consumption growth per capita in sub-Saharan countries.

Choudhry M. SHARIF, (1997) analyzed Foreign Direct Investment and Economic Growth: The Case of the Aisin Developing Countries. The Toda-Yamamoto test for causality relationship and the bounds testing (ARDL) were used in the methodology. The period of study was 1970-2005 for Malaysia. After running the test, the study's tests found that there is no strong evidence of a bi-directional causal relationship and pointed out that there is no correlation between FDI and economic growth in the long term.

Anusorn TAMAJAI, (2000) investigated the Effects of Flows of Capitals on Asian Economic Growth. For the period from 1980 until 1998. Using dynamic panel data. The cases were studied in four Asian countries: Indonesia, Malaysia, Thailand, and the Philippines. The study revealed a positive long-run and short-run effect from the relation between the growth of the gross domestic product and the FDI. And explained the results of the causality test between the study's variables are that FDI leads to an increase in Asia growth.

Victor OWUSU-NANTWI. (2016) examined the effect of foreign direct investment on the economic growth in South America. The study examines the relationship between institutional quality and FDI using two-stage least squares (2SLS) and fixed effect ordinary least squares regression analyses. Over the period 1970-2013. By using the co-integration technique and causality test. The study found that in the short-term (Granger causality test) relation between FDI and GDP

existence of (Granger causality) bidirectional relation between FDI and GDP. Also, due to the positive relation and long term between FDI and GDP.

Zuzana Szkorupová (2014) For Slovakia, we examined the causal relationship between foreign direct investment, economic growth, and exports. Between the years 2001 and 2010, the results of the co-integration test and then the vector error correction (VAR) model with quarterly data, shows a long-term causal relationship between economic variables FDI and exports on gross domestic production. A positive trend from both sides is sequential. In addition to capture, the long-term equilibrium is about a 33% convergence rate to balance the short-term shocks.

Table 1. 1. *Some Literature Review.*

	Study title		
Author (year)	**Data**	**Method**	**Results**
Mahmoud AL-LRIANI. (2007)	Foreign direct investment and economic growth in the six countries comprising the Gulf Cooperation Council (GCC)		
	1970-2004	Panel causality tests.	A positive long-run effect of FDI on economic growth
Joan O. W. KIIRU. (2014)	Exploring the determinants and implications of FDI, Sub-Saharan Africa Case Study		
	1988-2011	Using panel data methods.	There is no causality between FDI and household consumption
Choudhry M. SHARIF, (1997)	Foreign Direct Investment and Economic Growth: Case of the Aisin Developing Countries		
	1997	Toda-Yamamoto test. The bounds testing (ARDL).	No causality between FDI and economic growth
Anusorn TAMAJAI, (2000)	Effects of Flows of Capitals on the Asian Economic Growth		
	1980-1998	Using dynamic panel data. Indonesia, Malaysia, Thailand and the Philippines.	A positive long-run and short-run effect of FDI on Economic Growth

Table 1. 2. *Some Literature Review (continue)*

VICTOR OWUSU NANTWI (2016)	Effect of the foreign direct investment on the economic growth in South America		
	1970-2013	Using (2SLS) and fixed effect estimation and panel data Granger causality. In South America.12 countries.	FDI affected GDP
Brandon James SHERIDAN (2012)	Three Articles Related to the Relation Between Exports, Macroeconomics Policies and Economic Growth		
	2012	Panel data. A fixed-effects estimation and GMM estimation. For (OECD).	A positive effect between manufactured exports on Economic Growth
Khaliq and Noy. (2007)	Foreign Direct Investment and Economic Growth: Empirical Evidence from Sectoral Data in Indonesia		
	1997-2006	Using OLS fixed effects regression.	A negative impact of FDI on Economic Growth
Usha Nair-Reichert (1999)	Causality Tests for Cross-Country Panels: New Look at FDI and Economic Growth in Developing Countries		
	1971-1995	Panel data. A mixed fixed and random (MFR) panel data estimation. Granger causality testing is Holtz-Eakin et.al (1988).	The highly heterogeneous between FDI, DI and Economic Growth.
Zuzana Szkorupová (2014)	A causal relationship between foreign direct investment, economic growth and export for Slovakia		
	2001-2010	The vector error correction (VAR) model.	A positive effect of FDI and EX on GDP
Sahraoui Mohammed Abbes et al. (2014)	Causal Interactions between FDI, and Economic Growth: Evidence from Dynamic Panel Co-Integration		
	1980-2010	Using the methods (FMOLS) and (DOLS). The Granger causality test in the panel for 65 countries.	A unidirectional causality running from FDI to GDP

Table 1. 3. Some Literature Review (continue)

Chaido Dritsaki, et al. (2014)	Foreign Direct Investments, Exports, and Economic Growth in Croatia: A Time Series Analysis		
	1994-2012	A time-series analysis. Using the bounds testing (ARDL) approach.	A negative effect of FDI on EG. A positive effect of EX on GDP
Ahmad Zubaidi Baharumshah et al. (2010)	Foreign direct investment, economic freedom, and economic growth: International evidence		
	1976-2004	Panel data in 85 countries. Using the GMM model.	No causal from FDI to economic growth
Yaqin and Zhiqiang Liu. (2016)	The impact of foreign direct investment and human capital on economic growth: Evidence from Chinese cities.		
	1991-2010	Using fixed-effect estimates. The study case is 230 Chinese cities.	A negative effect of human capital on economic growth A positive effect of FDI on per capita GDP growth rate
Samuel Adams (2009)	Foreign Direct Investment, domestic investment, and economic growth in Sub-Saharan Africa		
	1990-2003	The OLS and fixed effects estimation.	A negative effect of FDI on DI
De Mello, Jr. Luiz R. (1999)	The impact of foreign direct investment (FDI) on capital accumulation, and output and total factor productivity (TFP) growth in the recipient economy		
	1970-1990	Using the VAR models and fixed-effect estimations. In OECD and non-OECD countries.	A positive impact of FDI on TEP A positive impact of FDI on capital.
Charles MENSAH (2018)	trends, challenges, and prospects: impact of FDI, imports and remittances on economic growth; the role of institutions on growth in sub-Saharan Africa		
	2000-2015	Using (ARDL) approach. Study case 30 African countries.	In the long run, is a positive impact of FDI and EX on GDP growth rates. In the short run is a negative effect of FDI and EX or GDP growth rates.

Table 1. 4. Some Literature Review (continue)

Chaido Dritsaki et al. (2014)	Causal Relationship between Energy Consumption, Economic Growth and CO2 Emissions: A Dynamic Panel Data Approach		
	1960-2009	Using (FMOLS) and (DOLS) approaches. Study case 3 (Greece, Spain and Portugal) southern European countries.	In the short run, there is a bilater causal relationship between the variables. Although In the long run is the relationships between variables are unidirectional.
Arshad Nuval Othman et al. (2015)	Do profit and loss sharing (PLS) deposits also affect PLS financing? Evidence from Malaysia based on DOLS, FMOLS and system GMM techniques		
	2010-2015	DOLS, FMOLS estimation and GMM system on panel data with a cross-section in Malaysia. Into monthly data.	Both long run and short run the relationships are on impact from FD on mudarabah and musharakah.

Brandon James SHERIDAN. (2012) employed Three Articles Related to the Relation between Exports, Macroeconomics Policies and Economic Growth. This thesis is composed of three articles collectively examining the relationship between exports, macroeconomic policy, and economic growth. The first study is concerned with the relationship between classified exports and growth to handle the reasons for the dependence of various developing countries on raw commodities as a major source of export income when the pieces of evidence point out that they can generate higher returns through the export of the manufactured goods. The second article is concerned with the effect of the financial chains on the wide and intensive margins of the exports of a sample of the Organization Economic Cooperation and Development countries (OECD) in the economic field. In addition, the third article attaches importance, from wide concept to description of the relation between detailed exports, macroeconomic policy, and economic growth. This study reached the fact that the countries having low levels of human capital do not benefit from the export. Particularly that the correlation between industrial exports and economic growth is negative and relatively large. Also, the findings show that the macroeconomic policy is closely related to the level of exports when using

the team data and not with the presented data. In addition to the existence of a positive relationship between manufactured exports and growth.

Khaliq and Noy. (2007) Foreign Direct Investment and Economic Growth employed: Sectoral data empirical evidence in Indonesia. Using OLS fixed effects regression. The period of study is 1997–2006. From that, the results showed there is a negative impact of FDI inflows on economic growth, especially in several sectors, including mining, non-oil, and the gas industry.

Usha Nair-Reichert. (1990) Causality Tests for Cross-Country Panels: A New Look at Foreign Direct Investment and Economic Growth in Developing Countries were studied. The period of study was for 24 developing countries between 1971 and 1995. And by using causality tests on panel data. The study proved that there is a highly heterogeneous relationship among the study variables of FDI, DI, and economic growth. Ordinarily, in this case, it is possible to give incorrect results.

Sahraoui Mohammed Abbes et al. (2014) examined causal interactions between foreign direct investment and economic growth using dynamic panel co-integration. This paper investigated and analyzed the relationship between foreign direct investment and economic growth and obtained a methodology, by using co-integration and panel Granger causality tests. The period of study was 1980–2010 for 65 countries. The groups of countries have been listed as follows: Asia and Oceanic countries, Middle Eastern countries, North American countries, Latin American countries, European countries, North African countries and Central African countries. This paper analyzes the relationship between FDI and economic growth in 65 nations. After running the tests, the results showed a unidirectional causality from FDI to GDP.

Chaido Dritsaki, et al. (2014) claimed a Time Series Analysis of Foreign Direct Investment, Exports, and Economic Growth in Croatia. For the period from 1994 until 2012, using the bounds testing (ARDL) approach for time series. The case study in

Croatia. The affection in a bidirectional long-run and short-run causal relationship between exports and growth is demonstrated in this paper. But the result also shows that foreign direct investment does not have the expected positive impact on economic growth.

Ahmad Zubaidi Baharumshah et al. (2010) examined foreign direct investment, economic freedom, and economic growth: international evidence. The study worked with the GMM system estimator over the period 1976–2004. Based on panel data from 85 countries. The study found that FDI does not impact output growth. Moreover, the promotion of free economic activities will see significant gains from the operations of forging companies in the host countries.

Yaqin and Zhiqiang Liu. (2016) examined the relationship between foreign direct investment and human capital and economic growth in Chinese cities. Using fixed-effect estimates. The study case includes 230 Chinese cities. According to the period of study between 1991 and 2010.The results in this paper show that there is a negative impact of human capital on economic growth and the existence of a positive effect between FDI and the per capita GDP growth rate.

Samuel Adams. (2009) (2009) Foreign investment, domestic investment, and Sub-Saharan Africa economic growth were evaluated. The period of study was in Sub-Saharan Africa, between 1990 and 2003. This paper adopted two methods: the OLS and fixed effects estimations. The paper found that FDI has a negative effect on DI. Nevertheless, the tests subsequently had a positive effect on the group of countries that had been surveyed.

De Mello, Jr. Luiz R. (1999) examined the effects of foreign direct investment (FDI) on capital accumulation, output growth, and total factor productivity (TFP) growth in the host economy. For the period between 1970 and 1990. Using the VAR models for time series and dynamic panel models for "fixed-effect estimations". The case studies are from OECD and non-OECD countries. The study noted that FDI has a positive long-run impact on capital accumulation. Also, the relationship between FDI and TEP growth is positive in the long run. But there is a negative impact in the case of Italy. In addition, panel data estimations had a positive impact on producer capital accumulation.

Charles MENSAH (2018) assessed trends, challenges, and prospects; the impact of FDI, imports, and remittances on economic growth; and the role of institutions on growth in sub-Saharan Africa. Over time, a period between 2000 and 2015. In 30 African countries, the (ARDL) approach was used. With annual data for the Gross Domestic Product growth rate. The result shows that, in the long run, FDI and EX have a positive impact on economic growth, while the case in the short run is that FDI and EX have a negative impact on growth in Africa.

A Time Series Analysis of Foreign Direct Investment, Exports, and Economic Growth in Croatia. The period of study was between 1960 and 2009, with annual data. According to the results of the co-integration test, which needs to analyze a long-run relationship between the variables of the study, economic growth, energy consumption and CO2 emissions. Using the FMOLS and DOLS approaches. The result of this study shows that there is a short-run and a long-run causal relationship between economic variables that is bilateral and unidirectional, respectively. This study was analyzed by Chaido Dritsaki et al. (2014). Is PLS financing affected by PLS deposits, as well? Malaysian evidence is based on DOLS, FMOLS, and system GMM techniques.

This study was done by Arshad OTHMAN et al. (2015). This study presented the results by using co-integration and panel data tests. The conclusion showed that there were no causality relationships between the variables, although alternative hypotheses existed for positive relationships in the short-run and long-run.

What will be the differences between this study and past studies?

Through the period of the study sample, which includes the member countries of the Islamic G-20 (Turkey, Saudi Arabia and Indonesia) in a limited and collective manner, as well as the European Union countries represented in 16 countries and Islamic countries, by analyzing the relationship of causality between economic growth and its relationship with FDI and the exports of those countries in a comparative causality study.

Forecasting of the expected economic variables is based on the mathematical patterns and testing of their orals in each group during the period from 1981–2015. Thus, it makes its accurate description, both descriptive as well as quantitative, possible through the economic reality of the economic variables. Consequently, it gives a profound and accurate view of the relationship between the variables.

CHAPTER 2

2. BACKGROUNDS ON ECONOMIC GROWTH RATES, FDI INFLOWS AND EXPORTS

2.1. The Islamic Members in G20 Definition and the Historical Period

One year after the financial crisis of 2008, policymakers and international lending institutions declared the crisis to be ended and told the rest of the world that recovery had begun. The Group of Twenty's (G20) actions have been widely credited with ensuring economic recovery. This paper explores the economic measures and strategies represented by the G20 after the crisis. The G20 summits have contributed to depoliticizing and naturalizing the problem, legitimizing a narrow and very specific approach to it. The politics of representation is intertwined with “money fetishism,” as I call it. To show and explain how and why the G20 summits have engaged in a politics of representation alongside a politics of management, I begin by disclosing the social construction of neoliberal-led growth and the market's rationality's subjection of all social activity. Second, comparing and contrasting the language of the 2009 G20 summits with that of their predecessor, the 1999 New International Financial Architecture. (Soederberg 2010).

The ability of developing countries to speak with one voice in Cancun was largely a result of their ability to create strong coalitions before the conference. The G20 is a particularly interesting example of a coalition that brought together a large number of participants with a wide range of interests that appeared to be incompatible. Using all of the available theoretical logic and historical precedent, it was predicted that the group would fail in the endgame. Despite this, the group managed to live. Using this group as a case study, it analyses the roots of their unity and traces them back to a process of learning that allowed the group to acquire specific structural traits and create methods that helped to further cement their unity. While the cohesion of the G20 is the major dependent

variable, we also consider the derivative question of the costs and benefits of sustaining such alliances. The Cancun coalitions serve as a great example of coalitions that were able to maintain their cohesion while also ending up in a scenario where there was no consensus, rather than even partial fulfillment of their goals. They look into some of the things that led to a stalemate in the negotiation process and make suggestions for how things could be better in the future.

2.2. The European Union Countries Definition and a Historical Period

The European Coal and Steel Community (ECSC), which was established in 1950 and consisted of only six members: Belgium, France, Germany, Italy, Luxembourg, and the Netherlands, was the precursor to the European Union. The European Economic Community was established in 1995 by the Treaty of Rome, and the European Community was established in 1995 by the Treaty of Rome (EC).

The European Union's initial priorities were the establishment of a single agricultural policy and the reduction of trade obstacles. The European Community (EC) first increased its membership in 1973, when Denmark, Ireland, the United Kingdom, Greece, and Spain joined. The European Parliament, which was elected by direct election, first convened in 1979.

The Single European Act, passed in 1986, reinforced the foundations of international cooperation in foreign policy and expanded the authority of the community over its members. In addition, the legislation established the concept of a single European market.

The Maastricht Treaty came into effect on November 1, 1993, and the European Community (EC) was replaced by the European Union (EU). The euro was founded as a result of the Treaty of Rome, and it is meant to serve as the EU's single currency. The euro was introduced on January 1, 1999 and has been in use ever since. Denmark and the United Kingdom were able to negotiate measures that allowed them to keep their national currencies.

There are a few newer members of the European Union who have not yet satisfied the requirements to adopt the euro. A wide network of links with countries and organizations in every area of the world exists within the European Union. The South, as a geographical region, is no more defined than its equally amorphous counterpart, the developed countries of the world. Nonetheless, the term "South" is almost universally

used to refer to the former colonies of Europe as well as other impoverished countries such as Liberia and Ethiopia, among others.

However, the term "South" is almost always used to refer to the countries that were once part of Europe, as well as other countries that are poor, like Liberia and Ethiopia. (Luster and Simeonova 2004) (Lister,2002).

Figure 2. 1. *The European Union Countries*

2.3. The Theoretical Relationship Between FDI and Economic Growth in The Neoclassical Growth Theory "The Exogenous Growth Model".

The neoclassical theory explains economic growth according to the objective of the development hypothesis, which is to clarify the determinants of development rates inside a nation and for reasons of contrast in development rates and per capita earnings over nations. There have been two periods of strong work on growth theory, the first within

the late 1950s and 1960s, and the second 30 a long time afterward, within the late 1980s and 1990s. Inquire about within the first period, to begin with, the neoclassical development hypothesis. The best-known commitment in that period was by Robert Solow is later investigated is known as the exogenous growth theory. (Charles_I._Jones 2013). The early commitments here were by Robert Lucas of the College of Chicago and Paul Romer of Berkeley. In this chapter, we will depict the neoclassical development hypothesis as well as the exogenous development hypothesis within economic theory. This part of Neoclassical Theory is based on conditions such as the following equation. (Barro et al. 1992).

$$Y = AF(K, N) \tag{2.1}$$

$$\frac{\Delta Y}{Y} = \left\{ (1 - 0) \times \frac{\Delta N}{N} \right\} + (0 \times \Delta K/K) + \Delta A/A \tag{2.2}$$

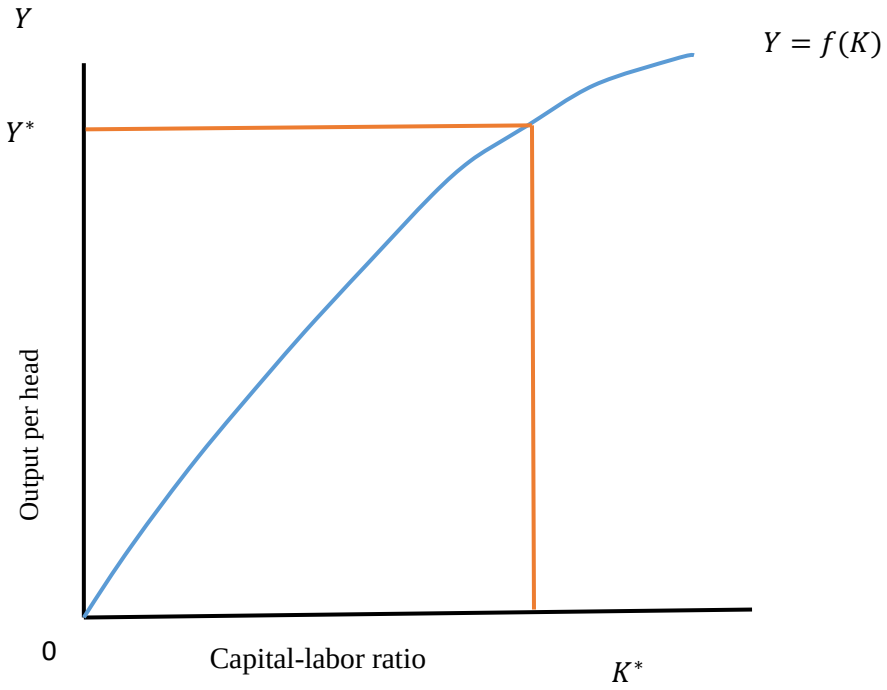


Figure 2. 2. *Exogenous growth theory.*

The production function appears as output per head as a work of the sum of capital per head or the capital-labor proportion. The higher the capital-labor proportion, the higher the output per head. But due to reducing returns, the increase in output that comes

about from raising the capital-labor proportion develops dynamically less as the capital-labor proportion rises. (Solow 1955).

For comfort, we should expect a given and steady rate of labor constrain development, ΔN/N = n, conjointly that there's no specialized advance, that's, ΔA/A= 0. It is valuable moreover to a fundamental of the aggregate production function in per capita terms, like following equation. (Holtz-Eakin & Schwartz, 1995).

$$Y = f(K) \tag{2.3}$$

Where y is output per worker and k is capital per labor. Figure (2.2) appears to be the per-worker generation work (3). It has the commonplace reducing returns of capital: as the sum of capital per worker rises, output per worker increases, but at a lessening rate. Given the suspicions of no technical progress and a settled populace development rate, as a variable component cleared out in condition (2) is the development rate of capital. Capital development is decided by sparing, which, in turn, depends on income.

2.3.1. Economic growth within the capital stock and the steady-state

At any specific time, the economy's output may be influenced by the capital stock, which can change over time, and these changes can have a direct impact on the financial sector. When money is spent on purchasing new machinery and equipment, this is referred to as an investment. Depreciation is the decrease in a company's capital stock as a result of the degradation of historical capital as a result of maturation and use. Consider each of these powers one at a time, starting with the most important one first. Y is the investment per worker sY goes up to me. For each worker's capital stock, we may calculate the investment per worker by substituting the production function for y (Charles_I._Jones 2013).

$$i = sf(K) \tag{2.4}$$

This equation establishes a relationship between the existing stock of capital k and the accumulation of new capital I where k is the exchange stock of capital. In this relationship, the figure (2.3) is depicted. It is illustrated in this picture how for each given value of k, the production function $f(K^*$ ddetermines the total amount of output, and the saving rate s determines the distribution of that total amount of output between consumption and investment. δ is accepted by the presser that a certain division of the capital stock wears out each year as a means of incorporating degradation into the model. (the Greek character delta in lower case) is referred to as the devaluation rate here (Mankiw et al. 1992).

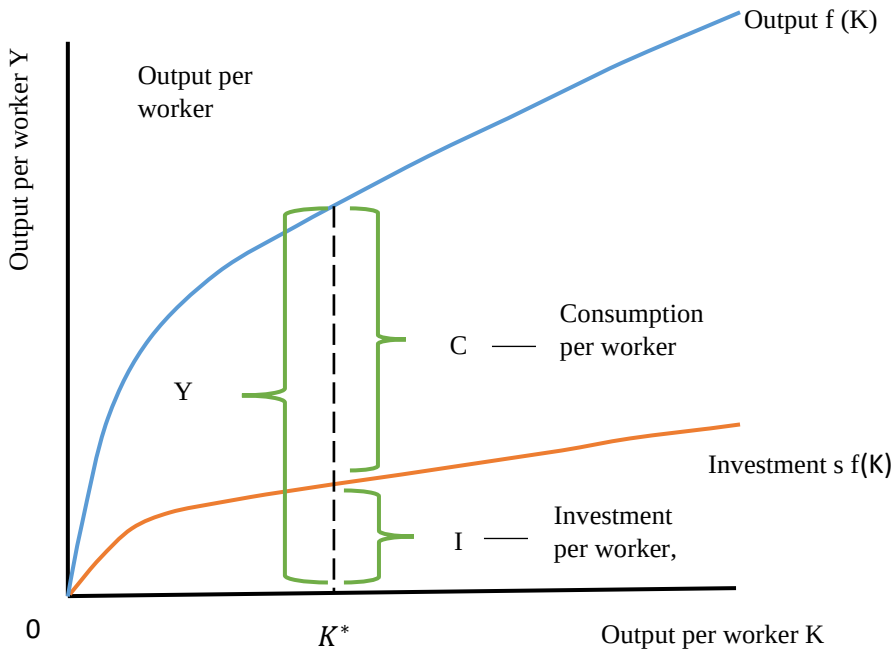


Figure 2. 3. Output between consumption and investment is decided by the saving rate.

According to the relationship in the figure (2.3) output, Consumption, and Investment That the saving rate (s) decides the allotment of output between consumption and investment. For any level of capital k, output is $f(K^*)$, investment is $f(K)$, and consumption is $f(K)$ - $sf(K)$, Previously if the value of K has been known, that means from the case of steady-state and the equation of the production function could find both of the levels of output and consumption too (Summers 1981). For two reasons, the steady-state rate is important. In most cases, an economy that is in a stable condition will continue in that state. The non-steady-states rate will reach that point if it continues to expand and be reasonable. That is, regardless of the level of capital with which the economy begins, it concludes with the level of capital that is consistent with the steady-state rate. Thus, the steady-state rate represents the long-run equilibrium of the economy in this context. Consider the case

when the economy begins with less capital than the steady-state level of capital, such as level K_1 in Figure (2.4), in order to better understand why an economy continuously closes at the steady-state. In this instance, the amount of investment outweighs the amount of depreciation by a significant margin. In order to better understand the impact of changes in capital stock on the economic growth process, the following equation can be used to illustrate the relationship between capital stock and economic growth: as investment increases and depreciation decreases, the capital stock increases and the economic growth process decreases (Vespignani 2008).

$$\Delta K = i - \delta K \tag{2.5}$$

In this case and from the equation (2.2), also can be presenting the equation such as following:

$$\Delta K = sf(K) - \delta K \tag{2.6}$$

According to these equations mean any change in the capital stock is equal to investment / saving equal to depreciation, respectively.

