REPUBLIC OF TURKEY
ISTANBUL GELISIM UNIVERSITY
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Department of Economics and Finance

THE RELATIONSHIP BETWEEN EXPORT AND ECONOMIC GROWTH: A COMPARATIVE ANALYSIS FOR TURKEY AND EUROPEAN UNION

Master Thesis

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Supervisor

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DECLARATION

I hereby declare that thesis is my own original work with the exception of specific sources which are acknowledged throughout and referenced according to the established scientific rules. The information contained in this thesis is my personal research and I also affirm that; this work has not previously been published or defended.

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SUMMARY

This study is carried out to analyze the nexus between export, import and economic growth in Turkey and 5 European Union countries (France, Germany, Italy, Netherlands and Spain) using panel data for the period 2010 to 2020. The justification for choosing this topic or carrying out this study is; because Turkey is an important trading partner with EU countries and a candidate to access EU zone, therefore checking it economic growth and export is important more especially when associated with EU countries. The dependent variable in this study is GDP while the predatory (independent) variables are export and import. The study uses the FMOLS (fully modified ordinary least square) estimation techniques. The Levin-Lin Chu (LLC) and Augmented Dickey Fuller (The Fisher ADF) panel unit root test were used to check the stationarity of the variables and also the Pedroni and Kao panel cointegration test were employed to check the cointegration between the aforementioned variables. The results demonstrated that there is a positive long run relationship between export and economic growth and a change in export will lead to 10.30% increase in GDP in Turkey and the five selected economics of EU (France, Germany, Italy, Netherlands and Spain). The VAR granger causality test confirmed a bidirectional relationship between export and economic growth. Though a long run relationship was established between import and economic growth, the VAR granger causality provide evidence of the causality which runs from GDP to import meaning a one-way direction. This study in a nutshell confirmed the validity of the export led growth bidirectional relationship for the case of Turkey and the selected countries of EU between 2010 and 2020 (last 11 years). The study in the last chapter made some comments on recommendations both to policy makers and future researchers.

Keyword: Granger Causality, FMOLS (Fully Modified Ordinary Least Squares) Method, export and economic growth

ÖZET

Bu çalışma, Türkiye ve 5 Avrupa Birliği ülkesinde (Fransa, Almanya, İtalya, Hollanda ve İspanya) ihracat, ithalat ve ekonomik büyüme arasındaki ilişkiyi 2010-2020 dönemi için panel verileri kullanarak analiz etmek amacıyla yapılmıştır. Bu konunun seçilmesinin veya bu çalışmanın yapılmasının gerekçesi; Türkiye'nin AB ülkeleri ile önemli bir ticaret ortağı olması ve AB bölgesine girmeye aday olması nedeniyle, ekonomik büyüme ve ihracatın kontrol edilmesinin, özellikle AB ülkeleri ile ilişkilendirildiğinde daha önemli olmasıdır. Bu çalışmada bağımlı değişken GSYİH iken bağımsız değişkenler ihracat ve ithalattır. Çalışma, FMOLS (tamamen değiştirilmiş sıradan en küçük kareler) tahmin tekniklerini kullanır. Değişkenlerin durağanlığını kontrol etmek için Levin-Lin Chu (LLC) ve Augmented Dickey Fuller (The Fisher ADF) panel birim kök testi, bahsedilen değişkenler arasındaki eşbütünleşmeyi kontrol etmek için de Pedroni ve Kao panel eşbütünleşme testi kullanılmıştır. Sonuçlar, ihracat ve ekonomik büyüme arasında uzun vadeli pozitif bir ilişki olduğunu ve ihracattaki bir değişikliğin Türkiye'de ve AB'nin seçilen beş ekonomisinde (Fransa, Almanya, İtalya, Hollanda ve İspanya) GSYİH'de 10.30% 'luk bir artışa vesile olacağını göstermiştir. VAR granger nedensellik testi, ihracat ve ekonomik büyüme arasında çift yönlü bir ilişki olduğunu doğrulamıştır. Bununla birlikte, ithalat ve ekonomik büyüme arasında da uzun dönemli bir ilişki kurulmuştur. VAR granger nedenselliği, tek yönlü bir istikamet anlamında GSYİH'den ithalata uzanan bu nedenselliğin kanıtını da sunmaktadır. Özetle bu çalışma, 2010 ve 2020 yılları arasında (son 11 yıl) Türkiye ve seçilmiş AB ülkeleri örneğinde ihracata dayalı çift yönlü büyüme ilişkisinin geçerliliğini doğrulamıştır. Çalışmanın son bölümü ise, hem politika yapıcılara hem de gelecekteki araştırmacılara öneriler konusunda birtakım değerlendirmelerde bulunmuştur.

Anahtar Kelimeler: Granger Nedenselliği, FMOLS (Tamemen Değiştirilmiştir Sıradan En Küçük Kareler) Yöntemi, İhracaat ve Ekonomik Büyüme

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ABBREVIATIONS

FMOLS	**:**	Fully Modified Ordinary Least Square
WDI	**:**	World Development Indicators
WBD	**:**	World Bank Database
WITS	**:**	World Integrated Trade Solution
ELG	**:**	Export Led Growth
OLS	**:**	Ordinary Least Square
EXP	**:**	Export
IMP	**:**	Import
GDP	**:**	Gross Domestic Product
EU	**:**	European Union
VAR	**:**	Vector Auto Regression
OLS	**:**	Ordinary Least Square
IMF	**:**	International Monetary Fund
LLC	**:**	Levin-Lin Chu
ADF	**:**	Augmented Dickey Fuller

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CHAPTER ONE

INTRODUCTION

1.0 General Background

It is known in economic theories that export constitutes a determinant macroeconomic indicator that influence the level of economic growth in an economy. Some economic schools of thought like the neoclassical advance consider export as a motivating factor towards economic growth (Sulaiman & Saad, 2009). The economic thought of export been connected to economic growth is an old school of thought which was explained in international trade by some economics founders like Adam Smith and David Ricardo. Export is considered as a blessing towards economic growth advancement as it facilitates the country that enjoys a comparative advantage over other countries to make efficient allocation of their resources and stimulate output production (Gokmenoglu *et al.* 2015). The export-economic growth nexus was earlier raised in the 1980s in developing countries like Taiwan, Singapore and South Korea following their trade openness policies aimed at increasing their export expansions. International organizations like the World Bank and IMF (International Monetary Fund) played a remarkable role in boosting and putting in place mechanisms that favor export to support economic growth in the early 1970s. Stimulating exports so as to achieve economic growth became a remarkable means to many countries across the world and specially to developing nations like Turkey. This made government officials and policy makers to explore more on the benefits of export expansion towards economic growth achievement as the latter is one of the main objectives of every nation across the world.

The relationship between export and economic growth or the impact of export on economic growth is a hot topic on which major investigations are still on going in recent era (Kristjanpoller *et al.* 2016). Stimulation of the export of goods and services play a very crucial role in international trade between countries as export in macroeconomics is considered as an injection into the economy which can guide monetary authorities as well to achieve the desired level of economic equilibrium in an economy. Additionally, rise in export leads to efficiency in cost of production,

balance of payment adjustments, local market extension and high productivity (Gökmen & Temiz, 2010). Earlier researchers like Fajana, 1979 also mentioned that export expansion is essential in international trade in escalating economic growth in an economy. Export also fosters specialization and improvement in technology which create in the long run a comparative advantage over other competitors (McKinnon 1964; Chenery & Strout 1966; Balassa 1978; Esfahani 1991). Examining the impact of export on economic growth in one country in rest of other countries permit to evaluate the level of market share and competitiveness a country can have in the international market and positively affect economic growth in the local economy.

Referring to the extant literature, there is no consensus on the results obtained on the relationship between export and economic growth across nations. A huge number of studies provide evidence in support of a positive correlation between export and economic growth for different countries (Ram, 1987; Bahmani-Oskooee, 1993; Gerni *et al.*, 2013; Bakari & Mabrouki, 2016; Ahmad *et al.*, 2016; Manzoor & Safdar, 2020). This school of thought that suggests that export expansion exert a positive impact on the level of economic growth gave rise to an economic theory supporting this argument commonly known as the Export Led Growth (ELG) hypothesis. Other scholars, in their research came out with a contrasting opinion or result. These studies provide in their outcome, evidence against the export led growth hypothesis. The results show that economic growth is responsible for export expansion (Sims, 1972; Romer, 1990; Giles & Williams, 2000; Abbas, 2012). Other studies saw a two-side causal relationship between export and economic growth (Mah 2005; Awokuse & Christopoulos, 2009; Balcilar & Ozdemir 2013; Dar *et al.* 2013). This divergence in the results on the nexus between export and economic growth explains why debates are still on-going amongst scientists till date. It was found that the validity of the export led growth hypothesis varies according to countries, time period and the sample size (Dabla-Norris *et al.*, 2015). Checking at the validity of the export-economic growth nexus in Turkey and European Union (EU) is of utmost importance as Turkey is a great economic partner with EU as 40% of their export goes to this area.

Although a good number of empirical studies came out with research on both economically developing nations and developed nations in support of the export led growth paradigm, this is not necessarily the case in Turkey and European Union (compose of a block of countries). Turkey adopted a free trade agreement with the

European Union since the past decades and one of the objectives of the agreement was to promote export towards this area in other to sustain its economy (Nas, 2018). Analyzing the causal relationship between export and economic growth in current years in Turkey and European Union allow us to evaluate the level of economic growth in Turkey with regards to its export and make comparative analysis with European Union countries (its trading partners). It is also important to note that the extant literature on the nexus between export and economic growth in Turkey does not provide common results in support of the export led growth hypothesis. For instance, Ozturk and Acaravci (2010) carried investigated on the nexus between export and economic growth and had contrasting results.

1.1 An Overview of the Trade and Export in Turkey and EU

This section is dedicated for a brief overview of trading activities and export for Turkey and European Union. Turkey is considered as an emerging country that covers both the European and Asian continent with around 83.5 million inhabitants (World development Indicators, 2019). It accesses to the European Union is still on-going and negotiations between the two trading partners are not yet closed. On the other hand, European Union is made up of twenty-seven countries but this study is limited to five countries of this region (France, Germany, Italy, Netherlands and Spain).

The trade policy of Turkey before the 1980s was mostly oriented towards trade barriers. The idea was to protect infant domestic industries from international competition and encourage import expansion (Yilmaz 2002). This policy caused severe economic repercussions to the Turkish economy over time like balance of payment problems, high unemployment, low quality of products due to the absence of competition and other negative externalities. It is only the beginning of the 1980s that the government adopted a policy aimed at stimulating exports to stabilize its economy (Adalessossi & Kaya 2015). One of the mechanisms put in place by the government to accelerate exportation was the signing of the free trade area agreement between Turkey and the European Union. The results of such policy adjustment could be observed few years later and the macroeconomic objective of the government was to revamp the economy by providing financial assistance or subsidies to manufacturing and other sectors of the economy, to create job openings, and adjust the balance of

payment (Adalessossi & Kaya 2015). In 2004, export reached by 85% based on the targeted objective for a total export of about 74 billion USD. Turkey, in a strategic and privileged trade with the European Union, also aimed to have one of the best stable and prosperous economies across the globe. The economic growth rate was positive until 2008 with positive realizations from one year to the other and export were planned to increase to up to 132 billion USD in 2008 (Team 2010).

