



International trade and competitiveness in the Mediterranean region

Presented by
MARIA DOLORES PARRA ROBLES

Supervisors:
INMACULADA MARTINEZ-ZARZOSO
CELESTINO SUÁREZ BURGNET

A dissertation submitted to the Economic Department Universitat Jaume I, for the
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Castellón – July 2014

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الي ابي رحمه الله
الي امي
الي اخواني

A mis padres,
A mis hermanos.

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List of abbreviations and notations (English)

AA	Association Agreement
ATE	Average Treatment Effect
CIF	Cost, Insurance and Freight
DB-WR	Doing Bussines World Bank Ranking
EFTA	European Free Trade Association
EU	European Union
FOB	Free on Board
FTA	Free Trade Agreement
GAFTA	Great Arab Free Trade Agreement
GCC	Gulf Cooperation Council
GDP	Gross Domestic Product
GMM	Generalized Method of Moments
IC	Investment Climate
ICA	Investment Climate Assesment World Bank
IFS	International Financial Statistics
ISIC	International Standard Industrial Classification
MENA	Middle East and North African Countries
MFA	Multi-Fiber Agreement
MLE	Maximum Likelihood Estimation
NN	North-North
NS	North-South
NS FTA	North-South Free Trade Agreement
OLS	Ordinary Least Squared
PTA	Preferential Trade Agreement
QIZ	Qualifying Industrial Zones
Roo	Rules of Origin
SITC	Standard International Trade Classification
SMC	South Mediterranean Countries
SS	South-South
SS FTA	South-South Free Trade Agreement
TFA	Total Factor Productivity
USA	United States of America
WBES	World Business Environment Survey
WBES	World Bank Enterprise Survey

List of abbreviations and notations (Spanish)

PLT	Productividad Total de los Factores
TLC	Tratados de Libre Comercio

Introducción

El comercio ha estado presente desde el inicio de las primeras sociedades, desde que el hombre realizara sus primeros intercambios en las sociedades pre-históricas, pasando por fenicios, griegos, romanos y llegando a nuestros días. Hoy en día, estos intercambios se han convertido en algo más complejo, donde entender el mundo actual sin hablar de comercio internacional sería un trabajo complicado. Desde Adam Smith con la teoría de la ventaja absoluta, el estudio y análisis del comercio internacional en la economía global ha sido un tema central de investigación para los economistas. Muchos han sido los autores encargados de analizar sus efectos, sus beneficios y sus consecuencias tanto positivas como negativas de una mayor integración de la economía mundial. La mayoría de estos autores coinciden en que el incremento del comercio internacional puede ayudar a la mejora de la productividad de las empresas y por tanto a incrementar el crecimiento económico de los países. Estas mejoras de productividad, se debe principalmente a que las empresas que están presentes en otros mercados internacionales están expuestas a una mayor competencia, lo que las incentiva a ser más competitivas para seguir dentro del mercado. Otro argumento, viene de la mano de la presencia de economías de escala, ya que al aumentar el tamaño del mercado de las empresas, estas pueden especializarse y expandir su producción reduciendo así sus costes unitarios. Igualmente, el hecho de que las empresas estén presentes en otros mercados internacionales, da pie a que tengan acceso a nuevas tecnologías o nuevas formas o ideas de producción que pueden mejorar la competitividad de sus empresas. A pesar de que la liberalización comercial puede resultar positiva para los países, resulta necesario que dicha liberalización comercial se acompañe de una serie de reformas u acciones adicionales de carácter económico, político y/o social para que dicho proceso de liberalización de buenos resultados, especialmente para los países en vías de desarrollo.

Así pues entender como la liberalización comercial puede ayudar a la integración de los países en vías de desarrollo dentro de la economía mundial resulta de especial interés. Igualmente resulta necesario conocer como estas actividades están relacionadas y sobre todo analizar otra serie de obstáculos que estén limitando la competitividad de las

empresas, con el fin de llevar a cabo reformas que junto con el proceso de liberalización fomenten una mayor integración comercial.