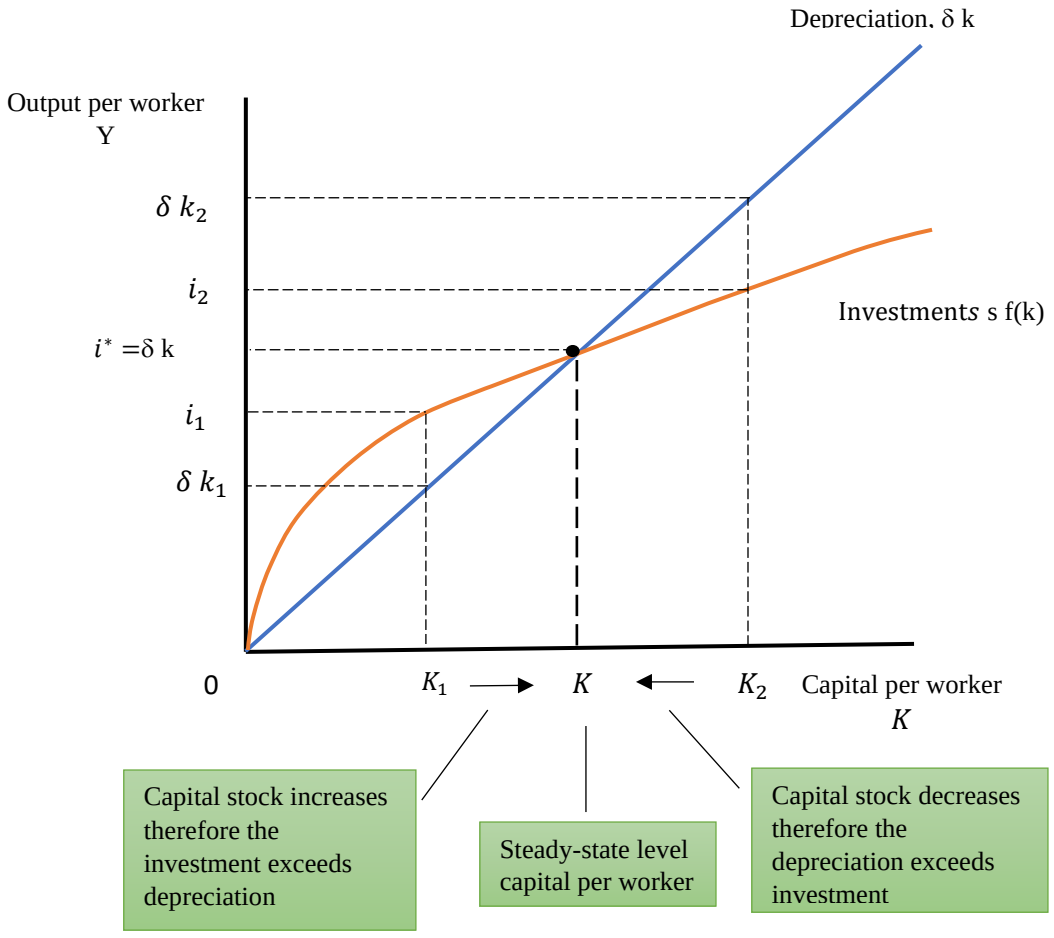


Figure 2. 4. *The steady-state level of capital*

After a while of the time, the capital stock will continue to increase and l-until it begins its steady state. Similarly, imagine that the economy starts with more capital than the steady-state level, such as level k_2. This is known as the k_2 level of capital. Depreciation is more than investment in this case because capital is being replaced by new capital at a faster rate than it is being depreciated. Investing all available savings in the economy in order reach the steady-state level required at this level of the correlation with both output per worker (Y) a capital per worker (K) is require to create the steady-state at (K^*) in the point of depreciation rate (δ) and population growth (N) (Aghion and Howitt 2008). That means increasing in saving level will make changing in (Y), in another way, and any a negative change in the value of the population growth rate will decline (Y) (Snowdon and Vane 2005).

The capital stock will decline once again, nearing the steady-state level. When the capital stock achieves a steady-state, investments equaled depreciation, and there will be no motivation to raise or decrease the capital stock (Charles_I._Jones 2013). (MANKIW 1992).

2.3.2. The golden rule level of capital

The goal of a policymaker is to maximize the well-being of the people who make up society as a whole. Individuals are uninterested in the quantity of capital in the economy, or even about the amount of production it produces. They are preoccupied with the number of services and goods which they can spend at a certain point in time. So, the steady state also with the maximum amount of consumption would be preferred by a wise policymaker, as seen in the graph. It is the Golden Rule capital level, symbolized by the symbol k* gold, that determines the steady-state value of k that allows for the greatest amount of spending. In what ways can we identify whether an economy has progressed to the Golden Rule stage? It is necessary to first know the steady-state con before we can decide which steady-state delivers the maximum. In order to calculate steady-state consumption per worker, users start with the identity of the national income account and rearrange it as l. The difference between production and investment is consumption. In order to calculate steady-state consumption, we attempt to substitute steady-state values for production and investment in the economy.

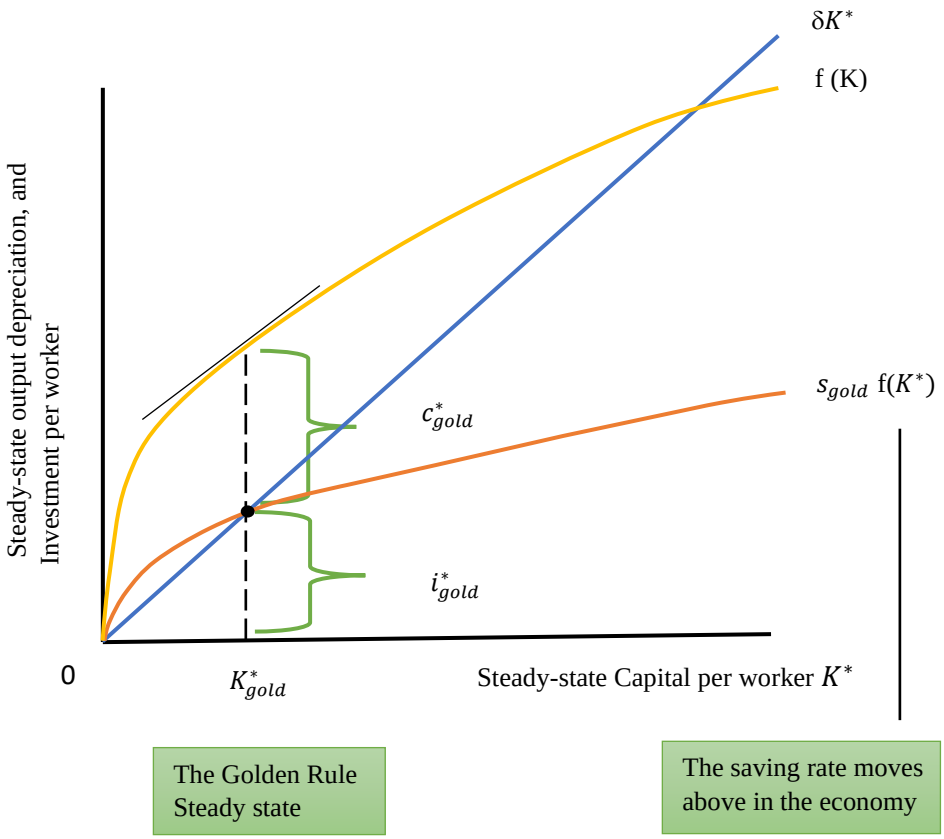


Figure 2. 5. *The Golden Rule level of capital*

Consumption is the sum of output minus investment. Because we want to find steady-state consumption, we use steady-state values for output and investment instead of the real values. People who work at a steady state make $f(K^*)$, or the steada y-state capital stock per worker is (K^*). (Aghion and Howitt 2008). As case in point, sK^* = investment. After paying for depreciation at a steady-state, then it can write steady-state consumption per worker, which is what is left of steady-state output after depreciation. We can do this by replacing y and I with $f(K^*)$ and ok with I. This equation shows that adding steady-state capital has two very different effects on steady-state consumption. This equation shows that adding steady-state capital has two very different effects on steady-state consumption. On the other hand, more capital means more output. A change in population growth rate (n), in the amount of money spent on new things, and in the amount of money invested in new things will have an effect on the economy's output per worker in general. But it won't have an effect on the same output per worker level in the economy when it's long-term (Brodie et al. 1966). (Daly and Daly 1973). (Charles_I._Jones 2013).

At the Golden Rule level of capital, the marginal product of capital equaled the rate of depreciation of capital. Another way to put it is that the economy begins with a steady-state capital stock of the type that the policymaker intends to increase to k_1^*. The marginal product of capital (MPK) would be f (k_1^*)-f (k*), for the additional production resulting from this increase in capital. The depreciation rate 6 represents the increased depreciation that occurs as a result of the addition of one unit of capital. As a result, the net effect of adding this additional unit of capital on consumption is MPK -8. If MPK-80 is present, then the rise in the capital is present.

As with the Golden Rule, consumers need to save at a certain rate to keep it going. Figure (2.5) highlights the steady state if the saving rate is set so that the Golden Rule level of capital can be achieved. Saving more money than shown in this figure will make the steady-state capital stock too big. Reducing the rate at which you save, as well as the steady-state capital stock might not be enough. There are two ways that steady-state consumption will be less than at the Golden Rule steady state (Vespignani 2008).

In a variety of ways, foreign direct investment (FDI) may promote economic growth. Starting with the neoclassical growth model, which includes more explanation of economic theories and empirical evidence to support our understanding of the process, it was proposed by Solow (1956) that product development is a function of an increase in the quantity of capital that each worker is assigned to operate concerning the production process. When workers are given more capital per capita, the marginal productivity of capital decreases. After a while, the capital-to-labor ratio stabilizes and no longer increases productivity. In this long-term equilibrium GDP, the growth of the capital and labor force was completely exogenously driven. Here, technological advancement has begun to play a major role. If technological progress exists, GDP per worker will rise at a rate equal to the rate of long-term technological progress growth. (Kurtishi-Kastrati 2013).

Furthermore, the expansion of the labor force and the advancement of technology are both necessary for the expansion of the economy. According to this idea, foreign direct investment (FDI) enhances the capital stock of the host nation, which in turn has an impact on economic growth. If foreign direct investment (FDI) provides new technology, which results in higher labor and capital productivity, this would then lead to more consistent returns on investment and, consequently, exogenous growth in labor, according to De Jager (2004). A study conducted by Barro and Sala-I-Martin (1995)

found a positive association between capital accumulation and production, while a more recent study conducted by Herzer et al. (2008) found that foreign direct investment (FDI) supports economic growth by boosting domestic investment. It has been demonstrated that foreign direct investment (FDI) may have a direct influence on economic growth through capital accumulation and the incorporation of new inputs and foreign technology into the production function of the host nation using the exogenous or neo-classical growth model. Accordingly, the neoclassical growth model demonstrates that foreign direct investment (FDI) stimulates economic growth by improving the efficiency of investment inside the host country (Mahembe, 2014).

As a result, economic growth depends on the increase of the workforce and the advancement of technology. According to this view, FDI enhances the host country's capital stock, which also influences economic growth. If foreign direct investment (FDI) brings new technology that boosts labor and capital productivity, according to De Jager (2004), this will result in more consistent returns on investment and exogenous employment growth. Barro and Sala-I-Martin (1995) established how capital accumulation and production have a positive link, whereas Herzer et al. (2008) recently showed that FDI boosts economic growth by encouraging domestic investment. It has been established that foreign direct investment (FDI) may have a direct impact on economic growth through capital accumulation as well as the integration of existing inputs and foreign technologies further into the host country's production function, as described by exogenous as well as neoclassical growth models. A consequence of this is that the neoclassical growth model reveals that foreign direct investment (FDI) stimulates economic growth by increasing the levels of investment efficiency (E.Mahembe et al, 2014).

2.4. The Classical Theory Includes International Trade Theories

2.4.1. Adam Smith's theory

In the beginning, Adam Smith's view of economic growth was qualitatively distinct from that of Quesnay and also the Physiocrats. According to their argument, the industry produces no investable surplus and hence contributes nothing good to growth, which is completely dependent on agricultural surplus reinvestment. Smith's Wealth of Nations

was published in 1776. Northern England had experienced the Industrial Revolution and following that, its consequences for high rate of production and higher living standards increased support for the theory (Eltis 2000). Classical economic theory is useful during the early stages of economic growth (Minami 1966). However, according to Smith, increasing returns to industry, or "learning by doing," as growth theorists now refer to it, should increase the manufactured goods here that workers can afford to purchase in a continuously economically sound and well-governed society. As Smith stated at the beginning of The Wealth of Nations, this is a necessary consequence of the division of labor (Eltis 2000).

The circular flow diagram (Figure 2-6) provides an important starting point for comprehending classical theory as proposed by the classical school. The circular flow of capital was examined in a fictitious economy with a given input (labor services) and a single output (bread). Figure 2-6 illustrates how real economies operate. It depicts the interactions of economic actors—households, businesses, and the government—as well as the flow of capital between them through the economy's various markets.

Consider the capital flow through the eyes of these economic actors: households earn income, which could be used to pay taxes, purchase goods and services, and also save through financial markets. Businesses generate revenue through selling goods and services, which they use to cover the cost of labor and perhaps other inputs. Financial markets enable individuals and businesses to borrow money to purchase investment goods such as houses and factories. The government earns revenues through taxes and uses them to finance government spending. Any difference between tax revenue and government spending is referred to as "public saving," although it can be positive (a budget surplus) or negative (a budget deficit) (a budget deficit). Specialists create a fundamental classical model in this section to account for the economic interactions depicted in Figure 2-6. Specialists begin with businesses and the factors affecting their rate of production (i.e., the level of national income). After that, examine how market forces for factors of production distribute this income to households. Following that, it considers how much income is planned to be spent or how much is saved by this household. Along with household consumption, we also discuss the demand for goods and services generated by investment and government purchases. Finally, to examine how

demand for goods and services (consumption, investment, and government purchases) and supply of goods and services (production level) are balanced (MANKIW 1992).

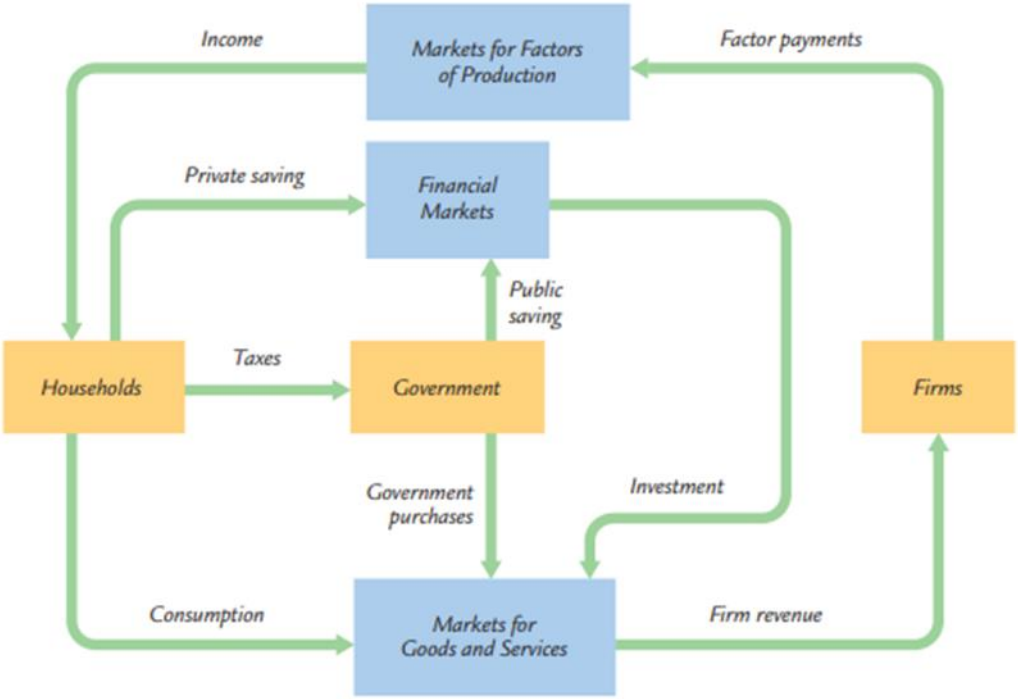


Figure 2. 6. *labor services to produce the output*

According to Smith, labor was the primary driver of economic growth, the ultimate source and quantity of economic value, and the primary beneficiary of the sympathies of both social scientists and public administrators among society's various producing groups. Throughout the classical period, as it did for medieval schoolchildren, the concept of labor served as the foundation for the connection between income and growth theory, price theory, and proposals (McNulty, 1973).

Workers, like peasants, benefited from the resulting division of labor, and Smith was certain that the maximum benefit had not been obtained by 1776. Smith then developed an argument for the existence of a positive relationship between capital accumulation and productivity growth, which modern theory has only recently begun to rediscover. Surprisingly, many twentieth-century growth theories predict that investment does not affect an economy's long-run growth rate of output or living standards. This holds for all neoclassical growth theories, as well as for a significant portion of Keynesian growth theory.

By contrast, according to Smith's theory, capital accumulation results in increased population and employment, and if the market for manufactured goods is widened as a

result, an increased division of labor results, which benefits labor productivity. In the figure (2.7) Also, he thought that with the accumulation of capital, the labor market would change. A rise in demand would occur as productivity increases after the accumulation of capital and higher wages. Demand for labor would increase, and that would imply a move along with the labor supply (and people) until the wage balance is reached W_2 (Lanza 2012). If competition is sufficient, and capital increases, generally increasing competition, the prices of manufactured goods will fall in lockstep with unit labor costs, increasing the quantity and variety of manufactured goods available to workers. The figure 2-8 showed that, according to Smith believed the industry and not agriculture, due to labor specialization, would have reduced marginal costs and increased returns. A further difference from Quesnay is that the population is no longer a fixed variable and manufacturing demand is not unnecessary (Lanza 2012). As a result, in Smith's idea of growth, greater capital accumulation is associated with a higher rate of employment and output growth, as well as higher living standards growth (Eltis 2000).

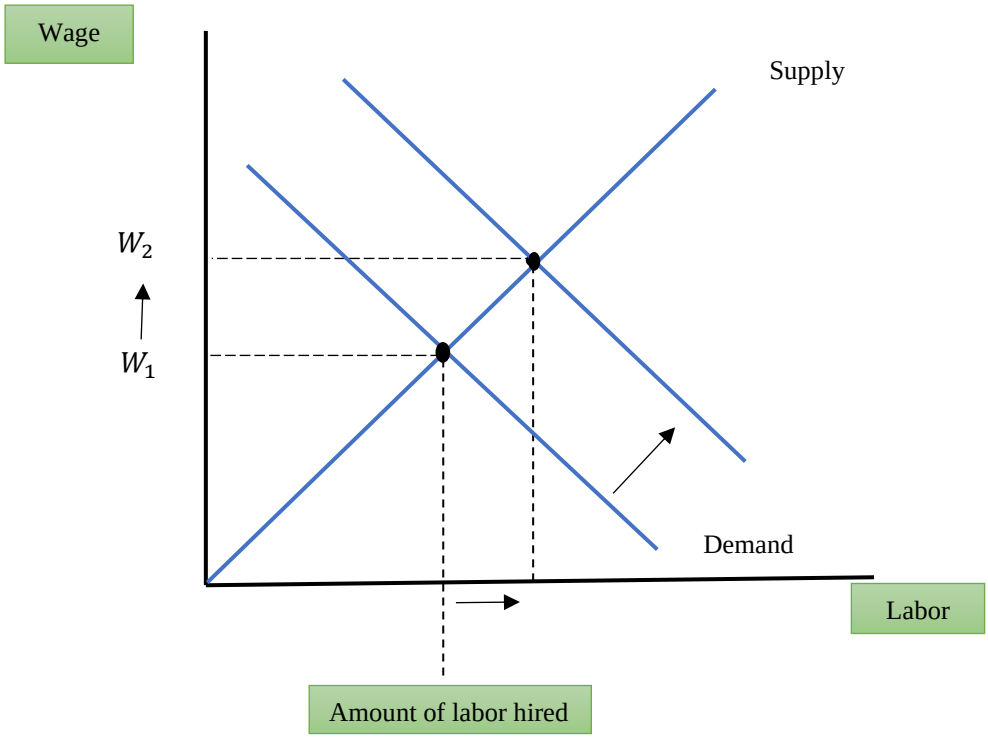


Figure 2. 7. *Adam SMITH's the accumulation of capita*

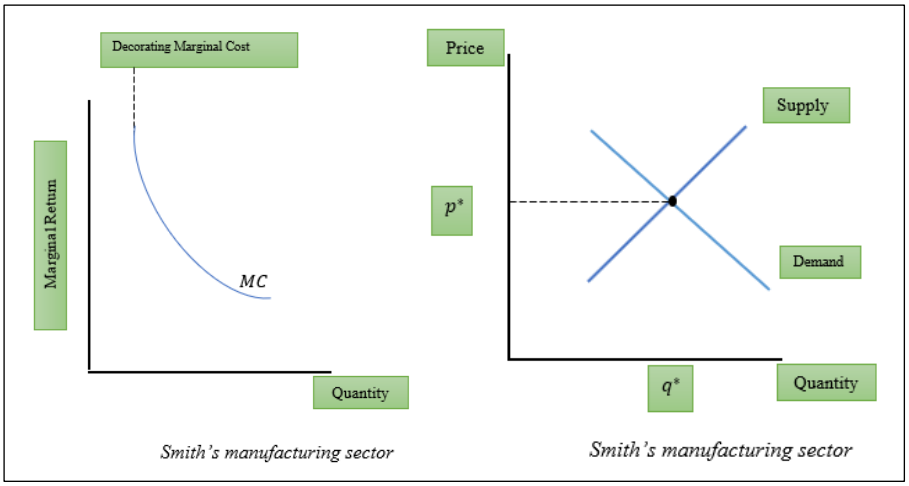


Figure 2. 8. *Adam SMITH's manufacturing sector.*

Because Smith's growth model is spiral, it is necessary to interrupt the continuous spiral mechanism at some point in order to discuss the diagram presented here (Figure 2-9). He assumed that the increasing marginal cost of production in agriculture was due to land scarcity (the first graph). Furthermore, he believed that division of labor and specialization in agriculture would be impossible due to the seasonal nature of agriculture, the small number of workers required to operate a farm, and the fact that only a small number of consumers provide a market. This would result in a decline in the rate of return in this sector of the economy. Furthermore, he believed industry and not agriculture, due to labor specialization, would have reduced marginal costs and increased returns (Lanza 2012).

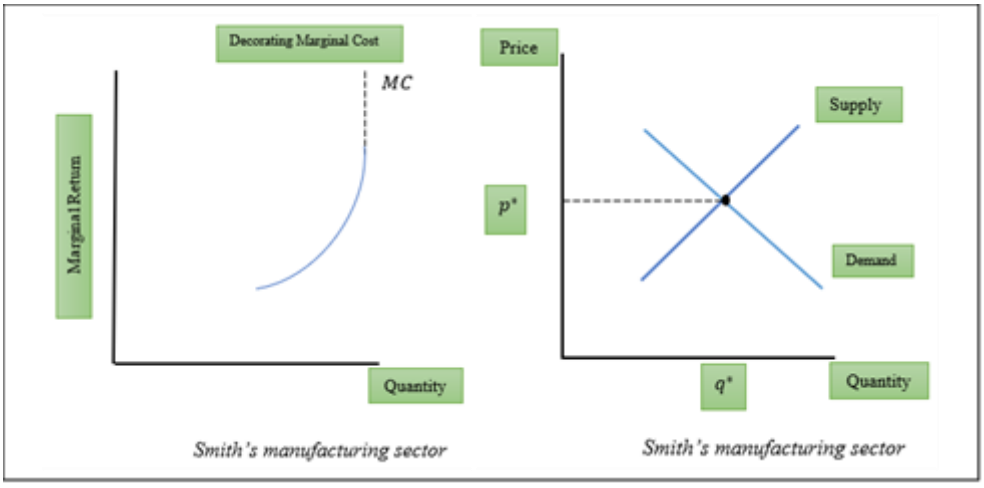


Figure 2. 9. *Adam SMITH's manufacturing sector.*

According to these equations, Adam Smith has been justified from the principal charges against him, and he also unveils the partial inaccuracy present in his theory which called "Invisible Hand "labor assumes that any of the commodities (q, q_n) is produced by its industry using labour inputs $(L_1, \ldots, L)$, land inputs $(T_1, \ldots, T)$, and produced inputs such as raw materials (or durable equipment) sought by the various industries: thus, q_j, will require production. (Samuelson 1977).

In contrast to what Smith was proposing, Marx believed in the influence of temporary technological unemployment by emphasizing several critical short-run factors - increased concentration (monopolization of industry), capital deepening (decreased profits). Marx's theory requires the latter in order to account for the growth of the army of the unemployed, and persistent bouts of (under-consumption). These factors have been combined in such a way that they have resulted in cyclical fluctuations of ever-increasing intensity. The pressure exerted by these short-run forces, he contended, is such that it lowers the growth curve and eventually results in class revolution and capitalism's demise (Thweatt 1957).

2.4.2. The Ricardian model

According to the Ricardian model, the theory of comparative advantage, a nation would export the products or services in which it has the greatest comparative advantage and import the goods or services in which it has the lowest comparative advantage

(Ricardo, 1817). "Comparative" is a relative phrase, not an absolute one. (Widodo 2009). In recent years, several neo-classical microeconomists have looked at the profit implications of components of production that are very inelastic in supply. Ricardo's work is the most well-known example of this; it was completed approximately 200 years ago (Ricardo, 1817). Using the profitability of farms under conditions where the availability of fertile land is fixed, Ricardo explains how these types of factors of production may produce profits for businesses. However, Ricardo implicitly implies that only a small number of elements of production possess the characteristics that distinguish them as being fixed in supply. (Barney 2001).

This model is built on certain tight assumptions, which are as follows: (1) a fixed endowment of (identical) resources, (2) factors of production that are completely mobile between alternative uses within a country, (3) factors of production that are completely immobile externally, (3) a labor theory of value1 is employed in the model, (4) the level of technology is fixed for both countries, (5) unit costs of production are constant, (6) there is full employment, (7) perfect competition, (8) no government-imposed obstacles to economic activity, (9) into (Appleyard and Field, 2001). Consider the following scenario: there are two nations, A and B, that manufacture two commodities, X and Y. Assume that nation A has the following labor requirements: X is the unit labor demand in X and Y, respectively; QX and QY are the quantity of X and Y, respectively; and LA is the total labor supply. Meanwhile, for nation B, let us represent X and Y as the unit labor needs in X and Y, respectively; LB as the total labor supply; and X as the unit labor requirement in X. The production possibility frontiers (PPF)2 for nations A and B are represented by the equations XQx+YQY=LA and XQx+YQY=LB, respectively, while the production possibility frontiers (PPF)2 for country C are represented by the equations XQx+YQY=LC. Figure 2.10 depicts two PPFs, each of which is a 60 Tri WIDODO. The slopes of PPFs for nations A and B are thus (- X/Y) and (- X/Y), respectively, as a result of this relationship. (Widodo 2009).