However, on the onset of 2009, Turkey started facing economic crisis which was to a greater extent as a result of the adverse effects of the global financial crisis. This is because European Union and United State of America (USA) were in economic recession and business slump. Thus, interest rates were raised and trade across boundaries was mitigated. Due to the fall in international trade, export in Turkey also dropped and this situation was similar across EU countries (Ertugrul *et al.,* 2010).

It is important to note on the other hand that European Union was founded in 1993 following the Maastricht accord. Today, it is composed of 27 countries which include; Austria, Belgium, Bulgaria, Croatia, South Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden. The European Union is a key trading partner to a good number of countries across the world more especially, Turkey.

The EU is a key trading partner having a significant influence on the export growth of Turkey as around 40 - 45% of the Turkish exports go in this area. Trading activities between The EU and Turkey was established in the past decades as earlier mentioned and this historical economically trading relationship is still maintained till date. Besides the evaluation of the export led growth hypothesis is necessary as well as comparative analysis so as to guide policy makers in setting their macroeconomic policies aimed at stimulating economic growth and development (Nikolaos & Pavlos, 2018).

Hereby, it presented what is Turkey's share in the total exports of these selected five countries which are composing our panel sampled. Firstly, we will talk about France, Turkey as an average has share 1.45% of total export of France during the sampled period. In other words, France makes an average of 1.45% of its exports to Turkey. On the other hand, Germany makes an average of 1.72% of its exports to

Turkey and respectively for Italy, Netherlands and Spain the average export figures are as follows; 2.26%, 1.15%, 1.89%. All figures and information are retrieved from WITS of WB database.

1.2 Problem Statement

It is stated in the principles of economics that export represents a macroeconomic factor that can influence the level of economic growth in a given location at a particular point in time. It is important to recall that the aim of every government or policymakers is achieve sustained economic growth. One of the roads towards this success is expanding export growth so as to achieve the desired overall economic growth. Furthermore, rise in export leads to efficiency in cost of production, balance of payment adjustments, local market extension and high productivity (Gökmen & Temiz, 2010). Stimulating exports with the target of economic growth became a remarkable means to many countries across the world and especially to developing nations like Turkey. Turkey initiated policy aimed at improving its exports with its trading partners especially within The European Union (EU). Today, Turkey is an important trading partner with the EU around 40% of its export goes into the region. But the question that arrives till date is to know whether export is considered as a blessing toward economic development in Turkey and EU? In other words, is the export led growth hypothesis still valid in Turkey and EU jointly? Additionally, what is happening in European Union countries which are important trade partners with Turkey?

Many scholars have carried out investigations on the relationship between export and economic growth or export led growth hypothesis but the results are still unclear (no common agreement). Some scientists support the argument that export growth is positively related to economic growth (Gerni *et al.*, 2013; Bakari & Mabrouki, 2016). Others, mention that economic growth creates condition that favors the level of export which they called the growth led export paradigm (Giles & Williams, 2000; Abbas, 2012). Other studies found no correlation between export and economic growth. Also, the result of this nexus in Turkey remains controversial, given that it is very vital to have clear findings on the relationship between export and economic growth especially for emerging countries like Turkey that are suffering from economic difficulties (Nikolaos & Pavlos, 2018).

Regrettably, very few studies have tried to come up with the export-economic growth in Turkey for a longer period of time with recent data and more reliable methods. To the author's knowledge, there is no existence study on the export-economic growth for Turkey and European Union countries and also comparative analysis in order to know it's well or worst they are doing in respect to each other. This is also important to make this analysis as Turkey is a current candidate for the European Union membership. Also, these selected five countries has the five largest economies in the EU zone. Besides so far, we have not come across any study that compares and analyzes these six countries with the methods we conducted. These factors were influential in determining the sample countries (the six countries) in our study.

Therefore, this study seeks to fill this gap in the extant literature by providing responses to the relevant interrogations.

1.3 Research Questions

The following questions are the areas that the author tries to make investigation on;

- Is there a causal relationship between export, import and economic growth in Turkey and EU countries in current era?
- Assuming that the correlation between export, import and economic growth is established, what is the causal direction?
- What is the position of Turkey, in export performance with regard to its European Union countries trade partners?

1.4 Research Objectives

- The central reason for carrying out this research is to examine the causal relationship that exists between export, import and economic growth in both Turkey and the selected five EU countries (France, Germany, Italy, Netherlands and Spain) and for the latest 11 years (2010-2020).

- The second objective is to establish the causal direction between export, import and economic growth in Turkey and European Union so as to know the validity of the export led hypothesis.

- Lastly, we aim to make a comparative analysis on the contributions of export towards economic growth in Turkey and selected five European Union countries. The scope of this comparative analysis is limited to the information obtained in the descriptive statistics analysis conducted.

1.5 Relevance of the Study

Given that it is established in macroeconomic theories that export constitute a major determinant to economic growth especially for emerging economies like Turkey (candidate to the European Union Zone), it is necessary for Turkey to maintain good performance in terms of export towards the EU. The essence of carrying out this research today is highlighted in the following points;

- Although many researchers have documented previously the nexus between export and economic growth, there is no consensus in the results and no study is making comparative analysis between Turkey and EU, whereas it is vital to have such results given that Turkey is aiming at joining the EU zone. Therefore, this study intends to fill this gap by providing results and recommendations based on the problem statement and results respectively.
- Secondly, this study is utmost importance because it provides information on the competitiveness of Turkish's goods and services in the international market to external investors and other stakeholders. This is because in the economy it is believed that an increase in the export of goods and services in particular area means that the country has a comparative advantage in the production of such goods or services and encourages exports by making itself cheaper in the foreign market. Thus, exports are encouraged.
- Last but not the least, this study is required because the Turkish economy is currently facing economic crisis due to the steady depreciation of the Turkish lira simultaneously with increase inflation level. Therefore, it is necessary to check whether this situation has a direct or indirect impact on Turkish's export, with regard to its trade partners and European Union countries. It is very important to have documentation on this subject in order to understand the subject.

1.6 Methodology of Study

This research applies the FMOLS (fully modified ordinary least square) technique to explore the relationship between export, import and economic growth in Turkey and selected five EU countries using panel data for the period covering 2010 to 2020. Our series (variables) must be stationary so as to go further with the research work. This stationarity is checked by using the Levin-Lin Chu (LLC) and the Fisher ADF (Augmented Dickey Fuller by Maddala and Wu) panel unit root test. The essence of these tests is to know whether the series suffer from unit root issue or not. The series are required to be stationary because, this is important for other essential tests to be carried out. Cointegration among the variables is, explored by the Pedroni and Kao panel cointegration test. We use this test to analyze whether there is cointegration amongst the variables (dependent and predatory variables) used in the study. The VAR (Vector Auto Regressive) model is also used to check the causality that exists between import, export and economic growth in the aforementioned case study. It determines whether the causality between two variables is unilateral, bilateral or no causality. In a summary, all the estimations techniques used in this study are first generational techniques and their computation is conducted using the econometric EVIEWS software program.

1.7 Hypothesis

The following hypotheses are verified in this study;

H_1: The Export Led Growth hypothesis is valid in Turkey and EU

H_2: The Export Led Growth hypothesis is not valid in Turkey and EU

1.8 Scope of Study

This study is limited to the analysis of the five largest countries in European Union and Turkey in terms of their output performance (GDP). Those countries include; France, Germany, Italy, Netherlands and Spain. The comparative analysis in this study is just based on overview of the descriptive statistics results reported for Turkey and the selected five European Union countries. The data covering period in this study is between 2010 and 2020 which is obtained only through secondary sources.

1.9 Organization of the Study

Organization of the study is a section that intends to give the reader, the chronological order of each section that comprises this study so as to easily be identified each main chapter and make understanding easy. Then, we are going to discuss the conclusion of the current chapters in the end of each chapter.

This thesis is segmented into five (5) chapters and each chapter constitutes an important piece which makes up the entire work. Chapter one commences with a general introduction and this followed by an overview of trade and export in Turkey and European Union. Then the problem statement, research questions, objectives of the study, relevance of the study and the methodology are presented respectively. Then, the hypothesis that guides our study is mentioned. The subsequent chapter presents a discussion of the theoretical and empirical literature related to our problem statement, research questions and objectives. Chapter three gives the explanation of the variables used in this study. Also, chapter three gives the methodology and estimation approaches used in this investigation too. Chapter four gives the results of the study and interpretations of these results. There is a discussion in the last chapter, related the summary of the overall thesis and general conclusion of the research. Recommendations are mentioned last, as based on the outcome of the work.

1.9.1 Conclusion of Chapter

This chapter presented a general introduction of the topic. The idea was to better understanding the historical background of the subject matter of this study. We also carried out an overview of trade and export in Turkey and EU to know the position of Turkey and the five selected European Union countries in terms of export level and trade transactions. This is important in terms of showing the connection between commercial relations and export activities. Also, it is important in terms of showing the interest in commercial activities and exports. Then we mentioned the problem statement. This research was carried out based on the identified problem statement in this sub-section. The research questions where formulated based on the identified problem and the research objectives were elaborated to guide the readers in the comprehension of the goal of the study. Subsequently, we introduced the relevance of the study. The idea here was to justify the need for carrying out the study about the relationship that exists between export, import and economic growth in Turkey,

France, Germany, Italy, Netherlands and Spain. Then the methodology of the study was mentioned and the empirical methods used to carry out this investigation were pointed out. On the other hand, the unit root technique, the cointegration method and the main empirical estimation technique were mentioned. Hypothesis were developed, scope and delimitation of the study was clearly stated. In preceding of the conclusion part of this chapter, the organization of remaining parts of the thesis was detailed.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

In this chapter, the appropriate theoretical literature and empirical literature connected to the objective of the analysis is discussed. To make our work much easier to comprehend, we have segmented the chapter into the following sections; the first section deals with the theoretical literature that guides us to better understand our study which is related to our problem statement. The second section identifies the relevant empirical studies and comparative analysis that investigated on the causal nexus between export and economic growth. The aim of this chapter is to identify the missing information in the extant literature so as to provide the necessary information in our current study.

2.2 Theoretical Literature

It is important to note that there exist macroeconomic theories that have explained the contributory impact of export on economic growth. However, based on our problem statement and research objectives, we have identified the best suitable theory that will be used to guide our study. This theory is the export led growth theory.

2.2.1 Export Led Growth Theory

Export Led Growth (ELG) theory is the most widely used theory in the existing literature to explain the causal relationship between export and economic growth. ELG theory suggests that export expansion is a pivotal macroeconomic factor that contributes to the level of economic growth (Beckerman, 1965). This is because, export growth encourages the country to get some benefits such as the efficient allocation of resources and improvement in the quality of the goods or services due to the increase in the efficiency of labor force. Also, the export growth provides advancement in technology, benefit from economies of scale, an increase in production and benefit of comparative advantage to exporting country. (Feder 1983; Kali *et al.*, 2007; Dreger & Herzer, 2013; Bahramian & Saliminezhad, 2020). More explanations have emerged from authors trying to shed more light on the export led growth theory. Exporting to the foreign markets represent an injection into the local economy due to

the revenue received from the sale of goods or services which goes to increase the GDP (Gross Domestic Product) figures. Since GDP is a representative of economic growth a phenomenon widely known among economists it is obvious that it contributes to economic growth (Giles & Williams, 2000).

