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# INVESTMENT FOR TRADE? IMPACT OF INVESTMENT FROM GULF COOPERATION COUNCIL COUNTRIES ON TRADE

Sattam Faleh Almodarra

*University of Kentucky*, [s.almodarra@uky.edu](mailto:s.almodarra@uky.edu)

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Sattam Faleh Almodarra, Student

Dr. Michael R. Reed, Major Professor

Dr. Carl Dillon, Director of Graduate Studies

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INVESTMENT FOR TRADE? IMPACT OF INVESTMENT FROM GULF  
COOPERATION COUNCIL COUNTRIES ON TRADE

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THESIS

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A thesis submitted in partial fulfillment of the requirements for  
the degree of Master of Science in Agricultural Economics in  
the College of Agriculture , Food, and Environment at  
the University of Kentucky

By

Sattam Almodarra

Lexington, Kentucky

Director: Dr. Michael R. Reed, Professor of Agricultural Economics

Lexington, Kentucky

2017

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## ABSTRACT OF THESIS

### INVESTMENT FOR TRADE? IMPACT OF INVESTMENT FROM GULF COOPERATION COUNCIL COUNTRIES ON TRADE

The world has made great progress over the centuries through the massive increase in the interconnectedness of nations around the globe. Today, the world is connected through various ways, including the movement of goods, people, and money. The amount of goods traded across countries borders has drastically increased as the result of technological progress and the removal of barriers to trade. Not only has the world become more interconnected with the physical flows of goods and services, but also countries of the world have become more integrated financially. This study proposes to analyze how increase in financial flows, as measured by Foreign Direct Investment, impact physical flows of goods, as measured by trade. The study focuses on Gulf countries. These countries represent an interesting case study given the structure of their economies, their massive natural resource endowments and heavy reliance on oil and natural gas revenue, and their large sovereign funds. Using panel data for the years 2001-2012 and reliable econometric techniques, the study assesses the impacts of increased investment from Gulf countries on the imports from and exports to partner countries. The results show that both FDI inflows and outflows significantly increase imports to and exports from the Gulf countries. The results are robust to various estimations methods and remain valid for both agricultural and non-agricultural products. The findings of the study provide a better understanding of the trade-investment nexus and shed light on the underlying motives of investment by Gulf countries. Inflows and outflows of investment serve as a strategic option for Gulf countries to both promote their exports while securing their supply in consumer and capital goods.

**KEYWORDS:** Foreign Direct Investment, Trade, Import, Export, Gulf countries.

Sattam Almodarra

May 2, 2017

INVESTMENT FOR TRADE? IMPACT OF INVESTMENT FROM GULF  
COOPERATION COUNCIL COUNTRIES ON TRADE

By

Sattam Almodarra

Michael Reed  
(Director of Thesis)

Carl Dillon  
(Director of Graduate Studies)

May 2, 2017  
(Date)

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## **Chapter I: Introduction**

### **1.1 Background**

The world is increasingly becoming a global village (Rodrik, 1997; Sassen, 1999; Held, 2004; Stiglitz, 2007). One sign of such globalization is the tremendous amount of interactions between countries within and across all continents (Held, 2004; Singer, 2004). Countries of the world interact in various forms which encompass the cross-border trade of goods and services, the flow of physical and financial capital, and the cross-border movement of people and ideas (Rodrik, 2008). Between 1995 and 2015, World Bank data show that total merchandises export for the world increased from \$5.3 trillion to more than \$16.5 trillion a 211% growth. Over the same period, there has been a substantial increase in the cross flow of people as measured by international travels and immigration data, and a surge in the movement of financial capital in the form of investment (WDI, 2017).

Gulf Cooperation Council countries, a group of six Arab states, are no exception to this globalization trend. Like most countries in the world, GCC countries have experienced substantial openness in the past decades highlighted by an increase in trade, investment, and migration (Kapiszewski, 2006; Karayil, 2007). Gulf Cooperation Council countries, simply known as Gulf countries, are major oil and natural gas producers. Oil and natural gas are also the main economic sectors in these countries creating a highly concentrated economy (Fasano and Iqbal, 2003; Hussein, 2009). The high reserves and production levels of oil and natural gas have enabled Gulf countries to accumulate massive wealth (Jen, 2009; Weiss, 2008). In the recent years, the accumulated wealth has served the purpose of economic diversification

away from natural resources to strengthen the structure of their economies and reduce vulnerabilities to external shocks (Fasano and Iqbal, 2003; Hvidt, 2013). At the same time, the resource abundance in Gulf countries makes them largely open to trading with the rest of world. While oil and petroleum goods are major export products, Gulf countries also export various other natural resources as well as agricultural and manufactured products. Gulf countries also trade with most other countries by importing various capital and consumer goods including agricultural and manufactured products.

This study seeks to test whether the investment flows (inflows and outflows) between GCC countries and the rest of the world influence trade. More specifically, it assesses the impact of increased investment from Gulf countries on the import from and export to partner countries. The findings of the study will provide a better understanding of the trade-investment nexus, and shed light on the underlying motives of investment by gulf countries.

## **1.2 Research questions**

This thesis addresses an important question on the relation between trade and foreign direct investment in the GCC countries over the period 2001-2012. More specifically, we assess the impact of financial flows as measured by foreign direct investment on the cross-border movement of goods. We consider both inflows of foreign financial capital and the outflows of domestic capital from GCC countries and how these two flows affect merchandise imports and exports. The answer to this question helps us to understand the motivations behind the massive amount of foreign investment undertaken by GCC countries in various partners countries from a trade perspective.

Given the importance of FDI and theoretical predictions that more financial capital is good for the economy, we formulate and test the following four hypothesis:

- i. H<sub>0</sub>: FDI Inflows to GCC countries increase exports to the rest of world;
- ii. H<sub>0</sub>: FDI Inflows to GCC countries increase imports from the rest of the world;
- iii. H<sub>0</sub>: FDI outflows from GCC countries increase exports to the rest of the world;
- iv. H<sub>0</sub>: FDI outflows from GCC countries increase imports from the rest of the world;

In answering the main questions of this study and testing the different hypotheses, we also address various other issues on both a conceptual and empirical level. This study attempts to identify the broader factors explaining trade in the literature and tests the relevance of these factors in the specific context of GCC countries. In particular, we test whether economic and market variables measuring trade costs affect the pattern of trade for GCC countries. Our study contributed to the literature on trade and investment with specific evidence for Gulf countries.

### **1.3 Outline of the thesis**

The rest of the dissertation is organized as follows. In chapter 2, we provide more background on GCC countries. The chapter also reviews the theoretical and empirical literature related to the trade-investment nexus with a particular focus on GCC countries and surveys trade and investment policies implemented by the country members of this regional union. This review also allows us to identify the existing evidence on the subject, and most importantly highlight our specific contributions to

the debate. Chapter 3 presents the conceptual framework that guides our analysis. We briefly survey economic theories related to international trade and argue how our study relates to them. In the same chapter, we also discuss our empirical models and econometric strategies to estimate the impact of FDI on trade. Chapter 4 presents the datasets use in the analysis and discusses the variable selection. We also present descriptive and exploratory analysis of the variables to be used in the model. The results are presented and discussed in chapter 5. In chapter 6 we summarize the analysis and the findings and discuss the limitation of the study as well as future endeavors we might consider to expand this present work.

## **Chapter II: Background on GCC countries and Literature Review**

### **2.1 Background information on GCC countries**

#### **2.1.1 Member States and objectives**

The Cooperation Council for the Arab States of the Gulf, also commonly known as Gulf Cooperation Council (GCC), is a regional political and economic organization established in 1981 by Arab states of the Arabian Gulf excluding Iraq. The member states, as shown in Figure 1 below, are Bahrain, Kuwait, Oman, Qatar, Saudi Arabia, and the United Arab Emirates.

**Figure 1 : Map of the GCC countries included in the analysis**



Source: Wikipedia available at [https://en.wikipedia.org/wiki/Gulf\\_Cooperation\\_Council](https://en.wikipedia.org/wiki/Gulf_Cooperation_Council)

Although GCC is an Arabic countries union, not all Arab countries are integrated into the council. However, there are plans to expand the organization to other Arab countries in the future. Jordan and Morocco have been accepted to the union as observers, but neither state has a timeline for full membership. Yemen is in the process of negotiating its admission to the group.

The GCC was formed to foster the cooperation among the member states for a shared prosperity of the people. To achieve this goal, the union sets out some clear objectives:

- Strengthening ties between their people who have been historically always close;
- Formulating common regulations in religion, finance, trade, customs, tourism, legislation, administration, etc.;
- Promoting scientific and technical progress in all economic sectors;
- Boosting cooperation and facilitating cross-border trade and investment;
- Creating a unified military force for the security and the defense of the union;
- Establishing a common currency.

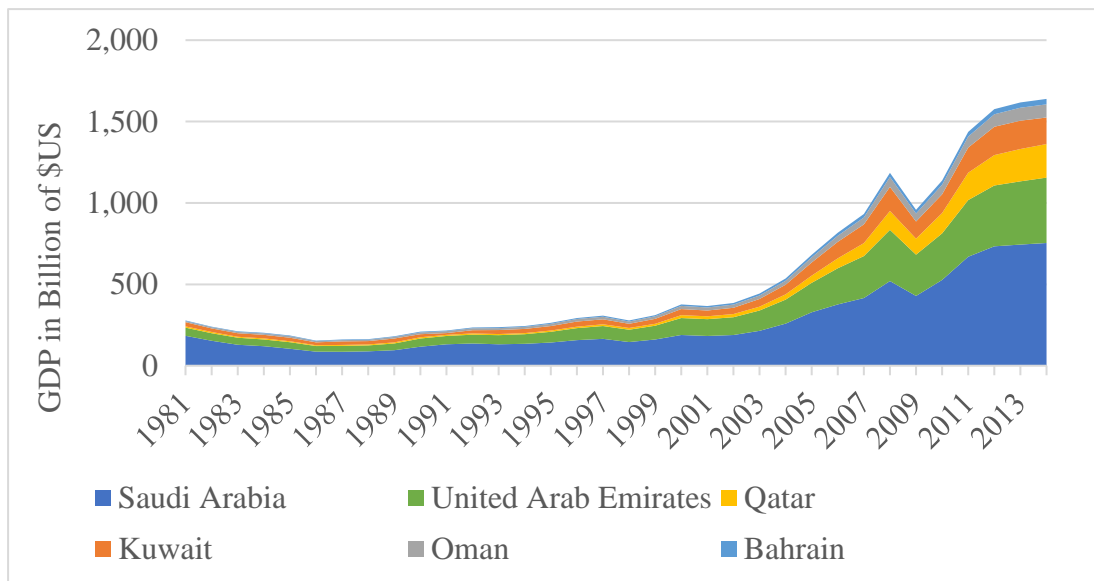
### **2.1.2 Economy and internal market**

The GCC countries constitute a large geographical and economic bloc in the Middle East. Together, the six states of the Council occupy a total area of 1,032,093 square miles and host a population of 50,761,260 as of 2014. This demographic size is one of its strength as it offers a large internal market for consumption goods and labor. One peculiarity of GCC countries is the large share of immigrants in the total population. In fact, most workers, particularly in the private sector, are foreigners. The highest proportion of non-nationals is found in Qatar (89.9%) and UAE (88.5%). Kuwait has about 69.4% of its population who are immigrant, Bahrain 52%, Oman 45.4%, and Saudi Arabia 32.7%. This diversity in the population provides strong linkages between the GCC countries and the rest of the world (Kapiszewski, 2006).