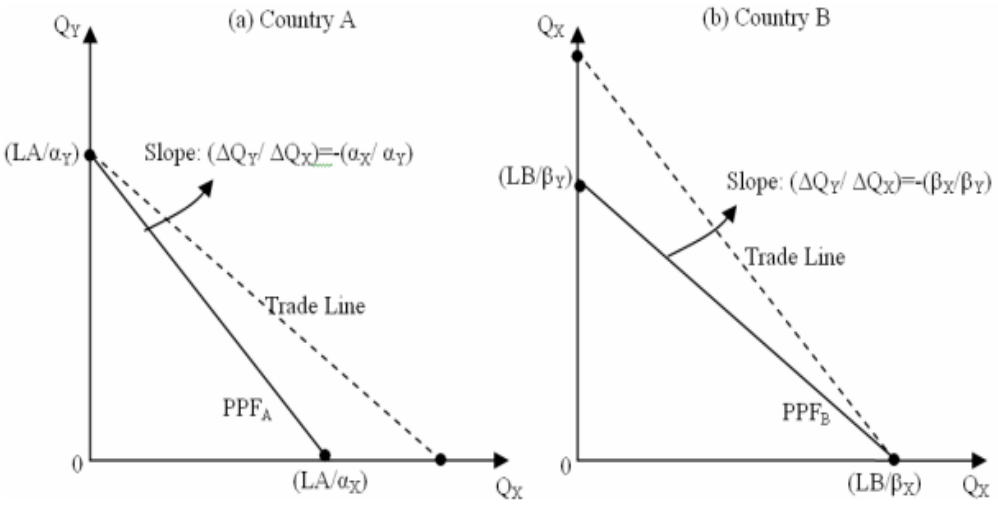


Figure 2. 10. *The Ricardian Model*

The slope of (αX/αY) is deeper than the slope of (βX/βY). Thus, X is comparatively more costly (in terms of Y3) in nation A than it is to purchase the same amount of Y3 in country B, and Y is relatively less expensive (in terms of X) than it is to purchase the same amount of Y3 in country B. A full specialization in Y will be achieved by Country A, and an equal level of specialization in X will be achieved by Country B. Trading along the trade line allows each country to achieve a higher level of consumption than it otherwise would (represented by the broken line). It is feasible that the terms of trade (TOT) will fall within the range (βX/βY)≤TOT≤(αX/αY). (Widodo 2009).

2.4.3. The production function

The available production technology dictates the amount of output that can be generated with a given amount of capital and labor. Economists quantify this relationship by a production function. Smith's production function is not characterized by diminishing returns, but by increasing returns. Smith states unequivocally that his production function is not subject to diminishing returns but to increasing returns. Smith states as follows: As production increases, economies of scale are obtained, both internal and external. The market will be expanded, while real production costs will decrease. (Concepts. 2010 - 2015) The production function is formulated as follows:

$$Y = F(K, L) \tag{2.7}$$

According to this equation, output is a function of capital and labor. The production function reflects the technology available for converting capital and labor into output. If someone develops a more efficient method of manufacturing a good, the result is an

increased output from the same amount of capital and labor. Thus, technological advancements alter the function of production. Numerous production functions exhibit what is known as “constant returns to scale”. A production function has constant returns to scale if an equal percentage increase in all factors of production results in an equal percentage increase in output. If the production function has constant returns to scale, increasing both capital and labor by 10% results in a 10% increase in output. A production function has constant returns to scale mathematically if:

$$zY = F\ (zK, zL) \tag{2.8}$$

For any positive z-value. This equation states that when both capital and labor are multiplied by some number z, the output is also multiplied by z. The following section demonstrates how the assumption of constant returns to scale has a significant effect on how income from production is distributed. Consider production at a bakery as an example of a production function. The bakery's capital consists of the kitchen and its equipment, its labor consists of the employees who make the bread, and its output consists of the loaves of bread. According to the bakery's production function, the number of loaves produced is proportional to the amount of equipment and the number of employees. If the production function has constant returns to scale, doubling the amount of equipment and workers produces multiple times as much bread. (MANKIW 1992).

2.5. The Theoretical Relationship between FDI and Economic Growth in the Endogenous Theory (AK) Model, “The Endogenous Growth Model”.

Endogenous growth is a broad term that encompasses a body of theoretical and empirical work that emerged in the 1980s. This work distinguishes itself from neoclassical growth by emphasizing that economic growth occurs endogenously within an economic system, rather than as a result of external forces. As a result, the theoretical work does not mention exogenous technological change to account for the order of magnitude increase in income per capita observed since the industrial revolution. Alternatively, Romer (1986) develops an AK model that incorporates intertemporal consumer maximization.(Barro 1992). The empirical work does not rely on a growth accounting residual that grows at a different rate in each country. Rather than that, it seeks to elucidate the private and public sector decisions that affect the rate of growth of the residual in different countries. As with neoclassical growth theory, endogenous growth

focuses on the economy's behaviour. As a result, this work complements, but is distinct from, research and development or productivity studies at the industry or firm level (Parente 2001; Romer 1994; Shaw 1992).

2.5.1. Endogenous growth with creative destruction in a simple model

Technically speaking, a model of growth through creative destruction can be described in terms of two long-run relationships: the economic growth rate (i.e. the growth rate of GDP per worker) and the amount of capital per efficient unit of labor. In this case, the labor input is in efficiency units rather than hours worked - hours multiplied by productivity. One relationship, which was included in the early Solow and Swan model, predicts the amount of capital per efficiency-unit of labor that the economy will accumulate over time, given the rate of economic growth. That is the downward sloping curve S of "saving" depicted in the figure, which takes the economy's proclivity to save from national income for granted. A faster rate of growth implies a larger increase in technological advancement and, consequently, a faster-growing labor force in efficiency units. This would indicate a lower steady-state capital per efficiency unit - a shift to the left of the curve. A higher saving rate shifts the curve to the right, resulting in a larger steady-state capital stock per effectiveness unit for any given long-run growth rate. (Howitt 2007).

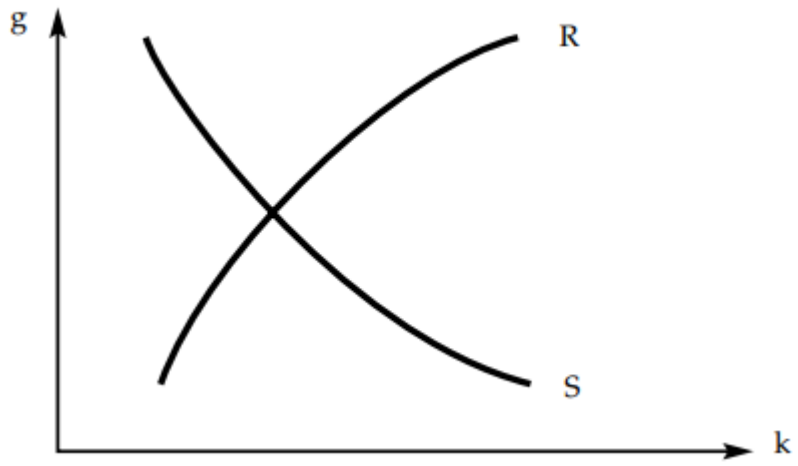


Figure 2. 11. *The Relationship Between Economic Growth Rate (g) and Capital Stock per Efficiency Unit of Labor (k): A Schumpeterian Justification*

The other relationship depicted in the figure (2.11) is the "research" curve R, which reflects the incentive to conduct R & D. The assumption is that firms invest in research and development at a level that maximizes their expected current value of profits. This choice is contingent upon the institutions, policies, and customs governing property rights, patent protection, and competition policy, among others, all of which affect both the costs of research and development and the expected net profit from successful innovation. All these variables are assumed to be constant along the R curve. The level of R &D across the economy determines the flow of innovations, which in turn determines the rate of technological progress and, consequently, the long-run rate of economic growth (Howitt 2007). Also, afforded constant institutional and policy variables along the R curve, an increasing trend in the steady-state capital stock per efficient unit of labor increases the incentive to conduct R &D by a scale effect. That means, for any given level of technology, more capital per worker results in increased production per worker and thus increased income per person (Howitt 2007; Snowdon 2005). Additionally, as incomes rise, people spend more on newly invented products, increasing the incentive for R&D and resulting in a faster rate of economic growth - a shift up the R curve. Similarly, any changes in institutions, policies, or other variables affecting the incentive to conduct R&D shift the R curve, resulting in a range of R&D rates and long-run growth rates for any given capital stock per effective worker. The long-run growth rate, according to this theory, is determined mostly by the intersection of the two curves in the figure 2.10. Thus, anything that increases the incentive to conduct research and development, thereby shifting the R curve upward, or anything that increases the economy's proclivity to save, thereby shifting the S curve to the right, results in a higher long-run growth rate (Howitt 2007).

2.5.2. Focusing on the real causes of growth

Dani Rodrik (2003) established a useful framework for defining the proximate and fundamental drivers of economic growth. Figure 2.8, adapted from Rodrik, summarizes the primary factors that influence an economy's size and growth. Referring back to the proximate determinants of growth in the upper section of Figure 2.8, with the output being directly related to an economy's endowments of labour (L_t), productivity(K_t), natural resources (N_t), and the productiviy of these resources (A_t). The productivity variable

captures the effect of both technical and allocation efficiency. We see the major fundamental determinants of economic growth, including social capability, in the lower portion of Figure 2.12. (S_t). Rodrik classifies the fundamental determinants of growth into three categories, including geography, integration, and institutions. These categories highlight three major research areas that have dominated growth analysis in recent years, as a large and rapidly expanding literature has been published.

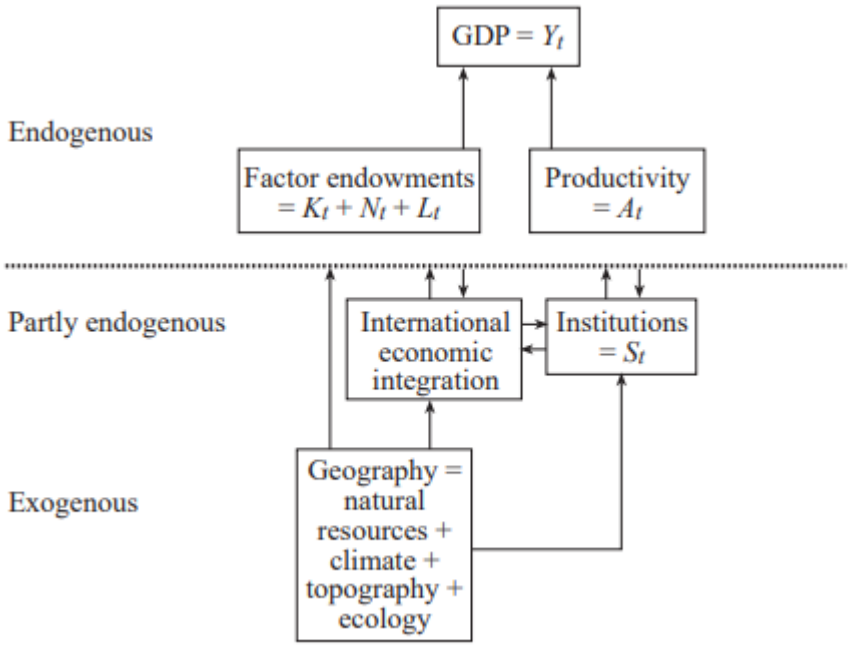


Figure 2. 12. *Growth source: Direct and fundamental*

Numerous social scientists would argue strongly that the influence of culture should be included among the critical deeper determinants of economic performance. Economic historians have undoubtedly paid much more attention to culture as a predictor of economic performance than economists have. As Rodrik mentions, the central question in growth analysis is: which of the causal relationships depicted in Figure 2.8 is the most important? Rodrik does note, however, that geography is the only exogenous factor in his three-tiered taxonomy, with integration and institutions "coevolving with economic performance". The causal relationships between the variables in Figure 2.12, as indicated by the two-way direction of several of the arrows, imply the existence of complex feedback effects. As a result, empirical work in the form of endless cross-country regressions attempting to establish clear causal relationships must be treated with extreme caution (Snowdon 2005).

2.5.3. The model

By adjusting the production function, Paul Romer's 1986 model can also be illustrated. The production function in equation (2.9) includes technology (A) as an "endogenous" input (Acemoglu 2010; Snowdon 2005).

$$Y = F(K, L, A) \tag{2.9}$$

At the micro-level, an individual firm's output (j) is determined by its own capital (Kj), labor (Mitić et al.), and the economy's overall state of knowledge (A), as shown in equation (2.10):

$$Yj = F(Kj, Lj, A) \tag{2.10}$$

Knowledge (technology) growth is assumed to be dependent on capital growth in this formulation because capital deepening fosters technological spillovers that increase capital's marginal productivity across the economy. As a result, any increase in aggregate K increases A and thus overall firm productivity. In Romer's (1986) endogenous growth model, aggregate knowledge expands as a result of firms' learning about externalities. In effect, the greater an economy's capital stock, the more productive each firm will be through a process known as "learning by doing". Thus, while the production function of an individual firm exhibits constant returns to scale and rapidly decreasing accumulation of capital, the aggregate production function exhibits increasing rather than constant returns to scale (Snowdon 2005). The AK* model, as shown in equation (2.11) below (Rebelo, 1991), is one of the simplest models of endogenous growth.

$$Y = K^{\alpha} H^{\beta} = AK^{*} \tag{2.11}$$

Here, A denotes a constant, K* denotes a broad definition of capital (K H), and + = 1. As Crafts (1995) notes, "models of this type emphasize an investment-driven process. The Solow residual has no function. As a result, the AK model and the Harrod–Domar model are very similar. There are no diminishing returns in either model, and thus no reason for growth to slow as capital deepens. If one group of countries has higher average savings rates, lower depreciation rates, and lower capital-output ratios than another group of countries, the first group will permanently grow faster than the second group, and "diversity, big time" will be the rule (Snowdon 2005).

Consequently, the new endogenous growth model considers long-run growth as a function of technological progress and thus provides a framework in which FDI can perpetually increase the rate of economic growth in the host country through technology transfer, diffusion, and spillover effects. Skills can also be transferred from one country to another to help the host country become more knowledgeable, according to the endogenous growth theory (Elboiashi, 2011).

FDI can help to promote knowledge transfer by introducing alternative management practices as well as labor training and skill acquisition (E.Mahembe et al, 2014). Multinational corporations (MNCs) are expected to contribute to research and development (R & D) as well as human capital accumulation, resulting in positive or negative externalities (growth spill-overs) that affect the host country's firms and economy (Barro and Sala-I-Martin, 1995). These growth factors, also known as FDI spillovers, are thought to come from investments in intangible capital, human capital, and R&D development (E.Mahembe et al, 2014).(Bhattarai 2016).

2.6. The Keynesian Theory

Since its inception in 1936 with John Maynard Keynes' General Theory of Employment, Interest, and Money, Keynesian macroeconomics has maintained a leadership role for three primary reasons. First, its fundamental analytical models were straightforward, adaptable, and simple to use, they and appeared to be generally compatible with observed trends of economic activity. Second, Keynes and his followers launched a vigorous and successful attack on the alternative school, which they dubbed classical macroeconomics, describing it as complex, inflexible, and empirically meaningless. Thirdly, these empirical Keynesian models laid the groundwork for developing detailed statistical models of macroeconomic activity that could be used for economic forecasting and policy evaluation.

Keynes defined his theory as general because full employment was a unique case and the characteristics of this special case implied by classical theory “do not correspond to those of the economic society in which we actually live”.

Keynesians believe that a higher wage would increase demand because a lower propensity to save out of wages and a higher propensity to save out of profits implies the Keynesian preference for increased aggregate demand (Blinder 2008). Wage levels may

decrease the profit per unit of output, but by increasing the volume of production and sales, businesses make up for it. In times of increased investment demand, there will be even more aggregate demand, which will lead to greater aggregate profits and a lower profit share. In this point of view, it is thought that growth and distribution are not compatible (Marglin 1991).

2.6.1. Keynes's important concepts of propositions

According to the theory of effective demand, the level of production (and thus employment) in a closed economy with spare capacity is calculated by aggregate planned expenditure, which is composed of two components: consumption expenditure by households (C) and investment expenditure by firms (I). There is no clear study in the general theory about the impact of changes in spending stimulated either directly by government spending or indirectly by changes in taxation. Consequently, in the general theory, there are two sectors of households and investors/businesses and planned expenditure is defined as follows:

$$E = C + I \tag{2.12}$$

Consumption expenditure is endogenous and fundamentally passive in Keynes's model, is determined by income rather than interest rates. This relationship is developed further in Keynes's theory of the consumption function. Investment spending is determined by the anticipated profitability of the investment and the interest rate at which funds are borrowed. Keynes referred to projected income as capital's marginal efficiency. Thus, jobs become inextricably linked to an uncertain element, investment spending, which is prone to large and abrupt fluctuations. The relationship between productivity and jobs and investment would be less significant if investment spending remained stable year after year. Unfortunately, investment decisions are complicated because equipment and buildings are purchased now in order to manufacture products that will be sold in an inherently unpredictable future.

Keynes derived the idea of the marginal tendency to consume from his study of the consumption function, which is critical in deciding the size of the multiplier. Due to the multiplier effect, any change in investment spending has a magnified effect on gross production. This can be shown quite simply as follows. If C equals the marginal tendency

to consume (C/Y), and that autonomous consumption is equal, we can write the consumption behavioural equation as:

$$C = a + cY \tag{2.13}$$

Consider that in Keynes's model, aggregate consumption is primarily determined by aggregate profits. By substituting (6) for (7), the equilibrium condition stated in (8) is obtained:

$$Y = a + cY + I \tag{2.14}$$

Form equation (9), it is possible to obtain the typical reduced following equation, when $Y - cY = a +$ I and $Y - cY = Y(1 - c)$.

$$Y = (a + I)/(1 - c) \tag{2.15}$$

Where $1/(1 - c)$. symbolizes a multiplier. By describing it as κ, the equation (9) can be written as $\mathrm{Y} = (\mathrm{a} + \mathrm{I})\, k$. For the change in investment expenditure (ΔI) the equation will be as follows:

$$\Delta Y = \Delta I k \tag{2.16}$$

According to Equation (10), income (output) varies by a factor of the change in investment expenditure. Keynes describes the investment multiplier (κ) as the ratio of a rise in income to the change in autonomous spending that caused it: when aggregate investment increases, income increases by a sum equal to the increase in aggregate investment (Keynes 1936). (Snowdon 2005).

The fundamental structure of Keynes' theory of effective demand can be understood by referring to Figure 2.9. As a result, it can be seen how aggregate output and employment are dependent on aggregate spending.(Keynes 1936). (Snowdon 2005).(Monette 2017). Additionally, (C + I) create the possibility of instability, as investment expenditure is typically unstable due to the influence of business expectations about an uncertain future. Uncertainty also increases the desire for liquidity, which means that changes in both the demand for money and the money supply can affect output and employment (Monette 2017). As a result, Keynes's model rejects the classical proposition that the quantity of money is neutral. By lowering interest rates, an increase in the money supply can stimulate aggregate spending through an increase in investment and the subsequent multiplier effect - see equation (10). The following figure 2.9. illustrates the below relationship.

$$+\Delta M \longrightarrow -\Delta r \longrightarrow +\Delta I \longrightarrow \Delta Y, +\Delta L \tag{2.17}$$

Keynes recognized, however, that monetary policy's effectiveness may be limited, particularly during a severe recession, and that “there may be so many slips between the cup and the lip”. If monetary policy proves ineffective or ineffective, aggregate expenditure can be stimulated directly through government spending or indirectly through tax changes that increase household disposable income. Keynes’ policy conclusions are hinted at in the concluding notes of the General Theory. The government will have to exert a guiding influence on the propensity to produce, partly through its taxation scheme, partly through interest rate fixing, and partly in other ways (Keynes 1936). (Snowdon, 2005).

2.6.2. Lack of flexibility in nominal wages

Keynes begins his General Theory by assuming money wages are constant to “facilitate the exposition,” before noting that “the essential character of the argument” remains the same whether money wages are variable or constant (Keynes 1936). Referring to Figure (2.13), we can see the impact of a negative demand shock on real output and employment in the case of nominal wage rigidity. It assumes an economy that is initially in equilibrium at full employment, (Le and YF) which experiences a fall in aggregate demand, as indicated by the *AD* curve shifting from AD_0 to AD_1 (Monette 2017; Snowdon 2005). If prices are flexible but nominal wages are fixed, the economy transits from e_0 to e_1 in panel (b). When nominal wages are rigid, the aggregate supply curve is transformed into W_0AS. With the price level falling to P_1 and nominal wages remaining at W0, the panel's real wage increases to W_0/P_1 in panel. At this real wage, the supply of labor L_D exceeds the demand for labour L_c, resulting in cd-induced involuntary unemployment (Snowdon 2005). Gold flows, on the other hand, according to Keynes, may fail to restore balance of payments equilibrium if wages and prices respond slowly to changes in the money supply (Salvadori 1998-1999).

Because the supply of labour increases with the real wage, this makes sense. For the involuntarily unemployed workers, a decrease in the real wage from W_0/P_1 to W_0/P_0 is suitable because they would have been prepared to work for a lower real wage, as shown by the supply curve for labor between b and e. If wages fall, businesses may need more labor to stay profitable. There are two options to minimize the wages. If money wages fall, the price level must increase relative to the nominal wage. Keynes advocated

aggregate demand, in order to boost the price level. In figure 2.13, (b) stipulates policies that will move AD from AD_1 to AD_0. The price level increases from P_1 to P_0, decreasing the real wage and the level of involuntary unemployment is removed (Monette 2017; Snowdon 2005).

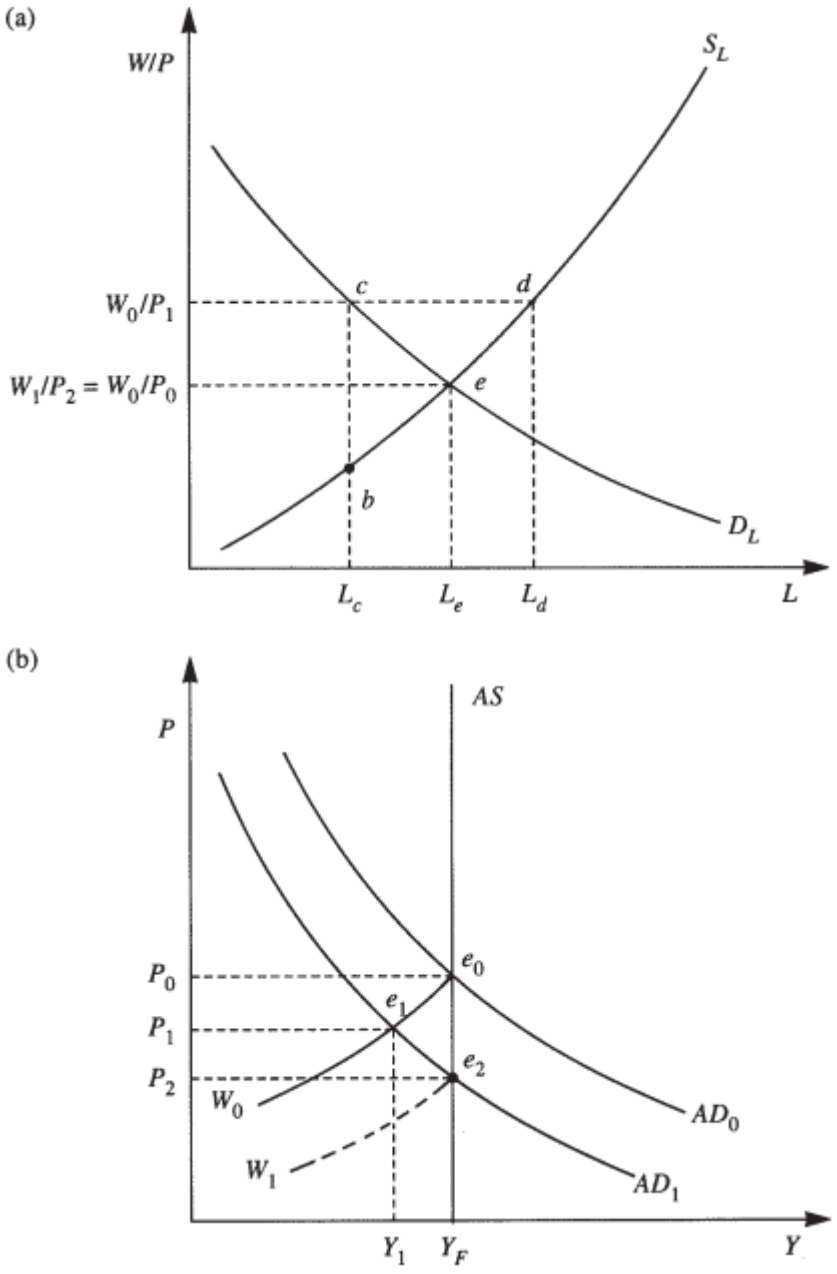


Figure 2. 13. *Unintended unemployment and Keynes*

2.7. The Effects of Foreign Direct Investment

Macroeconomic impacts and microeconomic consequences of FDI may be categorized. When analysing the macroeconomic consequences of FDI, it is customary to represent it as an increase in foreign borrowing. When there is unemployment and a capital shortage (as is often the case in developing nations), such borrowing results in an increase in the host country's production and revenue. Under these circumstances, FDI will benefit the balance of payments but will have an ambiguous effect on the terms of trade (depending on whether the impact of increased output falls on import substitutes or exports). The first formal examination of the macroeconomic consequences of FDI in a neoclassical framework dates all the way back to MacDougal (1960), who utilized partial equilibrium, comparative static analysis to demonstrate that the host country would benefit primarily from foreign profit taxation. Real wages would likewise increase at the cost of profits, the reasoning goes, as capital's marginal productivity declines. This type of analysis has been extended in several ways, including (1) the analysis of optimal taxes; (2) dynamic growth models with foreign investment and trade based on pure trade theory; (3) comparative statics general equilibrium models; and (4) comparative statics trade theory with capital movements. (Moosa 2002).

2.7.1. The effect of FDI on output

One of the most significant effects of FDI on the host country's economy is the increase in production. In developing nations, where inbound investment is seen as a method of promoting economic growth, this impact is inherently more relevant. Investments or takeovers can only work if there is a rise in the capital stock of the host country.

If FDI takes the form of takeover mergers and acquisitions, the production benefit will be less strong. (M&As). Capital accumulation, population expansion, technical advancement, and the discovery of new natural resources are all factors that contribute to the rise in real per capita income. There are several theories of economic growth based on the interrelationships between these components. Capital accumulation is considered the primary factor behind greater development in these theories, however. FDI, therefore, should be able to influence economic growth since it affects capital accumulation.

Inevitably, advances in technology have a significant impact. When compared to the conventional Solow-based growth model, which assumes that technological development is exogenous, more recent growth literature emphasizes the importance of domestic technology in determining economic growth. (Robert M Solow, 1955). (Moosa, 2002).

Since technology is catching up with the developed world, growth rates in emerging nations may be explained in part by technology. Growth in emerging nations is influenced by the degree to which leading countries have adopted and implemented new technologies that are already in use in their own countries. This approach holds that what counts is the acceptance and adaption of foreign technology, a claim that is highly backed by the Japanese experience. (Moosa, 2002).

The multiplier model may be used to describe the influence of foreign direct investment on production. However, quantifying the multiplier associated with FDI is problematic. In addition to leakages associated with domestic investment (such as taxes and imports), FDI has leakages of its own, such as import content (which reflects foreign claims on domestic output) and remittances (in the form of dividends, interest payments, fees and royalties), which represent claims on local output once again, among other things. This would result in a decrease in the output-capital ratio and a closer approach to meeting the consistency criteria for the economy. (Robert M. Solow, 1994).

Moreover, the MNC has the ability to move its activities across international boundaries to take advantage of cheap taxes or substantial subsidies. It may even be able to employ transfer pricing to shift its earnings to regions with the lowest taxes. (Kokko 2006). Also, it has been amply shown that foreign-owned enterprises pay greater salaries than locally held firms in host nations. (Lipsey 2004).