According to the ELG theory, an increase in export is as a result of the competitive nature of goods and services of the exporting country in the international market. The competitive nature of the goods and services of the exporting country in the international market can be as a result of the quality of its goods and services, its low prices and a huge portfolio of trading partners who need the exporting country's products (Olowofeso & Olorunfemi, 2006). This is usually the case with countries that have comparative advantage in the production of the goods and services against the other countries which do not have. Therefore, it is profitable for countries with no competitive advantage to buy at low cost from countries with comparative advantage. This goes a long way to stimulate the export of the exporting country and therefore increase in economic growth with the occasion of the efficient allocation of the factors of production. These export-oriented countries generally practice free trade with its most important trade partner so as to facilitate the expansion of its exports and hence its economic growth.

Therefore, ELG theory became the fundamental theory in most studies that explore the correlation between export and economic growth in different countries. Fagiolo *et al.,* 2010; Sannassee *et al.,* 2014; and Dabla-Norris *et al.,* 2015; recently checked the validity of the export led growth hypothesis for different countries. All their results confirmed a positive causal relationship between exports and economic growth. However, this view is not shared in all the extant studies that carried out similar investigations for different countries at a particular point in time. Some studies refute the export led growth hypothesis and provide evidence in support of the growth led export hypothesis. Other authors or researchers did not find any relationship between export and economic growth while another group of researchers found a bidirectional link between the two aforementioned variables. This explains why debates are still ongoing amongst scientist about the validity of the export led growth hypothesis in the selected countries of this study and therefore this study aims to address this.

2.3 Empirical Literature

The empirical literature is all about reviewing studies of earlier researchers in the area of our research so as to know what has been found before and the uncovered part of the literature so as guide in addressing the gap in the extant literature. Therefore, in this section, we present a detailed review the researches of some authors that carried out investigations on related topics and the outcome of the research. This review of the literature is very essential and is the section in every scientific study that should be covered prior to the methodology and data section.

Economic growth is one of the main priorities of every government across the world and export is considered as a fundamental variable that promote the level of economic growth according to most economists. Stimulating exports with the vision of achieving economic growth became a remarkable means to many countries across the world. Besides, it is a wisely decision to also analyze import when we are making any analysis regarding export so as to provide explanation from a more global angle. This explains why this subject has been of keen interest to explore by many scientists more on the validity of the export led growth hypothesis for different countries. However, the results of the extant empirical studies on the relationship between export, import and economic growth are complicated and nonconclusive. Sulaiman and Saad (2009) argued that these complicated results could be as a result of differences in the variables used, the economic performance of the sampled country or countries, the time period covering the study and the estimation approached used. This has given rise to different schools of thought about the export and economic growth relationship. We have the supports of the export led growth hypothesis who argue that export encourages economic growth expansion. Besides, there is a frame of mind is the growth led export who suggests that economic growth is a necessary condition for growth in exports as well. We have the bidirectional school of thought who found that export encourages economic growth and in return the expansion of economic growth will stimulate export later on. This means that this school of thought believes that the first two previous views should be combined. The last school of thought argues that there is no causal correlation between export and economic growth. This simply means that export variation does not have any impact on the level of economic growth.

Similarly, extant studies could not arrive to a common accord on the relationship between export and economic growth in Turkey. Besides, the few studies that carried out investigation on the validity of the export led growth hypothesis in Turkey or European Union countries did not the FMOLS (fully modified ordinary least square) method for latest data. Furthermore, there is no existence study that checked the relationship between export, import and economic growth by combining both Turkey and the five selected European Union countries (France, Germany, Italy, Netherlands and Spain) with some scientific or nonscientific comments on comparative analysis of the results. However, this is important to fill this missing information in the current literature. Because Turkey is an important trading partner with the EU countries and around 40% of its export goes into this area. By extension, Turkey is a candidate to enter the EU zone and getting a study where we could figure out the statistics of the five best countries of EU on the economic potential. Those countries who make up that region are carrying vital importance in terms of measuring the Turkey's economic performance. Turkey is facing a serious currency crisis due to the dramatically and rapidly depreciation of the Turkish currency and is exposed to high inflation level in the current situation. Therefore, checking at the volume of Turkey's export today is very crucial so as to know how the export influences the level of economic growth in Turkey with regard to EU countries. Currency crisis has been from time to time witnessed in Turkey since first half of 2018 as suddenly and unpredictable. For this reason, it is essential to evaluate the economic consequences of this issue in the Turkish economy.

The review of previous studies on the relationship between export and economic growth is discussed in this section. To make our study easy to understand, the research is composed of four categories, which represent the grouping of previous literature according to their findings. In the first section, studies that support the validity of the export led growth hypothesis are discussed. The second section dwells on supporters of the growth led export paradigm. The third section discusses studies that found bidirectional evidence on the export and economic growth nexus. Finally in the last section, studies that found no cointegration between export and economic growth are mentioned.

2.3.1 Supporters of the Export Led Growth Hypothesis

As earlier mentioned, numerous studies have analyzed the causal relationship between export and economic growth for various countries. Dritsaki (2013) examined the correlation between export and economic growth between 1960 and 2011 years in Greece. They applied granger causality test and found a positive short run and long run association between export and economic growth in the case study. The following year, Szkorupová (2014) besides export and economic growth, added foreign direct investment to check the nature of the relationship amongst the aforementioned variables in Slovakia over the period 2001 to 2010 years. The results confirmed the positive relationship of the two explanatory variables (export and foreign direct investment) on economic growth in Slovakia. This means that, export and foreign direct investment play a very important role in the economic growth of Slovakia during the sampled period and based on this result, the author suggested some policy recommendations. The results obtained about the causal effect between export and economic growth suggest that export variation of goods and services causes a change on economic growth and this change is a positive change.

Akyüz (2011), examined the role of export on economic growth in China. The results revealed a positive correlation between the two variables. He mentioned that foreign trade is essential because of export expansion which helps to allocate the use of the factors of production at optimal level and hence greater efficiency is achieved. Also, he talked that, domestic industries are able to grow up while new firms set in because of the economies of scale enjoyed. In such a scenario, greater employment opportunities are also created, which of course helps to increase the level of economic growth. Export is a key component of economic growth because of the great role it plays. China is a good example of a country where the export led growth hypothesis is valid because of the Chinese government's policy in stimulating the economic growth is export based. Mahadevan (2007) also confirmed this hypothesis in Malaysia using the granger causality and the Johansen cointegration techniques. Shahbaz *et al.* (2011) also scrutinized the effects of free trade, export and GDP growth in Pakistan using Johansen cointegration technique and FMOLS estimation technique and the results demonstrated the validity of the export led growth hypothesis in this country. This result was in identical line with most studies conducted for Asian countries within the same period. This means that the increase in the export of goods and services in

Pakistan is a key contributory factor in economic growth. The authors also highlighted in their studies that free trade is important so as to stimulate their economies and to promote the export of goods and services, especially for emerging and developing countries. This is essential for sustainable economic growth and development.

Ugochukwu, U. S., and Chinyere in (2013) carried out an investigation in Nigeria to examined the effects of oil export on economic growth using historical data from 1986 to 2011 years. They used the Ordinary Least Square (OLS) and the granger causality estimation approach to check the effects of such a relationship and the direction of the established relationship. The outcome of study presents a positive relationship between oil export in Nigeria and economic growth in Nigeria. Also, Ali and Dalmar (2018) carried out an investigation in Somalia on the influence of export and import on economic growth development using the Johansen cointegration test and the granger causality test. Their results which obtained also confirmed a positive influence of import and export on economic growth in Somalia. The Johansen cointegration firstly established the association amongst the variables. The results of the granger causality later confirmed the existence of a positive causal unidirectional relationship which runs from export to economic growth in Somalia.

Gökmen and Temiz (2010) checked the relationship between export and economic growth (used GDP as proxy) in Turkey using the Johansen cointegration test, Vector Error Correction Model (VECM) and the Granger Causality for the period covering between 1950 - 2006 time series data. The results confirmed both shape as a short run and long run integration of the aforementioned variables in Turkey over the sampled period. Santos *et al.* (2013) in their works also confirmed the validity of the export led growth hypothesis in European Union (EU) over the sample period 1995 - 2010. This means that export has a very important impact on economic growth. In such a scenario, the hypothesis that suggests that export expansion is necessary for economic growth holds its validity. Therefore, it is concluded here that; export has a positive effect on economic growth.

2.3.2 Supporters of the Growth Led Export Hypothesis

Other some researchers have come out with results about the export led growth hypothesis also, but their results with contradictory or opposite. This is the case with the reviewed studies in this section. Mishra (2011) analyzed the relationship between

export and economic growth in India over the period 1970 to 2009. The author provides evidence in his investigation that support existing a positive relationship from economic growth to export in India by using the granger causality test. According to this study, economic growth is necessary to provide favorable economic conditions that can permit export growth or facilitate export expansion. This means that when the economy is experiencing economic growth, there is more likely to be a positive impact on the level of exports. Similarly, Gokmenoglu *et al.* (2015) tested the export led growth hypothesis for the case of Costa-Rica for the time period 1980 to 2013. The overall long run results present evidence which demonstrates as well that economic growth is rather necessary for export growth. This result goes against the export led growth hypothesis but in favor of the growth led export hypothesis.

In the same vein, Cetintas and Barisik (2009) examined the relationship between export, import and economic growth in 13 emerging economies (Armenia, Hungary, Bulgaria, Belarus, Czech Republic, Kazakhstan, Estonia, Lithuania, Latvia, Slovak Republic, Russia, Poland and Slovenia) from 1995 to 2006. The findings of the study mentioned that, there is a long run relationship between export and economic growth. However, the causality relationship runs from economic growth to export. Taking one step further in the study, it is explained that the GDP growth which is the proxy for economic growth can be achieved by stimulating import. This means that, high volume of import will lead to economic growth and economic growth will later expand volume of export levels. This study also supports a unilateral causality that runs from economic growth to export, therefore validates the growth-export hypothesis. This means that in all the selected countries, firstly it is important to achieve economic growth so that it will help in the long run to support export expansion.

Shihab *et al.* (2014) checked the relationship between export and GDP (Gross Domestic Product), which is proxy of economic growth. This empirical study was carried out for the case of Jordan over the data period covering 2000-2012 years. He argues that economic growth can be used in the changes that can arise in export growth. This is because, economic growth is the basis for export growth. The situation in the results of the Jordan study also revealed that there is a positive relationship which goes from economic growth to export by validating the growth led export hypothesis in this country. In summary, in these studies it is revealed that there exists a long run

relationship between export and economic growth and the causality unilaterally runs from economic growth to export and therefore validating the growth led export hypothesis earlier explained in detailed in the theoretical literature. This theory is in contradiction with the export led growth theory.

2.3.3 Supporters of the Export-Economic Growth Bidirectional Nexus

In international trade literature, some scientists found a bidirectional relationship between export and economic growth. For instance, Elbeydi *et al.* (2010) carried out research on the causal nexus between export and economic growth in Libya using annual data for the period between 1980 - 2007. The result provides evidence of a long run bidirectional relationship between exports and economic growth in Libya. This means that over the sampled period in Libya, export is a contributory factor to economic growth. On the other hand, economic growth also helps to stimulate export of goods and services. Hussaini (2015) checked this nexus in India by using yearly data from 1980 to 2013. The result of this study is in the same line with the previous study. He mentioned in his study that export creates a favorable economic environment that contributes to economic growth. When there is economic growth in the country's economy, the policymakers can easily create a policy which is export oriented considered that the country is doing well as economically. This export-oriented policy will help to achieve greater economic growth in the long run. In addition, Hatemi (2002) in a similar study that he carried out in Japan, confirmed the bidirectional causality relationship between export, import and economic growth. The results were estimated using the FMOLS (fully modified ordinary least square) and DOLS (dynamic ordinary least square methods). This means that the expanding export leads to economic growth and vice versa. Similarly, import leads to economic growth and economic growth is a prior condition for an increase in import.