Gulf countries are also a major economic force on the world stage. They have robust economic growth and taken together their Gross Domestic Product (GDP) amounts to \$1.7 trillion, up from \$0.3 trillion in 1981 (WDI, 2017). Figure 2 shows the evolution of GDP for all six GCC countries from 1981. The figure shows a clear upward trend in GDP for all countries except a dip in 2008-2009 due to the global financial and economic crisis that shook the world. There is much heterogeneity among GCC countries. Saudi Arabia dominates the union in terms of area, population, and economic activity. In 2014, it accounted for 46% of the total economic output of the region. The UAE has the second largest economy in the region with 25% of its GDP. Oman and Kuwait are smaller economies with, respectively, 5% and 2% of the region's GDP.

**Figure 2: GDP of GCC countries over time**



Despite their wealth, GCC countries' economies appear to be highly concentrated (Fasano and Iqbal, 2003). They are endowed with large reserves of

natural resources, particularly oil and natural gas. Consequently, they have enjoyed a substantial increase in wealth in the recent decades due to the preeminence of oil and gas in the world economy and hikes in the price of these commodities. Saudi Arabia is the world's largest oil producer and exporter with oil and gas making up to 90 percent of government income, 88 percent of total exports, and 55% of GDP in 2010. The other countries have a similar economic structure. Petroleum and natural gas continue to play a significant role in UAE's economy and account for more than 85% of the total exports. Qatar also relies heavily on petroleum and liquefied natural gas, which are the basis of its economy with more than 70% of total government revenue, 85% of export earnings, and 60% of GDP. Oman, Kuwait, and Bahrain are much smaller economies but they are also highly dependent on oil and gas.

GCC countries have long recognized the vulnerability of their economies due to dependence on natural resources. As a consequence, there has been a strong push in recent years toward more economic diversification. Areas of diversification include services, such as high-class hotels and tourism, infrastructure development, and increasing eco-friendly financial services. UAE and Bahrain, for instance, have a strong financial sector that continues to modernize and develop. Saudi Arabia is also increasingly developing a modern industrial state. In all Gulf countries, the large reserve fund accumulated after decades of high oil and gas prices serve the primary purpose of financing economic diversification and investment abroad to secure future generations. Most of these initiatives are regional and piloted by the GCC.

## **2.2 Investment and Trade policies of GCC countries**

Historically, GCC countries have attracted important investment particularly in the oil and petroleum sectors where the countries lacked the necessary technologies and capital. However, the economies of most GCC countries have long been state-controlled with a little window for private domestic and foreign investment. This has weakened GCC countries integration into world financial markets and limited FDI flows.

With economic diversification as a target, there has been a radical paradigm shift since the early 2000s in most GCC countries. Since the mid-1990s, monarchies in GCC countries have increasingly encouraged private entrepreneurship and investment. In addition, foreign investment in the form of joint ventures with domestic public and private companies was welcomed. Various investment authorities such as the Saudi Arabian General Investment Authority (SAGIA), the Abu Dhabi Investment Authority (ADIA), the Qatar Investment Authority (QIA), the Kuwait Investment Authority (KIA), and the Omani Center for Investment (OCI) were created to formalize the process of economic liberalization and promote both inward and outward investment.

## **2.3 Review of the trade and investment literature**

There is relatively abundant literature on trade in both developed and developing countries. Our thesis relates largely to this literature. It is also at the intersection of this literature and another large literature on foreign investment. We contribute to both literatures in a number of aspects that we briefly discuss in this section.

Our first contribution is on the analysis of trade in GCC countries. Since the dawn of economic science, trade has occupied a center place in the discipline (Kemp, 1962). Why countries should trade and whether there are gains from international trade were the main questions. Subsequently, economists have shifted their attention on what actually explains observed trade patterns between countries (Helpman, Melitz, and Rubinstein, 2008). This question gained prominence in the literature as the gains from trade became more apparent, and the role of trade in the development process of nations was increasingly recognized (Kemp, 1966; Metcalfe and Steedman, 1974). Our study focuses on this specific question of what explains trade in Gulf countries

There are many determinants of trade identified in the vast literature, and each factor plays a different role depending on the countries analyzed and the period of study (Deardorff, 1998). These factors are related to physical barriers due to distances (Berthelon and Freund, 2008; Huang, 2007), technological barriers for transportation (Eaton and Kortum, 2002), economic barriers related to income and purchasing power (Rodriguez and Rodrik, 2000), political barriers related to institution and policies, and cultural and historical relationships (Tadesse and White, 2010). In the literature, various studies focus on these specific factors. Our study focuses in particular on a factor that has been overlooked: foreign direct investments.

There a small set of studies on trade in Arab countries. Various studies analyses intra-regional trade (Sahib and Kari, 2012; Laabas and Limam, 2002) and Gulf countries trade with the rest of the world (Dong, 2012; Habibi, 2010; Boughanmi, 2008). The same set of factors in analyzing trade is also used for Gulf

countries. The main findings of these studies support the general result that trade cost, economic purchasing power, and countries proximities are key determinants of trade. Our study complements this literature on trade in Gulf countries and updates previous studies using the most recent data with a focus on FDI and its effect of trade.

Our study also link the literature on trade to the literature on FDI. The question of the impact of FDI on trade been overlooked in most trade studies, essentially because of the lack of data on investment. Also study on FDI focus primarily on either the determinants of FDI inflows or the impacts of FDI on economic growth. Mina (2007) and Elfakhani & Matar (2007) studies the location and factors explaining FDI in Gulf countries. They find that natural resources, tourism, and the emerging financial sectors are the main drivers of FDI flow to GCC countries, Al-Iriani (2007) and Hussein (2009) study the impact of FDI on growth in GCC countries and find that recent increase in foreign investment to Gulf countries has increase economic growth. Iqbal & Nabli (2008) find a similar results for all Middle East and North Africa countries. There is almost no study on the direct impact investment by GCC countries in the rest of the world. Another important contribution of our thesis is that it links the literature on trade with the literature on trade and investment in GCC countries looking both at inflows and outflows.

## **Chapter III: Conceptual Framework and Empirical Models**

### **3.1 Conceptual Framework**

In our globalized world, trade is both an important engine and a manifestation of economic development (Feenstra, 1996; Frankel and Romer, 1999). Thus, understanding what drives this trade and the leverages to increase trade have always been of interest in academia and policy-making (Findlay, 1984). This study focuses on one particular potential driving force for trade: financial flows in the form of foreign direct investment (FDI). In this section, we seek to discuss conceptually how trade and FDI are linked. This discussion will lay the ground for our empirical analysis to test the hypothesis whether FDI flows foster or deter trade in the context of the GCC.

Trade analysis today traces its root to a number of theoretical models developed since the 1700s to answer the important question of why countries trade with each other (Arkolakis, Costinot, and Rodríguez-Clare, 2012). The literature initiated by Adam Smith's seminal work has quickly developed in many directions. Smith argued that countries trade primarily because of difference in the absolute advantage each country holds in the production of various goods. His argument implied that the exports of a country are the imports of the another and all nations will gain simultaneously if the specialized in production and export of goods for which they have an absolute advance over the rest of the world. While Smith's arguments were very appealing, they ignore the fact that some countries might not have any absolute advantage (Myint, 1977).

The drawbacks in Smith's model led to a number of refinements and the development of a new model. The Ricardian theory of trade is a direct refinement of the concept of absolute advantage. David Ricardo argued instead that comparative advantage matters for international trade. Countries have different comparative advantages in production due to substantial differences in technology and natural resources.

While the comparative advantage model recognizes the importance of natural resources, it does not explicitly account for differences in endowments. The Heckscher-Ohlin model makes this case by postulating that the observed pattern of trade is determined largely by large differences in the endowments of factors such as labor, land, and capital across countries. A key prediction of the model is that a country will export goods that require intensive use of factors abundantly available locally. However, the same country will import goods requiring factors that are not readily available.

The main issues with these earlier trade models are their notorious lack of empirical content (Anderson, 2011). In most cases, they fail to explain bilateral patterns, account for within country firm behavior (including competition), and capture the effect of various trade policies and geographic constraints. In the past three decades, new trade theory has developed, pioneered by the work of Krugman, (1991) and further developed by (Melitz, 2003; Helpman, Melitz, and Rubinstein, 2008).

We frame the issues on the impact of FDI on trade in general trade models. Foreign direct investment can influence trade through several channels. As financial

flows, FDI inflows can be critical inputs to production regarding the physical capacity as well as technological improvement. Foreign investors bring in financial capital that can complement domestic savings to finance production in both agriculture and manufacture. They also bring expertise and other modern technologies that might be lacking in the domestic countries. The combined results of these flows could be an increase in production, with an accompanying increase in exports. At the same time, a country might undertake an investment with the purpose of outsourcing production, which is then re-sent back to his home country. In such circumstances, an inflow will lead to higher exports.

### **3.2 Empirical methods: Model specification and estimation techniques**

#### **3.2.1 Model specification**

Initially formulated by Jan Tinbergen in 1962, the gravity model has become the workhorse model for the empirical analysis of international trade. The success and popularity of this model stems from its theoretical underpinnings (Anderson, 1979; Helpman and Krugman, 1985; Bergstrand, 1989; ) and its strong power in explaining and predicting bilateral trade flows (Feenstra, 2002). Following the vast literature on trade, this thesis uses a gravity model to analyze bilateral trade between GCC countries and the rest of the world.

In its original form, the gravity model predicts bilateral trade flows between two countries based on their economic sizes and the trade cost between the two countries. The basic model specification is formulated:

$$F_{ijt} = G \frac{M_{it}^{\beta_i} M_{jt}^{\beta_j}}{D_{ijt}^{\delta}} \quad (1)$$



Where for a year  $t$ ,  $F$  denotes the trade flow of goods between countries  $i$  and  $j$ ;  $M$  is the economic mass of each country,  $D$  is the distance (or more broadly trade costs), and  $G$  is a constant. The log-linearized version of the model yields the following equation:

$$\ln F_{ijt} = \ln G + \beta_i \ln M_{it} + \beta_j \ln M_{jt} - \delta \ln D_{ijt} + e_{ijt} \quad (2)$$

In our application of the model,  $\ln G$  is a constant term. The economic variables include variables such as GDP per capita and population. The trade cost variables include various bilateral variables that we describe in the data description section. The term  $e_{ijt}$  encompasses all the variables that could explain trade flows but are not included in the model. We decompose this term to include bilateral FDI flows from various origins and destinations, and time fixed effects. The model also includes a set of control variables that can be time invariant, origin country specific, or destination country-specific. Thus, the model estimated is formulated as follows:

$$\ln F_{ijt} = \alpha + \beta_i \ln M_{it} + \beta_j \ln M_{jt} - \delta \ln D_{ijt} + \beta \ln FDI_{ijt} + \gamma_1 X_{it} + \gamma_2 Z_{jt} + \mu_i + \mu_j + \mu_t + \varepsilon_{ijt} \quad (3)$$

Depending on the type of trade flow analyzed, the dependent variable  $\ln F_{ijt}$  is the log of the total value of trade measured as the sum of imports and exports, only exports, or only imports. In the equation, the main control variable is  $\ln FDI_{ijt}$  which measures the log of the total amount of investment flows (inflows or outflows) between a GCC country  $i$  and a destination country  $j$  during the year  $t$ . The other control variables include factors that are specific to the GCC countries  $X_{it}$  and factors that are specific to the destination countries  $Z_{jt}$ . To control for unobserved heterogeneities and capture the intrinsic characteristics of each trade partner, the

model also includes various fixed effects related to the GCC countries  $\mu_i$ , the destination countries  $\mu_j$ , and time  $\mu_t$ . As argued by Harrigan (1996) and Feenstra (2004), the inclusion of these fixed effects also control for the unobserved multilateral resistance terms of trade. Finally, the term  $\varepsilon_{ijt}$  captures all idiosyncratic shocks not captured by the control variables in the model.