To a considerable degree, the macroeconomic policy of the host country has a significant impact on the volume, composition, and growth of that country's output from foreign direct investment (FDI). When it is feasible to absorb excess resources and increase efficiency via alternative allocations, foreign direct investment (FDI) may have a positive influence on the production of the host nation in general. It's conceivable to get the following results, though:

1. One strategy to make sure that foreign direct investment (FDI) has no effect on the amount of the country's production is to ensure that the government's macroeconomic policy always reaches full employment.

2. FDI net of remittances is good for the host country's output if it uses resources that would otherwise go to waste.

3. Domestic production would increase if foreign direct investment (FDI) was able to improve the efficiency of domestic resources by transferring them to more productive areas of the economy.

2.7.2. The Effects of FDI on Economic Growth

A dynamic model of foreign direct investment (FDI), investment, and growth is designed to demonstrate how foreign capital is complementary to domestic capital due to the fact that it entails technology transfer and dissemination of new management and procedures. Countries wishing to attract foreign investment must first make a financial commitment. To understand the function of foreign capital in economic growth, it is necessary to use a conventional growth model, that is consistent with endogenous growth theory. The conventional utility [U] preferences are represented in equation (1) by the consumption [C] variable, while technology is represented by the Cobb-Douglas production function, which includes domestic capital [K], foreign capital [F], and technology [A]. When it comes to the infinite horizon utility maximization problem, factors like technological advancements, local and international capital accumulation, and market clearing conditions all play a role in how it is solved.

$$\max\ U_0 = \int_0^{\infty} e^{-\rho t} U\ (C_t) dt : U(C_t) = \frac{C_t^{1-\theta}}{1-\theta} \qquad (2.\ 18)$$

Following this formula, we arrive at the following one:

$$Y_t = A_t K_t^a F_t^{1-a} \qquad (2.19)$$

Net domestic investment as results in a change in physical capital is defined as follows:

$$K_t = I_k - \delta K_{t-1} \qquad (2.20)$$

In a similar context, net foreign investment leads to the build-up of foreign capital:

$$F_t = I_f - \delta_f F_{t-1} \qquad (2.21)$$

In order for the market to clear, the total output must always equal the total demand.

$$Y_t = C_t + I_{k,t} + I_{F,.t} \qquad (2.22)$$

As shown in the diagram below, infinite horizon-limited dynamic optimization problems are solved by using Hamiltonian functions:

$$J = \frac{C_t^{1-\theta}}{1-\theta} e^{-\rho t} + v[I_k - \delta K_{t-1}] + \mu\left[I_f - \delta_f F_{t-1}\right] + \omega\left[A_t K_t^a F_t^{1-\beta} - C_t + I_{k,t} + I_{F,.t}\right] \quad (2.23)$$

while C represents consumption, K represents capital stock, F represents the amount of FDI, I_K and I_F represent domestic and foreign investments, and In the model, the variables are: A technology, Y output, and U utility of representative households; the parameters are: θ, p, α, v, μ, δ, ω the symbol θ denotes the productivity of capital; the symbol p denotes the discount factor; and the symbol α denotes the productivity of capital. The symbols v, μ, and ω denote the shadow prices on domestic capital, foreign capital, and the resources of the economy, respectively. All of these things are first-order conditions: consumption, local and foreign capital and shadow prices, and they include the following:

$$\frac{\partial J}{\partial C} = C^{-\theta} e^{-\rho t} - \omega = 0 \quad (2.24)$$

$$\frac{\partial J}{\partial I_k} = v - \omega = 0 \quad (2.25)$$

$$\frac{\partial J}{\partial I_F} = \mu - \omega = 0 \quad (2.26)$$

$$v = \frac{\partial J}{\partial K} = 0 \quad (2.27)$$

$$\mu = \frac{\partial J}{\partial F} = 0 \quad (2.28)$$

K, F, Y, C, μ and v can be solved with these five equations to show how an economy like this can grow at a stable rate over time.

$$v = \frac{\partial J}{\partial K} = v\delta - \omega a A K^{a-1} F^{1-a} \quad (2.29)$$

$$\mu = \frac{\partial J}{\partial F} = \mu\delta - \omega(1-a)\, A K^a F^a \quad (2.30)$$

The following equation is derived from the last two equations:

$$C^{-\theta} e^{-\rho t} = v \quad (2.31)$$

Using all these sides of the log:

$$-\theta \mathrm{In} C - \rho t = \mathrm{In} v \quad (2.32)$$

By formulating a time distinction between the two sides:

$$-\theta\frac{C}{C}-\ \rho=\frac{v}{v} \tag{2.33}$$

Exchanging:

$$g_c=\frac{C}{C}=-\frac{1}{\theta}\left(\frac{v}{v}+\rho\right)=-\frac{1}{\theta}\left(\frac{v\delta-\omega aAK^{a-1}F^{1-a}}{v}+\rho\right)=\frac{1}{\theta}(aAK^{a-1}F^{1-a}-\rho-\delta) \tag{2.34}$$

Correspondingly, by using $v = \omega$

$$\frac{\mu}{\mu}=\frac{\mu\delta-\omega aAK^{a-1}F^{1-a}}{\mu}=\delta-(1-a)AK^{a-1}F^{1-a} \tag{2.35}$$

$\frac{v}{v}=\frac{\mu}{\mu}$ means

$$\delta-aAK^{a-1}F^{1-a}=\delta-(1-a)AK^{a-1}F^{-a} \tag{2.36}$$

$$\frac{K^{a-1}F^{-a}}{K^{1-a}F^{1-a}}=\frac{a}{(1-a)}or\frac{K}{F}=\frac{a}{(1-a)} \tag{2.37}$$

Consequently, the relationship between local and foreign capital is continuous. Incorporating this value into the production function is as follows:

$$Y=AK^aF^{1-a}=AK\frac{K^a}{K}F^{1-a}=AK\frac{F^{1-a}}{K^{1-a}}=AK\left(\frac{1-a}{a}\right)^{1-a} \tag{2.38}$$

Due to their interdependence, even though the marginal productivity of domestic and foreign capital is decreasing separately, the marginal productivity of domestic capital [K] equals A (1-a)/a due to the complementarity that exists between them (1-a). It does not lessen and may even expand because of technological advancement. In a manner that is similar to the AK endogenous growth model, adding domestic or foreign capital provides economic growth at a constant pace. This is represented as follows:

$$g-\frac{Y}{Y}=\frac{C}{C}=\frac{K}{K}=\frac{F}{F}=\frac{\mu}{\mu}=\frac{v}{v}=g_A+g_K+(1-a)\mathrm{In}\left(\frac{1-a}{a}\right) \tag{2.39}$$

Consequently, the growth rates for capital and technology are exactly proportional to the rate of increase in production. With the introduction of a stochastic shock (z) in technology, A(z), and by making technological development a function of accumulation of foreign as well as human capital appropriate for multinational firms to operate and invest in the domestic economy, this basic model can be further developed, allowing them to fully realize their potential for increasing returns of scale. The empirical estimation of this model will be carried out using the increase in production (growth), the domestic investment ratio, and the ratios of inflows (FDI ratio) and outflows (outflow ratio). Other factors, including openness and taxation, as well as the interplay between FDI and per capita income, were incorporated to account for characteristics that were not captured by the previous model (Bhattarai 2016).

2.8. Some Economic Notes on the Economic Theory of Economic Growth

The old theory obtains a pessimistic view of what economic policy could accomplish in this area, arguing that economic growth is constrained in the long run by advances in physics, biology, and engineering, rather than by economic forces. However, according to the new growth theory, an economy's long-run growth rate is determined by people's ability to save, which is strongly influenced by economic policy (Howitt 2007). As Tobin (1997) notes, Keynesian economics makes no pretense of being appropriate to long-run growth and development problems. The investors anticipate that the capital equipment will quickly pay for itself. It seems that the expected period of repayment for new equipment ranges between three and seven years. The main reason that investors/businessmen demand that the equipment be paid for in a relatively short period of time is their fear of these machines aging and becoming obsolete due to rapid technological change, a short repayment period (Kahn, 1931). (Bibow, 1995). While Keynes clearly indicated the effect of income in his analysis of the demand for money, he ignored the effect of changes in the level of income on the interest rate and instead calculated it solely by monetary factors, namely the supply and demand for money. This equilibrium interest rate cannot be determined unless we fix or presume the amount of income. This can be accomplished only in the very short term. If a connection between the monetary and real sectors through the impact of interest rates on investment

agreements is to be established, both income and interest rates must be determined concurrently. This is accomplished within the context of general equilibrium theory (Kahn, 1931). Also, Paul Krugman discusses the theory of endogenous development, which is virtually impossible to prove empirically and requires a great deal of inference on how unmeasured things affect other undefined objects. In such models like the AK model, long run growth is dictated by endogenous factors more accurately than exogenous factors, which assumes a constant exogenous saving rate and a constant level of technology (Wikipedia, 2020).

2.9. The Theoretical Concept of Economic Growth

International flows of financial resources between countries may take the form of capital that moves between borders, and for a period in previous centuries, it has become the main engine for promoting economic growth and facilitating the reconstruction and internationalization of former countries in the regions after the Second World War. Thus, there was a significant and important role for multinational corporations in contributing to the movement of capital and economic growth in both industrialized and developing countries.

The advanced economies' growth is forecast to accelerate from 1.8 percent in 2014 to 2.1 percent in 2015 and 2.4 percent in 2016, a more gradual acceleration than was forecast in April 2015. (WEO). The unforeseen weakness in North America, which accounts for the lion’s share of the growth forecast adjustment in advanced economies, is likely to prove a momentary setback. The fundamental drivers for acceleration in consumption and investment in the United States remain intact: wage growth, labor market conditions, easy financial conditions, lower fuel prices, and a strengthening housing market. Also, the United States remained the epicentre of the crisis, with financial institutions in Other advanced economies were also impacted by exposure to structured credit and varying degrees of prudential oversight and risk management system weaknesses at financial institutions. In response to these incidents, major central banks in the United States and Europe began to play a critical role in controlling systemic risk by providing large-scale access to short-term financial support through various existing and newly created facilities as private banks retrenched. Growth in 2007 was only 2.2%, down from 3% in 2006, and fell further, to about 1%, in the first quarter of 2008 as the correction

in the U.S. The housing market collapse resulted in a contraction of residential investment and a significant slowdown in household consumption. Rising oil prices contributed to the dampening of consumption while boosting 12-month headline inflation to more than 4% in late 2007 and early 2008. The United States' growth prospects have deteriorated in comparison to its trading partners, and expectations of interest rate cuts have dampened foreign investment in the United States. securities, putting downward pressure on the dollar. The dollar's reduction against the euro, the yen, and other fluctuating currencies, such as the Canadian dollar and some initial market currencies, boosted net exports, the one area of strength in the U.S. economy, and the current account debit of the United States moderated somewhat, to 5.3% of GDP in 2007. Figure 2.14 shows current account balances for different countries and regions as a percentage of world economic growth in the GDP.[1]

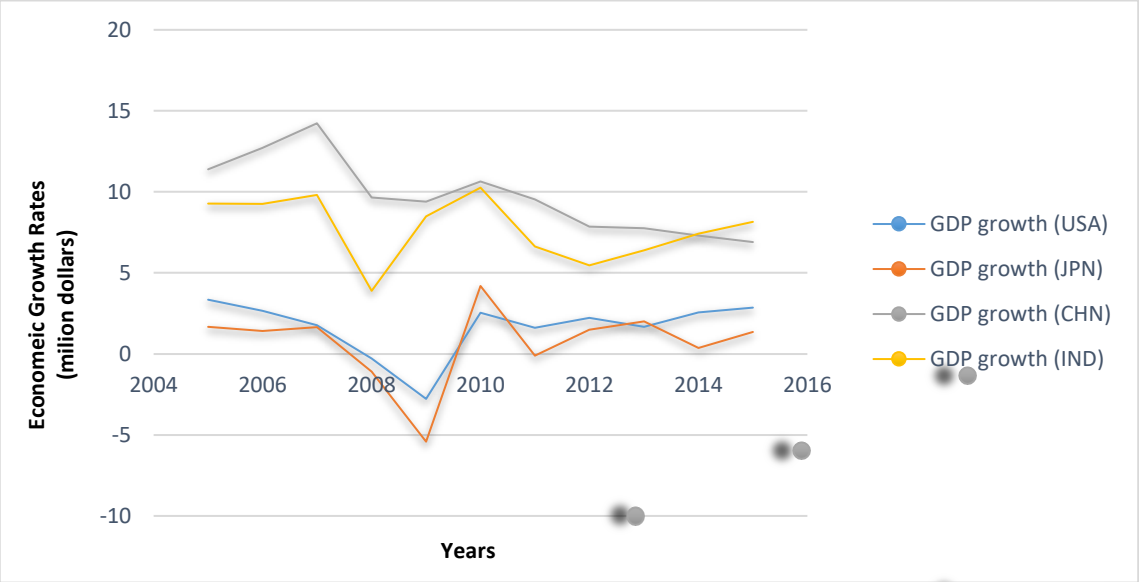


Figure 2. 14. *The economic growth in the biggest economies in the world, since 2005 until 2015 due to changing in the GDP, $ million*

Source: *OECD National Accounts data and World Bank national accounts data and files. This data is the annual percentage growth rate of GDP at market prices based on constant local currency. Aggregates are based on constant 2010 U.S. dollars.*

The economic recovery in the euro area seems broadly on track, with a generally robust recovery in domestic demand and inflation beginning to increase. Growth projections have been revised upward for many euro area economies. For example, in Japan, growth in the first quarter of 2015 was stronger than expected, supported by a pickup in capital investment. However, consumption remains sluggish, and more than

[1] For more details see, www.IMF.org/ Annual-Report-of-2008.

half of the quarterly growth stemmed from changes in inventories. With weaker underlying momentum in real wages and consumption, the pickup in growth in 2015 is now projected to be more modest.[2]

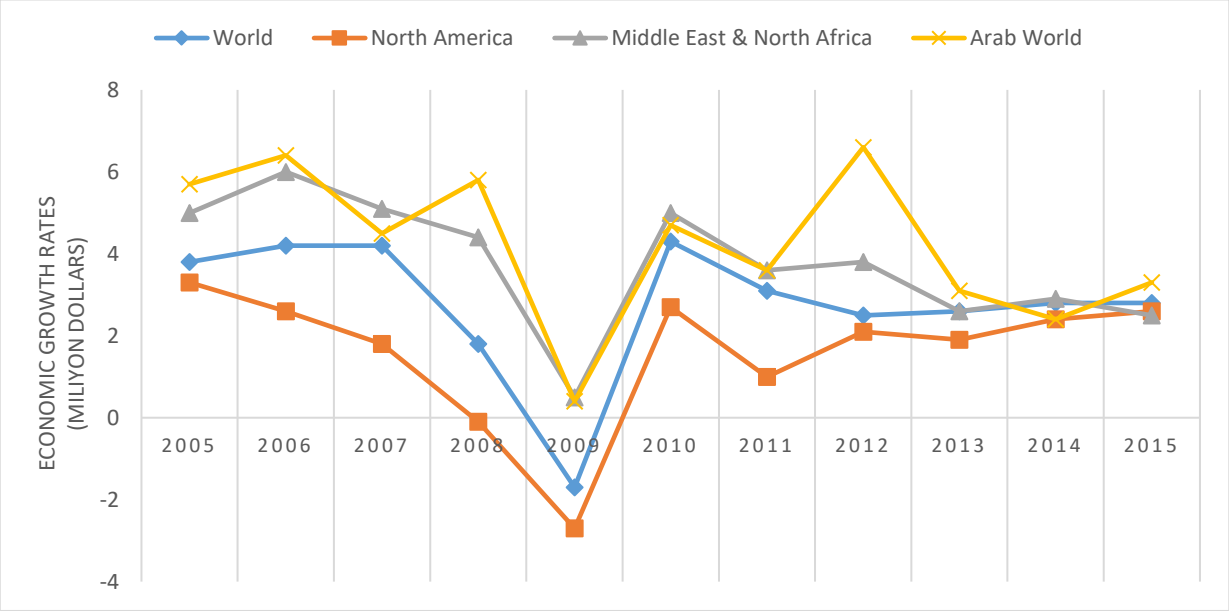


Figure 2. 15. *The economic growth in the economic clusters and the world, among (2005, 2015) annual %, $ million.*

Source: *World Bank statistics.*

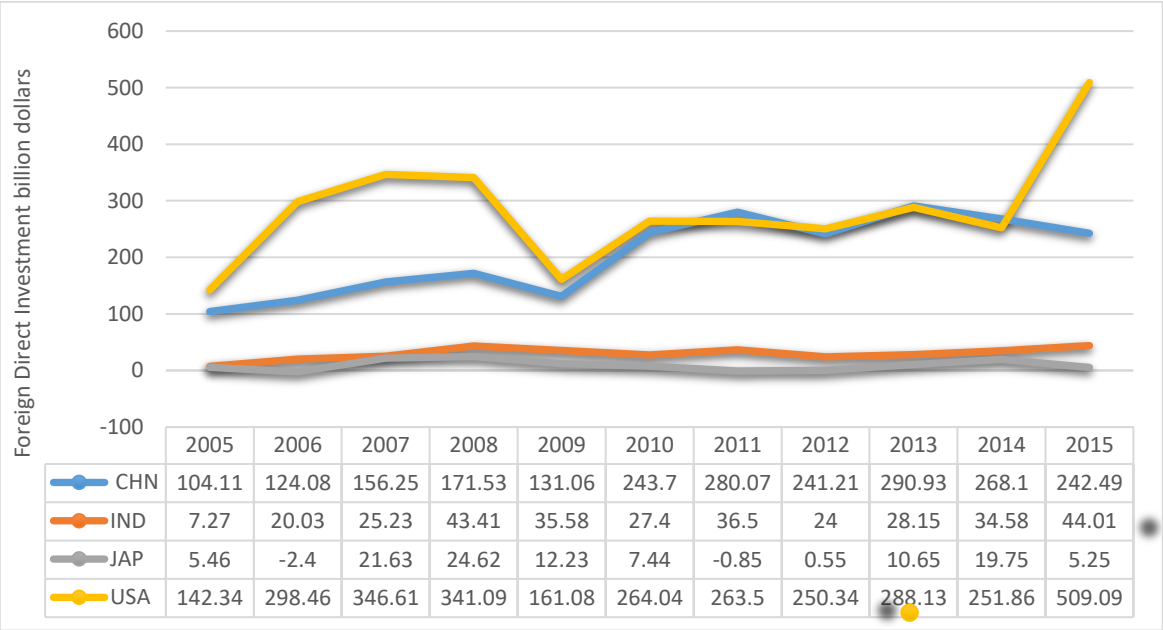
In general, growth in the world's largest economies was affected by the global crisis in 2008. But at different levels from one country to another. For example, in the United States, the impact was stronger than in China or India. Therefore, India achieved the highest recovery from the crisis in 2009, and then India got the highest rate of economic growth in the world in 2015.

2.10. The Historical Perspective on FDI Rates

Foreign direct investment has a large role in the long term and short term in the analysis and provides great quality advisory reports. As illustrated in Figure 2.16, the largest economies have the ability to attract foreign investment faster than other countries during the period (2005–2015). Especially the United States, China, Japan and India. These countries have achieved high rates of foreign direct investment, significantly. However, the global economic crisis in 2008 is clearly reflected in this, which led to a decrease in the volume of investments received. Since 2009, the United States has spent

[2] For more details see, www.IMF.org/ Annual-Report-of-2015.

$161.1 billion, China has spent $131.1 billion, India has spent $35.58 billion, and Japan has spent $12.23 billion. Thus, there was a gradual improvement to 2011, after which the value of the investment returned to a slight drop again, until the value of foreign direct forms in Japan reached negative values - 2.4 and -0.85 in 2006 and 2011, respectively.



	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
CHN	104.11	124.08	156.25	171.53	131.06	243.7	280.07	241.21	290.93	268.1	242.49
IND	7.27	20.03	25.23	43.41	35.58	27.4	36.5	24	28.15	34.58	44.01
JAP	5.46	-2.4	21.63	24.62	12.23	7.44	-0.85	0.55	10.65	19.75	5.25
USA	142.34	298.46	346.61	341.09	161.08	264.04	263.5	250.34	288.13	251.86	509.09

Figure 2. 16. *The foreign direct investment rates in the biggest economies in the world, from 2005 until 2015 due to a change in the GDP, $ billion.*

Source: *The global economy it is the entirety of value capital, reinvestment of profit, other long-term capital, and short-term capital as it appears within the balance of payments.*

Also, as noted in the study period, the US economy has been the major contributor to the ability to attract investment, with remarkable competition from the Chinese economy. From the beginning of 2005 until 2014 until its counterpart surpasses the US economy in 2011, 2013 and 2014. In addition to the expected rise of the US economy in 2015, which achieves the greatest value in attracting foreign investment, with an estimated value of $509 billion during the proposed years compared to other major countries.

2.11. The Historical Perspective on the Indicators of European Union, G-20 Countries, OPEC Members and OECD Members

According to the flows of global indicators in international institutions, those indicators show the extent of the impact of global economies and international federations. We can see the change between indicators for the two groups of European

Union and OECD Members. Figure (2.17), presents economic growth in the two groups from the beginning of the period, appears to have increased by 2.7 and 2.1, respectively, and both have gained in general. However, in the years of the global economic crisis, the two groups experienced a decline in 2008 and 2009, (0.4, -0.4) and (0.1, -3.5) respectively, but the volume of exports was not affected too much and was maintained fundamentally.

In a comparison of foreign direct investment flows, we note the rise in foreign direct flows in the first period. But the same effect was had by the economic crisis on the volume of the total flows of the two groups. Later, the rates also increased appreciably until 2012, causing a new decline for the group (B). However, the European Union was significantly affected in 2014 by the gradual and FDI growth rates that had increased vice versa in the earlier period.

Streams to create economies expanded further, after noteworthy growth in the earlier years. Inflows ascended by 5 % to $1 trillion. A fall in FDI in Europe was more than remunerated by humble growth in North America and a sizeable increment in other newly created economies. Built up economies' offer in worldwide FDI inflows developed to 59%. After two years of steep decline, FDI flows to changing economies nearly tripled, to $68 billion, reflecting extensive privatization bargains and increased interest in mining investigation exercises. Major monetary gatherings, for example, the G-20, have firmly affected worldwide FDI patterns. Inflows to the G-20 achieved a record of more than $1 trillion out of the blue. Intragroup FDI is a developing element in certain gatherings. (UNCTAD, 2017).

In view of the data contained in figure (2.18), it is clear that the G-20 countries differ in their growth rates. For example, in 1990, Turkey's economic growth rate was 9.3 percent, Saudi Arabia's was 15.2 percent, and Indonesia's was 7.2 percent. These rates are the highest in that year. These rates are the highest in that year. While both Argentina and Russia had negative economic growth rates of the same year, Italy has also acquired a negative rate in indicator growth (-2.8 and -1.7) in 2012 and 2013, respectively. And also in the same context, Brazil achieved negative economic growth at the beginning of the period and at the end too, with -3.5 in 2015.

While growth rates in the Group of 20 (G-20) Islamic countries Turkey, Saudi Arabia, and Indonesia were 6.1, 4.1, and 4.9 percent in 2015, respectively.1990 and 2015, Turkey achieved an average of 9% and Saudi Arabia, with an average of 7% over the

same period. The average growth rate for the same period in Indonesia was 6% between 1990 and 2015. Saudi Arabia achieved the highest economic growth of 15.2 years in 1990, followed by China, whose rate of economic growth was 11.4% in the same year, and Turkey, with economic growth of 11.1% in the G-20.

Recent data for advanced economies points to decelerating activity, especially in the OPEC members. The following values in Figures 2.19 and 2.20 illustrate the disparity and volatility between economic growth rates between countries. Between 1990 and 2015. For example, the case of Iraq achieved growth of about 58% in 1990 compared to other countries in the organization, followed by the United Arab Emirates 18.3% in the same year, and Saudi Arabia by 15%. On average, Saudi Arabia achieved an average of 6%.

Also, referring to the security and political situations in the countries, the rate of economic growth varies according to geopolitical conditions fundamentally. For example, Guinea achieved growth of 18.2% in 2000 while losing -1.8 in 1990. Conversely, in 2012, economic growth was 8% but fell to -4.1% in the second year. In the same context, because of the events in Arab countries and the Middle East, political tensions led to increased crises in the balance of payments. For example, the situation in Libya had a 5% economic growth rate in 2010. The following year saw a sharp decline in growth until -62% in 2011. Even changing the political system, which led to a significant rise in growth next year to 123% in 2012, which saw the return of oil exports. These rates of economic growth of the oil petroleum exporting countries depend on the economic growth achieved by the major industrial countries and the extent to which they achieve their growth rates and the black markets for the sale of oil.