Mahadevan (2007), argues that export encourages division of labor and specialization which helps to expand economic growth and which economic growth further assists an increasing in exports. Tang & Ravin (2013) examined in their study the relationship between export and economic growth in Cambodia for the period time from 1972 to 2008 years. Also, it has been confirmed a bidirectional relationship for the case of Cambodia in this study. In the same vein, Dritsakis & Stamatiou (2014) carried out analysis about the relationship between export, foreign direct investment

and GDP for EU countries in the period between 1970 – 2011 years. The results have confirmed a causal bidirectional export-economic growth nexus. The main empirical estimation in the study was conducted using the ordinary least square method. These results can be used by decision makers of at issue country so as to plan and forecast the economy for today and future.

Yildiz (2020) also investigated the relationship between import, export and economic growth in BRICS (Brazil, Russia, India, China and South Africa) and Turkey countries using the panel data for the period between 1990 and 2018 years. The author in his study examined the regression estimates conducted for every single country in the panel so as to analyze the outcome of the study per country. It has been revealed in the study that, there exists a bidirectional connection among export, import and economic growth in Brazil. This simply means that Brazil validates the export led growth and the growth led export over the sampled period in the study. For the case of Russia, a unilateral relationship was found from export to economic growth therefore validating the export led growth hypothesis. The results obtained in the remaining countries failed to provide evidence in support of any causal relationship between export, import and economic growth between 1990 and 2018 years. The author made some recommendations based on the outcome of the empirical study.

Stamatiou and Dritsakis (2017) conducted a study on the impact of export and unemployment on economic growth in 13 countries that joined the European Union group lastly. The data set used in the study covered the period from 1995 to 2013 years and the method utilized was the Vector Error Correction Model (VECM) for regression analysis. The results suggested that, there is a bidirectional causality relationship between export and economic growth for the countries sampled and a unidirectional relationship between unemployment and economic growth. This study supports the research results previously discussed in this sub section. Thus, this provides enough and valid argument to justify the causality from export to economic growth and economic growth to export. So, we can say that; in the light of these studies, there is a bidirectional relationship between economic growth and export.

2.3.4 Studies with no Evidence on Export-Economic Growth Nexus

The investigations reviewed in this last part are those, that did not find any causal relationship between export and economic growth for different countries.

Bakari & Mabrouki (2016) examined the relationship between export, import and economic growth in Turkey for the time period 1960 to 2015. The study used the Vector Autoregression Correction technique and the Granger Causality to check the data collected. The study found no causal relationship between export, import and economic growth in Turkey over the sampled period. In the same way, Ahmed *et al.* (2000); Marwan *et al.* (2013) in their studies found no relationship between export growth and economic growth in Pakistan and Sudan respectively. Therefore, the study claims no Granger Causality amongst the series.

Öztürk and Altun (2013) also carried out an empirical study on the impact of export, health expenses and economic growth for selected European Union countries (Belgium, Spain, Italy, Denmark, Portugal, Greece, Luxembourg, Austria and France) over the period 1980-2009. The authors used the Johansen cointegration and causality tests to obtain the results of their work. The study failed to provide valid arguments on a causality and connection between export and economic growth in the aforementioned countries over the sampled period. In simple terms means that, no causality was found between export and economic growth in the selected EU countries for this research.

2.4 Assessment of Reviewed Studies

While reviewing previous studies, we observed that there is no common accord on the causal relationship between export and economic growth amongst economists. However, the majority of the studies validate the export led growth hypothesis meaning that export is an all-important factor for economic growth in many economies whether developing or developed economies. Though, other some scholars came out with different results in different countries that are against the export led growth theory. Additionally, the result found in Turkey on the validity of the export led growth hypothesis is still unclear due to mixed outcomes in various studies reviewed.

In the process of screening the extant literature, we have not come across a recent study that carried out investigation on the relationship between export, import and economic growth in Turkey and the selected five EU countries in a unique (or original) panel using the FMOLS regression model. Besides, an overall comparative analysis was not found in the descriptive statistics results of extant studies which are very important in order to picture out the summary statistics of the export, import and GDP level in each of the selected countries in the study. Thus, it shows the uniqueness of this study because it aims at filling this missing information in the extant literature and serves as guide for other scholars in the same discipline.

2.5 Summary of Selected Empirical Literature

Authors	Country	Period	Method	Variable	Findings
Dritsaki (2013)	Greece	1960 - 2011	Granger causality	Export and GDP	Positive relationship from export to economic growth
Szkorupová (2014)	Slovakia	2001 - 2010	DOLS (Dynamic ordinary least square)	Export, GDP and foreign direct investment	Positive effect of export and foreign direct investment on GDP
Ugochukwu, U. S., and Chinyere (2013)	Nigeria	1986 - 2011	OLS (Ordinary least square) and the Granger causality	Oil export and GDP	Positive relationship from export to economic growth
Ali and Dalmar (2018)	Somalia		Johansen cointegration test and the Granger causality test	Import, export and GDP	Positive influence of export and import on economic growth
Gökmen and Temiz (2010)	Turkey	1950 - 2006	Johansen Cointegration test, Vector Error Correction Model (VECM) and	Export and GDP	Positive correlation is confirmed both as a short run

			the Granger causality		and long run
Santos *et al.* (2013)	European Union (EU)	1995 - 2010	DOLS (Dynamic ordinary least square)	Export led growth hypothesis	Validity confirmed
Mishra (2011)	India	1970 - 2009	Granger causality technique	Export and GDP	Positive relationship from economic growth to export
Gokmenoglu *et al.* (2015)	Costa-Rica	1980 - 2013	Granger causality technique	Export led growth hypothesis	Invalidate the hypothesis and support the growth led export hypothesis
Cetintas and Barisik (2009)	13 emerging economies (Armenia, Hungary, Bulgaria, Belarus, Czech Republic, Kazakhstan, Estonia, Lithuania, Latvia, Slovak Republic, Russia, Poland and Slovenia)	1995 - 2006		Export, Import and GDP	Positive relationship from economic growth to export. Also interestingly, there is a positive relationship from import to economic growth
Shihab *et al.* (2014)	Jordan	2000 - 2012		Export and GDP	Positive relationship from economic growth to export
Elbeydi *et al.* (2010)	Libya	1980 - 2007		Export and GDP	Bidirectional nexus
Hussaini (2015)	India	1980 - 2013		Export and GDP	Bidirectional nexus

Tang & Ravin (2013)	Cambodia	1972 - 2008		Export and GDP	Bidirectional relationship
Dritsakis & Stamatiou (2014)	EU countries	1970 - 2011		Export, foreign direct investment and GDP	Bidirectional export-economic growth nexus
Yildiz (2020)	BRICS (Brazil, Russia, India, China and South Africa) and Turkey	1990 - 2018		Export, import and GDP	Brazil validates the export led growth and the growth led export. For Russia, a unilateral relationship was found from export to economic growth. Remaining countries failed to provide evidence in support of any causal relationship between export, import and economic growth
Stamatiou and Dritsakis (2017)	13 EU countries (The joined into the group lastly)	1995 - 2013	Vector Error Correction Model (VECM)	Export, unemployment and GDP	Bidirectional relationship between economic growth and export.
Bakari & Mabrouki (2016)	Turkey	1960 - 2015	Vector Autoregression Correction technique and	Export, import and GDP	No causal relationship between export,

			the Granger causality		import and economic growth
Öztürk and Altun (2013)	Selected European Union countries (Belgium, Spain, Italy, Denmark, Portugal, Greece, Luxembourg, Austria and France)	1980 - 2009	Johansen cointegration and causality tests	Export, health expenses and GDP	No causality was found between export and economic growth

2.6 Conclusion of Chapter

This chapter talked about the theoretical literature used in the study, which is the export led growth (ELG). It is the most widely used theory in the existing literature to explain the causal relationship between export and economic growth. It suggests that export expansion is a crucial macroeconomic factor that contributes to the level of economic growth. Later on, we examined the existing literature about our study which was organized in sub groups. In the light of the empirical literature, we examined the studies in support of the export led growth hypothesis. In here, previous studies have demonstrated a direct relationship between export and economic growth. The empirical literature was followed by studies that provided evidence in support of the growth led export hypothesis. Studies in here argued that economic growth is a condition for a country to encourage its export. Therefore, the relationship between the aforementioned variables runs from economic growth to export. In the same vein, we also examined the studies in support of the export led growth bidirectional nexus. These are studies that argued that the relationship between export and economic growth is not unilateral. This is because economic growth causes a change in export and export also causes a change in gross domestic product (economic growth) which gives a bidirectional relationship. Finally, we discussed the studies which could not find empirical evidence between export and economic growth. This means that, according to the findings of these aforementioned researchers who founded no causal relationship between export and economic growth, the export changes did not affect the level of economic growth in the countries analyzed during the sampled period in

any way. Also vice versa confirmed too. Thereafter, we created a section for the assessment of the reviewed studies. The goal was to evaluate the existing empirical literature of this research and determine the unexplored area in the extant literature in order to fill in the deficiency in the current literature. A tabular summary of the reviewed literature was presented so as to facilitate the understanding and easily guide the readers in identifying or comprehension the reviewed studies, countries, sample year, used variables and the outcomes of the studies.

CHAPTER THREE

DATA AND METHODOLOGY

3.1 Introduction

The objective of this chapter is to present and compare the data and methodology used in analyzing the causal relationship between export and economic growth in terms of GDP in Turkey and the 5 largest European Union countries (France, Germany, Italy, Netherlands and Spain). It is also to enrich the study by means of making comparative comments. These five selected EU countries are based on the largest GDP size in the EU zone. The comparative comments are based on the output produced in the descriptive statistics table. Therefore, we organized the study into data section and methodology section, as described below.

3.2 Data

The data are simply raw information collected on research platforms using the series or selected variables for the research study that is used to explain our problem statement. We are going to describe in this section the dependent and explanatory variables of the study and give their sources and finally present the descriptive statistics of our series to have preliminary results of the study. In the table below, you can find the summary information about the variables employed in the study.

Table 1: Variable and Summary

Acronym of Variables	**Meaning**	**Unit of Measurement**	**Data Source**
EXP	Export	USD (United States Dollar)	World Bank Database
IMP	Import	USD (United States Dollar)	World Bank Database
GDP	Gross Domestic Product	USD (United States Dollar)	World Bank Database

3.2.1 Data Description and Sources

The objective of this thesis is to examine the causal relationship between export, import and economic growth in Turkey and the five largest European Union countries in terms of GDP for the period from 2010 to 2020 using panel data. Our data consists a balanced panel of 66 observations. Our case study has been prepared based on Turkey and European Union countries. It is important to note that in this study, we are dealing with the five (5) largest European Union countries in terms of GDP for the years covering our sampled period. These five European Union countries are France, Germany, Italy, Netherlands and Spain. In this study, we are dealing exclusively with secondary data sources.