### **3.2.2 Model estimation**

Ideally, one should estimate the original model as formulated in equation (1). However, given the non-linear nature of the model, it is often difficult to estimate the model and achieve convergence. Instead, it has become common in the literature to log-linearize the model as in equation (2) and (3). Also, linear models are easier to understand. We follow this standard approach in our analysis. However, there are some complications with the log-linear gravity model. The first problem is the treatment of zeros in the models. Many country pairs do not trade all the time. As consequence, there are many zeros in the trade variables as well as in the FDI variables. Taking the log results in a substantial loss of observations (the log of zero is not define). In our specific case, 31% of the observations are zeros in the import variable and 29% are zeros in the export variable. More importantly, we have 94% zeros in the both the FDI inflows and FDI outflows variables. These zero values are information that should not be discarded.

Many solutions have been suggested to account for zeros in gravity model, in particular zeros in the dependent variables. The tradeoff is between saving most of the observations and allowing for high computational time. These solutions include ignoring the zeros, using a transformation of the variable that preserves all observation after taking the log, or modeling the presence of zero in the variables

using tobit regression or Heckman selection regression. Each method has its merits and drawbacks.

Clearly ignoring the zeros is not a viable solution in our specific case given that we will lose almost one-third of the observations and incur a substantial loss of information. The simplest approach to address the zeros problem while not losing observations is to add a small, fixed constant, (generally 1) to all observation before taking the log. This approach preserves all observations and allows an estimation of the linearized model using Ordinary Least Squares. It has been used in various studies such as Wang and Winters, (1992) and Baldwin and Nino (2006). However, it has some problems. We will use this method but will focus on other methods with fewer problems.

**Fixed effect regression.** One problem with Ordinary Least Squares is that it does not provide consistent parameter estimates in the presence of unobserved heterogeneity. As formulated in the model, the equation to estimate includes the terms  $\mu_i + \mu_j + \mu_t$ , which capture importer, exporter, and time fixed effects. To account for this heterogeneity, we use fixed and random effect regressions and include year dummies. In order to estimate the panel models, we form a unique identifier for each country pair, which serves as the unit of observation and controls for country-pairs fixed effects  $\mu_{ij} = \mu_i + \mu_j$ .

For fixed and random effects, the model can be estimated in the presence of unobserved heterogeneity. The fundamental difference between the two approaches lies in their underlying assumption on the statistical properties of  $\mu_{ij}$  (Green, 2012). In the fixed effect regression,  $\mu_{ij}$  is assumed to be an additional intercept that varies across countries pairs and we can exploit the within estimation method that uses

deviations from group means (or period) to estimate the model. In a random effect model,  $u_{ij}$  is assumed to be part of the errors and is distributed independently of the regressors. We consider both the fixed and the random effect model and use a Hausman test to choose the best estimation technique. However, we should note that with the fixed effect regression, all time-invariant variables are automatically absorbed in the fixed effect terms.

**Robustness check: Addressing the zero trade flow.** To deal the loss of observations after linearization of the model, we have added a constant equal to unity to all observation. This approach has been shown to yield estimated coefficients that can be biased. To test the robustness of the results, we use tobit regression to account for the censored nature of the trade variables. Tobit regression is a simple method to deal with the present of zeros. It allows two processes to generate the data: one for the probability that an observation will be censored and equal to zero; and the other for the value of the trade when it is observed. In the tobit model, the same set of variables explain both processes.

## **Chapter IV: Data Sources and Descriptive Analysis**

### **4.1 Data sources and selection of variables**

To analyze the questions stated in this thesis, we combine data from various sources on trade, foreign direct investment, and other control variables. All the data cover the period 2001-2012. The choice of this period of study is determined by the availability of the data on foreign direct investment variables. In this sub-section, we present these data sources and discuss the choice and definition of the different variables.

#### **4.1.1 Trade variables**

The primary source of the bilateral variables is the Massachusetts Institute of Technologies' Observatory of Economic Complexity (MIT-OEC). The data available on the MIT-OEC website combine trade data from Feenstra et al. (2005) and the United Nations COMTRADE (UNCOMTRADE). We collect yearly aggregate trade values between all country pairs in the world over the period 2001-2012. In analyzing international trade, three measures are considered: imports, exports, and total trade. Imports are measured from the buyer's perspective while exports are captured from the seller's perspective. Total trade is defined as the aggregate value of goods movement between two countries and is estimated by adding import and export values together. In all empirical models, we start by using total trade and then disaggregate by type of flow: import versus export.

### 4.1.2 FDI variables

The main variables of interest in the analysis conducted in this thesis are related to foreign direct investment. Our data on FDI are from the United Nations Conference on Trade and Development (UNCTAD) who have compiled bilateral FDI data for most country pairs. Their effort to collect these data, which are not often readily available elsewhere, is fundamental in understanding bilateral FDI. Our study takes advantage of this great data set to analysis the impact of FDI on trade, focusing on GCC countries.

Like trade, FDI is generally captured from both the investor and the recipient perspective. There are broadly four different types of FDI variables: inflows, outflows, instocks, and outstocks. Flow variables refer to current transactions taking place within a year while stocks are positions indicating the total valuation of all investments from preceding years. Below, we provide a definition of each of the four types of FDI.

- **FDI inflows** are the total value of all inward direct investment made by non-resident investors, in our case non-GCC national, in one or more of the GCC countries in a particular year;
- **FDI outflows** are the total value of all outward direct investment made by resident investors, in our case GCC nationals, in any other country in the world in a particular year;
- **FDI instocks** are the total cumulative net value of all direct investment made by non-resident investors of GCC countries in any other country in the world in a given year.

- **FDI outstocks** are the total cumulative net value of all direct investment made by resident investors in one or more GCC countries in a given year.

FDI stock measures include many non- FDI flows within a given year, such as depreciation, price changes, and currency valuation changes. Thus, FDI stocks are not useful for this analysis; instead FDI inflows and outflows are used.

#### **4.1.3 Other variables**

Trade is affected by many other factors than FDI. In our empirical analysis of the impact of FDI on trade, we control for other determinants of trade. According to the gravity model, bilateral trade depends on the size of the trading partners and the cost of trading. Following the literature, this study includes two measures of market and economic size: total population and GDP per capita. Both variables are from the World Bank World Development Indicators (2017). We include total population as a proxy for the size of the market when looked from the importing countries and a proxy for production and export capacities when looked from exporting countries. The larger a country's population the more the trade can occur. We expect import to be positively correlated with population since a large population is directly associated with a larger consumer based and high demand for both domestic and imported products. We also expect exports to be positively correlated with population for the exporter since labor is a direct input in the production process.

Following the tradition in the literature on bilateral trade, we also use GDP per capita as a measure of the economic size of the trading partners. In fact, GDP per capita is widely known as the best measure of a country income and consequently of

purchasing power. It is also a direct measure of economic development. We expect rich countries with high GDP per capita to export more products as well as import more. Thus, we expect the sign of both destination countries and origin countries GDP per capita to be positive.

Beside markets and economic size, factors influencing trade cost are also powerful predictors of trade and the pattern of trade. Trade cost can be as direct as geographical distances, but it also includes cultural similarities and other factors. We include the distance between capital cities as a measure of distance between countries. The law of gravity in physics predicts that two objects that are close exercise stronger attraction on each other than distant objects. Following this same logic, we expect the distance variable to have a negative sign in the trade models. We also include a dummy variable indicating whether the trading partners share a common border. In the same spirit as the distance variables, contiguous countries should trade more. Observations on all these variables are from the CEPII gravity database available online on CEPII's website (Head et al., 2010; Head and Mayer, 2013).

In term of cultural proximity, we include variables that measure such factors as having the same religion in the sense that a majority of the populaion in the two countries claim the same cultural faith, a common official language, and same legal origin. These variables are also available from the CEPII gravity database. Religious proximity has been increasingly shown to matter for bilateral relations in general and trade in particular (Felbermayr and Toubal, 2010; Guo, 2007; Mehanna, 2003). Since most of the origin countries in this study are majority Muslim countries; this variable essentially captures whether the destination country is Muslim-dominated. Given that many countries have been subject to colonization to some extent, many country-pairs



share strong relationships attributed to their colonial history. Some of these relationships include the inheritance of their legal system from the former colonizer, whether it is the French, the English, the Scandinavian, the German, or the Soviet. Another important variable facilitating trade is the difference in official languages. Trading involved various forms of communication, oral and written, and having the same official language substantially lower trade cost. Overall we expect the sign of the variables indicating a common origin of the legal system and a common official language to have a positive coefficient.

Finally, in all our models, we include several country-specific factors that could affect trade as control variables. We include the quality of institutions in both origin and destination countries to account for business and trade environment. The quality of institutions is measured by the Polity IV Project <http://www.systemicpeace.org/polity/polity4.htm>. We also include the inflation rate for both trading partners as a proxy for prices in both countries. We expect that higher a inflation rate in a country, the more this country will import from the rest of the world where goods might be cheaper. Another important variable is whether there is free trade agreement between the two countries that could substantially facilitate trade relations.

## **4.2 Description analysis**

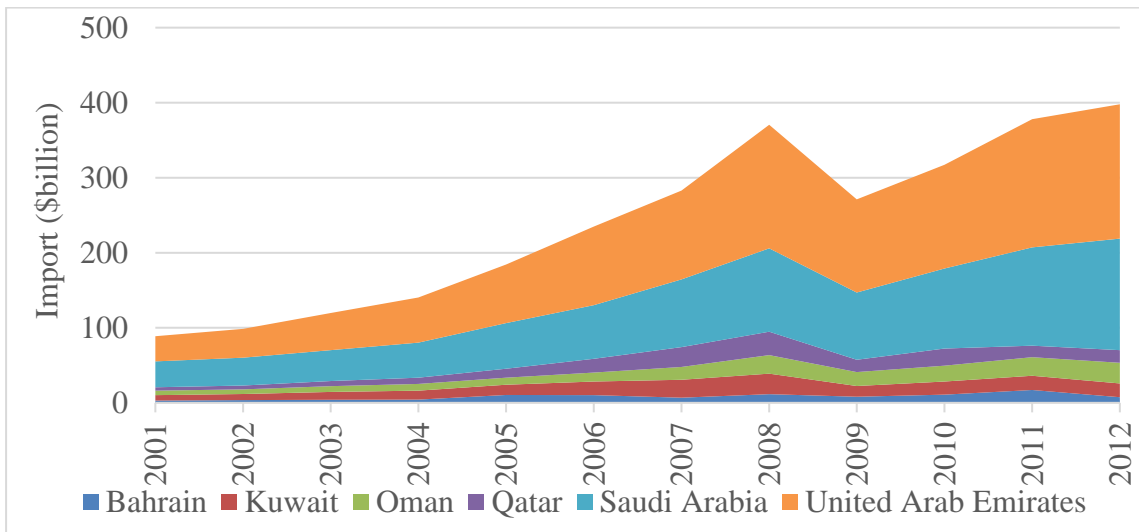
Before turning to the formal econometric analysis, it is important to perform a preliminary analysis of the variables using descriptive statistics. In this section, we present the findings of such exploratory and descriptive analysis.