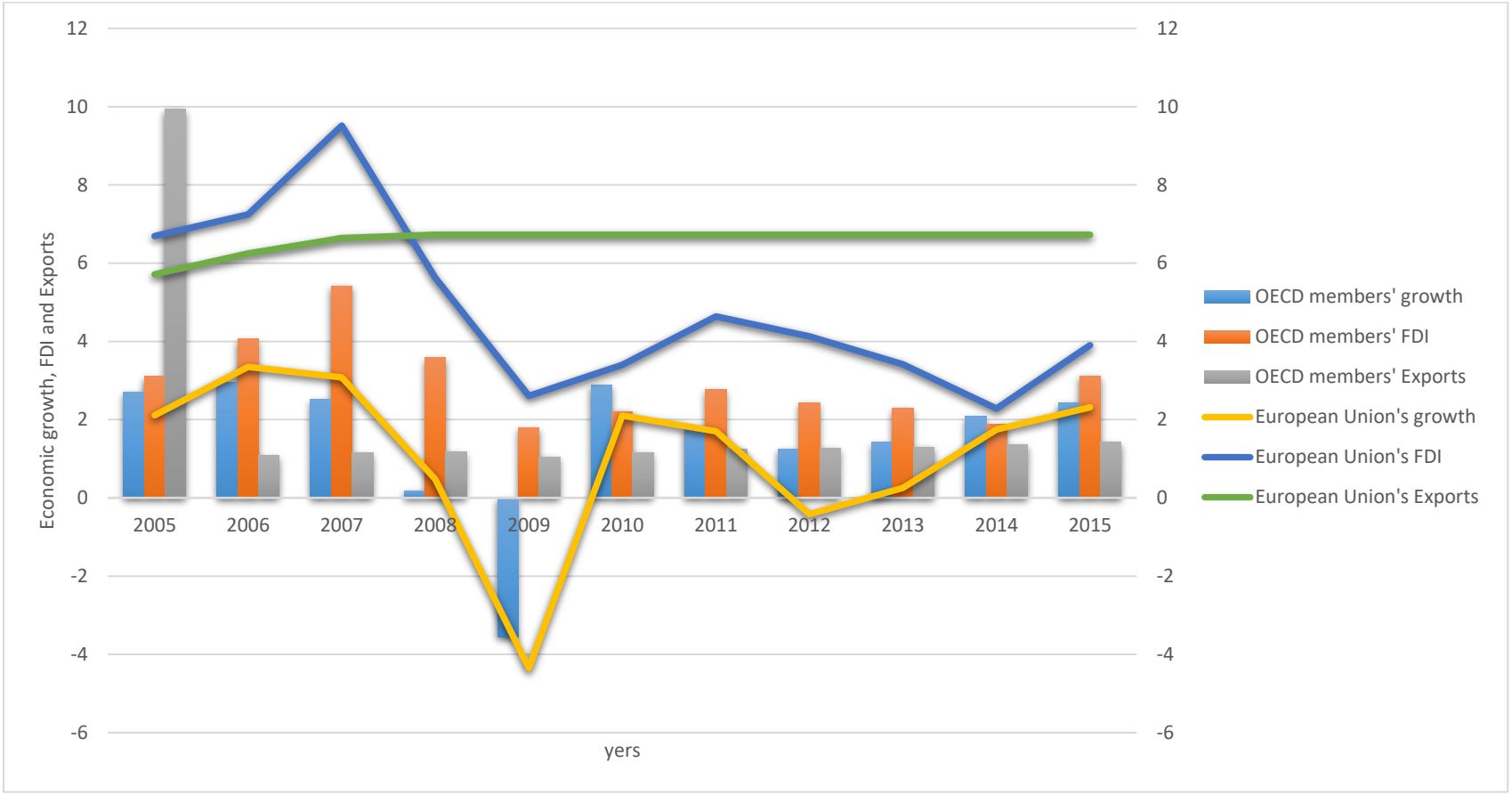
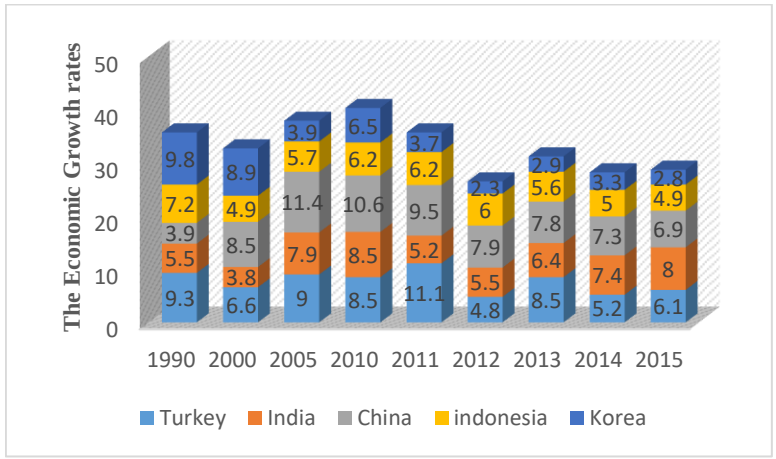
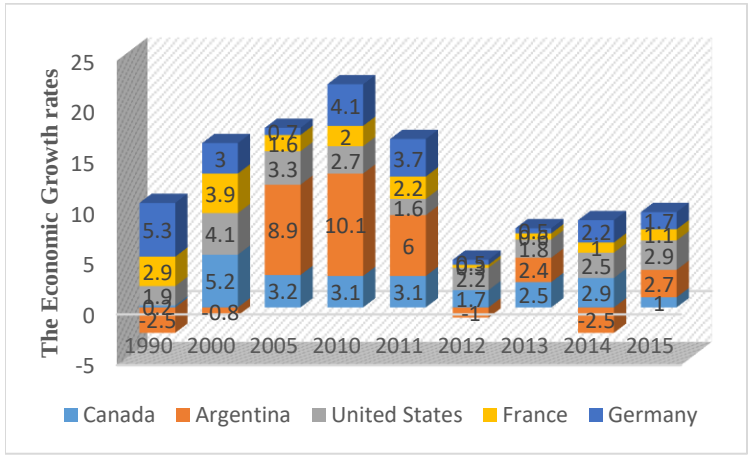
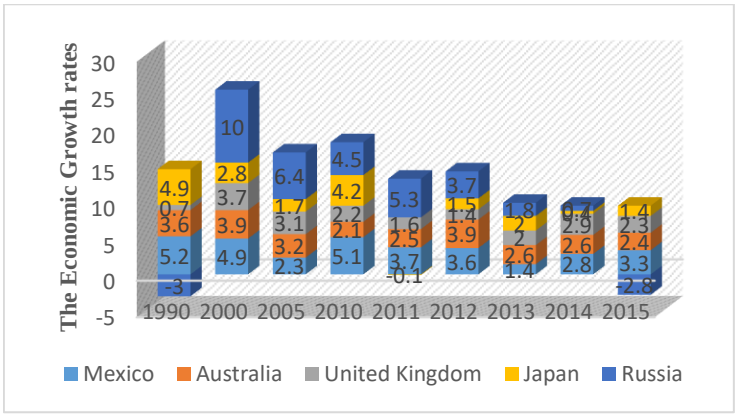


Figure 2. 17. *The economic growth, FDI and exports in (European U and OECD M), since 2005 until 2015, $ billion.*

Source: *the global economy. In these numbers of indicators are annual %, also, the exports are generally by constant 2010 US$.*







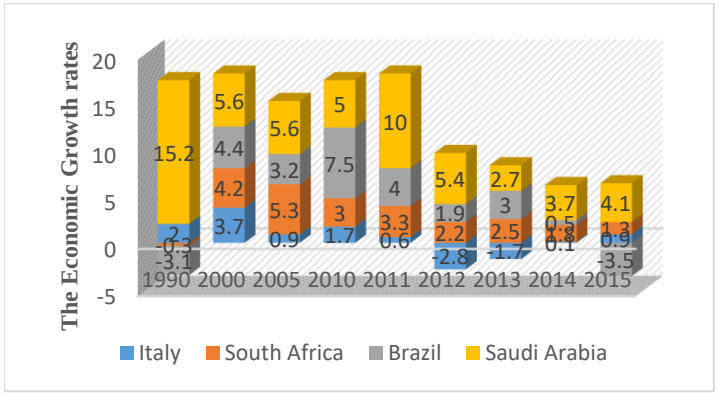


Figure 2. 18. *The economic growth of G-20 countries, since 1990 until 2015, $ million*

Source: *knoema. Statistics and Penn World Table 9.0. The economic growth evolution of G-20, through (1990-2015).*

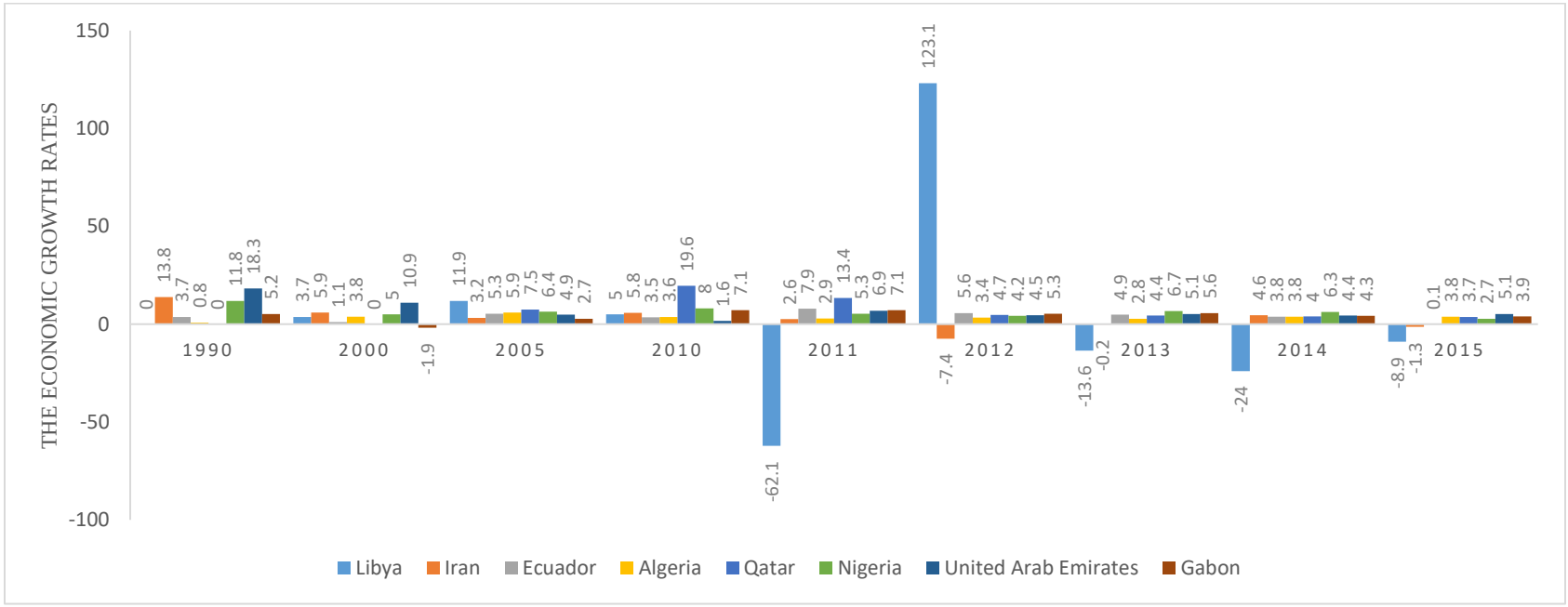


Figure 2. 19. *The economic growth of OPEC*

Source: *knoema. Statistics and Penn World Table 9.0. The economic growth evolution of OPEC, through (1990-2015).*

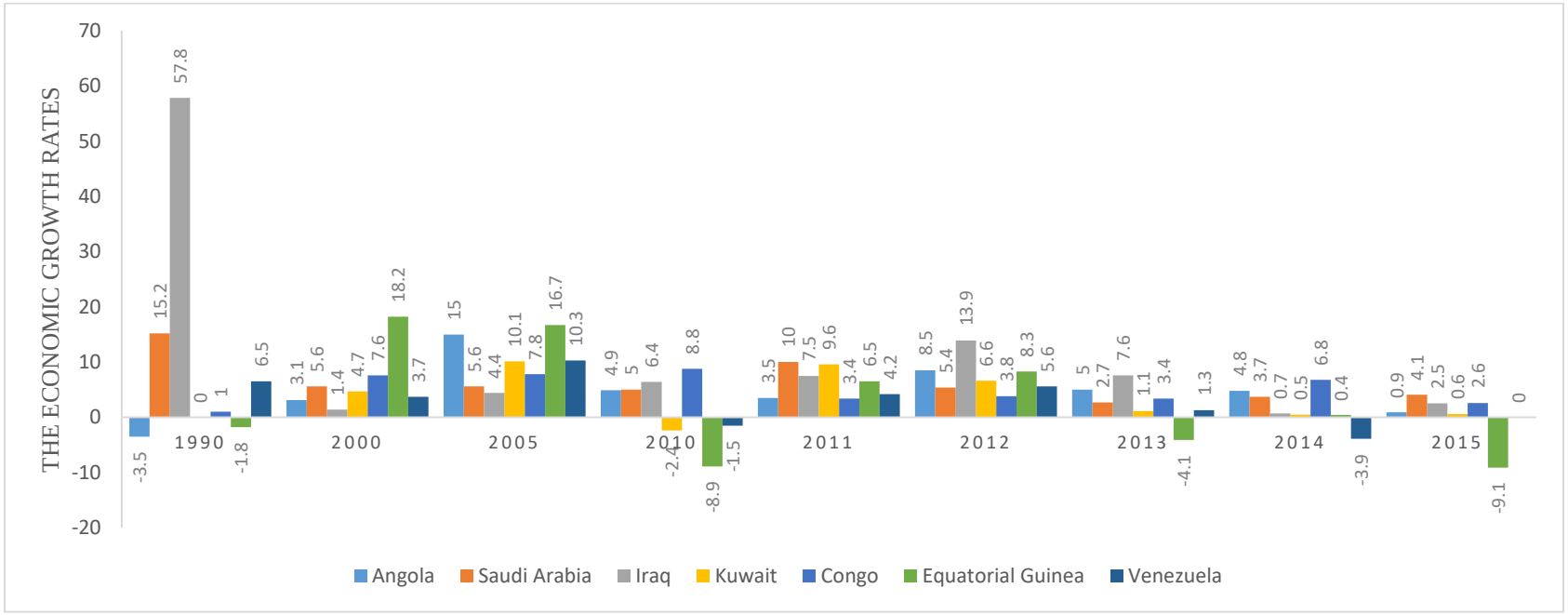


Figure 2. 20. *The economic growth of OPEC*

Source: *knoema. Statistics and Penn World Table 9.0. The economic growth evolution of OPEC, through (1990-2015).*

2.12. The Historical Perspective on the Economic Growth Rates

The figure shows the rates of economic growth in three countries within the G-20 Organization. It is clear that economic growth rates and depend on the shape of the curve between the countries as follows:

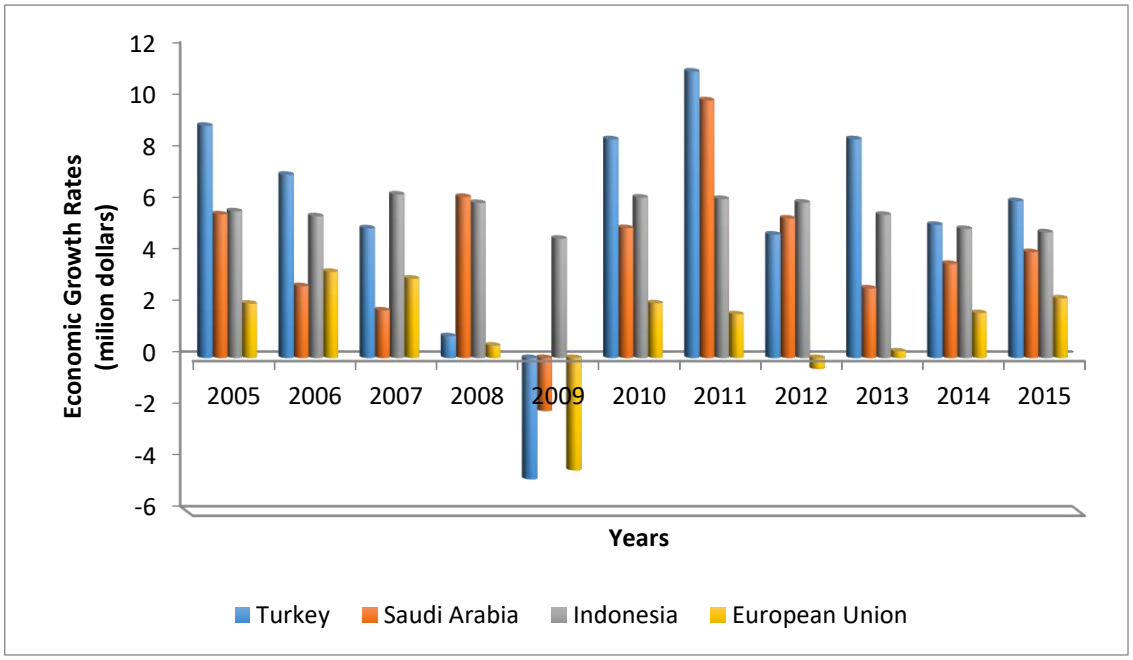


Figure 2. 21. *The economic growth in groups (A and B) from 2005 until 2015 was due to a change in the GDP of $ million*

Source: *World Bank statistics show Figure: Economic growth evolution of groups (A and B) through 2005-2015.*

In 2005, Turkey had achieved the highest growth rate in the year 2011 with a value of $11 million, Saudi Arabia, worth 9.9 million dollars and Indonesia, worth 6.1 million dollars, while the European countries with the lowest rate of growth compared to 1.6 million dollars' worth of groups in the same year. In addition, Turkey and European Union countries got a low value at the beginning of the global financial crisis in 2008, while Saudi Arabia and Indonesia had economic growth rates of 6.2 and 6 million dollars, respectively. Since the financial crisis in 2008, investment in advanced economies has collapsed.

After one year, the crisis affected the combined study states and got negative values for economic growth in all of Turkey, Saudi Arabia, and the European Union countries except for Indonesia, where the annualized portfolio growth was positive at 4.6

million dollars. After that, the States began at varying rates of growth among themselves until 2015, when Turkey, Saudi Arabia, Indonesia, and the European Union's annual value were 6. 4.1, 4.9 and 2.3 million dollars, respectively.

2.13. The Historical Perspective on the Amount of Foreign Direct Investment Flows

The figure above shows the volume of FDI. It is clear that foreign direct investments vary from state to state depending on the configuration of the local economy.

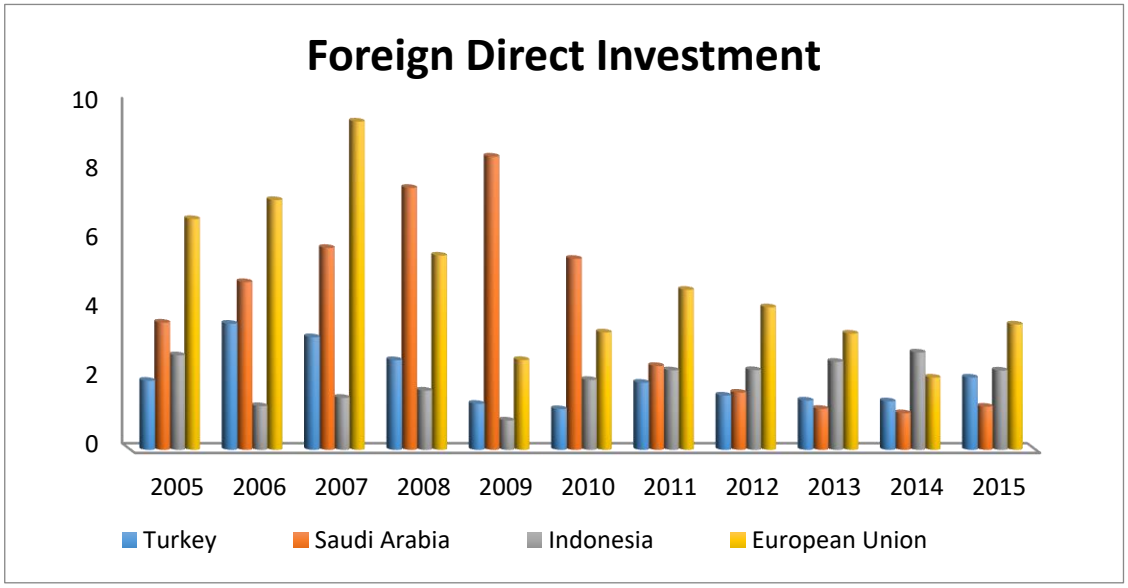


Figure 2. 22. *Foreign direct investment in groups (A and B) from 2005 until 2015 due to a change in the GDP, $ million.*

Source: *World Bank statistics. Figure: Economic growth evolution of groups (A and B) through 2005-2015.*

Generally, the shape of the curve is uneven between countries. In 2005, the EU had achieved higher rates of attracting foreign direct investment, so in the year of the global financial crisis in 2008, the Union suffered from a decline in the flow of foreign direct investment to the value of $5.6 million. Then it experienced a fluctuation in the value of its investments between the year 2015. The second group received a disparity in the size of foreign investments within the years 2005 and 2015, except for Saudi Arabia, which had no influence in the financial crisis and the next year. And then the drug was reduced in size and achieved low direct foreign investment until the year 2015, when it reached $1.5 million.

2.14. The Historical Overview of the Amount and the Value of Domestic Exports

According to the data in the chart below, which shows the number of exports for the countries. It is clear that the number of exports is not very different between the two groups during the study period.

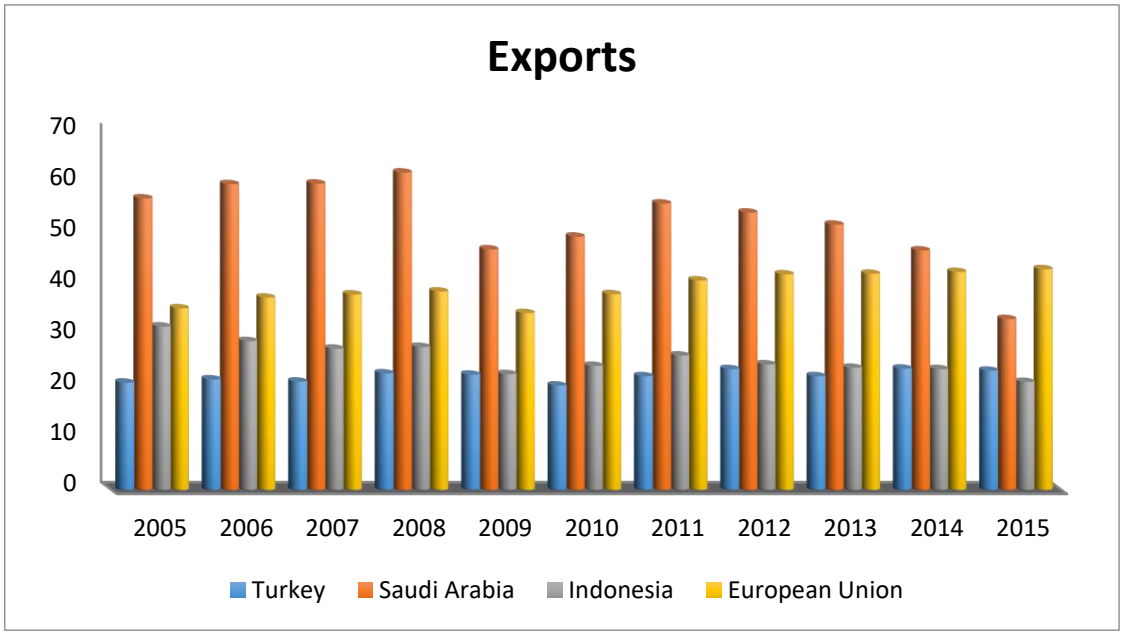


Figure 2. 23. *Foreign direct investment in groups (A and B) from 2005 until 2015 due to changes in GDP*

Source: *IMF statistics.*

The data takes the form of a stable path through the years from 2005 until 2015. The European Union exported goods worth $35.5 billion dollars in 2005. And did not witness any collapse in the value of exports to EU countries significantly, only a simple decline or rise slightly even during the global financial crisis in 2008. In the same context, for the first group, local exports stabilization during school years with varying simple values only.

It is also noted that Saudi Arabia's big-sized excels in exports between countries in the two groups (A and B) in 2005 was $57 billion dollars' worth of exports, then, after a year of the global financial crisis, fell to $47 billion in 2009 and then recommenced

climbing slightly in value of exports. The property of the Saudi economy is its dependence on exports of raw materials such as oil, gas, and petrochemicals.

As evidenced by the painting too, which characterized Turkey's export stabilization during the years of 2005 to 2015, exports rose from $21 billion to $23.34 billion dollars in 2015. The observer noted that after the global financial crisis, exports declined to $22.44 billion dollars in 2010 and then also fell to $22.27 billion dollars in 2013.

And also, with respect to Indonesia, which saw exports drop from 2005 to 2015. During the 2008 financial crisis, exports fell from $27 billion to $23 billion in 2009, before rebounding to $24 billion and $26 billion in 2010 and 2011, respectively.

CHAPTER 3

3. THE CAUSAL RELATIONSHIP BETWEEN ECONOMIC GROWTH, FOREIGN DIRECT INVESTMENT AND EXPORT

3.1. Time Series Analysis for Islamic Members of G-20 Countries

3.1.1. Model specification and estimation

In this part of the study, will deal with using the causal relations model between FDI, economic growth and EX. In addition to examining them by a VAR autoregressive model, using a traditional model, and presenting the time series data in the relationship between the study's variables. The model is in the following form:

$$DGrowth_t = \beta_0 + \beta_1 . DFDI_t + \beta_2 . DEX_t + \varepsilon_t \qquad (3.1)$$

t= 1, 2,……,34

Whereas DGrowth represents growth in the GDP (dependent variable) with a first difference for specific slowdown periods. Alsoβ_0, β_1 and β_2 represent pattern bookmarks and independent variables, consequently. $DFDI_t$ Refers to the direct forging investment (an independent variable) with the first difference for specific slowdown period. Also, DEX_t represent export volume (independent variable) with the first difference for the specific slowdown period, ε_t the residuals. Should be independent and distributed identically. T shows the time period.

3.1.2. Unit root tests, empirical results

After using the unit root tests" ADF, PP and KPSS, the study performs unit root tests in levels for the time series of growth, FDI and EX and finds that most of them are not stationary in their levels, such as in Turkey's variables. For example, FDI and EX are thus level nonstationary and exhibit unit roots, that is, their P values are 0.57 and 0.87, respectively, in the ADF Test, as well as in the PP Test's P values are 0.66 and 0.96, respectively, and also in the KPSS Test's results show that the variables growth and FDI are stationary, but not stationary for Ex, which is P = 0.77 at level. Furthermore, from the

table (3.1) in the same tests for the dependent variable “growth” in three cases: Turkey, Saudi Arabia, and Indonesia, which are stationary at current levels. Comparatively, in Saudi Arabia’s variables, the result is nearly the same as that from the P values of the ADF Test and the PP Test, which for FDI and EX are equal to 0. 1388 and 0.1929, respectively, which are not stationary. While FDI’s the P = 0.0673, meaning that we can reject H_0 and accept an alternative hypothesis at 10% otherwise we cannot reject H_0 at 1%, and 5%.