To carry out our investigation, we use export (EXP) and import (IMP) as explanatory variables and Gross Domestic Product (GDP) as the dependent variable which is a proxy of economic growth. Export in here represents the annual total export of goods and services expressed in American Dollars (USD). Import as well is the annual total import of goods and services expressed in American Dollars. All our data were converted to natural logarithm using EVIEWS software, to ease the interpretation of the outcome of the study. The Gross Domestic Product is the annual GDP expressed in current USD, which we used as a proxy for economic growth in this study. All three data used in this study were retrieved from the World Development Indicators of the World Bank Group Dataset.

3.2.2 Descriptive Statistics

Descriptive statistics enable us to have a picture of; the total volume of export of goods and services, the total volume of import of goods and services and the size of the Gross Domestic Product (GDP) in each country in the sample. You can find the descriptive statistics of the five (5) largest economies in the EU and Turkey with panel data covering the period from 2010 to 2020 (the last 11 years) in the table below.

Table 2: Descriptive Statistics of the panel data with 66 observations

C	Var.	Mean	S. D.	Skewness	Kurtosis
France	GDP	2.680	1.44	-0.363890	1.993285
	EXP	29.67384	1.552157	-0.375186	2.210983
	IMP	30.85014	1.303783	-0.439996	3.136478
Germany	GDP	3.680	2.15	-0.256366	1.671324
	EXP	45.67881	1.519473	-0.938708	2.794451
	IMP	39.47423	1.230260	-0.428351	2.209511
Italy	GDP	2.040	1.42	0.046686	2.018161
	EXP	29.12558	1.922381	-0.680066	2.984659
	IMP	27.15713	1.075269	0.336897	1.711497
Netherlands	GDP	8.61	5.26	-0.642965	2.124290
	EXP	79.63019	4.183740	-1.130351	3.817467
	IMP	69.91229	3.784945	-0.635177	3.116579
Spain	GDP	1.340	8.56	-0.239750	2.190966
	EXP	32.43466	2.841387	-1.103859	3.386309
	IMP	30.06195	1.569846	-0.203860	2.627679
Turkey	GDP	8.41	7.45	-0.016753	2.028955
	EXP	25.79245	3.600719	0.816334	2.509229
	IMP	28.79178	2.281554	-0.220355	2.056676

Note: C, Var. and S.D indicate respectively; countries, variables and standard deviation. GDP, EXP, IMP are measured in USD. The values of the mean GDP are in billions USD.

Source: Author's Calculation.

3.3 Methodology

The main estimation technique used in this study is the fully modified ordinary least square (FMOLS). This technique is used to analyze the nexus between export, import and economic growth in Turkey and the selected five EU (European Union) countries for the period from 2010 to 2020. We start in this section by establishing the regression equation in our model. We proceed with panel unit root test and cointegration analysis. When the cointegration is established between the variables, we run the FMOLS estimation which is the main method used in this study. We close this section with the analysis of the causality of the variables. All these empirical

estimates are the procedures necessary to bring out the main results of the study, which will be analyzed and interpreted. At the same time, these procedures exist to respond to our research objectives at the outset of the study.

3.3.1 Model Specification

In exploring the nexus between export, import and economic growth in Turkey and the 5 European Union countries using the fully modified ordinary least square (FMOLS) method over the sampled period. Besides, in regression analysis it is necessary to establish an econometric model which will guide the study and the running of empirical estimations and to facilitate the understanding of the research. FMOLS estimation technique is a reliable technique for dynamic panel data and also it has the advantage of controlling endogeneity issue and auto correlation issue. The main estimation in the study is based on the below equation which is logarithm of the variables.

$$\mathbf{lgdp}_{i,t} = f\,(\mathbf{exp}_{i,t},\ \mathbf{imp}_{i,t},\ e_{i,t}) \quad \mathbf{(1)}$$

Where *i is* the cross section in the panel which in this case is 6 countries and *t* is the time period of the sample.

3.3.2 Initial Empirical Tests

It is important to verify the stationarity of our variables because other analytical researches and decisions are based on this test. After this is done, we will verify the cointegration between the variables in the next section. These initial estimations like unit root test and cointegration test are very important tests required to know the nature of the series we are dealing; whether they contain unit root issue or not and whether there is cointegration between the variables or not. The following sub sections provide detailed information about these two tests.

3.3.2.1 Panel Unit Root Tests

The data used in the study needs to be stationary. This is a rule in regression analysis. Stationarity simply means that the mean and variance of variables do not vary

over time. The condition for progressing with other initial tests and main tests is that the series used in the study do not have unit root issues. Two panel unit root tests were employed in this study which are; Levin-Lin Chu (2002, LLC) and the Fisher ADF (Augmented Dickey Fuller by Maddala and Wu, 1999). LLC and Fisher ADF are the two most reliable and most widely applied methods used by current researchers in the similar area. This is because of their robustness in providing unbiased results. These are first generation panel unit root techniques suitable for small panel sample. The interpretation of the results is based on two assumptions: The null hypothesis (H_o) says that there is the presence of unit root in the series while the alternative hypothesis (H_1) says that the variables are stationary.

Table 3: LLC and Fisher ADF Panel unit root test

Variable	**LLC**		**Fisher ADF**	
	Constant	Trend	Constant	Trend
LGDP	-2.67628	-3.72480	14.1968	9.91013 (0.6238)
	(0.0037)*	(0.0001) *	(0.2883)	
LEXP	-5.62932	-0.99974	30.6052	7.61733 (0.8143)
	(0.0000)*	(0.1587)	(0.0023) *	
LIMP	-3.89256	0.55268	28.4104	10.0631 (0.6104)
	(0.0000)*	(0.7098)	(0.0048) *	
ΔLGDP	-6.91325	-6.82015	34.2118	22.2517 (0.0348)
	(0.0000)*	(0.0000) *	(0.0006) *	**
ΔLEXP	-0.60859	0.31617	12.0038	10.3893 (0.5818)
	(0.2714)	(0.6241)	(0.4454)	
ΔLIMP	-2.34498	-2.32689	22.4128	13.7637 (0.3160)
	(0.0095)*	(0.0100) *	(0.0331) **	

Note: Δ indicates first difference
Values in brackets represent probability values. The lag selection is the Akaike Information Criterion AIC
LLC and Fisher-ADF by Maddala and Wu (1999) are the panel unit root tests.
***** Represent the level of significance at 1%
****** represent the level of significance at 5%

3.3.2.2 Cointegration Techniques

This test is conducted to check the cointegration between GDP, export and import, which is part of the initial tests required before conducting the main FMOLS (fully modified ordinary least square) method. Pedroni and Kao (1999), were utilized for this purpose in this study. In simple terms, cointegration is a test conducted to know whether there is a long run relationship between the variables used in the study. These results of the test are presented on the table below.

Table 4: Pedroni and Kao Cointegration test

Pedroni residual panel cointegration				
Alternative hypothesis: common AR coefs. (Within-dimension)				
	Statistic	Prob.	W. Statistic	Prob.
Panel v-Statistic	-1.844110	0.9674	-1.851666	0.9680
Panel rho-Statistic	-0.671676	0.2509	-0.627501	0.2652
Panel PP-Statistic	-1.926279	0.0270**	-1.961876	0.0249**
Panel ADF-Statistic	-4.551131	0.0000*	-5.038373	0.0000*
Alternative hypothesis: individual AR coefs. (Between-dimension)				
	Statistic	Prob.		
Group rho-Statistic	0.512702	0.6959		
Group PP-Statistic	-2.898707	0.0019*		
Group ADF-Statistic	-6.813353	0.0000*		

Kao residual panel cointegration		
	t-Statistic	Prob.
ADF	-1.864258	0.0311**

Residual variance	0.004539
HAC variance	0.002584

Note: * and ** significance level at 1% and 5% respectively

3.3.3 Main Empirical Method

3.3.3.1 Fully Modified Ordinary Least Square (FMOLS)

In regression analysis, the prerequisite for using FMOLS method is that there exists cointegration relationship among the variables. Therefore, in the previous stage, Pedroni and Kao cointegration test was performed for this purpose and it was observed that there was cointegration among the variables. Now we can continue to check for the long run relationship using the FMOLS technique. The FMOLS (fully modified ordinary least square) of Phillips and Hansen (1990) is the main technique we applied in this study to check the long run relationship that exists between GDP, export and import in Turkey and five European Union countries (France, Germany, Italy, Netherlands and Spain). The justifications for using this method in the study are mentioned in the following few points. Firstly, this method is suitable for small panel data. Secondly it has the advantage of solving any auto correlation that exists in the model and also accounts for endogeneity issue. It also controls for the issue of heteroscedasticity which is a common issue in panel data models. FMOLS is the main technique used in the study to provide an answer to the problem statement and give clear and valid responses to the research questions drawn in the study.

The regression model is based on the following econometric equation;

$$\mathbf{GDP}_{i,t} = \boldsymbol{\beta}_1 + \boldsymbol{\beta}_2 \mathbf{Q}_{i,t} + \boldsymbol{u}_{i,t} \quad \mathbf{(2)}$$

GDP is the dependent variable, $\boldsymbol{\beta}_1$ is the constant term, Q symbolizes our explanatory variables which are export and import and $\boldsymbol{u}$ is the error term. The table below presents the results of the estimation;

Table 5: FMOLS long run relationship between GDP, export and import

FMOLS Estimation			
Explanatory Variables	P	P-W	G
LEXP	11.67629**	10.29568*	-1.472251
	(0.0351)	(0.000)	(0.2860)
LIMP	19.63555*	18.39871*	9.324479*
	(0.007)	(0.000)	(0.000)

Notes: Values in the brackets are the probability values. FMOLS is the fully modified ordinary least square. P, P-W and G are the Pooled, Pooled-Weighted and Grouped estimates respectively. It is conducted using Bartlett Kernel method.
*** and **** symbolize p-value level of significance at 1% and 5% respectively.
Source: Author's Calculation.

3.3.4 Granger Causality Test

Checking the causality is very important in a study, especially when we are trying to establish the interconnection that can exist between a given set and groups of variables. The granger causality enables us to know which of the variable causes a change on the other variable or variables. Given that it was established that a long run cointegration relationship among the variables, we need to verify the direction of this causality at this stage. The vector auto regression (VAR) granger causality is the method used in this study for this purpose. Since this technique gave to researchers quite reliable results, it has been seen as the most appropriate technique to be employed in the study. It has been the most widely used technique for similar studies in the extant literature. All of these show us that technique is the best technique to use in this field, at least for the moment this is the case.

VAR causality is based on the assumption that, there is no causal effect between two variables for the null hypothesis. The lag 5 which is used in Table 7 for the VAR granger causality is based on the results of the lag selection criterion in Table 6 below. This information is of utmost importance in choosing the optimal lag selection when running the VAR causality test.