#### **4.2.1 Description of trade variables**

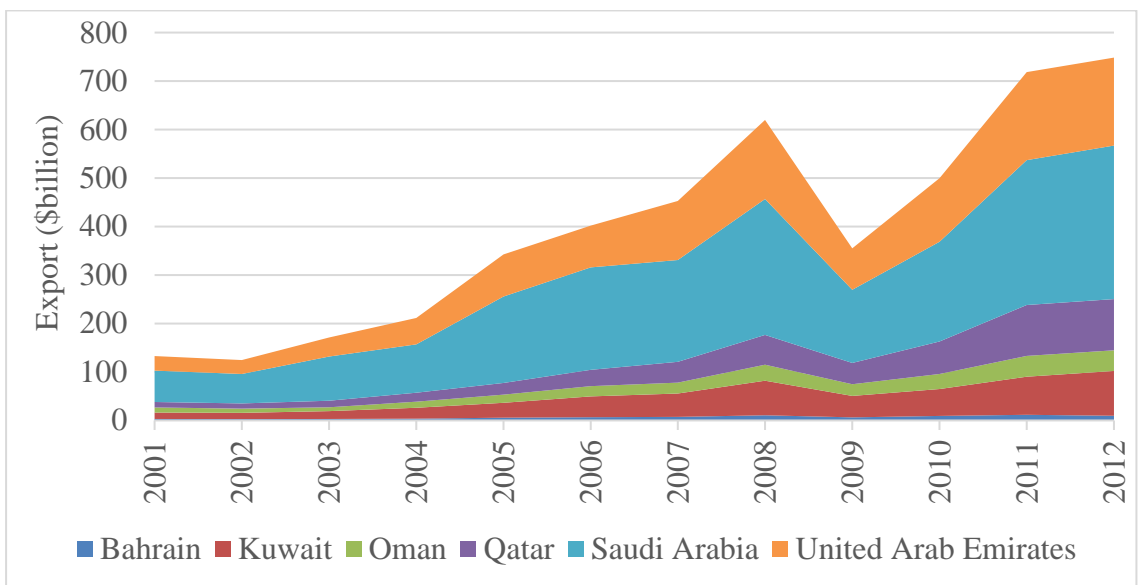
We start the descriptive and exploratory analysis by examining trade statistics for GCC countries over the period of study. Figures 3 and 4 show that imports and exports by all Gulf countries have sharply increased over the years except for the major dip in 2008-2009 due to the global financial crisis. Between 2001 and 2012, GCC countries together imported more than \$400 billion in goods and exported more than \$750 billion in goods over the same period. These numbers show that the Gulf bloc runs a trade surplus in most years; selling more to the world than it buys. Much of this surplus comes from oil and gas exports, which are the main export commodities.

The graphs also show import differences between GCC countries. These differences in trade performance mirror the relative economic forces in the region. Saudi Arabia, the largest GCC economy, naturally has the largest exports but it has the second largest imports. Exports and imports for the other four countries are relatively smaller but have consistently grown over the past years. In most of the year, GCC countries with the exception of Bahrain and UAE have consistently carry trade surplus. Bahrain, the smallest economy of the union has always been in deficit except for the year 2007 and 2012. UAE which is a large economy experience trade deficit more often than trade surplus which have occurred only in 2005, 2007, 2011, and 2012.

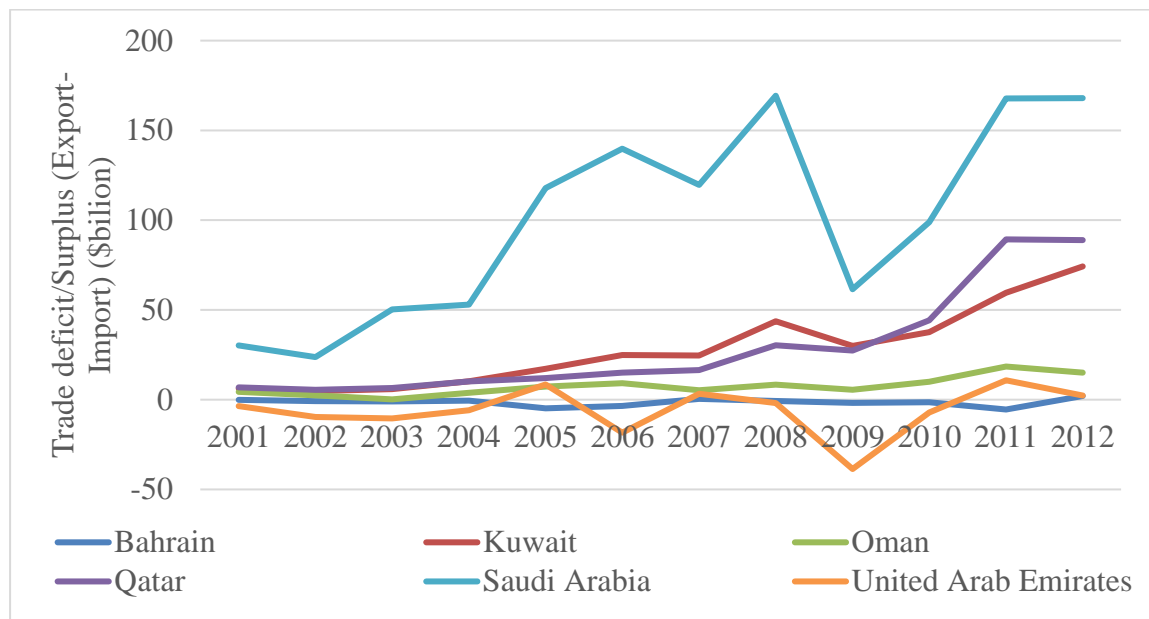
**Figure 3 Total imports of the GCC over time**



**Figure 4: Total exports of the GCC over time**



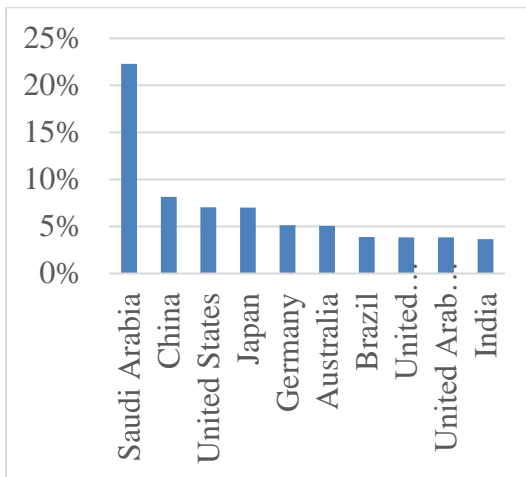
**Figure 5: Trade deficit/surplus as Export-Import for the GCC over time**



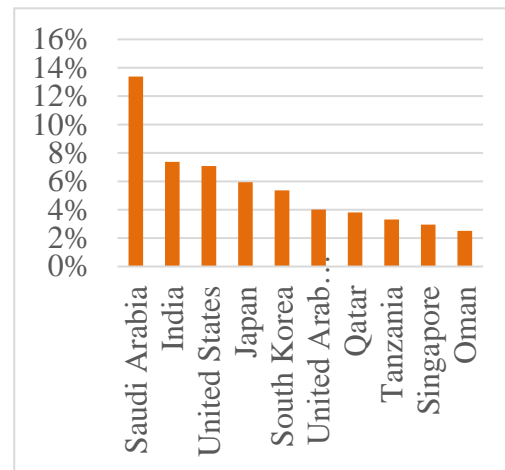
Given our interest in bilateral trade, we look at the top origin of imports and top destinations for export for each of the Gulf countries. We present the results of this analysis in graphical forms for a better visual analysis. The main messages from these graphs are that GCC countries are very outward oriented and there is very little intra-Arab trade, as shown by Al-Atrash and Yousef (2000). Except for Bahrain, which is the smallest economy in the GCC, the top ten origin countries for imports and destination countries for exports are dominated by countries outside the Middle East, such as the United States, China, Japan, India, Germany, South Korea, Brazil, France, and United Kingdom.

**Figure 6: Top 10 origin and destination countries of Bahrain's trade over 2001-2012**

(a). Top 10 origin of import

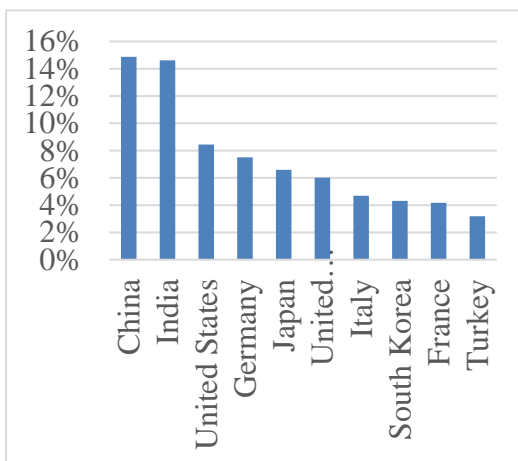


(b). Top 10 destination of export

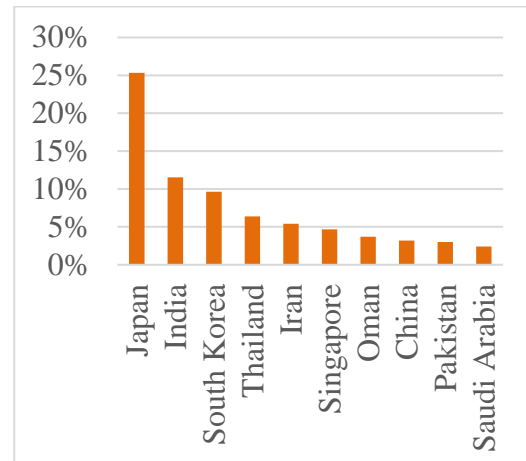


**Figure 7: Top 10 origin and destination of UAE's trade over 2001-2012**

(a). Top 10 origin of import

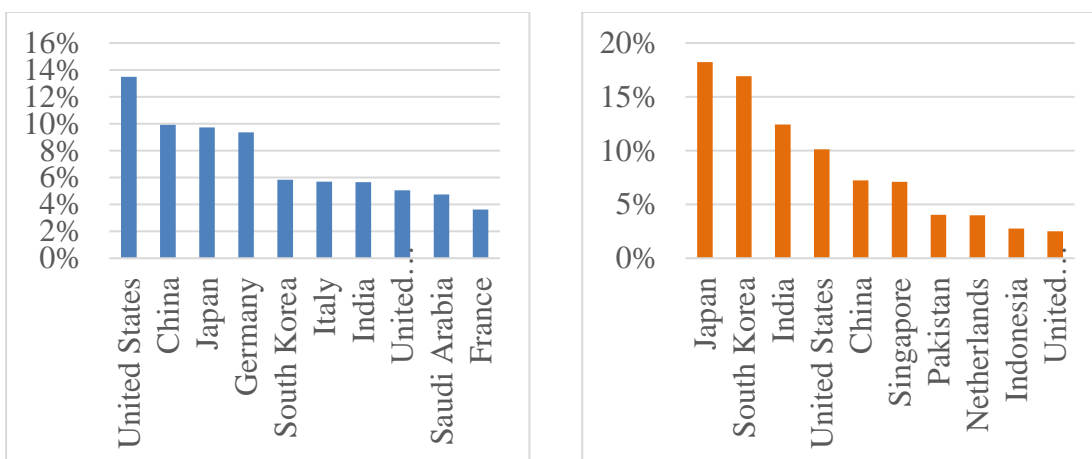


(b). Top 10 destination of export



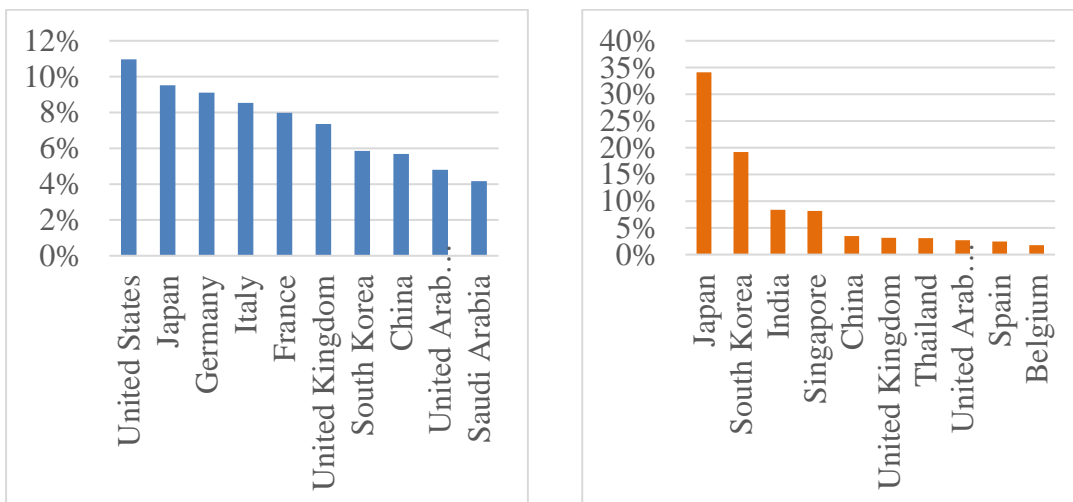
**Figure 8: Top 10 origin and destination of Kuwait's trade over 2001-2012**