Table 3. 1. The unit root tests of the time series for Turkey, Saudi Arabia and Indonesia, during 1981-*2015.*

Country	Form Type	The third model (Without constant and Trend)		The third model (Without constant and Trend)		The third model (Without constant and Trend)	
		Critical Value	T-VALUE P-VALUE	Critical Value	T-VALUE P-VALUE	Critical Value	T-VALUE P-VALUE
Turkey	The ADF Test	($GROWTH_t$)		($FDIt$)		(EXt)	
		-2.634731 -1.951000 -1.610907	-3.539659 0.0009*	-2.634731 -1.951000 -1.610907	-0.281931 0.5769**	-2.636901 -1.951332 -1.610747	0.744683 0.8706**
	The PP Test	($GROWTH_t$)		($FDIt$)		(EXt)	
		-2.634731 -1.951000 -1.610907	-23.30508 0.0006*	-2.634731 -1.951000 -1.610907	-3.908657 0.*6667***	-2.636901 -1.951332 -1.610747	1.472302 0.9623**
	The KPSS Test	($GROWTH_t$)		($FDIt$)		(EXt)	
		0.739000 0.463000 0.347000	0.120960*	0.739000 0.463000 0.347000	0.621653*** *	0.739000 0.463000 0.347000	0.770935**
Saudi Arabia	The ADF Test	($GROWTH_t$)		($FDIt$)		(EXt)	
		-2.634731 -1.951000 -1.610907	-3.252296 0.001**	-2.636901 -1.951332 -1.610747	-1.809758 0.0673****	-2.634731 -1.951000 -1.610907	-1.299524 0.1751*
	The PP Test	($GROWTH_t$)		($FDIt$)		(EXt)	
		-2.634731 -1.951000 -1.610907	-13.48787 0.00*1**	-2.634731 -1.951000 -1.610907	-1.433569 0.*1388***	-2.634731 -1.951000 -1.610907	-1.240891 0.1929**
	The KPSS Test	($GROWTH_t$)		($FDIt$)		(EXt)	
		0.739000 0.463000 0.347000	0.423849***	0.739000 0.463000 0.347000	0.343517*	0.739000 0.463000 0.347000	0.371102*** *
Indonesia	The ADF Test	($GROWTH_t$)		($FDIt$)		(EXt)	
		-2.634731 -1.951000 -1.610907	-2.298841 0.022**	-2.634731 -1.951000 -1.610907	0.266307 0.757*	-2.636901 -1.951332 -1.610747	-0.43492 0.518**
	The PP Test	($GROWTH_t$)		($FDIt$)		(EXt)	
		-2.634731 -1.951000 -1.610907	-2.205741 0.0*28****	-2.634731 -1.951000 -1.610907	0.151634 0.*723***	-2.634731 -1.951000 -1.610907	-0.65645 0.4253**
	The KPSS Test	($GROWTH_t$)		($FDIt$)		(EXt)	
		0.739000 0.463000 0.347000	0.085721*	0.739000 0.463000 0.347000	0.522548*	0.739000 0.463000 0.347000	0.178756*

NOTES: *the table prepared by the researcher according to the results obtained from tests, as per each country and their economic variables. Asterisks (*), Shows it is significant coefficients at the1%, 5% and 10% significance level respectively. (**) Shows it is not significant coefficients at the1%, 5% and 10% significance level respectively. (***), LM-Stat. accept at 5%. (****), Show it is a significant value and we can accept at 10%.*

Additionally, from the table above, the case of Indonesia's variables for unit root tests shows that the P values of the ADF Test for FDI and EX is equal to 0.75 and 0.51, respectively, which is not stationary. And the PP test for FDI and EX are equal to 0.72 and 0.42, respectively, which is not stationary at all levels, so we cannot reject H_0 and the time series of variables has a unit root. Identically, the KPSS test shows that the results are stationary for FDI and Ex because FDI's the LM-Stat = 0.522, so we can accept the null hypothesis at 1% level and alternative hypothesis at 5% and 10% levels. Hence, Ex's the LM-Stat = 0.178; we can accept the null hypothesis at all levels since it is stationary too.

3.1.3. Unit root tests with the first difference for group (A), empirical results

The study applied the natural log values of the variables to determine the presence of unit root in the time series. However, the results above indicate that, after using the first difference of the variables and applying the ADF, PP, and KPSS unit root tests, they remained stationary. That is, to test for the presence of unit roots or non-stationary relationships among all the variables of the study. The ADF test, the PP test, and the KPSS test involve testing the null hypothesis of a unit root or non-stationary of the series against the alternative of stationary in three cases: Turkey, Saudi Arabia, and Indonesia. In the table (3.2), which presents the results of the unit root test, it is evident from the table that all the variables are log level non-stationary, so it is not possible to reject the null hypothesis of a unit root in three cases.

The results also show that all the variables are integrated of order one, I (1). The results again show that the ADF, the PP, and the KPSS are statistics for the three variables that imply first-difference stationery, as all the variables become stationary after being first differenced. In the event that Turkey's variables become stationary, from the probability values of the ADF test of (0.000), we can reject the null hypothesis and accept the alternative hypothesis. In the same way, for the PP test, we can reject the null hypothesis and accept the alternative hypothesis from the probability values of the PP test, which is (0.000). Also, the results of the KPSS test are stationary too, in LM-Stat's values of (0.073), (0.445) and (0.151), respectively. We can accept the null hypothesis and reject the alternative hypothesis.

Table 3. 2. *The unit root tests of the time series for Turkey, Saudi Arabia and Indonesia, during 1981- 2015.*

Country	Form Type	The third model (Without constant and Trend)		The third model (Without constant and Trend)		The third model (Without constant and Trend)	
		Critical Value	T-VALUE P-VALUE	Critical Value	T-VALUE P-VALUE	Critical Value	T-VALUE P-VALUE
		($DGROWTH_t$)		($DFDIt$)		(DEXt)	
Turkey	The ADF Test	-2.636901 -1.951332 -1.610747	-10.09595 0.0000**	-2.639210 -1.951687 -1.610579	-4.887930 0.0000**	-2.636901 -1.951332 -1.610747	-6.559813 0.0000**
		($DGROWTH_t$)		($DFDIt$)		(DEXt)	
	The PP Test	-2.636901 -1.951332 -1.610747	-23.30508 0.0000**	-2.636901 -1.951332 -1.610747	-3.908657 0.0003**	-2.636901 -1.951332 -1.610747	-6.943436 0.0000**
		($DGROWTH_t$)		($DFDIt$)		(DEXt)	
	The KPSS Test	0.739000 0.463000 0.347000	0.073319***** 	0.739000 0.463000 0.347000	0.445728***** 	0.739000 0.463000 0.347000	0.151412****
		($DGROWTH_t$)		($DFDIt$)		(DEXt)	
Saudi Arabia	The ADF Test	-2.639210 -1.951687 -1.610579	-6.243784 0.0000**	-2.636901 -1.951332 -1.610747	-3.928986 0.0003*	-2.636901 -1.951332 -1.610747	-4.258375 0.0001*
		($DGROWTH_t$)		($DFDIt$)		(DEXt)	
	The PP Test	-2.636901 -1.951332 -1.610747	-13.48787 0.0000**	-2.636901 -1.951332 -1.610747	-3.928986 0.0003**	-2.636901 -1.951332 -1.610747	-4.258375 0.0001**
		($DGROWTH_t$)		($DFDIt$)		(DEXt)	
	The KPSS Test	0.739000 0.463000 0.347000	0.230695**** 	0.739000 0.463000 0.347000	0.081156**** 	0.739000 0.463000 0.347000	0.188748****
		($DGROWTH_t$)		($DFDIt$)		(DEXt)	
Indonesia	The ADF Test	-2.636901 -1.951332 -1.610747	-7.779639 0.0000**	-2.636901 -1.951332 -1.610747	-5.284911 0.0000*	-2.636901 -1.951332 -1.610747	-8.995327 0.000**
		($DGROWTH_t$)		($DFDIt$)		(DEXt)	
	The PP Test	-2.636901 -1.951332 -1.610747	-20.88844 0.0000**	-2.636901 -1.951332 -1.610747	-5.324172 0.0000**	-2.636901 -1.951332 -1.610747	-9.111708 0.000**
		($DGROWTH_t$)		($DFDIt$)		(DEXt)	
	The KPSS Test	0.739000 0.463000 0.347000	0.292274**** 	0.739000 0.463000 0.347000	0.175432**** 	0.739000 0.463000 0.347000	0.120973 ****

NOTES: *the table prepared by the researcher according to the results obtained from tests, as per each country and their economic variables. Asterisks (*), (**) show significant coefficients at the1%, 5% and 10% significance level respectively. (****), LM-Stat. accept at 1%, 5% and 10%. (*****), LM-Stat. accept at 1% and 5%.*

The results of the ADF, PP and KPSS tests for Saudi Arabia's variables became stationary. From the probability values of the ADF test, which are (0.000), (0.000) and (0.000), respectively, with these values, we can reject the null hypothesis and accept the alternative hypothesis for three variables. In the same way, for the PP test, we can reject the null hypothesis and accept the alternative hypothesis from the probability values of the PP test, which is (0.000). Also, the results of the KPSS test are stationary too, with LM-Stat's values of (0.230), (0.081) and (0.188), respectively. Here we can accept the null hypothesis and reject the alternative hypothesis.

In addition, in the case of Indonesia, the results of the ADF, PP and KPSS tests for the variables became stationary. From table (3.2), the probability values of the ADF test are (0.000), (0.000) and (0.000), respectively. With these values, we can reject the null hypothesis and accept the alternative hypothesis for tree variables. In the same way, for the PP test, we can reject the null hypothesis and accept the alternative hypothesis from the probability values of the PP test, which is (0.000). Also, the results of the KPSS test are stationary too, at all levels. Also, in LM-Stat's values of (0.292), (0.175) and (0.120), which are smaller than critical values, we can accept the null hypothesis and reject the alternative hypothesis. In this context, growth, FDI, and exports are all stationary in the first difference without trend and intercept. In Turkey, Saudi Arabia, and Indonesia.

3.1.4. Co-integration test, empirical results

The trace test tests and the null hypothesis that the number of co-integrating vectors is less than or equal to r, where r is 0, 1, or 2. In each case, the null hypothesis is tested against a general alternative hypothesis. The maximum eigenvalue test, on the other hand, tests the null hypothesis r =0 against the alternative that r =1, against the alternative r =2, etc. The table below shows the co-integrating results as follows:

Table 3. 3. *The results of Johansen's Co-integration Test for co-integrating vectors table (A) The Trace test in Turkey, Saudi Arabia and Indonesia, during 1981- 2015.*

Country	Hypothesis		Eigen value	Trace Statistic	5% Critical Value	Probability **
	H_0	H_1				
Turkey	r=0*	r≥1	0.612318	33.60695	29.79707	0.0174
	r≤1	r≥2	0.158541	5.179822	15.49471	0.7894
	r≤2	r≥3	4.22E-05	0.001265	3.841466	0.9709
Saudi Arabia	r=0*	r≥1	0.758286	61.19130	29.79707	0.0000
	r≤1	r≥2	0.335599	20.01135	15.49471	0.0097
	r≤2	r≥3	0.245106	8.154153	3.841466	0.0043
Indonesia	r=0*	r≥1	0.746949	58.80595	29.79707	0.0000
	r≤1	r≥2	0.344857	20.32932	15.49471	0.0086
	r≤2	r≥3	0.261508	8.488079	3.841466	0.0036

Notes: *Trace test indicates 3 cointegrating eqn(s) at the 0.05 level*

** denotes rejection of the hypothesis at the 0.05 level*

***MacKinnon-Haug-Michelis (1999) p-values*

Table 3. 4. *The results of the Maximum Eigenvalue Test for Turkey, Saudi Arabia and Indonesia from 1981 to 2015*

Country	Hypothesis		Eigen value	Trace Statistic	5% Critical Value	Probability **
	H_0	H_1				
Turkey	r=0*	r≥1	0.612318	28.42712	21.13162	0.0039
	r≤1	r≥2	0.158541	5.178556	14.26460	0.7191
	r≤2	r≥3	4.22E-05	0.001265	3.841466	0.9709
Saudi Arabia	r=0*	r≥1	0.758286	41.17994	21.13162	0.0000
	r≤1	r≥2	0.335599	11.85720	14.26460	0.1161
	r≤2	r≥3	0.245106	8.154153	3.841466	0.0043
Indonesia	r=0*	r≥1	0.746949	38.47663	21.13162	0.0001
	r≤1	r≥2	0.344857	11.84124	14.26460	0.1168
	r≤2	r≥3	0.261508	8.488079	3.841466	0.0036

Max-eigenvalue test indicates 1 cointegrating eqn(s) at the 0.05 level

* denotes rejection of the hypothesis at the 0.05 level

**MacKinnon-Haug-Michelis (1999) p-values

The reported trace test statistic for the null hypothesis of no co-integration (H0: r =0) is 77.11150, which is well above the critical value of 29.79707 at the 5% significance level in Turkey. In the second case, the test shows that the null hypothesis is co-integration (H0: r = 0) is 55.68396 which is well above the critical value of 21.13162 at 5%, and it is a significant level in Saudi Arabia. Also, in the third case in our test, is that the null hypothesis of no co-integration (H0: r = 0) is 44.91042, which is well above the critical value of 21.13162 at 5%, and it is a significant level in Indonesia. Thus, it rejects the null hypothesis of no co-integration (r = 0) in the general alternative r ≥ 1. However, the null hypothesis of r ≤ 1, that the system contains at most three co-integrating vector cannot rejected at the 5% significance level since the reported trace statistic of 37.59179 is more the critical value, which is 15.49471 at the 5% significance level in Turkey. In addition, the value of the trace statistic of 19.76340 is above than the critical value of 15.49471 at

the 5% significance level in Saudi Arabia. As well, in Indonesia is the value of trace statistic of 41.50402 is more than the critical value of 15.49471 at the 5%. It is a significant level. This test thus concludes that there are three co-integrating relationships among FDI, growth and exports in three cases in group A.

On the other hand, the maximum eigenvalue statistic testing the null hypothesis of no co-integration (H0: r = 0) is rejected at the 5% significance level as the reported maximum eigen statistic (39.51971, 35.92056 and 44.91042) exceed the critical value at the 5% significance level in Turkey, Saudi Arabia and Indonesia respectively. The test, however, rejected the null hypothesis of ($r \leq 1$ and $r \leq 2$) as reported in the table (3.4) at the 5% significance level. This result adds to the above conclusion that three co-integrating relationships exist among the three variables under investigation in group (A).

In essence, both the test statistics of the trace and the maximum eigenvalue test statistics reject the null hypothesis of (H0: r = 0) at 5%, so it is a significance level and suggests that there is a unique co-integrating vector. Therefore, our yearly data from 1981 to 2015 appears to support the existence of a long-run relationship among growth, FDI and EX, based on the Johansen's co-integration procedure. This further implies that growth maintain a stable equilibrium with FDI in the long run in this study.

3.1.5. The vector error correction model, empirical results

The results of the VEC tests as presented in Table (3.5) were estimated from the equations to determine whether a feedback relationship exists between growth, FDI and exports respectively, with the long-run relationship and the short run relationship in Turkey's case, such as following:

Table 3. 5. *VECM Tests for Turkey, Saudi Arabia and Indonesia from 1981 to 2015.*

Country/ Info	VECM		Prob	VECM	Prob	R^2 value
	Long -run Relationships			Short-run Relationship		
Turkey	-0.98	FDI,EX and Growth	0.021**	FDI → Growth	0.424****	0.60
				EX → Growth	0.783****	
Saudi Arabia	-0.36	FDI,EX and Growth	0.023**	FDI → Growth	0.009***	0.68
				EX → Growth	0.005***	
Indonesia	-0.96	FDI,EX and Growth	0.005***	FDI → Growth	0.466****	0.38
				EX → Growth	0.79****	

NOTES*: (***) we can reject the null hypothesis at 1%. (**) we can reject the null hypothesis at 5%. (****) we cannot reject the null hypothesis and statistical they are not a significance.*

The results of this test were as follows: the first case is Turkey, where the value of the long run = -0.98 and P = 0.021, P < 0.05 meaning that there is a long run relationship between FDI, EX and growth. And the short-run relationship between FDI and growth could be by H_0. And based on the Wald test, the result is that there is no short-run causality running from FDI to growth. Because P = 0.424, meaning that P > 0.05, so we accepted H_0 . As well as the short-run relationship from EX to growth could be by H_0. And based on the Wald test, the result is that there is no short-run causality running from EX to growth. Because P = 0.783, meaning that P > 0.05, so we accepted H_0 . After that, we have to do the diagnostic checking of the Turkey case. From R^2 =0.60 and it is a significance. Then the serial correlation LM test from P of the Breusch-Godfrey Serial Correlation LM test is 0.322, which is P > 0.05, so we can accept H_0 that means there is no serial correlation. And also, the heteroscedasticity test from the value of Breusch-Pagan-Godfrey P = 0.922, meaning that P > 0.05, that is, there is not the heteroscedasticity in the residual, so we can accept H_0.

The second case is Saudi Arabia. According to the value of a long run = -0.36 and P = 0.005, P < 0.05 means that there is a long run relationship between FDI, EX and growth. And the short-run relationship between FDI and growth could be by H_0. And

based on the Wald test, the result is that there is a short run causality running from FDI to Growth. "Because P = 0.009 meaning that P > 0.05, so we accept H_0 ". As well as the short run relationship from EX to growth could be by H_0. And based on the Wald test, the result is that there is a short run causality running from EX to growth. Because P = 0.005 meaning that P > 0.05, so we accepted H_0 . After that we have to do the diagnostic checking of the Saudi Arabia case. From R^2 =0.68 and P = 0.000 the model is fitted well, and it is a significance. Then the serial correlation LM Test from P of the Breusch-Godfrey Serial Correlation LM test is 0.924, which is P > 0.05 so we can accept H_0 that means there is no serial correlation. And also, Heteroscedasticity test from the value of Breusch-Pagan-Godfrey P = 0.78 meaning that P > 0.05, that is, there is no heteroscedasticity in the residual so we can accept H_0.

The third case is Indonesia, according to value of a long run = -0.96 and P = 0.005, P < 0.05 meaning that there is a long run relationship between FDI, EX and Growth. And the short run relationship from FDI to Growth could be by H_0. And based on Wald test the result is that there is a short run causality running from FDI to growth. Because P = 0.466 meaning that P > 0.05, so we accept H_0 . As well as the short run relationship from EX to Growth could be by H_0. And based on the Wald test the result is that there is a short run causality running from EX to growth. Because P = 0.79 meaning that P > 0.05, so we accepted H_0 . After that we have to do the diagnostic checking of the Indonesia case. From R^2 =0.38 and P = 0.005 the model is fitted well, and it is a significance. Then the serial correlation LM test from P of the Breusch-Godfrey Serial Correlation LM test is 0.986, which is P > 0.05 so we can accept H_0 that means there is no serial correlation. And, the heteroscedasticity test from the value of Breusch-Pagan-Godfrey P = 0.93 meaning that P > 0.05, that is, there is no heteroscedasticity in the residual, so we can accept H_0.

3.1.6. VEC Granger causality test, empirical results

According to the VEC Granger Causality/ Block Exogeneity Wald Test in this study. It turns to examine the relationship between the growth, FDI and exports. Table (3.5) shows the results, we can test the variables of the study in a co-integrating relationship and link them among growth, FDI and exports. The important part here in this test is that it is possible to predict or precedence regarding causation among the study variables in general. Where it includes that while the past can cause or predict the future,

the future cannot cause/predict the past. According to Granger, X G-causes Y if the past values of X can be used to predict Y more accurately than simply using the past values of Y (Granger 1969).

The results of the VEC Granger-causality/Block Exogeneity Wald Test as presented in Table (3.6) were estimated from the equations to determine whether or not a feedback relationship exists between growth, FDI and exports, respectively. Furthermore, in the study, we used the first log difference of the variables because the VEC Granger Causality/Block Exogeneity Wald Test works on the assumption of stationary variables and as already discussed, these first log differences are stationary. Here, in Turkey, the dependent variable is growth and the independent variables are FDI and exports. As we can see from the table above, the terms of growth don't lead to the Ex. This is the null hypothesis, but since p-value is less than 0.05, so we can reject the null hypothesis because p- value is 0.001, and accept the alternative hypothesis that the overall direction of causality is unidirectional in this case. And also, the dependent variable is exports and the independent variables are FDI and growth, we can see from table (3.6) too, that the terms of FDI don't lead to the exports and also exports doesn't lead to FDI. These are null hypothesizes, respectively, but since P > 0.05, so we cannot reject the null hypothesis because the p-values are 0.24 and 0.36 which means we reject the alternative hypothesis. Furthermore, in Saudi Arabia, the dependent variable is growth and the independent variables are FDI and exports. The results from table (3.6) show that the terms of FDI don't lead to growth, so this is a null hypothesis, but since P > 0.05, so we can reject the null hypothesis because the p-value is 0.015, and another null hypothesis is that exports don't lead to growth, as the p-value is 0.005, we can accept the alternative hypothesis in two relationships and the direction of causality is unidirectional.

Table 3. 6. *(VEC) Granger Causality/Block Exogeneity Wald Tests for Turkey, Saudi Arabia and Indonesia* from 1981 to 2015.

Turkey			
The variables/ Info	DGrowth	DFDI	DEX
Null Hypothesis	P-VALUE	P-VALUE	P-VALUE
	Chi-sq	Chi-sq	Chi-sq
Dependent variable: D(GROWTH)		0.4240	0.7832
		(1.715893)	(0.488713)
Dependent variable: D(FDI)	0.9013		0.8809
	(0.253635)		(0.207802)
Dependent variable: D(EX)	0.3439	0.8462	
	(0.333931)	(0.333931)	

Summary of main Finding of Causality Tests	
Variables	Direction of causality
EX --- FDI	No causality
Growth --- EX	No causality
Growth --- FDI	No causality

Saudi Arabia			
The variables/ Info	DGrowth	DFDI	DEX
Null Hypothesis	P-VALUE	P-VALUE	P-VALUE
	Chi-sq	Chi-sq	Chi-sq
Dependent variable: D(GROWTH)		0.009***	0.005***
		(9.261392)	(10.29448)
Dependent variable: D(FDI)	0.204		0.068*
	(3.177698)		(5.365405)
Dependent variable: D(EX)	0.3439	0.087*	
	(0.378313)	(4.866119)	

Summary of main Finding of Causality Tests	
Variables	Direction of causality
Growth ← EX	Unidirectional – causality
Growth ← FDI	Unidirectional - causality
EX ↔ FDI	Bidirectional - causality

Table 3. 7. *(VEC) Granger Causality/Block Exogeneity Wald Tests for Turkey, Saudi Arabia and Indonesia* from 1981 to 2015 (continue).

Indonesia			
The variables/ Info Null Hypothesis	DGrowth P-VALUE Chi-sq	DFDI P-VALUE Chi-sq	DEX P-VALUE Chi-sq
Dependent variable: D(GROWTH)		0.4665 (0.530331)	0.7977 (0.262445)
Dependent variable: D(FDI)	0.5237 (0.406669)		0.6084 (0.207802)
Dependent variable: D(EX)	0.7287 (0.120292)	0.6176 (0.249278)	

Summary of main Finding of Causality Tests	
Variables	Direction of causality
Growth --- EX	No causality
Growth --- FDI	No causality
EX --- FDI	No causality

NOTES: *(*) denotes rejection of the null hypothesis and statistical significance. (***) we can reject the null hypothesis at 1%. (*) we can reject the null hypothesis at 10%.*

Additionally, in Indonesia, the result in this case is clear from the table above: that the relationships between independent and dependent variables are negative, which means the inability of independent variables to predict the dependent variable. So, the null hypotheses accepted by p-values (0.46, 0.79 and 0.61) lead us to accept the null hypothesis and reject the alternative hypothesis for all variables in the third case.

3.1.6.1. Impulse response of Turkey

From the graphs below we can identify, for example, whether there is any forecasting feasibility for the model or not. After running the impulse responses test, the results are produced for all the variables over these other variables and they usually come up to the stability threshold as in the long-run in our study. Also, we can check the predictability of the models with the variables of study. This is the response of the same variable in time series data: it contains the variables' short-term effects on each other and can be identified from the equations by determining the variable(s)' future values. For example, in Turkey, between independent and dependent variables FDI and growth, respectively, by changing one unit of standard deviation of the variable FDI, the effect of

that change will be increasing over the time from one period to two, then it will decrease and take a negative value until the third unit, and then start to increase again until it takes a positive value in the fourth unit, after that it will take a non-straight shape between increasing and decreasing.

On the other hand, in the same case, we can see the results produced by exports to growth, the independent variable and the dependent variable after changing one unit of standard deviation of the variable EX. The effect of that change will initially decrease over time from one period to two periods, eventually taking a negative value. After that, exceeding the third period will be a positive increase until the fourth period will be a negative decline.

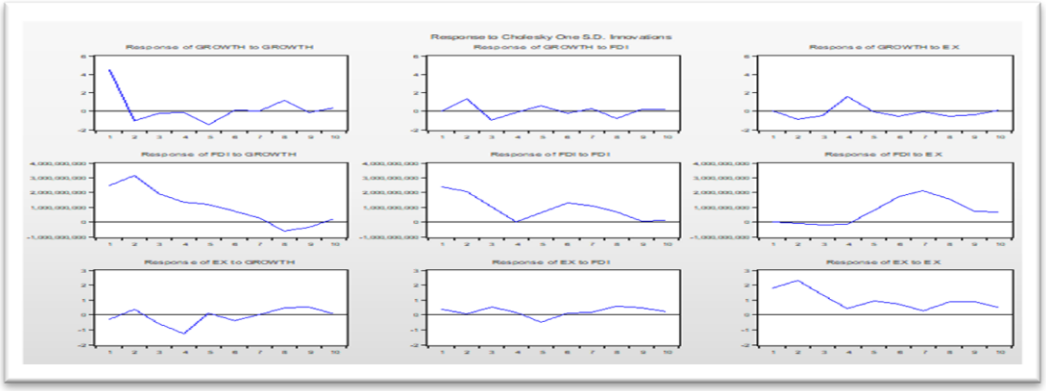


Figure 3. 1. *Impulse response of Turkey.*

NOTES: this figure has been done by the author using EViwes *software.*

3.1.6.2. The variance decomposition of Turkey

In addition, from the table (3.7) shows the results of the variance decomposition, we can see that the first one is the variance decomposition of growth, the second one is the variance decomposition of FDI and the third one is the variance decomposition of EX. Also, we can see the periods in which there are ten quarters, so we can forecast for ten periods and growth, FDI and EX, which are in the short-run and long-run. In the short run, that is quarter 3, impulse, innovation, or growth shock account for 85.16 percent of the variation in growth (own shock). A 11% drop in growth can be caused by a shock to FDI. However, the EX shock caused a 3.82 percent fluctuation in growth.As a result, total fluctuation becomes one hundred percent because the values of variables 85.16 percent, 11.00 percent, and 3.82 percent become one hundred percent in the short run, which is

quarter three. Moreover, in the long-run 10, we can see that the value is 75.09 percent This means that the growth shock can account for 75.09 percent of growth. That means we can call it its own shock. Then for FDI percent, it is 12.07 percent, meaning that a shock to FDI can contribute to a 12.07 percent fluctuation in the variance of growth. Furthermore, EX percent is 12.82 percent, which means that an EX impulse can cause a 12.82 percent fluctuation in growth. In addition to what can happen in the short-run and long-run, we can see that in the short-run growth can contribute 85.02 percent, but in the long-run its contribution to growth has decreased, and in the case of FDI, they can contribute 11.00 percent to the fluctuation of growth in the short-run but 12.07 percent in the long-run. After that, the EX in the short-run can cause a 3.82 percent fluctuation in growth, but in the long-run it is also 12.82 percent. Thus, in the same context, the remaining cases illustrate the causal relationship between the variables of the study.