Table 6: VAR Lag Order Selection Criterion

Lag	LogL	LR	FPE	AIC	SC	HQ
0	2.461064	NA	0.000207	0.029941	0.161901	0.075998
1	158.8734	278.0664	5.76e-08	-8.159635	-7.631795	-7.975405
2	168.6290	15.71734	5.59e-08	-8.201612	-7.277893	-7.879209
3	204.6702	52.05955	1.28e-08	-9.703902	-8.384303	-9.243327
4	223.9631	24.65195	7.66e-09	-10.27573	-8.560247	-9.676978
5	248.6309	27.40868*	3.54e-09*	-11.14616*	-9.034802*	-10.40924*

* Indicates lag order selected by the criterion
LR: Sequential modified LR test statistic (each test at 5% level)
FPE : Final prediction error
AIC : Akaike information criterion
SC : Schwarz information criterion
HQ : Hannan-Quinn information criterion

Given that we have determined the optimal lag selection, we can now estimate the VAR causality test. The results were reported in Table 7 below.

Table 7: VAR (Vector Auto Regression) Causality Test

Null hypothesis	Chi. sq	lag	P.Value	Causality	Conclusion
EXP — GDP	10.90849	5	0.0532**	YES	Bi-directional
GDP — EXP	34.51610	5	0.0000*	YES	
IMP — GDP	1.818243	5	0.8737	NO	Uni-directional
GDP — IMP	48.48214	5	0.0000*	YES	

Notes: P-value is the probability value **Source:** Author's Elaboration
*** and **** symbolize p-value significance level at 1% and 5%.

3.4 Conclusion of Chapter

In this chapter, the data and methodology are mentioned. Within the scope of the data section, we highlighted the data description and sources. Three variables were used to carry out this investigation. Two of them are export and import as independent

(explanatory) variables and the one is GDP (proxy for economic growth) as dependent variable. Those data used in this study were collected through secondary sources (mainly from the World Bank database). We conducted in the next sub section, a descriptive statistic of the study. The descriptive statistics provide the numerical information for the individual countries that constitute the panel of this study. Based on the results of the descriptive state results of the descriptive statistics, we had information on the average export, import and GDP for each country and this permitted us to make comparison based on the disparity in the obtained results. Also, the results of the kurtosis and skewness provide evidence on the normality distribution of the data set used in the study. Secondary data source was used in gathering the raw data set used in the study. Within the scope of the methodology section, we conducted some initial tests such as panel unit root test to check for stationarity of the variables. This test is a precondition test in every empirical scientific research because of all the useful decisions which taken are based on the results of this test. In addition, further estimations can be made only if the series used in the study do not have a unit root problem. Otherwise, research cannot proceed. Then, panel cointegration test was carried out in order to verify the cointegration between export, import and economic growth in Turkey, France, Germany, Italy, Netherlands and Spain. This test is necessary because we need to check whether the variables are cointegrated or not so as to proceed with the main empirical estimation technique. Subsequently we analyzed the main empirical method, which is the FMOLS (fully modified ordinary least square). Given that cointegration between export, import and GDP was established in the previous sub section, the FMOLS was then conducted to find out whether there exists a positive or negative cointegration between the aforementioned variables. Next, we analyzed in this chapter the VAR (Vector Auto Regression) granger causality test to check for causality that exists between export, import and economic growth. Because it has vital importance to provide results that can be used to answer the research questions highlighted at the onset of this study. With this test, we concluded this chapter and moved on to the analysis and discussion of results.

CHAPTER FOUR

ANALYSIS AND DISCUSSION OF RESULTS

4.1 Introduction

This chapter presents the analysis and discussion of results on the nexus between export, import and economic growth in Turkey and in the selected five EU countries for 2010 to 2020. Next step after making different estimations in the study is interpreting the figures obtained from the regression model which can understand easily and logically by other researchers and policy makers. This chapter deals with the discussion of these results. We divide this chapter into four sections. The first section discusses the results of the descriptive statistic table. Next, we give place to the discussion about initial tests such as panel unit root test and panel cointegration test. Subsequently, we analyze the results of the main estimation technique used in the study; which is the FMOLS technique. Finally, we provide an explanation on the results of the VAR granger causality test.

4.2 Analysis of Descriptive Statistics Results

We analyze the results of the descriptive statistics reported in Table 2 above. Descriptive statistics have vital importance because of they help us to analyze the normality distribution of the variables and checking if there is any error or biased datasets or not in the panel. Above all, they provide some information that can help us to better apprehend the variables used in the study.

Germany has the highest GDP average (3.680 billion USD) in EU. Also, Germany is one of the best countries in EU in terms of their general economic performance, even at the top. That means, is not valid only for GDP average, but also for export and import performances. Therefore, it is not unexpected situation that it has the largest GDP according to the results.

About France, it has the second-best export performance as average (2.680 billion USD) after Germany. However, its import average is more than its export average. Still for France it is tolerable table.

In case of Italy, this country is in a balanced economic picture. Its export is slightly better from its import. Thus, its terms of trade are positive. It should try to keep its economic performance like this shape.

Netherlands has a high export average but in return it has also a high import average relatively to other countries in the panel (respectively 79.63019 USD and 69.91229 USD). As we can see Netherlands has a good economic performance. As an average its GDP is 2.040 billion USD. A situation that is desired to be sustainable for a country with a small population (approximately 17.44 million population according to World Bank Database) like the Netherlands.

In the same vein, Spain is in a good economic path like Netherlands and Italy. It seems especially these two countries according to its export and import values and also its GDP average.

On the other hand, Turkey has the lowest GDP average (8.41 billion USD) in the panel that consists our cross sections. In addition, Turkey is currently not a member country of the EU but it is a candidate for the union since 1999. It is important to make the comparison between Turkey and the five selected EU countries so as to know the economic situation in Turkey with regard to those European Union countries. It is notice as well on descriptive statistics reported in Table 2 that; Turkey is the only country whose import exceeds export in the panel with the exception of France, which does not have a considerable disparity between its level of export and import (respectively 29.67384 USD and 30.85014 USD). During the sample period, the value of Turkey's export is 25.79245 USD against 28.79178 USD for import. This means that Turkey has negative terms of trade. Germany, Italy, Netherland and Spain export more than their import. Turkey should also increase its export above its import as soon as possible like the aforementioned countries. Otherwise, the already existing current account deficit will continue to progress rapidly and this situation will also deteriorate the balance of payments over time.

The standard deviation helps us to apprehend the degree of error that might be in our data set. To provide evidence of robust and reliable data sets, the disparity between the mean value and the standard deviation value should not be too high also the standard deviation value should be small. The value of GDP in all our cross sections does not deviate too much from the mean while there is a disparity between

the values of export and import. The skewness and the kurtosis are the two measures of the normality of distribution of the variables. A normal skewness has the value of 0 and the skewness can either be positive or negative. It has been observed that all values in our data set, has skewness which is close to zero for all the variables and countries which means that there is normal distribution in our data set. This result is confirmed by kurtosis because we have the platy kurtosis which presents that the coefficient of kurtosis is less than 3.

4.3 Initial Results and Discussions

We present discussions of the two initial tests each one conducted for a specific purpose which will permit to make further estimations in the study. Firstly, discussion of the panel unit root results is dwelled on. Secondly, discussion of the Pedroni and Kao panel cointegration techniques is presented.

4.3.1 Panel Unit Root Results

It is a mandatory test which has to make before making further estimations in every scientific study so as to determine whether the variables are affected negatively by unit root problem or the variables are stationary. It is important for the mean and variance of the variables to be constant (stationary) in over time. The panel unit root used in this thesis are the Levin-Lin Chu (2002, LLC) and the Fisher ADF (Augmented Dickey - Fuller by Maddala and Wu, 1999). The lag is based on the Akaike Information Criterion (AIC). We generally interpret the results of unit root based on two assumptions. Firstly, there is a unit root problem in the variables; which is the null hypothesis (H_0). The alternative hypothesis (H_1) suggests that there is no unit root problem in the variables. The decision is made according to the level of significance of the variables, which are then compared with the following probability values; 1%, 5% or 10% (They are the standard probability values used as guide in empirical studies to determine the level of significance of any coefficient value.)

According to the results of unit root reported in Table 3 using the LLC technique, all the variables are stationary at level and constant and the level of significance is 1%. However according to the Fisher ADF technique, the variables are at level and constant both import and export are stationary at 1% level of significance while the coefficient of GDP is not significant. Still at level, if we check for the

significance at constant and trend, most variables are significant. The similar scenario happens at 1st difference where not all the variables are significant. In considering in terms of conflicting results of LLC and Fisher ADF, the decision is based on the LLC because of is the most reliable and widely used method in economic studies and also it is enough to verify one time of one of both. Therefore, the decision in this study will be in this direction. In summary, we therefore mention that all our variables used in this study are stationary at level.

4.3.2 Panel Cointegration Results

The panel cointegration is essential because it helps to explore if there is a cointegration between the variables or not. There are various methods in regression analysis that are frequently used for this purpose. Two methods are used for this study which are; Pedroni and Kao (1999) panel cointegration techniques. These are two reliable techniques that are widely used in the international trade and finance literature. The null hypothesis (H_o) suggests the non-existence of cointegration between the variables while the alternative hypothesis (H_1) suggests the presence of cointegration between the variables. Table 4 shows the results of the Pedroni and Kao cointegration tests. According to the results of Pedroni test, 6 out of 11 statistics provide evidence for cointegration among the variables. This is because the 6 statistics represent the majority and the decision is based on the majority statistics in the panel. It is observed that the panel PP statistics are significant at 5% level and the panel ADF statistics are significant at 1% level. Additionally, group PP and group ADF are both significant at 1% level. Therefore, we can reject the null hypothesis and accept the alternative hypothesis which says that there is cointegration between export, import and economic growth during the sample period in the study. Kao also confirms these results with ADF statistics at 5% which says that there is cointegration. In summary, we can say that there exists a long run relationship between export, import and economic growth in France, Germany, Italy, Netherlands, Spain (the selected five EU countries) and Turkey between 2010 and 2020. Therefore, we can make long run estimations between the aforementioned variables using the FMOLS method and also the results of the analysis are explained in the next sub section.

4.4 Main Empirical Discussion of Results

In this sub-section, an empirical discussion of the results of the FMOLS method is given.

4.4.1 FMOLS (Fully Modified Ordinary Least Square) Estimation Results

The FMOLS technique of Phillips and Hansen (1990) was used in this study for the main analysis of the nexus between export, import and economic growth in Turkey and the selected five EU countries for the period covering 2010 to 2020. The results of this technique were reported in Table 5 above with three different estimators; pooled estimator (P), pooled weighted estimator (P-W) and the grouped estimator (G). Only the coefficient of import is significant as completely. The interpretation of the results in Table 5 will be based on the results of pooled weighted output.

It is important to recall here that there exists a cointegration among export, import and economic growth in Turkey and the selected five EU countries. After this cointegration established, we can check for the long run relationship that exists between the variables mentioned earlier, which is the objective of this section. Looking at the results of pooled weighted output, we notice that a unit change in the amount of export in Turkey and the five EU countries, will provide to a 10.30% rise in the GDP value and the level of significance is 1%. This suggests that, there is a direct relationship between export of goods and services and economic growth in the selected countries in the panel during the sampled period. This result provides evidence in support of hypothesis $H_{1,}$ which states that the export led growth hypothesis is valid in this study. The causality of this result will be established in the next sub section. Furthermore, one percentage increase in import provides to 18.40% increase in economic growth via GDP growth. This result is highly statistically significant at the 1% level. The direction of the causality between import and GDP will also be analyzed in the subsequent section. This means of the results that; there is a positive long run relationship between export, import and economic growth in Turkey and the selected five countries in European Union between 2010 and 2020.