El importante papel que el Mediterráneo ha tenido en la construcción del capitalismo europeo fue ya señalado en la obra de Braudel (1949) o en López (1962). Desde la antigüedad, los pueblos rodeados por el Mediterráneo han comerciado de forma intensa, desde los fenicios quienes fueron los primeros en expandir el comercio a lo largo del Mediterráneo, los griegos quienes lo organizaron de forma que el pueblo se pudiese beneficiar de dichos intercambios o los romanos con la aparición del primer derecho comercial hasta nuestros días, donde el Mediterráneo aparece como un región clave tanto desde un punto de vista comercial o económico como de estabilidad política internacional. La región mediterránea está compuesta por tres esferas diferentes, la región compuesta por los países del Sur de Europa, la región del Norte de África y región de Oriente Próximo. Nuestro interés se centra en estas últimas dos regiones, quienes cuentan en la actualidad con más de 300 millones de personas y tienen un verdadero potencial de crecimiento, especialmente desde los últimos acontecimientos políticos a finales de 2010 con el inicio de la primavera árabe en Túnez, seguida por Egipto, Libia y pasando por Siria o Líbano. Además de ser regiones estratégicas por su situación con Europa o Turquía y como nexo de unión entre África, Asia y Europa.

El objetivo de esta tesis doctoral, es por tanto analizar el impacto que ha tenido el proceso de liberalización llevado a cabo por los países del Norte de África y Oriente Próximo sobre su comercio internacional, analizar cómo dicha participación en los mercados internacionales fomenta doblemente las actividades de exportación e importación de las empresas y finalmente analizar aquellos obstáculos que están afectando al crecimiento y competitividad de las empresas de la región, análisis necesario para definir políticas más efectivas.

En el primer capítulo se analiza el impacto de los Tratados de Libre Comercio (TLC) celebrados por Oriente Próximo y los países del Norte de África durante el período 1994-2010 con el resto del mundo y el impacto que dicha liberalización ha tenido sobre sus exportaciones e importaciones. El análisis distingue entre el comercio agrícola e industrial para tener en cuenta los diferentes programas de liberalización, ya que a pesar de que principalmente la mayoría de estos acuerdos de liberalización contemplan la

liberalización de productos industriales, en algunos casos los acuerdos incluyen también productos agrícolas. Para llevar a cabo dicho análisis se utiliza un modelo de gravedad aumentado, utilizando las últimas técnicas econométricas de datos de panel, con el fin de controlar por aquellos factores bilaterales que no cambian con el tiempo y que influyen en el comercio bilateral y se controla igualmente por la resistencia multilateral. También se tiene en cuenta la endogeneidad de los acuerdos y la presencia de ceros en los datos de comercio. Después de llevar a cabo dicho análisis, los principales resultados indican que tanto los acuerdos de liberalización llevados a cabo entre países del Sur como entre países Norte-Sur, tienen un impacto similar a la hora de incrementar el comercio bilateral de los países firmantes de dicho acuerdo, mostrando por tanto una mayor integración en el mercado mundial. Además de esto, aquellos TLC que incluyen productos agrícolas, productos sobre los que los países del Sur del Mediterráneo tienen una clara ventaja comparativa, son acuerdos más deseables para estos países que los que sólo incluyen productos industriales. Este punto por tanto debe ser tenido en cuenta a la hora de negociar o renegociar sus futuros acuerdos comerciales.

En el segundo capítulo se analizan la relación entre la actividad importadora y exportadora de las empresas, para ello nos centramos en el caso particular de Egipto debido a que es uno de los países con mayor peso de la región, por su proceso de reforma en el que se ha visto envuelto desde su primavera árabe en 2011 hacia una modernización de su sistema político y por la calidad de los datos disponibles a nivel de empresa para llevar a cabo el análisis. En el estudio se utilizan datos de 554 empresas manufactureras egipcias desde 2003 a 2007. El objetivo es analizar la probabilidad de que las empresas exporten/importen en función de si ya han realizado alguna de estas actividades anteriormente. La literatura muestra, que cuando las empresas realizan una de las dos actividades se genera un beneficio en términos de reducción de los costes hundidos para realizar la otra actividad. Tal y como señalan, Kashara y Lapham (2013), esto se debe a la existencia de costes fijos de entrada a los mercados internacionales y que una vez asumidos con la primera actividad, llevar a cabo la segunda es mucho más fácil. En general los hechos estilizados indican que las empresas que se inician a la actividad exportadora o importadora son más propensas a realizar ambas de forma simultánea. El propósito de nuestra investigación es comprender mejor esta relación en Egipto, que es el país más poblado y económicamente influyente en el Norte de África.

Para el análisis se utiliza un modelo Probit para medir el margen extensivo del comercio de ambas actividades teniendo en cuenta si la empresa exportaba o importaba anteriormente y un modelo Tobit para el margen intensivo. Los principales resultados muestran un alto grado de histéresis en la actividad de importación/exportación del año anterior, donde se muestra que la experiencia del pasado en esa actividad es importante para determinar la continuidad de la misma. Igualmente se obtiene que los costes hundidos a los que las empresas egipcias deben hacer frente para importar son mayores que para exportar sus productos al mercado internacional.