Table 3. 8. *Variance Decomposition of (A) GROWTH, (B) FDI and (C) EX in Turkey.*

(A) Variance Decomposition of GROWTH:				
Period	**S.E.**	**GROWTH**	**FDI**	**EX**
1	4.479210	100.0000	0.000000	0.000000
2	4.872674	89.02660	7.856716	3.116687
3	4.988608	85.16850	11.00192	3.829577
4	5.236841	77.35848	10.10831	12.53321
5	5.467154	77.85493	10.62829	11.51677
6	5.496573	77.04244	10.68103	12.27653
7	5.502521	76.87647	10.85676	12.26677
8	5.706403	75.58028	12.01284	12.40688
9	5.727187	75.08348	12.05563	12.86089
10	5.741926	75.09645	12.07932	12.82422
(B) Variance Decomposition of FDI:				
Period	**S.E.**	**GROWTH**	**FDI**	**EX**
1	3.41E+09	51.83838	48.16162	0.000000
2	5.08E+09	61.86228	38.11090	0.026820
3	5.53E+09	64.18045	35.68002	0.139532
4	5.70E+09	66.18399	33.62935	0.186658
5	5.91E+09	65.64632	32.43080	1.922877
6	6.32E+09	58.66827	32.37341	8.958316
7	6.77E+09	51.41248	30.81757	17.76995
8	7.00E+09	48.70973	29.71301	21.57726
9	7.05E+09	48.27876	29.31322	22.40802
10	7.09E+09	47.89720	29.04088	23.06192
(C) Variance Decomposition of EX:				
Period	**S.E.**	**GROWTH**	**FDI**	**EX**
1	1.838350	2.940339	3.620025	93.43964
2	2.972286	2.888008	1.409914	95.70208
3	3.370429	5.634887	3.549921	90.81519
4	3.627164	16.83520	3.333290	79.83151
5	3.778040	15.62428	4.832017	79.54370
6	3.872181	15.95038	4.682096	79.36752
7	3.884058	15.85699	4.831486	79.31152
8	4.051602	16.08295	6.458127	77.45892
9	4.202259	16.47764	7.274987	76.24737
10	4.233084	16.28289	7.444853	76.27225
Cholesky Ordering: GROWTH FDI EX				

3.1.6.3. Impulse response of Saudi Arabia

In our second study case, we can see the relationships between the variables FDI, EX and growth in the impulse response by changing one unit of standard deviation of the variable EX. The effect on growth is that change will increasing over the time from one

period until two period, then decrease and take a negative value until the third period, where the value will be equal to zero. And then it starts to increase again until it takes a positive value in the fourth, fifth and sixth periods, respectively. After that, it starts to decline until the ninth period. Also, if the impulse response is changed by changing one unit of FDI, then the effect on Ex will be that the change will be decreasing over time from one period to two periods. And then, it will increase until the third period, when the value will be nearly equal to zero. Until the fifth period, Carve will move by positive values. Then, it will decrease until the value is equal to zero again. In addition to that, we have to check the variance decomposition, which is a proportion of the movements of a variable due to shocks to itself and shocks to other variables.

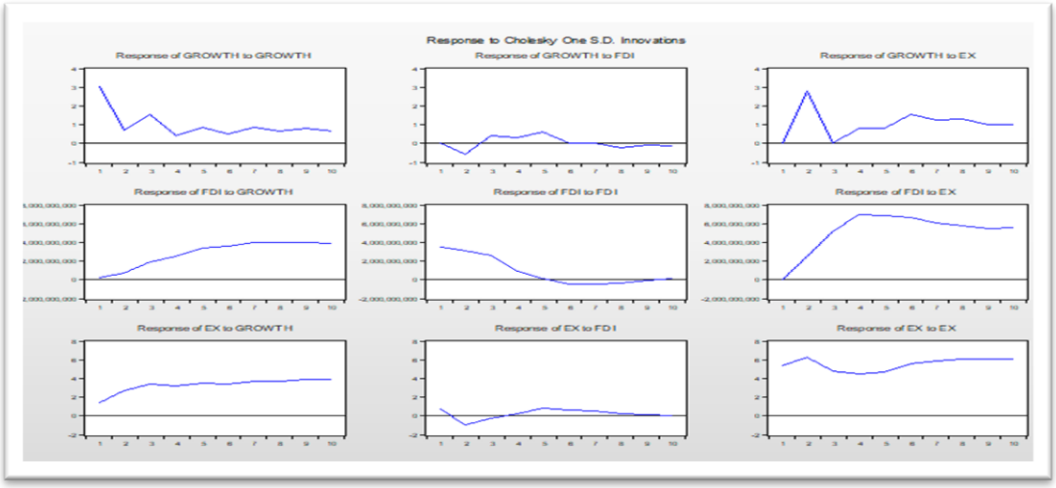


Figure 3. 2. *Impulse response of Saudi Arabia.*

NOTES: *this figure has been done by the author using EViwes software.*

3.1.6.4. The variance decomposition of Saudi Arabia

In our second case, From the table (3.8), which shows the results of the variance decomposition, we can see that the first one is the variance decomposition of growth, the second one is the variance decomposition of FDI and the third one is the variance decomposition of EX. Also, we can see the periods, of which there are ten quarters, so we can forecast for ten periods and of growth, FDI and EX in the short-run and long-run. In the short run, that is quarter 3, shock to Growth account for 59.26 percent variation of the fluctuation in growth (own shock), shock to FDI can cause 2.52 percent fluctuation in growth. But shock to EX causes how much 38.20 percent fluctuation in growth. Also the

total fluctuation changes by 100% because 59.26 percent + 2.52 percent + 38.20 percent = 100%. This is happening in the short-term, which is a quarter of three. Moreover, in the long run, what is 10? We can see from that value that this is 46.55 percent. That means the shock to growth can contribute 46.55 percent to growth. That means we can call, it its own shock. The FDI percent is then 3.09 percent, implying that a shock to FDI can contribute a 3.09 percent fluctuation in the variance of growth. And also, EX percent is 50.35 percent meaning that an impulse on EX can cause 50.35 percent fluctuation in growth. In addition to, what can be happening in the short-run and long-run, we can see in the short-run growth can contribute 59.26 percent but in long-run contribution to growth has gone down, and in the case of FDI in the short-run could contribute 2.52 percent to the fluctuation of growth but in the long-run they can contribute 3.09 percent in the fluctuation of growth. After that the EX in the short-run can cause 38.20 percent in fluctuation of growth, but in the long-run also 50.35 percent that means can really cause in the fluctuation of growth. Thus, in the same context, the remaining cases illustrate the causal relationship between the variables of the study.

Table 3. 9. *Variance Decomposition of (A) GROWTH, (B) FDI and (C) EX in* Saudi Arabia.

(A) Variance Decomposition of GROWTH:				
Period	**S.E.**	**GROWTH**	**FDI**	**EX**
1	3.028964	100.0000	0.000000	0.000000
2	4.224512	54.21682	2.043759	43.73942
3	4.520213	59.26925	2.526589	38.20416
4	4.620179	57.56286	2.848167	39.58897
5	4.801231	56.47883	4.186252	39.33492
6	5.079396	51.55207	3.746072	44.70186
7	5.299846	49.91486	3.442623	46.64252
8	5.503307	47.76650	3.339902	48.89360
9	5.651939	47.32122	3.196103	49.48267
10	5.785587	46.55181	3.096822	50.35136
(B) Variance Decomposition of FDI:				
Period	**S.E.**	**GROWTH**	**FDI**	**EX**
1	3.48E+09	0.548633	99.45137	0.000000
2	5.35E+09	1.995317	75.83913	22.16555
3	8.13E+09	6.363115	42.89267	50.74421
4	1.10E+10	8.552080	23.93719	67.51073
5	1.34E+10	12.23671	16.19300	71.57028
6	1.54E+10	14.82256	12.36667	72.81076
7	1.71E+10	17.62494	10.20371	72.17135
8	1.84E+10	19.68940	8.765986	71.54461
9	1.97E+10	21.50340	7.717853	70.77874
10	2.08E+10	22.75180	6.905778	70.34242
(C) Variance Decomposition of EX:				
Period	**S.E.**	**GROWTH**	**FDI**	**EX**
1	5.563747	6.235414	1.746502	92.01808
2	8.869474	11.52011	1.854064	86.62582
3	10.66597	18.36866	1.323830	80.30751
4	12.01653	21.45522	1.072934	77.47185
5	13.38042	24.03787	1.210606	74.75153
6	14.90653	24.61461	1.151575	74.23382
7	16.44095	25.30352	1.049810	73.64667
8	17.93548	25.58802	0.900394	73.51158
9	19.33269	26.10456	0.779799	73.11564
10	20.64557	26.50505	0.683776	72.81118
Cholesky Ordering: GROWTH FDI EX				

3.1.6.5. Impulse response of Indonesia

The relationships between these variables FDI, EX, and growth in the impulse response of growth are changed in the same context in this study by changing one unit in EX. And after running the test, the result will decrease over the time from one period until the third period, when it will increase still with a negative value, which continues until

the fifth point. At this point, it will be equal to zero and move until the eighth period. In the same way, the impulse response of FDI is by changing one unit of EX and this change will start from zero and take a negative value while the EX will change until the tenth period. Furthermore, the impulse response of FDI is changed by one unit of growth. As well, the effect on FDI is that the change will increase over the time from the beginning until the third period, then decrease until the tenth period. In the same way, as the impulse response of FDI changes by one unit in FDI, this movement in carve will start with a positive value then decrease until the third point in the graph. Since the value of FDI will change, the impulse response of FDI changing between a negative and a positive value, nearly to a straight line.

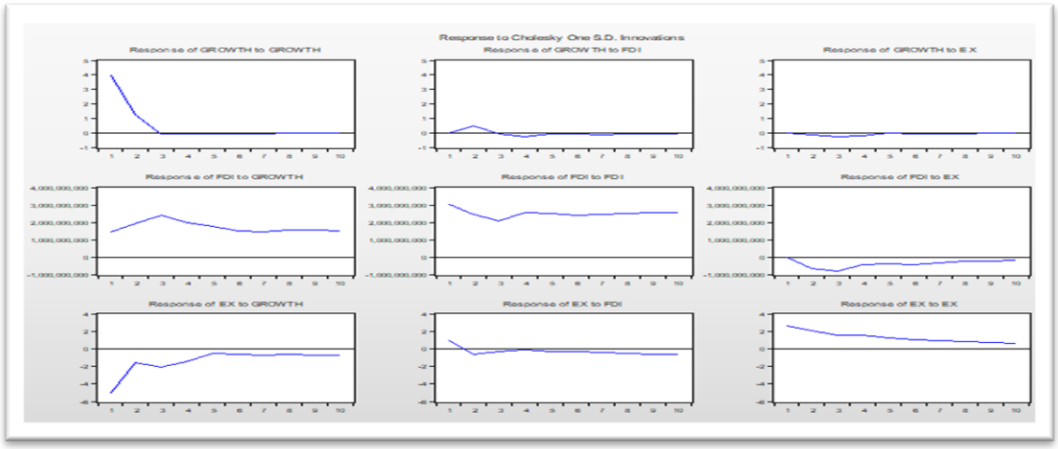


Figure 3. 3. *Impulse response of Indonesia.*

NOTES: *this figure has been done by the author using EViwes software.*

3.1.6.6. The variance decomposition of Indonesia

Additionally, From the table (3.9), which shows the results of the variance decomposition, we can see that the first one is, the variance decomposition of growth, the second one is the variance decomposition of FDI and the third one is the variance decomposition of EX. Also, we can see the periods, of which there are ten quarters, so we can forecast for ten periods of growth, FDI and EX in the short-run and long-run. In the short run, that is quarter 3, shock to Growth account for 98.20 percent variation of the fluctuation in growth (own shock), shock to FDI can cause 1.35 percent fluctuation in growth. But shock to EX causes how much 0.44 percent fluctuation in growth. As a result, the total fluctuation becomes a hundred percent because, from the values of variables

98.20 percent plus 1.35 percent plus 0.44 percent, it becomes hundred percent and that is happening in the short-run, which is quartered three. Moreover, in the long-run, what is 10? We can see from that value that it is 98.00 percent. That means that the shock to growth can contribute 98.00 percent to growth. That means we can call it its own shock. Then for FDI percent is 1.40 percent meaning that shock to FDI can contribute 1.40 percent fluctuation in the variance of growth. And also, EX percent is 0.58 percent meaning that an impulse on EX can cause 0.58 percent fluctuation in growth. In addition to what can be happening in the short-run and long-run, we can see that in the short-run growth can contribute 98.00 percent, but in the long-run, the contribution to growth has the same value. And in the case of FDI in the short-run it could contribute 1.35 percent to the fluctuation of growth but in the long-run it can contribute 1.40 percent. The fluctuation of growth here has got the same value too. After that, the EX in the short-run can cause a 0.44 percent fluctuation in growth, but in the long-run it is also 0.58 percent. That means there is no change in value. Thus, in the same context, the remaining cases illustrate the causal relationship between the variables of the study.

Table 3. 10. *Variance Decomposition of (A) GROWTH, (B) FDI and (C) EX in Indonesia.*

(A) Variance Decomposition of GROWTH:

Period	S.E.	GROWTH	FDI	EX
1	3.678433	100.0000	0.000000	0.000000
2	3.889631	98.57238	1.344459	0.083165
3	3.897768	98.20231	1.352141	0.445544
4	3.900842	98.06746	1.403154	0.529387
5	3.903857	98.03296	1.410577	0.556458
6	3.905714	98.02023	1.409321	0.570445
7	3.906311	98.01132	1.409015	0.579665
8	3.906564	98.00678	1.408950	0.584265
9	3.906719	98.00472	1.408846	0.586437
10	3.906814	98.00370	1.408798	0.587506

(B) Variance Decomposition of FDI:

Period	S.E.	GROWTH	FDI	EX
1	3.28E+09	16.48001	83.51999	0.000000
2	4.57E+09	23.51094	76.33689	0.152166
3	5.75E+09	27.93592	71.96445	0.099631
4	6.78E+09	30.68586	69.23803	0.076110
5	7.66E+09	31.83262	68.10497	0.062405
6	8.44E+09	32.48798	67.45846	0.053560
7	9.16E+09	32.93893	67.01423	0.046842
8	9.82E+09	33.27198	66.68635	0.041676
9	1.04E+10	33.51840	66.44400	0.037603
10	1.10E+10	33.70738	66.25830	0.034318

(C) **Variance Decomposition of EX:**

Period	S.E.	GROWTH	FDI	EX
1	5.504189	72.48586	1.680300	25.83384
2	5.971621	70.18622	2.156026	27.65776
3	6.412542	70.70851	1.999525	27.29197
4	6.710165	71.28361	2.596145	26.12025
5	6.916844	71.44271	3.333080	25.22421
6	7.060750	71.25522	4.230042	24.51474
7	7.177031	70.93062	5.188360	23.88102
8	7.278759	70.49955	6.206678	23.29377
9	7.371285	69.99790	7.251153	22.75095
10	7.457657	69.45148	8.301919	22.24660

Cholesky Ordering: GROWTH FDI EX

3.2. The Panel Data Analysis of the EU Countries

3.2.1. Model specification and estimation

In this section, we use the causal relations model between FDI, economic growth and EX. For this aim of study, we have to examine the variables by a VAR autoregressive model, using a traditional model, and present the Fixed Model (LSDV) approach for causality testing in dynamic panel data in the relationship between the study's variables. That can be use in the conditions of Holtz-Eakin et al., such as traditional panel data causality testing. The model is in the following form:

$$\mathbf{lnGROWTH_{it}} = \alpha_0 + \sum_{j=1}^{p} \beta_j \mathbf{lnGROWTH_{it-j}} + \sum_{j=1}^{p} \delta_j \mathbf{lnFDI_{it-j}} + \sum_{j=1}^{p} \mu_j \mathbf{lnEXPORTS_{it-j}} + \mathbf{F_i} + \mathbf{u_{it}} \quad \textbf{(3.2)}$$

i= 1,….., N. t= 1,……,T.

Where $\boldsymbol{GROWTH}$ is the change of GDP, which is during the period, FDI presents foreign direct investment and EX shows an export value with a lag length of time and $\boldsymbol{F_i}$ is as a set of unobserved sectoral effects (fixed effects) and $\boldsymbol{u_{it}}$ suggests the autocorrelation of the error. Also, $\boldsymbol{\beta_j}$, δ_j and $\boldsymbol{\mu_j}$ show the coefficients for each variable. Moreover, the null hypothesis and alternative hypothesis are presented as follows:

$H_0 : \rho_{ij} = \rho_{ji}$= cor($\boldsymbol{u_{it}}$, $\boldsymbol{u_{jt}}$) = 0 for i≠j , agonist $H_1 : \rho_{it} = \rho_{it} \neq 0$ for some i≠j ,

Where ρ_{ij} is the item minute connection coefficient of the aggravations and is given by the following condition:

$$\rho_{ij} = \rho_{ji} = \frac{\sum_{t-1}^{T} \boldsymbol{u_{it}} , \boldsymbol{u_{jt}}}{(\sum_{t-1}^{T} \boldsymbol{u^2_{it}})^{1/2} (\sum_{t-1}^{T} \boldsymbol{u^2_{jt}})^{1/2}}$$

Notice that the number of possible pairings ($\boldsymbol{\mu_{it}}$, $\boldsymbol{\mu_{jt}}$) according to the observation (N).

3.2.2. Cross-section dependence test, empirical results

From table (3.10) according to the CD test clearly indicates that introducing region-specific trends. In this test the H_0 is No cross-section dependence (correlation) in residuals, therefore after running the CD test the results shows probabilities values are less than 5% for all tests respectively; (Breusch-Pagan LM, Pesaran scaled LM, Bias-corrected scaled LM and Pesaran CD). That is enough to capture the cross-section dependence in the residuals. Here, we can reject the null hypothesis H_0 at conventional significance levels and accept alternative hypothesis in a group (B). In particular, the effect of the browser of cross-sectional dependence in estimation naturally depends on a variety of factors, such as the magnitude of the correlations across cross-sections and the nature of cross-sectional dependence. Also, the results of the cross-section dependence tests are the most informative about the role played by FDI and EX in driving regional long-run the economic growth levels. The CD test is in the following table:

Table 3. 11. *(A) Cross-section Dependence Test.*

Country/ Info	Variable	Coefficient	Std. Error	t-Statistic	Probability
EU	**C**	**4.272659**	**0.884207**	**4.832193**	**0.000*** **
Countries	**LNFDI**	**0.353874**	**0.133351**	**2.653701**	**0.008*** **
	LNEX	**0.212455**	**0.119369**	**1.779816**	**0.075***
Effects Specification					
Cross-section fixed (dummy variables)					
R^2 value		**0.15**		**Prob(F-statistic)**	**0.0000**

Test	Statistic	d.f	Prob
Breusch-Pagan LM	**277.5017**	**66**	**0.000*** **
Pesaran scaled LM	**17.36439**		**0.000*** **
Bias-corrected scaled LM	**17.18792**		**0.000*** **
Pesaran CD	**13.31308**		**0.000*** **

NOTES*: The CD test is the Pesaran (2004) test for cross-section dependence in the model residuals, asymptotically standard normal under the null hypothesis of no cross-section dependence, which is based on p-values conditions in brackets. (***) denotes rejection of the null hypothesis and statistical significance. (*) we can reject the null hypothesis and statistically, it is a significant value at 10%.*

3.2.3. Panel unit root tests, empirical results

In this table (3.11) the panel unit root tests are Levin, Lin & Chu t Test, The Im, Pesaran and Shin W-stat Test, The ADF – Fisher Chi-squar Test and The PP - Fisher Chi-squar Test; these tests have shown that the variables lnGrowth, lnFDI and lnEX are stationary at 1st difference and also these variables do not have unit root. Equally, for DlnGrowth, the result is that p-values = 0.000, 0.000, 0.000 and 0.000, respectively, meaning that we can reject the null hypothesis and accept the alternative hypothesis which is stationarity at 1st difference. As well as unit root tests for lnFDI show that DlnFDI's p-values = 0.000, 0.000, 0.000 and 0.000, respectively, meaning that the variable is

stationary too and we can reject the null hypothesis. Then the results of p-values for DlnEX = 0.000, 0.000, 0.000 and 0.000 respectively. As has been noted, the variable is stationarity and we can reject the null hypothesis and accept the alternative hypothesis for the same reason.

Table 3. 12. *The panel unit root test for EU countries from 1981 to 2015.*

Country	Form Type	The third model (With constant)			The third model (With constant)			The third model (With constant)		
		Statistic	P-VALUE **	Cross-sections	Statistic	P-VALUE **	Cross-sections	Statistic	P-VALUE **	Cross-sections
		D(ln*GROWTHit*)			D(lnFDIit)			D(ln*EXit)*		
EU Countries	The Levin, Lin & Chu t Test	-13.1004	0.0000*	12	-7.93344	0.0000*	12	-8.09659	0.0000*	12
		D(ln*GROWTHit*)			D(lnFDIit)			D(ln*EXit)*		
	The Im,Pesaran and Shin W-stat Test	-15.9576	0.0000*	12	-8.02141	0.0000*	12	-9.94436	0.0000*	12
		D(ln*GROWTHit*)			D(lnFDIit)			*D(lnEXit)*		
	The ADF – Fisher Chi-squar Test	239.072	0.0000*	12	109.351	0.0000*	12	139.618	0.0000*	12
		D(ln*GROWTHit*)			D(lnFDIit)			D(ln*EXit)*		
	The PP - Fisher Chi-squar Test	365.900	0.0000*	12	129.086	0.0000*	12	181.604	0.0000*	12

NOTES: *(**) Probabilities for Fisher tests are computed using an asymptotic Chi-square distribution. All other tests assume asymptotic normality. The table prepared by the researcher according to the results obtained from panel unit root test, as EU countries and their economic variables. Asterisks, (*) Shows it is significant coefficients at first difference.*

3.2.4. Fixed and random models, empirical results

Table (3.12) presents the results of the Pooled, Fixed and Random Models and also the Hausman Test; after running the pooled regression model, the dependent variable is growth and the independent variables are FDI and EX; we can see that P-values = 0.000 and 0.000 respectively, that is less than 0.05 percent, meaning that the independent

variables are significant and both can explain the growth “dependent variable”. It seems that the EU countries have the same intercept, therefore the Fixed Effects (LSDV) model can give different results from the pooled regression model. In brief, the Fixed Effects model presents that both independent variables are stationary, because P-values = 0.000 and 0.075, which are supposed to be at 5% and 10%, respectively. Therefore, we can reject the null hypothesis and accept the alternative hypothesis.

Table 3. 13. *The Pooled, Fixed and Random Models for EUR Countries from 1981 to 2015.*

The Pooled Regression Model:				
Country	Variable	Coefficient	P-VALUE**	R-squared Prob (F-statistic)
EU Countries	C	1.686795	0.0000*	0.101 0.0000*
	LNFDI	0.144431	0.0001*	
	LNEX	0.095948	0.0251*	

The Fixed Effect Model:				
Country	Variable	Coefficient	P-VALUE**	R-squared Prob (F-statistic)
EU Countries	C	4.272659	0.0000*	0.150 0.0000*
	LNFDI	0.353874	0.0083*	
	LNEX	0.212455	0.0759*	

The Random Effect Model:				
Country	Variable	Coefficient	P-VALUE**	R-squared Prob (F-statistic)
EU Countries	C	1.807308	0.0000*	0.111 0.0000*
	LNFDI	0.139712	0.0011*	
	LNEX	0.481084	0.0733	

The Correlated Random Effects – Hausman Test:				
Country	Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	P-VALUE**
EU Countries	Cross section random	9.851965	2	0.0073*

NOTES; *Asterisks, (**) Shows probabilities for Fisher tests are computed using an asymptotic Chi-square distribution. All other tests assume asymptotic normality. The table prepared by the researcher according to the results obtained from panel unit root test, as EU countries and their economic variables. (*) Shows it is significant coefficients at 1%.*

In addition to the independent variables can explain the growth which FDI's coefficient shows (- 0.13), meaning that there is a negative relationship between growth and FDI. If the independent variable increases the dependent variable will decrease by 0.13 as a present value; and the relationship between growth and EX from the table above shows that there is a positive relationship between growth and FDI. If the independent variable increases the dependent variable will increase too by 0.48 as a present value. After that, we check the Random Effects Model to see the result of the estimation of the variables in this study. It has shown that FDI and EX are significant values, respectively, and the relationship between growth and FDI is a negative one. From the results of the fixed and random models, we have to estimate both in the Hausman test to see which model is more appropriate for the study's variables.

Comparatively, after running the Hausman Test, the result is reported based on the test summary of Cross Section Random. The Fixed Effects Model is an appropriate model because the null hypotheses are that the Random Effect model is appropriate and the alternative hypotheses is, Fixed Effect model is appropriate. Therefore, from P-value = 0.00, meaning that it is less than 0.05 percent, we can reject the null hypotheses and accept the alternative hypotheses.

3.2.5. Co-integrating tests, empirical results

3.2.5.1. Johansen Fisher Panel Co-integration test

Table (3.13) presents the Johansen Fisher Panel Co-integration Test outcome as a trace test and a max-eigen test. The co-integration requires that all the variables be integrated in the same order. According to the null hypotheses, there is no co-integration between the variables, but the P-value of the trace test = 0.000 and the P-value of the max-eigen test is 0.000, which means there is co-integration between the variables. Then from the probabilities of 1st hypotheses "at most 1", co-integration is 0.000 and 0.001 respectively. There is one co-integration equation. Moreover, the probabilities of second hypotheses "at most 2", co-integration are 0.012 and 0.012, respectively, for both tests. In conclusion, we can reject all null hypotheses and the test reported that there is co-integration between growth, FDI and EX for this case of study EU countries.

Table 3. 14. *A the results of Johansen Fisher Panel Co-integration Test, Unrestricted Co-integration Rank Test (Trace and Maximum Eigenvalue), for EU countries from 1981 to 2015.*

Country/Inf	Hypothesized No. of CE(S)	Fisher Stat.* (from trace test	Probability **	Fisher Stat.* (from max-eigen test	Probability **
EU Countries	None	110.4	0.000***	78.43	0.0000***
	At most 1	54.94	0.000***	47.62	0.0012***
	At most 2	39.38	0.012***	39.38	0.0128***

NOTES; *Asterisks, (**) shows probabilities are computed using asymptotic Chi-square distribution, (***) Shows it is significant coefficients at 1%.*

3.2.5.2. Kao Residual Co-integration test

Table (3.14) presents the results of the Kao Residual Co-integration test. In this model, ADF's t-statistic and p-value are also from the null hypothesis which means no co-integration and trend assumption, which means no deterministic trend. According to p-value equal to 0.00, and it is a significant value because it is less than 5%, so we can reject the null hypothesis and accept the alternative hypothesis, meaning that growth, FDI and EX are co-integrated and the three variables have a long-run relationship.