To summarize the main outcome of this section, it was found that the export led growth hypothesis is valid in this study and therefore the hypothesis one (H_1) is confirmed. This means that export of goods and services has a positive influence on

the economic growth in the long run. This result is in same line with the results presented by researchers who carried out investigations earlier in the same area. One of the main points of the study is that, based on the FMOLS (fully modified ordinary least square) result, export is more likely to have a positive impact on economic growth or GDP growth in the long run. This is the main result in the analysis of the relationship between export, import and economic growth in Turkey and the five selected countries in EU. Besides the subsequent step is to check the causality between variables using the VAR causality test.

4.5 VAR Causality Outcome and Interpretation

Before going further in the analysis, it is important to recall that checking the causality is vital especially when we are trying to establish the interconnection that can exist between a given set and groups of variables in a study. It enables us to know which of the variables causes a change in respect to other a given variable or variables. Given that it has been found that there is a long run cointegration among the variables, we need to verify the direction of this causality at this stage. The Vector Auto Regression (VAR) granger causality is the method used for this purpose in this study. This technique was employed for the study because it is considered the best technique for the panel data set, as it is dynamic and more recent technique that provides reliable results. At the same time the panel VAR granger causality is one of the most common techniques used by earlier researchers.

Given that we have already established long run estimates in the study, it is crucial to check for causality to give more meaning to the findings. Before running the VAR causality test, it is necessary to make of the lag criterion selection in order to determine the optimal lag to use in the VAR causality regression test. This result is reported in Table 6 and it shows that the optimal lag to use is 5, which is indicated by all the five different lag selection methods (LR, FPE, AIC, SC and HQ). In light of these information, we can go further in analyzing the results in Table 7 above. It is important to note that, causality analysis assumes that; there is no causality between two variables under null hypothesis. This means that a change in one variable does not impact on the other variable. If we are dealing for instance with two variables; let's assume they are X and Y variables. The null hypothesis of the panel VAR granger

causality says that X does not cause a change in Y and in the same way vice versa. With this information, we can proceed to interpret the results of the causality test reported in Table 7 above. In addition, the coefficient of the variables should be less than 5% level of significance to provide evidence of causality.

Based on the information reported in Table 7 above using the panel VAR (Vector Auto Regression) causality method, it can be concluded that there is a bidirectional relationship between export and economic growth since the probability coefficient of both variables is below 5%. That is the threshold for decision making. This means that the effect can come either through export or GDP. Therefore, export can create a change in economic growth as well as economic growth could be used to further support export expansion. On the other hand, the causal long run relationship that exists between import and economic growth or GDP is unidirectional when is going from GDP to import. That means import does not influence so much on GDP. This is one of the conclusions we have reached.

4.6 Conclusion of Chapter

This chapter has analyzed exclusively all the results reported in the previous chapter. We started the chapter with the empirical analysis of the descriptive statistics results of the countries used in this study (Turkey, France, Germany, Italy, Netherlands and Spain). One of the findings here is that Germany had the highest average GDP, while Turkey had the lowest average GDP during the sampled period in this study. Subsequently, we discussed the results of the unit root test. The techniques used in the study were the Levin-Lin Chu (LLC) and the Fisher ADF (Augmented Dickey Fuller), which confirmed that there were no unit root problems in the series. In the next sub section, the cointegration between the variables was checked using the Pedroni and Kao cointegration techniques. Since this cointegration has been established we proceeded to the discussion of the main empirical results. An empirical discussion of the main results was carried out with FMOLS (fully modified ordinary least square) of Phillips and Hansen. It provided us to understand the implication of the figures reported on each table mentioned in the chapter three. The next empirical discussion was about the results of the VAR (Vector Auto Regression) granger causality test. This test established the causality relationship between export and GDP (a proxy for economic growth) and import and GDP. It was concluded here that; a changing like

an increase or decrease in export causes a change in GDP and also a changing such as an increase or decrease in GDP causes a change in export. Thus, it has been confirmed that there is a bidirectional relationship between export and economic growth in the countries comprising this panel. In addition, the causality link between import and economic growth was also checked. It has been determined that any changing in import does not cause a change in GDP. However, a changing in GDP causes a change in import which confirms a unilateral relationship between both variables. At the same time, the existing unilateral relationship which is at issue runs from GDP to import.

CHAPTER FIVE

CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

Chapter five is the last chapter of the thesis and it's segmented into different sub sections. This chapter summarizes the main points discussed in each chapter and then it presents to researchers a general conclusion of the study for further studies, also it includes some recommendations for policy makers and scientists.

5.2 Summary of the Thesis

In the first chapter of the thesis, carried out a general introduction of the topic and an overview of trade and export in Turkey and EU. The aim of this to present a brief historical development of the topic. Then we formulated the problem statement, research questions and research objectives. Subsequently, we introduced the relevance of the study, the methodology of the study, the hypothesis, scope and delimitation of the study and closed the chapter with the organization of the remaining parts of the thesis.

In the next chapter talked about the theoretical literature used in the study, which is the export led growth theory. We later on examined the existing literature on our study which was divided in sub sections. In the empirical literature, we examined studies that supported of the export led growth hypothesis, followed by studies that provided evidence in support of the growth led export hypothesis. In the same vein, we examined studies that support of the export led growth bidirectional relationship and finally the studies which found no evidence the relationship between export and economic growth. We closed the chapter with the assessment of the reviewed studies and with the assessment of known and researched areas in the extant literature.

In the third chapter, the data and methodology part are mentioned. Under the data section, we highlighted the data description and sources and conducted a descriptive statistic of the study. A secondary data source was used to collect the raw data set used in the study. Within the methodology, we conducted firstly some initial tests like panel unit root test to check for stationarity of the variables. Later on, we carried out a panel cointegration test to verify the cointegration between export, import

and economic growth in Turkey, France, Germany, Italy, Netherlands and Spain. Afterward we analyzed the main empirical method which is the FMOLS (fully modified ordinary least square) and closed the chapter with the VAR granger causality test used to check the causality that exists between the variables.

In the fourth chapter, all the results reported in the previous section were specifically analyzed for every single country. Thus, it is enabled us to apprehend the meaning of the figures reported on each table mentioned in the third chapter. Here, we conclude the thesis by examining the fifth chapter, which is the last chapter. This chapter provides us a brief summary of the entire study and makes some recommendations based on the results.

5.3 General Conclusion

The main objective of the study is to analyze the nexus between export, import and economic growth in Turkey and the five selected European Union countries (France, Germany, Italy, Netherlands and Spain) using panel data for the period 2010 to 2020. On the other hand, the minor objective is to make a comparative analysis the relationship between the export, import and economic growth between Turkey and the five selected EU countries using the descriptive statistics results. We used the FMOLS (fully modified ordinary least square) technique for the main estimation in this study. According to the results obtained there is a positive long run relationship between export and economic growth in the aforementioned countries and a change as a percentage in export will conduce toward to 10.30% increase in GDP in Turkey economy and in the economies of the five selected countries of EU (France, Germany, Italy, Netherlands, and Spain). The VAR granger causality test confirmed that there is a bidirectional relationship between export and economic growth. On the other hand, although there is a long run relationship has been established between import and economic growth, the VAR granger causality provides evidence of the causality relationship which running from GDP to import, which means a one-way direction. In summary, this study confirmed the validity of the export led growth bidirectional relationship for the case of Turkey and the five selected countries of EU between 2010 and 2020 (last 11 years). Based on the findings, it is essential to make some recommendations that will guide to policy makers and other stakeholders in decision making process and will also serve as a reference to scientists for further studies.

5.4 Limitations of the Research

During the process of compiling this thesis study, some difficulties were encountered which are worth mentioning. Some of the difficulties I encountered during the research process of my thesis are given below.

- **Inadequate data**

  Some other useful variables could not be included in the study because there was not sufficient data for a longer period that could cover which was requested sampled period.

- **Time constraint**

  The available time allocated for this research thesis was rather short because of my own special conditions. Therefore, a more detailed investigation and analysis could not be carried out regarding some of the issues mentioned in the thesis.

5.5 Recommendations

This section is dedicated for the recommendations based on the conclusion of the thesis and these recommendations are both policy recommendations and recommendations for next studies in the similar area. Those are intended to guide to policy makers in the decision-making process and to guide for future researchers in areas that can be explored or revisited to add in the literature database.

- The study recommends the relevant researchers to consider a longer time period for future studies about the relationship between export, import and economic growth. This will provide more observation opportunities that might make it possible to make the estimations which are hard to do or impossible with short data set in our study. This could be a very useful recommendation for subsequent researchers.
- The study also recommends that to other academicians who will carry out similar studies; use different methods to see whether the results which they will reach at the end of the research overlap with the results obtained from this study, and also to be sure that the obtained results are correct.
- This research should encourage the other scholars to investigate other factors that cause an increase or a decrease in the level of export and import. The

aforementioned idea refers that to analyze the study from a more global perspective.

- At this point, we recommend to policy makers especially Turkish authorities to set up strategies that can help increase the volume of export and control the level of import so as to adjust the balance of payments deficit noticed in the descriptive statistics results. This is a useful recommendation for the Turkish economy if they take into account. If new trade strategies based on increasing export are developed, the performance of the Turkish economy will increase and this will bring along sustainable economic growth targets. Moreover, such an economic development will also encourage other EU countries to develop their trade with Turkey.
- Finally given that since the Helsinki Summit in the last month of 1999, Turkey is still a candidate for the European Union and it is wise to have a good economic performance to get the desired result; we recommend that the Turkish authorities develop plans and strategies to increase the level of economic growth. One of the ways to do this is to increase exports. Hereby, increasing exports will reduce the current account deficit and create a more balanced financial picture, which will contribute to economic growth.