(a). Top 10 origin of import to Kuwait (b). Top 10 destination of export from Kuwait



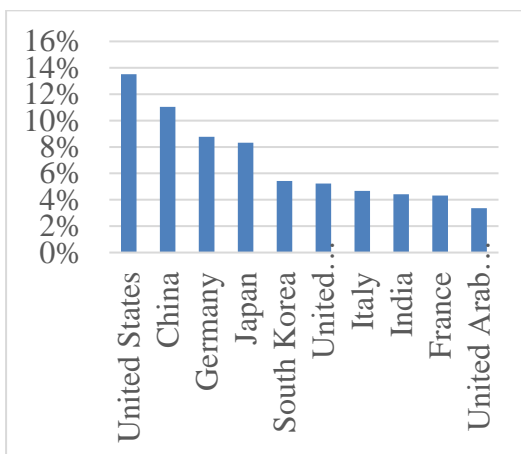
**Figure 9: Top 10 origin and destination of Qatar's trade over 2001-2012**

(a). Top 10 origin of import to Qatar (b). Top 10 destination of export from Qatar

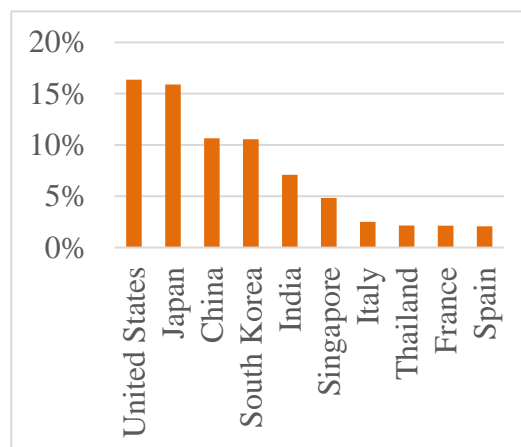


**Figure 10: Total tens origin and destination of Saudi Arabia's trade over 2001-2012**

(a). Top 10 origin of import

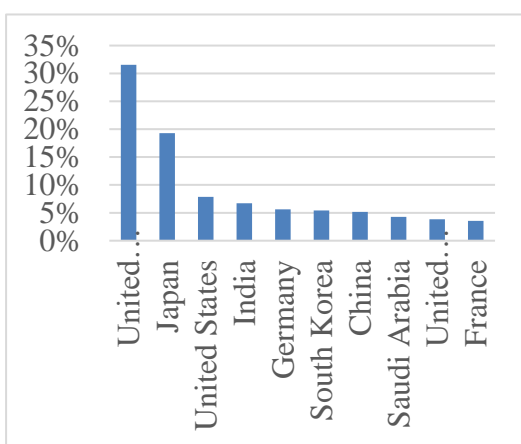


(b). Top 10 destination of export

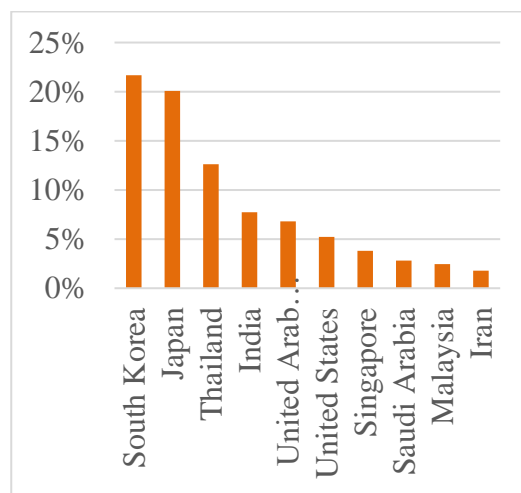


**Figure 11: Top 10 origin and destination of Oman's trade over 2001-2012**

(a). Top 10 origin of import



(b). Top 10 destination of export

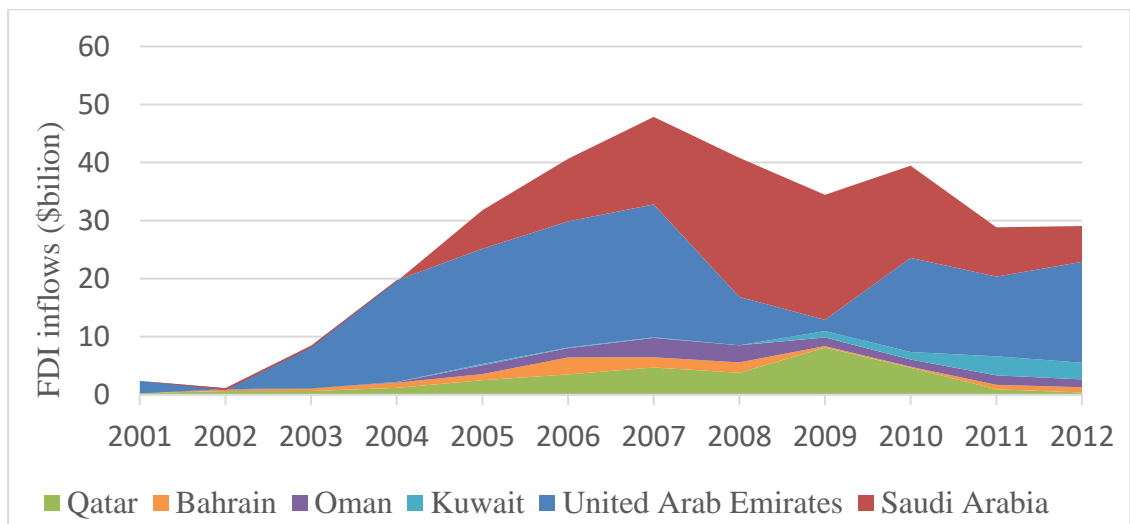


#### 4.2.2 Description of investment variables

After analyzing GCC countries trade statistics, we run a similar descriptive and exploratory analysis of the investment data as well. We look at FDI inflows and FDI outflows. Figure 11 and 12 presents the evolution of FDI inflows and outflows, respectively, for all six countries. Contrary to the trade variables, investment flows are

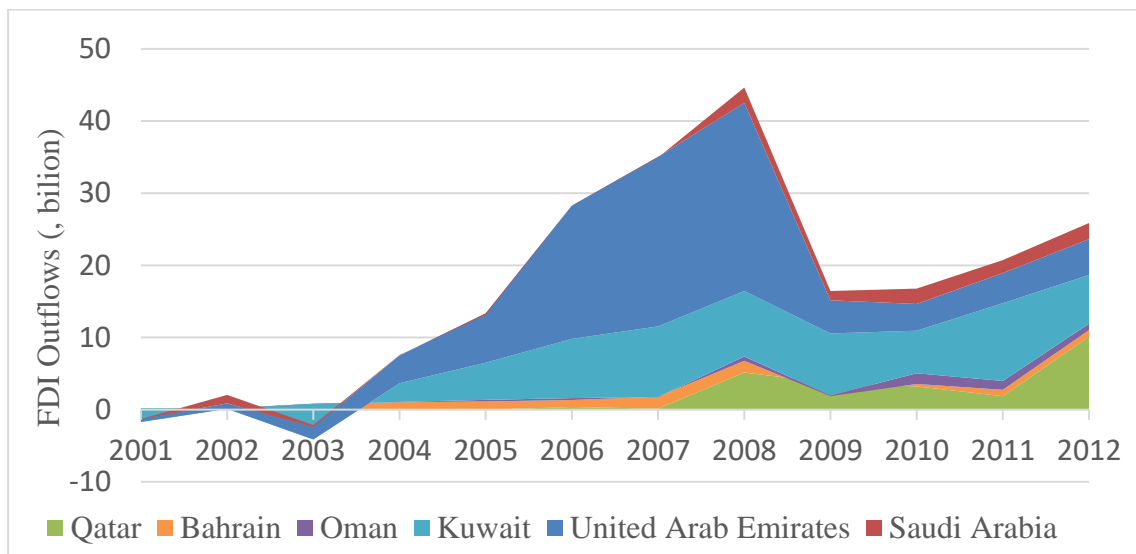
much more volatile and have smaller values. On average GCC countries attract \$13 billion of foreign investment annually and invest about \$21 billion in other countries. Similarly to trade, CGC countries are surplus investors in the sense that they invest more in other countries than the rest of the world invests back in their economies. Again, there is great heterogeneity among Gulf countries when it comes to investment. UAE and Saudi Arabia are the largest recipients of FDI but UAE, Kuwait, and, to some extent, Qatar are the largest investors in the rest of the world.

**Figure 12: FDI inflows into the GCC over time**





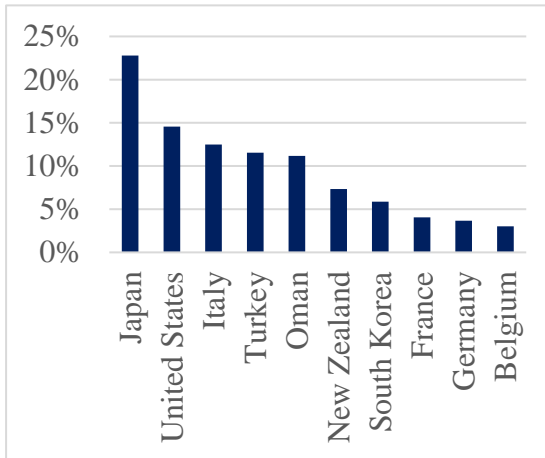
**Figure 13: FDI outflows from the GCC over time**



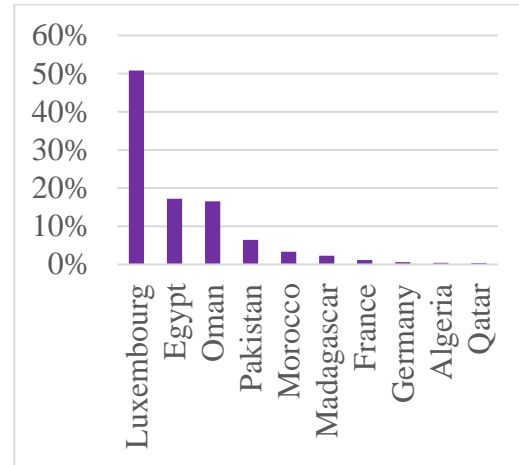
We also analyze the origin and destination countries for FDI flows into GCC countries. There is a heterogeneous group of countries investing in GCC countries and GCC countries also invest in many countries of the world. Unlike trade, we see that there is intra-GCC investment. Many Gulf countries appear in the top 10 list of origin and destination countries of other Gulf countries.