Table 3. 15. T*he Kao Residual Co-integration Test for EU countries from 1981 to 2015.*

Country/ Inf	ADF		t-Statistic	Probability
EU Countries	Residual variance	0.174535	-8.924938	0.000***
	HAC variance	0.115243		

NOTES; *(***), Shows it is significant coefficients at 1%. Number of lag length had selected according to SIC with a max lag of 8.*

3.2.5.3. Pedroni Residual Co-integration test

Table (3.15) presented the Pedroni residual co-integration test with three variables of study. Identical to the null hypothesis, which is that there is no co-integration relation between this test. And after running the Pedroni test, the results show that there is a co-integration relation between growth, FDI and EX. The probabilities of all tests are significant and we can reject the null hypothesis rather than accept alternative hypotheses. Because p-values equal 0.00, which is $P < 0.05$, meaning that a majority can accept the alternative hypothesis of this test. In addition, there is no deterministic trend or deterministic intercept or trend for accepting all p-values that are less than 5%.

Table 3. 16. *The Pedroni Residual Co-integration Test for EU countries from 1981 to 2015.*

Country/ Inf	tests	Statistic	Probability	Statistic	Probability
EU Countries	Panel v-Statistic	3.553301	0.000***	1.844858	0.032**
	Panel rho-Statistic	-4.690003	0.000***	0.255427 -4.898013	0.000***
	Panel PP-Statistic	-5.860006	0.000***	-6.472205	0.000***
	Panel ADF-Statistic	-5.880692	0.000***	-6.421382	0.000***
	Group rho-Statistic	-3.568204	0.000***		
	Group PP-Statistic	-7.027129	0.000***		
	Group ADF-Statistic	-7.299129	0.000***		

NOTES; *Asterisks, (***), (**) Show it is significant and statistically they are at 1% and 5% respectively*.

Number of lag length had selected according to SIC with a max lag of 7.

3.2.6. Vector error correction model, empirical results

The results in Table (3.16) presented Vector Error Correction (VEC) Tests as were estimated from the equations to determine whether or not a feedback relationship exists between growth, FDI and export, respectively, with the long-run relationship and the short-run relationship in the EU countries, so according to a value of $P = 0.00$, $P < 0.05$, meaning that there is a long-run relationship between FDI, export and growth in this case.

Table 3. 17. *(VECM) Tests for EU countries from 1981 to 2015.*

Country/ Info	VECM Long Run Relationship*		Probability	Short Run Relationship	Probability	R^2 value
EU Countries	-0.55	FDI,EX and Growth	0.0000***	FDI → Growth	0.0007***	0.51
				EX → Growth	0.0204**	

NOTES: *(***) denotes rejection of the null hypothesis and statistical significance at 1%. (**) we can reject the null hypothesis and statistically they are a significance at 5%.*

Furthermore, in the short-run relationship between FDI and growth could be by H_0 and based on the Wald test, the result is that there is a short-run causality running from FDI to growth. Because, P = 0.000, meaning that P < 0.05, so we cannot accept H_0 and rejected it. As well as the short-run relationship from export to growth could be by H_0 and based on the Wald test the result is that there is a short-run causality running from export to growth. Because P = 0.020, meaning that P < 0.05, so in this case also, we reject H_0 .

3.2.7. The fully modified least squares test

The result in (table 3.17) shows the estimated coefficients from the fully modified least squares estimator[3]. In this test, some variables are included, such as FDI and exports as the independent variables and only one variable, which is economic growth, as an independent variable. The result, according to this test (FMLS), explains the strong and direct relationship between foreign direct investment and economic growth in general. It also explains the statistically significant long-run impact of exports on economic growth. In the long run, it is a stable and significant relationship, with a normal p-value between FDI, exports, and economic growth.

[3] According to analyzing the data between variables in the macroeconomic and the finances, by the economic theory. Generally, in the field of the panel co-integration models suggested using the tests by means of Philips and Moon (1999), Pedroni (2000) proposed a fully modified estimator. In the same context, it was assumed as an alternative solution to another approach of statistical significance in this case. Both Kao and Chiang (2000) refer to following a panel dynamic least squares estimator. For more details, see Badi H. Baltagi. (2008). Econometric Analysis of Panel Data.

Table 3. 18. *(FMOLS) Test for European Countries.*

Country/ Info	Variable	Coefficient	Std. Error	t-Statistic	Probability
EU	LNFDI	0.363899	0.013246	27.47172	0.000***
Countries	LNEX	0.201413	0.019175	10.50396	0.000***
R^2 value	0.13	Cross-sections	11	Total of panel observations	373

NOTES: (***) denotes rejection of the null hypothesis and statistical is that it is a significant value at 1%.

3.2.8. The panel dynamic least squares test

The result from the panel dynamic least squares (DOLS) estimator is reported in (table 3.18). We can consider in this test again specification a statistically significant long-run impact of FDI on economic growth. In addition to implying that the relationship between exports and economic growth is also a statistically significant long-run between them, fundamentally and it is complementary. Through the test and p-values, the null hypothesis has been rejected and the alternative hypothesis accepted.

Table 3. 19. *(DOLS) Test for European Countries.*

Country/ Info	Variable	Coefficient	Std. Error	t-Statistic	Probability
EU	**LNFDI**	**0.760902**	**0.199366**	**3.816601**	**0.000*** **
Countries	**LNEX**	**0.906677**	**0.236350**	**3.836169**	**0.000*** **
R^2 value	**0.40**	**Cross-sections**	**11**	**Total of panel observations**	**373**

NOTES: *(***) denotes rejection of the null hypothesis and statistical is that it is a significant value at 1%.*

3.2.9. Granger causality test, empirical results

In Table (3.19) presented the alternative specifications from the equations to determine whether or not a feedback relationship exists between growth, FDI and exports. In addition, the study also used stationary variables. And after running the VEC Granger Causality Test, which showed that FDI and exports had statistically significant positive causal impacts on growth, the null hypothesis has been rejected by the probabilities which equal to 0.00 and 0.02 at 1% and 5%, respectively, and we accept the alternative hypotheses. In the same contest, there are causal impacts between growth, exports and FDI. From the P-values = 0.00 and 0.00, we can accept the alternative hypotheses at 1% for both cases of effects on FDI.

Table 3. 20. *VEC Granger Causality/Block Exogeneity Wald Tests for EU Countries from 1981 to 2015.*

EUR Countries			
The variables/ Info	DGROWTH	DFDI	DEX
Null Hypothesis	P-VALUE	P-VALUE	P-VALUE
	Chi-sq	Chi-sq	Chi-sq
Dependent variable: D(GROWTH)		0.0007*** (25.32694)	0.0204** (16.56213)
Dependent variable: D(FDI)	0.0003*** (27.42335)		0.0002*** (28.09751)
Dependent variable: D(EX)	0.0000*** (51.50962)	0.0000*** (39.59312)	

Summary of main Finding of Causality Tests	
Variables	Direction of causality
Growth ↔ FDI	Bidirectional - causality
Growth ↔ EX	Bidirectional - causality
EX ↔ FDI	Bidirectional - causality

NOTES: *(*) denotes rejection of the null hypothesis and statistical significance. (***), (**) we can reject null hypothesis and statistical significance at 1% and 5% respectively.*

Additionally, the relationships between growth, FDI and exports show there is a casual impact from growth to exports at 10% and from FDI to exports. We accept the null hypotheses because the P-value = 0.00, which is smaller than 0.05%. In brief, the same content clearly results from the Granger causality test that there are bidirectional relationships between the variables growth and FDI also between growth and exports. Even though the result of the Granger causality test between exports and FDI is a bidirectional relationship from exports to FDI and there is a causal relationship from FDI on exports, that bias in the VEC Model test found a long-run relationship and there are the relationships in short-run terms in the EU countries.

3.2.9.1. Impulse response of the EU countries

In the same context of the study, the relationships between these variables (FDI, exports and growth) in the impulse response of growth are changed by changing one unit

on its own. And after running the test, the result initial will decrease over the time from one period until the third period, when it will be equal to zero and the curve in this shape will be around zero, which continues until the point of fifteen and then just in the sixth period, the value takes a negative value. Again, the impulse response of FDI is by changing one unit of growth and this change will start from zero and take a positive value while the growth will be changing until the fifteen period where values are greater than zero. Furthermore, the impulse response of exports is changing one unit of growth. From the graph, it shows that the effect on exports is that the change will be equal to zero and move around that until the seventh period, then increase over the time after unit seven. This processor will be nearly stable again until the fifteenth period, when it will be nearly to stable again as a stearate lien that will be going until the end of the time with positive values.

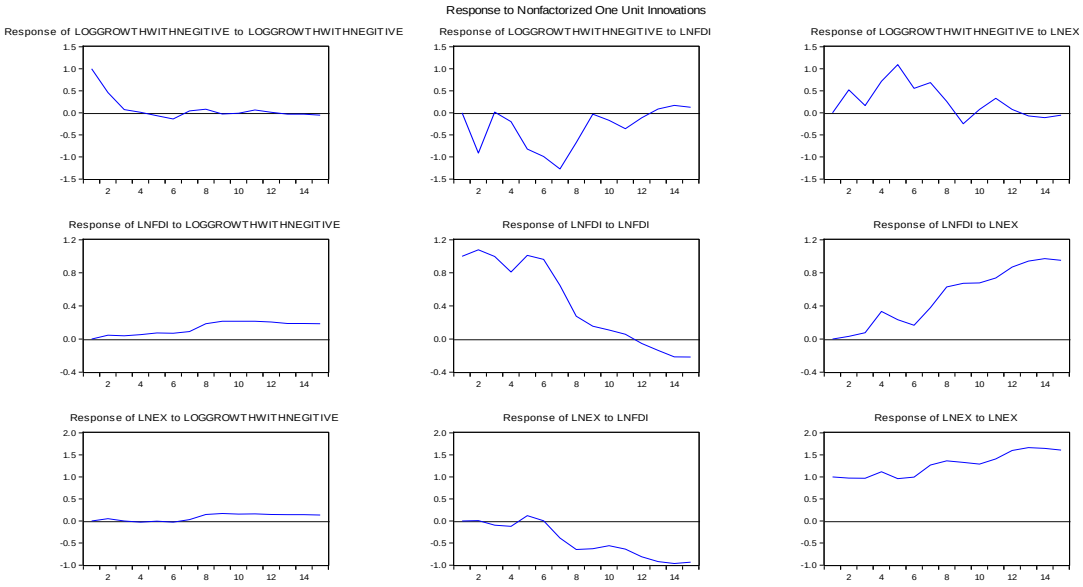


Figure 3. 4. *Impulse response of the EU countries.*

NOTES: *this figure has been done by the author using EViwes software.*

3.2.9.2. The variance decomposition of the EU countries

Also, from the table (3.20), shows the results of the variance decomposition, we can see that the first one is the difference deterioration of growth, the second one is the fluctuation disintegration of FDI and the third one is the fluctuation decay of exports. Likewise, we can see the periods in which there are ten quarters, so we can gauge the ten

times of growth, FDI and exports, which are in the short-run and long-run both, for example, in the table above. In the short run, that is quarter 3, a stun to growth represents 100% of the change in growth to FDI can cause a 0.00% variation in growth, and a stun to exports causes a 0.00% variation in growth. Additionally, an outcome in general all-out change becomes 100% on the grounds that from the estimations of factors, 100 percent in addition to 0.00 percent and in addition to 0.00 percent, it turns into a hundred percent and that is going on in the short run, which is quartered three Similarly, we can see from that esteem that this is 97.77 percent, implying that the stun to growth can contribute 97.77 percent to growth, implying that it can be called its own stun. At that point, the FDI percent is 1.39 percent, implying that a 1.39 percent change in growth fluctuation can be attributed to stun to FDI. And furthermore, EX's percent is 0.82 percent implying that a drive on exports can cause a 0.82 percent vacillation in growth. Furthermore, what can be going on in the short-run and long-run? We can find that in the short-run, growth can contribute 97.77 percent, yet in the long-run, commitment to growth has about a similar esteem, and on account of FDI in the short-run, they can't contribute any impact because the esteem is 0.00 percent, the variance of growth here did not get a similar esteem as well. From that point forward, exports in the short run can cause 0.82 percent of the vacillation of growth, however over the long run an additionally 0.00, percent implies there is a little change in the estimation of love on growth. Along these lines, in a similar setting, the rest of the instances of the causal connection between the factors of the examination.

Table 3. 21. *Variance Decomposition of growth in the EU countries.*

Variance Decomposition of LNGROWTH:				
Period	S.E.	LNGROWTH	LNFDI	LNEX
1	0.356627	100.0000	0.000000	0.000000
2	0.395724	97.96424	1.278187	0.757576
3	0.397331	97.77556	1.399020	0.825423
4	0.402460	95.58724	2.227898	2.184865
5	0.409006	92.57417	2.200047	5.225780
6	0.416944	90.66180	3.538748	5.799449
7	0.424712	87.45918	5.809886	6.730931
8	0.427924	86.48633	6.723275	6.790391
9	0.429125	86.14772	6.955109	6.897175
10	0.429292	86.08951	7.004684	6.905805
Variance Decomposition of LNFDI:				
Period	S.E.	LNGROWTH	LNFDI	LNEX
1	0.095882	3.637535	96.36247	0.000000
2	0.145985	7.839787	92.14084	0.019369
3	0.180163	8.723273	91.18789	0.088841
4	0.212639	10.31159	88.56512	1.123289
5	0.246966	12.02742	86.75144	1.221135
6	0.272156	12.91508	85.91920	1.165716
7	0.293118	14.61384	83.65478	1.731373
8	0.318100	20.19834	76.62842	3.173238
9	0.342829	25.74219	69.84562	4.412194
10	0.364918	29.92142	64.67743	5.401146
Variance Decomposition of LNEX:				
Period	S.E.	LNGROWTH	LNFDI	LNEX
1	0.106471	7.312033	54.28980	38.39817
2	0.153396	12.65254	51.37185	35.97561
3	0.181215	11.11537	50.63454	38.25009
4	0.210931	9.188485	50.42412	40.38739
5	0.238462	8.611748	52.74653	38.64172
6	0.260216	7.816574	53.39282	38.79060
7	0.283492	8.658958	49.93777	41.40327
8	0.311420	13.74015	43.59113	42.66872
9	0.338070	18.28620	38.77218	42.94162
10	0.361729	21.29489	35.67245	43.03266
Cholesky Ordering: LNGROWTH LNFDI LNEX				

3.3. Conclusions and Recommendations

This study has investigated the impact of FDI and exports on economic growth as we selected the variables in our study cases. The study further examined the causal relationships among the considered series. The empirical methodology uses the Johansen co-integration test with the VEC Granger Causality/Block Exogeneity Wald Test to examine possible long-run and short-run effects among the involved series, as well as the direction of these effects. The study used data from 1981 to 2015, mostly from the World Bank and World Development Indicators, the International Monetary Fund, the global economic indicators, and the central banks of each country.

Test results of two groups showed that all the variables of study in time series and panel data are stationary up to their first difference, I (1). Turkey, Saudi Arabia, and Indonesia are the Islamic members of the G20 group (A). In addition to the EU countries, Finland, France, Germany, Italy, the Netherlands, Norway, Poland, Portugal, Spain, Swaziland, Sweden, and the United Kingdom are included in group (B). The study used these tests for groups (A) and (B), such as: The augmented Dickey-Fuller (ADF) test, the Philips-Perron (PP) test and the Kwiatkowski-Philips-Schmidt-Shin test. Econometric techniques were used to examine the unit roots of the involved variables, and cross-section dependence tests (CD) and then the panel unit roots tests are: Pesaran (2004), Levin, Lin & Chu t*, Im, Pesaran and Shin W-stat (2003), ADF– Fisher Chi-square and PP– Fisher Chi-square. And co-integrated tests are Pedroni (Engle-Granger based) (1999, 2004), kao (2012) and Fisher, which were all variables on the natural logarithm (Ln) scale in panel data of the EU countries group.

The co-integration tests revealed two unique co-integrating vectors, implying two unique long-run relationships among growth, exports and FDI for the period of study in three countries, which are Turkey, Saudi Arabia and Indonesia. Co-integration evidence indicated and thus confirmed a long-run positive relationship between growth and FDI and also between growth and exports in three cases of group (A). All things considered, the VEC Granger causality test indicated a causal relationship between growth and FDI. Also, growth and exports are unidirectional in this relationship between variables in Turkey. Therefore, the VEC Granger causality test indicated a causal relationship between growth and FDI and also exports and FDI, and finally exports and growth with unidirectional in all the relationships between variables in Saudi Arabia. Consequently,

the VEC Granger causality test indicated a causal relationship between growth and FDI and also exports and FDI, with no direction in all the relationships between variables in Indonesia. The error correction term for growth is a negative value and statistically significant in three countries of group (A).

This indicates that there is a long-run Granger causality running from FDI inflows and export values to economic growth. Furthermore, the error correction term for economic growth, which is -0.98 shows that growth is adjusted by 98% annually to conform to the long-run equilibrium relationship between economic growth and FDI and EX in Turkey. According to these facts demonstrate the accepted argument that economic growth is a positive force for export values in Turkey and in one of the biggest economies and members of the G20. In a broadly open economy, trade and manufacturing are encouraged to increase exports as a result of the increased economic growth in the local sectors.

In the same group, Saudi Arabia was Also, the results indicate that in the long-run, Granger causality between FDI, EX and economic growth exists. This implies that there is no way to establish causality between FDI, EX, and economic growth in the short run. According to the results, economic growth causes exports in a bidirectional relationship. And the error correction term for economic growth, which is -0.36 shows that growth is adjusted by 36% annually to adapt to the long-run equilibrium relationship between economic growth, FDI and EX. In this case, the study differs from that of the other countries under study because it is a country dependent on oil, gas and petrochemical exports for an increase in GDP growth. This shows the reality of the link between foreign direct investment and economic growth and exports that is appropriate with economic theory.

The difference in the case of Indonesia is that the results showed there was no FDI impact on the rate of economic growth within the country. Both tests suggest that in the long-run, the error correction term for economic growth, which is -0.96 shows that growth is adjusted by 96% annually to offer the long-run equilibrium relationship between the variables. But, in the short-run, there is no effect of Granger causality between FDI, EX and economic growth. Although the real reason for the decline in FDI in the Indonesian economy is from some countries' policies such as the United Kingdom, the investment value was dropping from nearly 1 billion dollars to approximately 500 million dollars,

and the domestic role of domestic investment is affecting the rate of economic growth. Which is, the growth rate in the trade balance usually increases by 14%. In particular, it relies on other sectors to raise the economic growth rates of the country, such as the machine industry and the leather industry.

All things considered, FDI and EX have a positive impact on economic growth compared to other types of capital flows. In addition, FDI has a significant role in the economic growth of countries that host FDI in all its forms. It is especially important as a vehicle for the transfer of advanced technology. Another advantage of FDI can be the development of labor in the host countries.

Correspondingly, the results of the group (B) in this study showed that there is an FDI impact on the rate of economic growth within the EU countries. As well, the results of cointegration tests show that, in the long run, there is a bidirectional Granger causality between FDI, EX and economic growth. According to the results, there is a positive relationship between FDI and growth. In this case, it agreed with the economic theory, as much as the relationship in a dynamic growth rate model between the variables. In the short-run term, there is a two-way causality between FDI, EX and economic growth; indeed, FDI and EX cause economic growth. Together with the error correction term for economic growth, which is -0.55 this shows that growth adjusts by 55% annually to the long-run equilibrium. In general, EU countries imply that economic policies encouraging FDI inflows are a tool for stimulating economic growth.

Of course, economic growth is assessed with a long-term focus when the economy can achieve a stable situation in which the most important factors grow at a steady rate. From the basic equation of economic growth, it can be seen that the value of the increase in investment within the domestic economy leads to a consequent increase in the volume of gross domestic product (GDP), which represents the economic growth of the country. Therefore, countries with a large stock of human capital will develop faster in the long run than countries with a deficiency in this respect.

The interpretation of a causal relationship between the study's variable(s) is based on the following points:

1 Foreign direct investment is directed at some loans from international institutions in that period, The second reason is the Central Bank of Turkey's

reduction in interest rates, which has prompted investors to invest in real estate in order to maximize profits.

2 The Saudi side is very different, in terms of the Saudi economy's dependence on attracting foreign investment in the oil and gas sectors in a significant way. Foreign investors are preferred to invest in this field in an effort to achieve increased profit rates.

3 In addition to the situation in Indonesia, the reason for the lack of a causal link between economic variables is the dependence of foreign investment on domestic investment significantly in the production and export process. Hence the absence of a causal link through foreign investment and its effect on the growth rate.

4 FDI has a strong positive impact on the productive process in the European Union countries in general. This is done through various channels such as foreign exchange, worker training, technical and administrative assets, the labor force, and flexibility through the foreign trade of the countries. Hence, foreign exchange can be provided to finance the economic growth of the local economy. It is also a feature of FDI that European Union countries can easily access technology for foreign investors. And then take advantage of it by having the ability to grow productivity in industries that depend on comparative advantage.

In conclusion, comparing the two cases shows that there is a role played by foreign direct investment and export value in the economic growth rate in European countries. Because of the case of the union among European countries, it usually requires the unlimited movement of investors and gives the opportunity for capital movement between the union countries. Thus, it increases the efficiency of local branches of the economy in a positive manner. This contrasts with members of the G20. It is different in its ability to take advantage of foreign investments when it sets its policies and investment laws unilaterally, which is followed by the export value and growth rate. Because of the different characteristics of each economy.

So, the economic institutions in countries should be more precise when they decide on some new conditions for foreign investors, especially a conducive investment environment to attract beneficial FDI should be facilitated in economic sectors. Such

benefits do not exist within the existing institutional framework. Because of the heterogeneity of the policies and laws in different ranked countries globally, In the same context, the quality of education should be increased because the cheap labor force is not sufficient and foreign investors always need to be more competitive in the local economy. The Islamic countries should make an agreement with others and then enter into global trade as one economic conglomerate with other foreign countries.

Therefore, foreign direct investment is involved in the real economic spatiality for the production and the added value, such as in the industrial sectors and after that, the country will get some dynamic benefits, like an increase in the rate of employment in the local economy, a better-trained labor force, a higher national income, more innovation, and a competitive economic system.

In general, countries should invest in human capital to improve their skills and also improve the quality of R & D for more opportunities in all financial and monetary roles and policies.

Through the study, the study can suggest some topics that will be dealt with excellence in future studies:

1 How can political and economic institutions be established to increase the importance and role of the local economies of non-oil countries in the G-20?
2 How can we increase the productive capacity of the local economy in the group of the members' Islamic countries in the G-20?
3 The role of a state's institutional system in creating an investment climate more in industries with a comparative advantage at the stage of establishing a regional union
4 The importance of the oil countries in the formation of fixed capital to achieve a productive and service economic base within the local economy has "opportunities and objectives".

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APPENDIXES

Appendix (A)

G-20 countries G(A)	European Union countries* G(B)
Turkey, Saudi Arabia and Indonesia.	Finland, France, Germany, Italy, Netherlands, Norway, Poland, Portugal, Spain, Sweden, Switzerland and the United Kingdom (Paprzycki and Fukao).
Total 3 countries	**Total 12 countries**

NOTES: (*) For the necessity of study and its developments, it is possibility able to add some countries or I will cancel at least two of them. Or replace them, this will be more cl with the tests of the study, also depends on the availability of data from the sources.

Appendix (B) shortcuts for study's variables

List of variables

Variable	Definition
GGDP	Growth rate of gross domestic production (% of GDP).
Exports	Exports of goods and services.
FDI	Foreign direct investment, net inflows.

Country/years	1990	2000	2005	2010	2011	2012	2013	2014	2015
Turkey	9.3	6.6	9	8.5	11.1	4.8	8.5	5.2	6.1
India	5.5	3.8	7.9	8.5	5.2	5.5	6.4	7.4	8
China	3.9	8.5	11.4	10.6	9.5	7.9	7.8	7.3	6.9
Indonesia	7.2	4.9	5.7	6.2	6.2	6	5.6	5	4.9
Korea	9.8	8.9	3.9	6.5	3.7	2.3	2.9	3.3	2.8
Canada	0.2	5.2	3.2	3.1	3.1	1.7	2.5	2.9	1
Argentina	-2.5	-0.8	8.9	10.1	6	-1	2.4	-2.5	2.7
United States	1.9	4.1	3.3	2.7	1.6	2.2	1.8	2.5	2.9
France	2.9	3.9	1.6	2	2.2	0.3	0.6	1	1.1
Germany	5.3	3	0.7	4.1	3.7	0.5	0.5	2.2	1.7
Mexico	5.2	4.9	2.3	5.1	3.7	3.6	1.4	2.8	3.3
Australia	3.6	3.9	3.2	2.1	2.5	3.9	2.6	2.6	2.4
United Kingdom	0.7	3.7	3.1	2.2	1.6	1.4	2	2.9	2.3
Japan	4.9	2.8	1.7	4.2	-0.1	1.5	2	0.4	1.4
Russia	-3	10	6.4	4.5	5.3	3.7	1.8	0.7	-2.8
Italy	2	3.7	0.9	1.7	0.6	-2.8	-1.7	0.1	0.9
South Africa	-0.3	4.2	5.3	3	3.3	2.2	2.5	1.8	1.3
Brazil	-3.1	4.4	3.2	7.5	4	1.9	3	0.5	-3.5
Saudi Arabia	15.2	5.6	5.6	5	10	5.4	2.7	3.7	4.1

3.3.1. *Appendix (F) the economic growth in G-20 Countries*

Source: *knoema. Statistics and Penn World Table 9.0.*

Country/Years	1990	2000	2005	2010	2011	2012	2013	2014	2015
Libya	0	3.7	11.9	5	-62.1	123.1	-13.6	-24	-8.9
Iran	13.8	5.9	3.2	5.8	2.6	-7.4	-0.2	4.6	-1.3
Ecuador	3.7	1.1	5.3	3.5	7.9	5.6	4.9	3.8	0.1
Algeria	0.8	3.8	5.9	3.6	2.9	3.4	2.8	3.8	3.8
Qatar	0	0	7.5	19.6	13.4	4.7	4.4	4	3.7
Nigeria	11.8	5	6.4	8	5.3	4.2	6.7	6.3	2.7
United Arab Emirates	18.3	10.9	4.9	1.6	6.9	4.5	5.1	4.4	5.1
Gabon	5.2	-1.9	2.7	7.1	7.1	5.3	5.6	4.3	3.9
Angola	-3.5	3.1	15	4.9	3.5	8.5	5	4.8	0.9
Saudi Arabia	15.2	5.6	5.6	5	10	5.4	2.7	3.7	4.1
Iraq	57.8	1.4	4.4	6.4	7.5	13.9	7.6	0.7	2.5
Kuwait	0	4.7	10.1	-2.4	9.6	6.6	1.1	0.5	0.6
Congo	1	7.6	7.8	8.8	3.4	3.8	3.4	6.8	2.6
Equatorial Guinea	-1.8	18.2	16.7	-8.9	6.5	8.3	-4.1	0.4	-9.1
Venezuela	6.5	3.7	10.3	-1.5	4.2	5.6	1.3	-3.9	0

3.3.2. *Appendix (G) the economic growth in OPEC*

Source: *knoema. Statistics and Penn World Table 9.0.*