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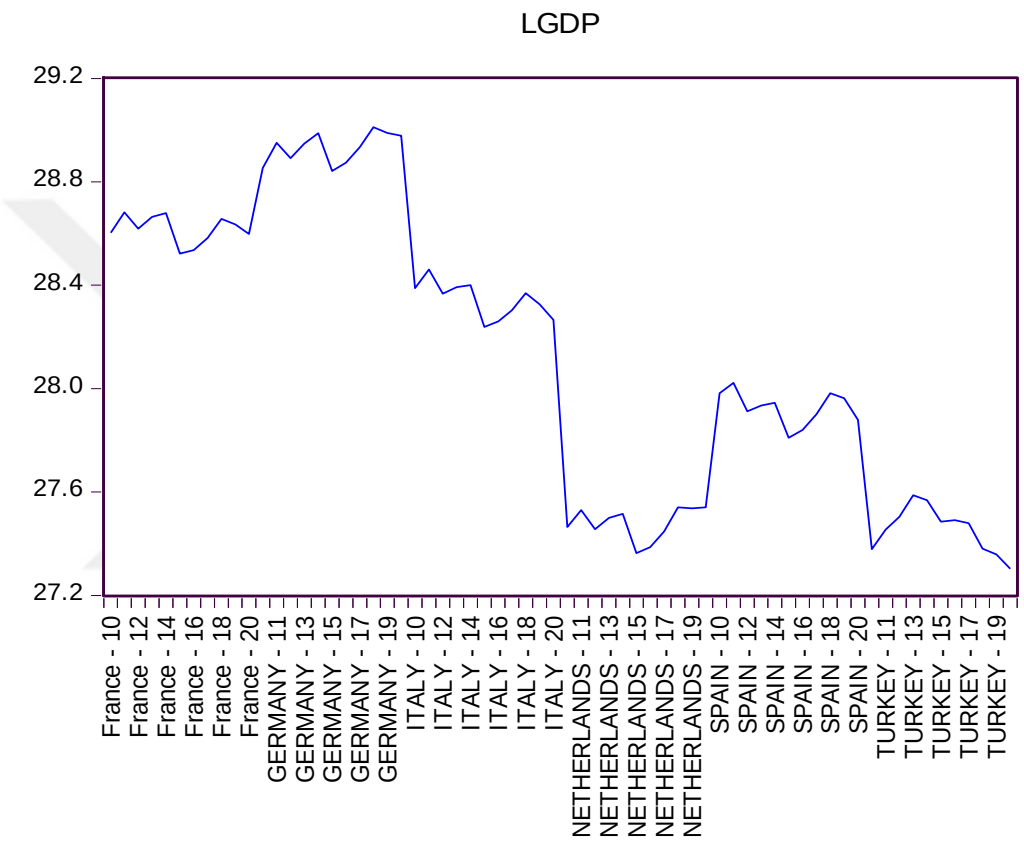
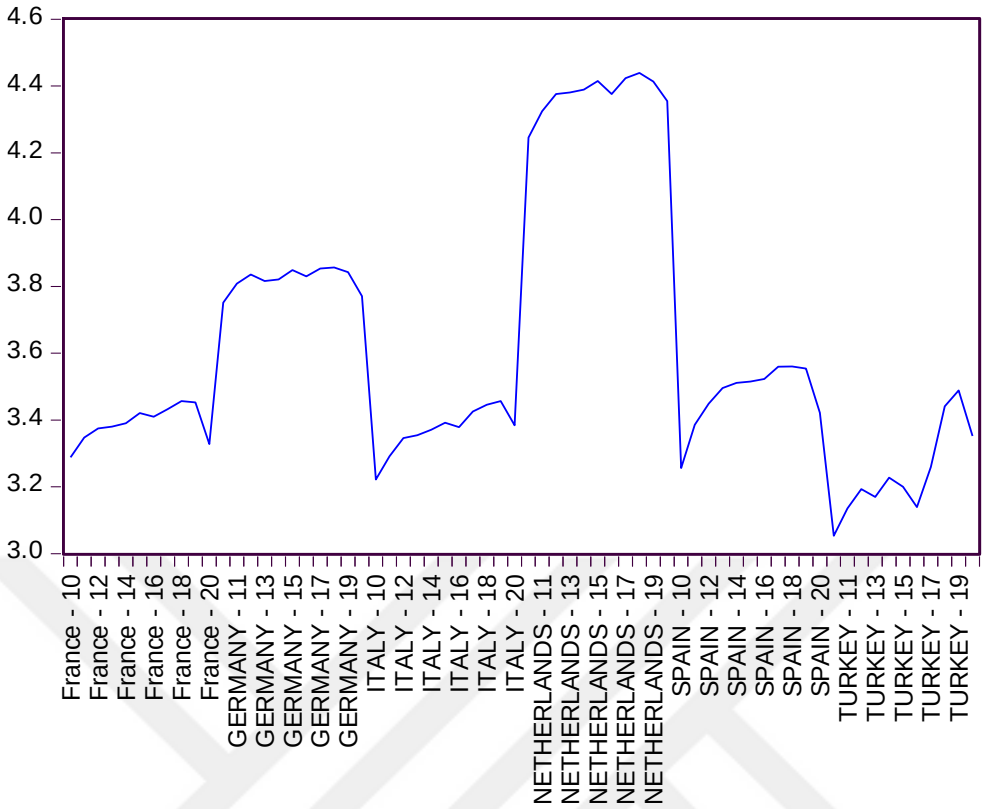
APPENDIXES

Figure 1: Representation of the log series using graphs between 2010 and 2020



LEXPORT



LIMPORT

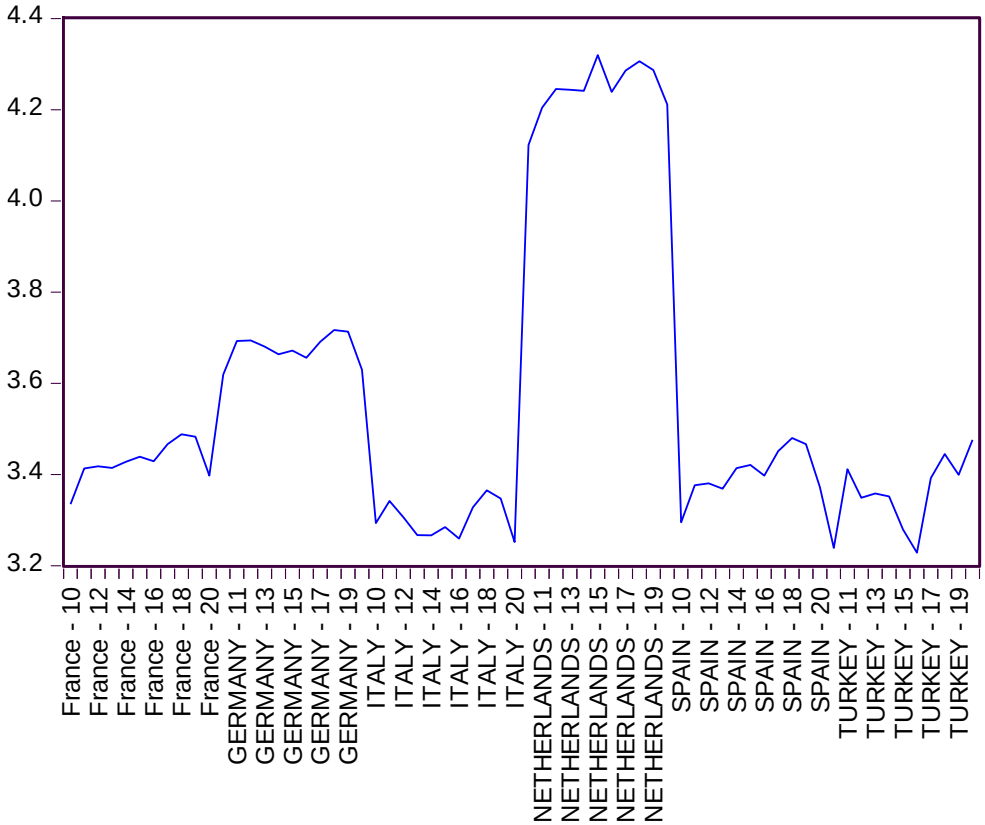


Figure 2: Raw statistics used for the study (Data set).

TIME	COUNTRY	GDP	EXPORT	IMPORT
2010	France	2.64261E+12	26.78829984	28.07949124
2011	France	2.86141E+12	28.42133748	30.36923895
2012	France	2.68383E+12	29.20302719	30.49903198
2013	France	2.81108E+12	29.36473787	30.39931721
2014	France	2.85217E+12	29.6666845	30.81211202
2015	France	2.43821E+12	30.59262238	31.15907156
2016	France	2.47129E+12	30.24753718	30.8526052
2017	France	2.58874E+12	30.94863319	32.01321411
2018	France	2.78959E+12	31.71366721	32.72428539
2019	France	2.72887E+12	31.59205541	32.54941778
2020	France	2.63032E+12	27.87364408	29.89378425
2010	Germany	3.39635E+12	42.56547341	37.30315083
2011	Germany	3.74441E+12	45.05713628	40.14898499
2012	Germany	3.52734E+12	46.30712014	40.20693474
2013	Germany	3.73274E+12	45.41867786	39.66019884
2014	Germany	3.88392E+12	45.61926331	39.00083008
2015	Germany	3.35624E+12	46.92073836	39.32548626
2016	Germany	3.4675E+12	46.07326285	38.69638311
2017	Germany	3.68173E+12	47.16304068	40.07416227
2018	Germany	3.97535E+12	47.30104577	41.13336065
2019	Germany	3.88833E+12	46.62423885	40.97542718
2020	Germany	3.84641E+12	43.41689532	37.69165212
2010	Italy	2.13402E+12	25.07404985	26.93213852
2011	Italy	2.29199E+12	26.87246347	28.27305899
2012	Italy	2.08708E+12	28.37924284	27.27547801
2013	Italy	2.14132E+12	28.63324308	26.23433632
2014	Italy	2.15913E+12	29.10882819	26.21328696
2015	Italy	1.8359E+12	29.71598237	26.70219379
2016	Italy	1.8758E+12	29.32789075	26.03971207
2017	Italy	1.95695E+12	30.73373332	27.87044263
2018	Italy	2.09112E+12	31.35046232	28.94714219

2019	Italy	2.00491E+12	31.69579799	28.41229041
2020	Italy	1.88645E+12	29.48971325	25.82831298
2010	Netherlands	8.46555E+11	69.80367248	61.71840166
2011	Netherlands	9.04086E+11	75.50306831	66.96870498
2012	Netherlands	8.38971E+11	79.50337384	69.76504137
2013	Netherlands	8.76924E+11	79.88047779	69.66885352
2014	Netherlands	8.90981E+11	80.57790815	69.47584728
2015	Netherlands	7.65265E+11	82.65889671	75.15767933
2016	Netherlands	7.83528E+11	79.53516476	69.32349997
2017	Netherlands	8.3181E+11	83.39176802	72.6364432
2018	Netherlands	9.13597E+11	84.68346368	74.13974653
2019	Netherlands	9.10194E+11	82.5377127	72.73296394
2020	Netherlands	9.13865E+11	77.85662953	67.44799055
2010	Spain	1.42072E+12	25.95167935	26.97656121
2011	Spain	1.47877E+12	29.5349622	29.25820883
2012	Spain	1.32482E+12	31.45527248	29.39009736
2013	Spain	1.35476E+12	32.96257747	29.03372183
2014	Spain	1.3694E+12	33.48256759	30.38304213
2015	Spain	1.19512E+12	33.62651843	30.58612274
2016	Spain	1.23208E+12	33.8800905	29.89253394
2017	Spain	1.3093E+12	35.14946203	31.54311122
2018	Spain	1.4203E+12	35.16258761	32.44554996
2019	Spain	1.39305E+12	34.95465595	32.02467102
2020	Spain	1.28148E+12	30.62093787	29.14778582
2010	Turkey	7.76993E+11	21.19413332	25.50033191
2011	Turkey	8.38763E+11	22.99370125	30.31047438
2012	Turkey	8.80556E+11	24.36087552	28.46992714
2013	Turkey	9.57783E+11	23.79300951	28.73428929
2014	Turkey	9.38953E+11	25.2055417	28.56075947
2015	Turkey	8.64317E+11	24.53127734	26.55726626
2016	Turkey	8.69693E+11	23.08350913	25.2446771
2017	Turkey	8.58996E+11	26.03942234	29.72274641
2018	Turkey	7.78377E+11	31.20486295	31.34254384

2019	Turkey	7.61428E+11	32.74140442	29.94145931
2020	Turkey	7.20101E+11	28.56923074	32.32514978

RESUME

Personal Information

Name, Surname : Hakan Altun

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Education

Degree	Education Unit	Graduation Date
Master	Istanbul Gelişim University	2022

Work Experience

Year	Place	Title
2012 - 2013	Polis Akademisi (in Ankara)	
2018 - Today	Neşe Kırtasiye (in İstanbul)	I am co- founder with my wife

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Publications

Hobbies

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