**Figure 14 : Top 10 origin and destination of Bahrain’s FDI over 2001-2012**

(a). Top 10 origin of inflows

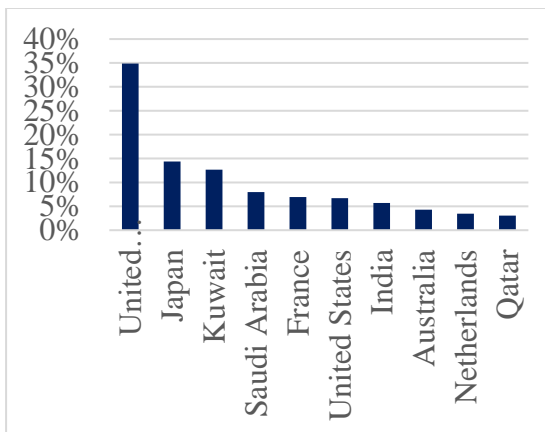


(b). Top 10 destination of outflows

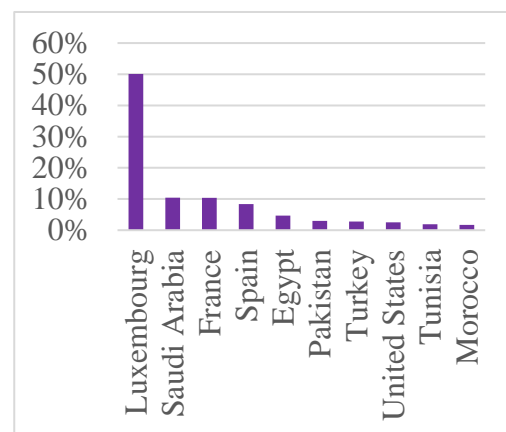


**Figure 15: Top 10 origin and destination of UAE’s FDI over 2001-2012**

(a). Top 10 origin of inflows

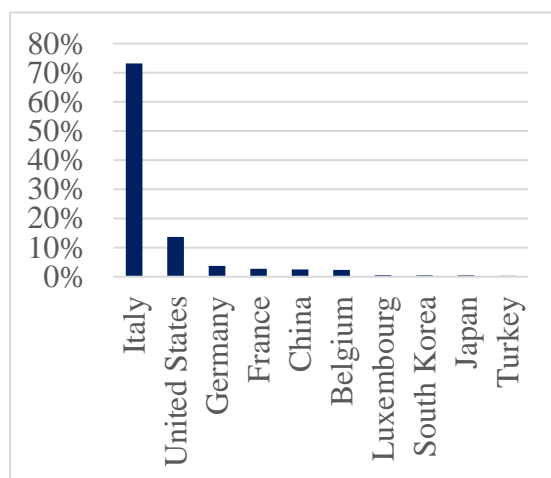


(b). Top 10 destination of outflows

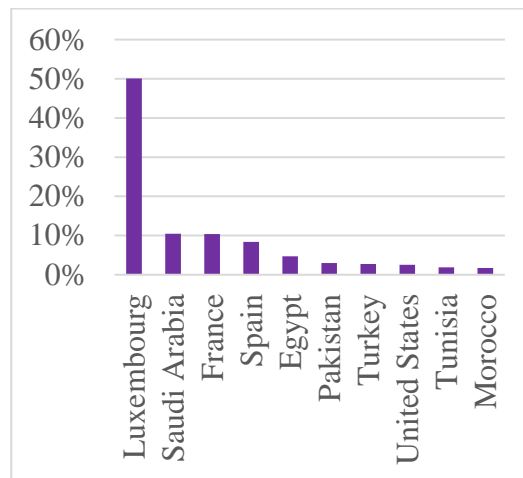


**Figure 16: Top 10 origin and destination of Kuwait's FDI over 2001-2012**

(a). Top 10 origin of inflows

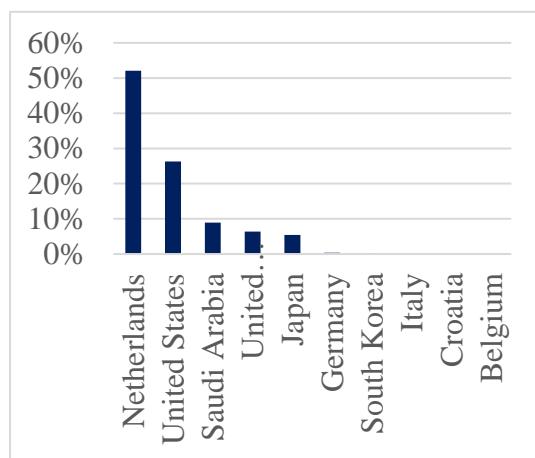


(b). Top 10 destination of outflows

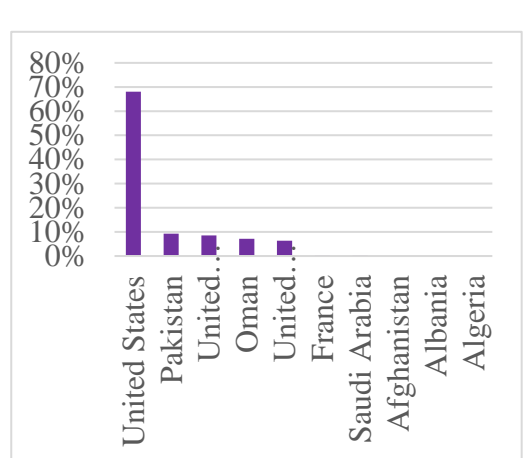


**Figure 17: Top 10 origin and destination of Qatar's FDI over 2001-2012**

(a). Top 10 origin of inflows

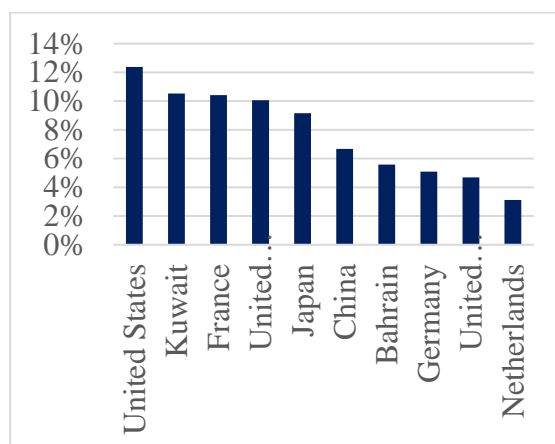


(b). Top 10 destination of outflows

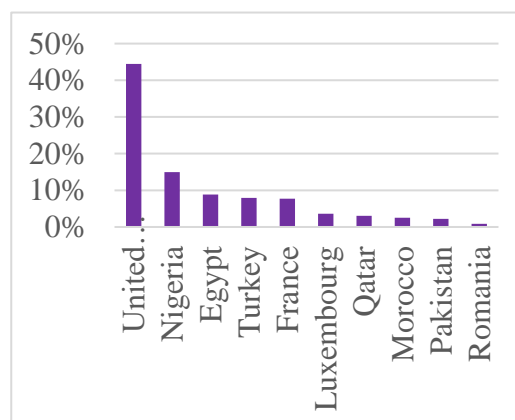


**Figure 18: Top 10 origin and destination of Saudi Arabia's FDI over 2001-2012**

(a). Top 10 origin of inflows

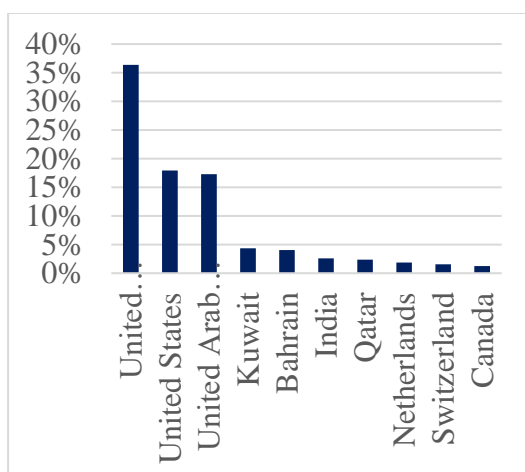


(b). Top 10 destination of outflows

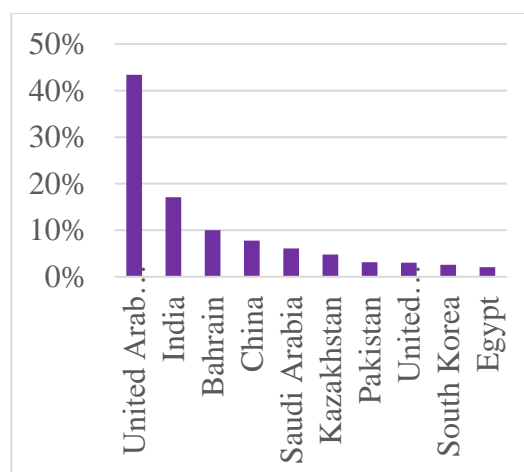


**Figure 19: Top 10 origin and destination of Oman's FDI over 2001-2012**

(a). Top 10 origin of inflows



(b). Top 10 destination of outflows



### 4.2.3 Summary statistics on other variables

Finally, table 1 shows basic descriptive statistics on the variables used in the models.

The statistics are computed on the pooled sample of country pairs and years. The main information from this table is that there is sufficient variability in the data to allow an econometric estimation of the models.

**Table 1: Summary statistics for the variables used in the models**

Variable	Mean	Std. Dev.	Min	Max
Total trade value (, million)	599	3110	0	67800
Log total trade value	12.7	7.53	0	24.94
Imports (, million)	226	1100	0	31900
Log import	10.82	7.89	0	24.19
Export (, million)	373	2310	0	50100
Log export	11.07	7.73	0	24.64
Trade agriculture (, million)	31	131	0	4340
Log trade agriculture	9.37	7.42	0	22.19
Import agriculture (, million)	24.4	105	0	2570
Log import agriculture	8.24	7.57	0	21.67
Export agriculture (, million)	6.63	59	0	3830
Log export agriculture	5.86	6.78	0	22.07
Trade manufacture (, million)	568	3050	0	67100
Log trade manufacture	12.31	7.64	0	24.93
Import manufacture (, million)	201	1040	0	29900
Log import manufacture	10.13	7.96	0	24.12
Export manufacture (, million)	367	2300	0	50100
Log export manufacture	10.88	7.77	0	24.64
FDI inflows (, million)	23.31	283.45	0	10438.7
Log FDI inflows	0.17	0.95	0	9.25
FDI outflows (, million)	16.16	617.84	0	66966
Log FDI outflows	0.16	0.81	0	11.11

**Table 1 (cont.): Summary statistics for the variables used in the models**

Variable	Mean	Std. Dev.	Min	Max
Free Trade Agreement	0.09	0.28	0	1
Distance between capital cities	6.08	3.84	0.13	16.07
Contiguity	0.02	0.13	0	1
Same legal origin country	0.37	0.48	0	1
Common language	0.13	0.34	0	1
Common religion	0.23	0.34	0	0.99
Origin country inflation	0.03	0.03	-0.05	0.14
Origin country log GDP capita	10.13	0.62	9.06	11.44
Origin country institution	-8.42	1.28	-10	-5
Destination country inflation	0.07	0.19	-0.44	5.5
Destination country log GDP per capita	8.09	1.64	4.68	11.64
Destination country institution	4.14	6.08	-10	10

## **Chapter V: Econometric Results, Interpretations, and Discussions**

In this chapter, we present and discuss the econometric results. We start the analysis by examining how inflows and outflows of foreign direct investment into and out of GCC countries affects the total trade pattern as measured by the total value of imports plus the total value of exports for all products. We then disgregate all results by distinguishing imports and exports. The baseline models are estimated using OLS. We further address various empirical challenges using panel data regression, including fixed and random effect regressions and the presence of zeros in trade.

### **5.1 Baseline regressions using Ordinary Least Squares**

Table 2 presents the regression results of equation (3) using OLS. These results are our baseline results, and in the subsequent analysis, some of the empirical challenges will be addressed that might compromise the quality of these estimations.

Nonetheless, there are a number of interesting observations to note from the table.

The first observation is the quality of the fit of the models. The models fit the data particularly well, as we expected from the gravity models. The variables included in the analysis together explain between 31% and 39% of the variation in trade flows.

These values are relatively large in a pooled panel setting. Also across all models, most of our right-hand side variables are statistically significant and have the expected sign.

In the first two columns, the dependent variable is the log of total trade defined as the sum of exports and imports. The next two columns concern imports and the last two columns concern exports. For each model, we present the results for both FDI inflows and FDI outflows separately. We find that both FDI inflows and FDI outflows

are positively correlated with the total value of trade. These results suggest that an increase in the inflows of foreign investment in GCC countries from another country is associated with a substantial increase in the flow of goods between the two pairs of countries. The point estimates suggest that a 10% increase in FDI inflows to Gulf countries translates into a 7.1% increase in total trade which is the result of 7.8% increase in imports (column 3) and 8.2% increase in exports (column 5). Similarly, an increase in the investment by GCC nationals in another country translates into more trade in goods. A 10% increase in FDI outflows results in a 5.5% increase in total trade that comes from a 7% increase imports and a 6.3% increase in exports. Overall, our benchmark results using OLS document positive and statistically significant correlations between FDI inflows and outflows with imports to and exports from Gulf countries.

While not necessary the focus our study, we should note that many other factors besides FDI affect trade. These control variables in most cases have the sign we expect from the conceptual framework. However, in some cases, the signs are counter-intuitive and reveal something specific to GCC countries that might be different from a more general model for all countries. For instance, across all models, we find that the GDP per capita of the destination countries, which serves as a proxy for purchasing power, has a positive effect on trade. This result is consistent with the general finding from trade using gravity models. However, unlike the previous study, we find that GDP per capita in the origin countries, here the Gulf countries, is negatively correlated with trade. This result is counter-intuitive given the previous findings in the literature. One possible explanation is that for GCC countries, what



appears to matter the most is the economic power of the partner countries and the GDP in original countries only attenuates this effect.

Other significant coefficients involve economic variables related to inflation. Not surprisingly, higher inflation in the Gulf countries leads to more imports from the rest of the world. However, we also find that high inflation in the destination countries is consistently associated with higher trade, both imports and exports. The positive association between the destination country's inflation and imports seems straightforward to understand because it means exported goods might be relatively cheaper. However, the positive correlation between inflation and exports is counter-intuitive.

The quality of institutions, both in domestic and destination countries appears to be also a key determinant of trade. Across all the models, the variables used as a proxy institution is positive and statistically significant. As the quality of strong and better institution emerge in Arab countries, particularly the introduction parliamentary institutions, they increasingly trade with the rest of world by import and exporting more. Also, when in partner countries, institutions improved, trade is facilitated and this result in higher import and export.

**Table 2: OLS regressions of the impact of FDI on trade in GCC countries**

Variables	(1) Total Trade	(2) Total Trade	(3) Import	(4) Import	(5) Export	(6) Export
Log FDI inflows	<b>0.713***</b> (0.045)		<b>0.767***</b> (0.052)		<b>0.819***</b> (0.061)	
Log FDI outflows		<b>0.553***</b> (0.085)		<b>0.695***</b> (0.097)		<b>0.630***</b> (0.090)
Inflation origin	1.511 (2.400)	2.358 (2.409)	5.542** (2.627)	6.467** (2.634)	-0.744 (2.617)	0.226 (2.632)
GDP per capita origin	-0.166 (0.109)	-0.348*** (0.108)	-0.273** (0.119)	-0.471*** (0.117)	0.010 (0.118)	-0.199* (0.117)
Institution origin	-0.325*** (0.041)	-0.390*** (0.041)	-0.324*** (0.043)	-0.395*** (0.043)	-0.358*** (0.046)	0.433*** (0.046)
Inflation Destination	0.872*** (0.206)	0.862*** (0.207)	1.097*** (0.227)	1.086*** (0.226)	0.706*** (0.243)	0.695*** (0.244)
GDP per capita Destination	1.292*** (0.043)	1.339*** (0.042)	1.779*** (0.044)	1.826*** (0.043)	1.092*** (0.045)	1.146*** (0.045)
Institution Destination	0.105*** (0.014)	0.103*** (0.014)	0.127*** (0.014)	0.125*** (0.014)	0.084*** (0.014)	0.082*** (0.015)
Free Trade Agreement	2.473*** (0.301)	2.314*** (0.308)	3.569*** (0.334)	3.343*** (0.341)	2.634*** (0.324)	2.455*** (0.330)
Distance between Capitals	-0.241*** (0.015)	-0.242*** (0.015)	-0.246*** (0.016)	-0.247*** (0.016)	-0.299*** (0.017)	0.301*** (0.017)
Contiguity	-0.268 (0.401)	0.284 (0.390)	-1.125** (0.531)	-0.563 (0.531)	-1.841*** (0.559)	-1.205** (0.550)
Same legal origin	-0.446*** (0.118)	-0.405*** (0.118)	-0.901*** (0.124)	-0.856*** (0.124)	-0.126 (0.125)	-0.078 (0.126)
Common Langage	-1.189*** (0.295)	-1.058*** (0.297)	-1.482*** (0.313)	-1.311*** (0.314)	-1.124*** (0.316)	0.975*** (0.318)
Common Religion	2.592*** (0.245)	2.426*** (0.246)	1.291*** (0.274)	1.079*** (0.275)	3.254*** (0.260)	3.065*** (0.262)
Observations	12,660	12,660	12,660	12,660	12,660	12,660
R-Squared	0.392	0.388	0.380	0.377	0.313	0.309

All regressions include a constant term. Robust standard errors in parentheses\*\*\* p<0.01, \*\*

p<0.05, \* p<0.1

The other set of explanatory variables we include in the models relate to trade costs. One particularly interesting result is the positive effect of free trade agreements (FTA) on trade. For all models, the existence of an FTA between a Gulf country and its partner country results in substantially higher imports and exports, and consequently total trade. This finding is consistent with trade theories that predict that FTAs, by removing tariffs and other quantitative restrictions and by providing preferential access to a market, lead to increased movement of goods and services (Martínez-Zarzoso, Felicitas, and Horsewood, 2009).

We also, not surprisingly, find that distance between countries is a significant barrier to trade (Buch, Kleinert, and Toubal, 2004; Disdier and Head, 2008). Distance is the most straightforward measure of trade costs. Our results show that the value of goods exchanged is negatively correlated with the distance between trading partners. A vast literature supports this result on trade. Despite substantial progress in transportation technologies and shipment, distance continues to be a hindering factor of trade (Bougheas, Demetriades, and Morgenroth, 1999; Limao and Venables, 2001; Clark, Dollar, and Micco, 2004). While distance reduces trade, contiguity or sharing a border in the specific context of Gulf countries does not increase trade. This reflects the preliminary results of the descriptive analysis that there are little intra-GCC trade

Another important determinant of trade is religion. We find in our analysis that when two countries have a common religion, in the sense that the majority of the population in both countries practice the same religious faith, the more they trade. In our specific context, the result means that everything else being equal, GCC countries tend to trade more with countries that have a majority Muslim population. This finding is a bit attenuated by the common language variable. In fact, all GCC

countries have Arabic as the main language, and most countries in the world with large Muslim populations have Arab as the main language. Thus, the negative effect of the variable common language, which clear implies Arabic as the main language, reduces the positive effect that the variable religion has on trade.

## **5.2 Accounting for unobserved heterogeneity via fixed effects**

The previous analysis focuses on the OLS results. As we discussed in the methodology section, OLS coefficients can be biased in the presence of country-pair unobserved heterogeneity. We address this issue using panel methods. We estimate both the fixed effect and random effect and use a Hausman test to choose the most efficient models. Across all specifications, the Hausman test favors the fixed effect over the random effect model. Thus, we only discuss the results of the former model and show the later in the appendix.

Table 4 presents the regression results of equation (3) using fixed effect regression. The first two columns concern total trade, the next two columns concern imports, and the last two columns concern exports. As before, we present model results for FDI inflows and FDI outflows separately. Qualitatively, the results of the fixed effect regressions are similar to the benchmark results using OLS. Like before, we find a positive effect of FDI inflows and FDI outflows on both imports and exports. However, after controlling for country-pair fixed effects and year fixed effects, the magnitude of the impacts of FDI on trade drops substantially, confirming the bias in the OLS results. The point estimates now suggest that a 10% increase in FDI inflows to Gulf countries translates into 1.1% increase in total trade, which is the result of a 1.1% increase in imports and exports. Similarly, a 10% increase in FDI

outflows results in a 1.1 % increase in total trade that comes primarily from a 1.5% increase in imports and a 0.6% increase in exports.

A natural consequence of the fixed effect regression is that the all time-invariant variables are complete absorbed into the fixed effects and so they are dropped from the regression tables. Thus, we cannot comment on their effects.

However, other time-variant variables included in the models are analyzed. Most of these variables preserve the effects as discussed in the previous section.

**Table 3: Fixed effects regressions of the impact of FDI on trade in GCC countries**

Variables	(1) Total Trade	(2) Total Trade	(3) Import	(4) Import	(5) Export	(6) Export
Log FDI inflows	<b>0.109***</b> (0.030)		<b>0.104***</b> (0.039)		<b>0.118**</b> (0.055)	
Log FDI outflows		<b>0.104*</b> (0.055)		<b>0.148*</b> (0.081)		<b>0.065</b> (0.067)
Inflation Origin	8.644*** (1.470)	-8.511*** (1.474)	-2.691 (2.030)	-2.538 (2.027)	-13.512*** (1.803)	-13.392*** (1.811)
GDP per capita Origin	0.577 (0.380)	0.559 (0.378)	-1.020** (0.396)	-1.028*** (0.395)	0.932** (0.407)	0.903** (0.410)
Institution Origin	0.050 (0.091)	0.046 (0.091)	-0.006 (0.084)	-0.009 (0.084)	-0.027 (0.103)	-0.033 (0.103)
Inflation Destination	0.518** (0.236)	0.518** (0.237)	0.731** (0.288)	0.732** (0.288)	0.950*** (0.302)	0.947*** (0.303)
GDP per capita Destination	0.482* (0.258)	0.471* (0.258)	0.355 (0.291)	0.349 (0.291)	1.130*** (0.292)	1.114*** (0.292)
Institution Destination	-0.040 (0.033)	-0.041 (0.033)	-0.068** (0.032)	-0.069** (0.032)	-0.053 (0.037)	-0.054 (0.037)
Free Trade Agreement	1.097*** (0.298)	1.041*** (0.279)	1.733*** (0.423)	1.686*** (0.402)	1.039*** (0.322)	0.972*** (0.302)
Observations	12,660	12,660	12,660	12,660	12,660	12,660
Number of Panels	984	984	984	984	984	984
R-Squared	0.549	0.548	0.446	0.446	0.424	0.424

Robust standard errors in parentheses\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

### **5.3 Agricultural versus nonagricultural trade**

We have shown the FDI flows between GCC countries and the rest of the world play an important role in affecting trade flows. In this section, we are looking at the heterogeneity of this effect across types of trade. We specifically assess the effect of FDI flows on agricultural and non-agricultural trade. For this analysis, we only use fixed effect regressions, which are the preferred estimation methods, and the results are presented in table 4. The format of table 4 is identical to tables 2 and 3. Overall, we find that the positive effects of FDI on total imports and exports remain when we look at agricultural and non-agricultural trade. Comparing the effect across type of trade, we find statistically significant differences between agricultural and non-agricultural trade for FDI outflows on import and FDI inflow on export.

**Table 4: FDI, Import, Export: Agriculture versus Non-agricultural**

Variables	(1) Agricultural Import	(2) Non agricultural Import	(3) Agricultural Import	(4) Non agricultural Import	(5) Agricultural Export	(6) Non agricultural Export	(7) Agricultural Export	(8) Non agricultural Export
Log FDI inflows	0.113*** (0.036)	0.126*** (0.039)			0.169*** (0.059)	0.127** (0.055)		
Log FDI outflows			0.180** (0.080)	0.167** (0.080)			0.100 (0.064)	0.076 (0.067)
Observations	12,660	12,660	12,660	12,660	12,660	12,660	12,660	12,660
R-Squared	0.337	0.411	0.338	0.411	0.206	0.414	0.205	0.413
Number of Panels	984	984	984	984	984	984	984	984

Agricultural trade concern all products in the chapters 1 to 24 is the World Trade Organization's Harmonized System of product classification 1996. Non-Agricultural trade regroups all the products in the chapters 24 to 99. All regressions include the same set of control variables as in previous tables and year fixed effects. Robust standard errors in parentheses\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

#### 5.4 Robustness: addressing the presence of zeros

One of the challenges faced in the analysis is the presence of zeros due to the censored nature of trade variables. In this sub-section, we present results from tobit regression that attempts to address the problem of zeros (Table 5). We present only a version of the main models. Tobit regression results are similar to the OLS and fixed effects regression. These results suggest that accounting for the presence of zeros using tobit regressions confirm the findings that FDI inflows to and outflows from Gulf countries increase they import and export.

**Table 5: Tobit regressions of the impact of FDI on trade in GCC countries**

Variables	(1) Total Trade	(2) Total Trade	(3) Import	(4) Import	(5) Export	(6) Export
Log FDI inflows	0.65*** (0.017)		0.70*** (0.022)		0.79*** (0.022)	
Log FDI outflows		0.50*** (0.019)		0.685*** (0.026)		0.585*** (0.024)
Observations	12,660	12,660	12,660	12,660	12,660	12,660

All regressions include the same set of control variables as in previous tables and year fixed effects. Robust standard errors in parentheses\*\*\* p<0.01, \*\* p<0.05, \* p<0.1



## **Chapter VI: Concluding Remarks and Implications**

### **6.1 Summary of findings**

This thesis evaluates the impacts of Foreign Direct Investment (FDI) flows on trade of Gulf Cooperation Council countries (GCC). The study is motivated by the observation that the world has become a global village in which countries interact in various forms. Over the years, the physical flows of goods and people across countries have drastically increased. At the same time, the world has become more integrated financially with massive flows of capital in forms of foreign investment across countries.

Gulf countries are no exceptions to these changes in the world. In fact, they offer an interesting case to study the relationship between FDI and trade. GCC countries are well integrated into world trade and sell mostly oil and natural gas products thanks to their massive natural reserves. The structure of these economies and their reliance on oil and nature gas force them to depend largely on the rest of the world for imports of many goods. The descriptive analyses show the top destination countries for exports to and origin countries for imports. The analysis from this study helps to understand how their investment strategies translate into their trade with the rest of the world.

Data on trade, imports and exports, and FDI inflows and outflows were gathered from various sources. Information on other factors affecting trade that serve as control variables in the analysis were also collected. The empirical analysis starts with an Ordinary Least Square regression analysis. The results suggest that FDI inflows substantially increase both imports to and exports from Gulf countries. Similarly an increase in investment by GCC national abroad results in higher imports

to and exports from GCC countries. The magnitude of the impacts decrease when the empirical model accounts for unobserved heterogeneity via fixed effects regression. However, qualitatively the results are robust across estimation methods. The results also remain unchanged when the analysis is disaggregated across agricultural and non-agricultural products.

## **6.2 Implications**

The study sheds light on the determinants of trade flows between Gulf countries and the rest of the world. The preliminary analysis highlights the low intra-GCC trade. At the same time, the results show that investments into GCC countries and by Gulf nationals are both associated with higher imports and exports. These findings provide a better understanding of the trade-investment nexus, and shed light on the underlying motives of investment by Gulf countries. An implication of the study is that inflows and outflows of investment serve effectively as strategic options for Gulf countries to both promote their exports while securing their supply in consumer and capital goods. However, a suggestion from the study is that GCC countries need to intensify regional trade and intra-GCC investment in order to achieve the goals set out by the union and promote the desired shared prosperity while reducing the dependence toward to the rest of the world.

## **6.3 Limitations and further research**

Despite our efforts, there are a number of limitations to this study that need highlighting. While these limitations do not necessarily weaken the findings, they provide avenues for future research. The main limitation of this study is data related. In fact, the study is largely constrained by the available data on investment which

covers only the period 2001-2012. While the trade data cover a longer period, valuable information on trade is left out in order to run the econometric analysis. This forces the study to limit itself to shorter impacts of FDI on trade. It will be interesting in the future study when the data permit to analyze the long-run relationship between FDI and trade in Gulf countries using cointegration techniques. Another limitation of the study concerns the aggregated nature of the data. It would be interesting to analysis the differential impact of various types of FDI on trade and disaggregate FDI's impact by product type. While there some data on FDI in specific sectors, such as land and energy, the number of observations is too small to permit meaning econometric analysis.

## Appendix

**Table 6: Random effects regressions of the impact of FDI on trade in GCC countries**

Variables	(1) Total Trade	(2) Total Trade	(3) Import	(4) Import	(5) Export	(6) Export
Log FDI inflows	<b>0.168***</b> (0.033)		<b>0.181***</b> (0.041)		<b>0.180***</b> (0.057)	
Log FDI outflows		<b>0.148**</b> (0.062)		<b>0.215**</b> (0.085)		<b>0.116</b> (0.074)
Inflation Origin	-7.68*** (1.498)	-7.49*** (1.503)	-2.689 (2.053)	-2.432 (2.051)	-12.185*** (1.826)	-12.017*** (1.837)
GDP per capita Origin	0.306 (0.262)	0.275 (0.262)	-0.670** (0.279)	-0.705** (0.279)	0.552** (0.269)	0.516* (0.272)
Institution Origin	-0.061 (0.081)	-0.069 (0.081)	-0.112 (0.078)	-0.120 (0.078)	-0.141 (0.090)	-0.149* (0.091)
Inflation Destination	0.669*** (0.218)	0.670*** (0.219)	0.963*** (0.277)	0.965*** (0.278)	0.952*** (0.269)	0.954*** (0.271)
GDP per capita Destination	1.227*** (0.110)	1.227*** (0.111)	1.594*** (0.116)	1.592*** (0.117)	1.261*** (0.118)	1.266*** (0.118)
Institution Destination	0.011 (0.028)	0.009 (0.028)	0.004 (0.027)	0.002 (0.026)	-0.008 (0.030)	-0.009 (0.030)
Free Trade Agreement	2.073*** (0.571)	2.027*** (0.567)	3.153*** (0.656)	3.084*** (0.650)	1.847*** (0.613)	1.810*** (0.609)
Distance between Capitals	-0.23*** (0.043)	-0.23*** (0.043)	-0.23*** (0.048)	-0.23*** (0.048)	-0.28*** (0.047)	-0.288*** (0.047)
Contiguity	0.282 (0.937)	0.420 (0.941)	-0.602 (1.221)	-0.473 (1.249)	-1.439 (1.233)	-1.283 (1.220)
Same legal origin	-0.483 (0.352)	-0.477 (0.353)	-0.929** (0.374)	-0.922** (0.375)	-0.114 (0.364)	-0.107 (0.365)
Common Language	-1.060 (0.686)	-1.015 (0.684)	-1.253* (0.735)	-1.193 (0.732)	-0.963 (0.695)	-0.924 (0.694)
Common Religion	1.785*** (0.669)	1.716** (0.667)	0.026 (0.758)	-0.065 (0.753)	2.877*** (0.692)	2.822*** (0.691)
Constant	-11.7*** (2.872)	-11.5*** (2.876)	-5.04* (3.061)	-4.73 (3.058)	-15.03*** (2.984)	-14.78*** (3.005)
Observations	12,660	12,660	12,660	12,660	12,660	12,660
Number of Panels	984	984	984	984	984	984
R-Squared	0.55	0.55	0.44	0.44	0.42	0.42

Robust standard errors in parentheses\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

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## Vita

# SATTAM FALEH ALMODARRA

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### EDUCATION

Master of Science in Applied Economics July 2013  
Washington State University, Pullman WA

Master of Science in Agricultural Economics May 2007  
King Saud University, Saudi Arabia

Bachelors in Agriculture Science Feb 2003  
King Saud University, Saudi Arabia

### PROFESSIONAL EXPERIENCE

Teaching Agricultural Economics courses from April'06 – Dec'07. Department of Agricultural Economics, King Saud University, Saudi Arabia.

Lecturer Agricultural Economics courses from August'13 - until Now. Department of Agricultural Economics, King Saud University, Saudi Arabia.

### RESEARCH EXPERIENCE AND PUBLICATIONS

“Investment for Trade: Impact of Foreign Direct Investment from Gulf Cooperation Council countries on Trade”, MSc Thesis at the University of Kentucky

“Climate change effects on tomatoes production: a panel data analysis for Gulf Cooperation Council countries” University of Kentucky Working Paper

“Measuring the Competitiveness of Saudi Arabia’s Fruit Date Exports” with Sayed Saghalian, Paper Presented at the 2016 Southern Agricultural Economics Association Annual Meeting, San Antonio, Texas, February 6-9, 2016

“Economic Factors Affecting Variations of Faculty Members’ Salaries: A study from the College of Agriculture at the University of Kentucky” University of Kentucky Working Paper

“Estimation of virtual water for current and target Saudi exports for dates” with Mohamed H. Al-Qunaibet and Adel M. Ghanem, Life

Science Journal 2014 11(12)

“Examining the Factors Affecting Variations of WSU Faculty Members’ Salaries” MSc Thesis at Washington State University, Pullman WA

“Inflation Impact on Agricultural Sector in the Kingdom of Saudi Arabia” MSc Thesis at King Saud University, Saudi Arabia.

#### PRESENTATIONS AT CONFERENCES

Southern Agricultural Economics Association meeting in San Antonio, TX

Paper Presented: “Measuring the Competitiveness of Saudi Arabia’s Fruit Date Exports”

#### TECHNICAL SKILLS

- Microsoft office : Word, Excel, PowerPoint
- Statistical Packages: SAS, Stata, SPSS.
- Database: SQL, Ms Access.
- Tools: MS Office.

#### LANGUAGE

English (Fluent) Arabic (Native Speaker)

Science Journal 2014 11(12)

“Examining the Factors Affecting Variations of WSU Faculty Members’ Salaries” MSc Thesis at Washington State University, Pullman WA

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#### LANGUAGE

English (Fluent) Arabic (Native Speaker)