Finalmente en el último capítulo se evalúan los principales obstáculos a los que las empresas egipcias se enfrentan a la hora de hacer negocios en su país y se investiga en qué medida estas restricciones afectan a sus resultados empresariales. Para medir el resultado de las empresas se utiliza la productividad total de factores (PTF), que se obtiene utilizando la metodología de Levinsohn y Petrin (2003). Para el análisis se utilizan datos de las empresas manufactureras egipcias obtenidos de la base de datos Enterprise Survey del Banco Mundial, construyendo un panel desde 2003 a 2009. En el análisis se evalúan los efectos que tienen los diferentes obstáculos sobre la PTF de las empresas y se incluyen un número de variables de control tradicionalmente usadas en la literatura empírica. Para comprobar la robustez de nuestros resultados se utilizan medidas alternativas como variable dependiente, tales como las ventas totales y el número medio de trabajadores. Los principales resultados indican que el acceso y el coste de la financiación, los impuestos, la incertidumbre política, el precio del suelo y las infraestructuras básicas, como el agua y la electricidad, se encuentran entre los factores que afectan de forma negativa a la productividad de las empresas. Estos resultados tienen importantes implicaciones políticas, en particular para decidir qué tipo de acciones específicas se pueden llevar a cabo para reducir los principales obstáculos que están afectando de forma negativa a la competitividad de las empresas egipcias.

Chapter 1

The impact of FTAs on MENA trade in industrial and agricultural products

1.1. Introduction

The reduction in the number of trade barriers through the implementation of trade agreements is a major step towards trade liberalisation and MENA (Middle East and North African) countries have greatly increased their participation in FTAs (Free Trade Agreements) in the last ten years, both in North-South FTAs (NS FTAs) and South-South FTAs (SS FTAs). But have they really helped to improve trade integration in the region? Customs tariffs in MENA countries have been reduced in the last 15 years by about 5 points and the openness ratio has risen from 47% in 2000 to 66% in 2008.¹ Exchanges with the European Union (EU) represent more than 60% of total trade for some MENA countries, but have been losing ground in the last years in favour of new emerging partners. Behar and Cirera (2010) state that only a few empirical papers have recently analysed the impact of NS and SS FTAs in developing countries and more research is needed addressing the real impact of FTAs on developing countries, in particular comparing the effects of NS FTAs and SS FTAs. Developing countries could profit in different ways from each type of agreement. On the one hand, FTAs between southern partners could be a first step towards improving diplomatic relations between potential members, especially between Arab countries, and they could be better positioned in the negotiations on the content of the agreements, which is not the case with North-South agreements. On the other hand, FTAs between northern and southern partners usually incorporate not only trade integration but also laws, institutions, regulations and financial programs that promote deeper integration. Their main disadvantage is southern countries' limited negotiating power in regard to the content of the agreement, which is dictated commonly by northern countries. Behar and Cirera (2010) show that both NS, SS and NN (North-North) agreements increase bilateral trade in developing countries, SS agreements registering larger effects on trade despite developing countries not being natural trading partners.

A number of papers have recently analysed the impact of FTAs on MENA trade flows. Most of the studies cover only the late 1990s and early 2000s; Peridy (2005a, b); Cieslik

¹FEMISE (2011)

and Hagemeyer (2009) and only a few compare different FTAs, including NS FTAs and SS FTAs, Abedini and Peridy (2008) and Cieslik and Hagemeyer (2009). As far as we are aware, no studies have differentiated between industrial and agricultural products in the same analysis. The present study adds new insight along these lines. The main aim of this paper is to analyse the impact on trade flows of a number of FTAs which came into force for ten MENA countries during the period from 1994 to 2010. We estimate the trade effects of five NS FTAs and five SS FTAs² to compare whether agreements with northern partners are more desirable than those with southern partners, or vice versa. We also differentiate between trade in industrial and agricultural products to compare the effects when an FTA includes and does not include agriculture. We compare the average impact of the agreements on trade, differentiating between import and export flows. An augmented gravity model is estimated using up-to-date panel data techniques that allow to control for all bilateral factors that influence bilateral trade and are time-invariant (unobserved heterogeneity), as well as for the so-called multilateral resistance factors (the effect of relative prices with respect to all trading partners). We use the methodology recently proposed by Baier and Bergstrand (2007) to control for the endogeneity of the agreements and for multilateral resistance and we also control for self-selection bias due to the presence of zero trade in our sample.

The main results show that the majority of the FTAs considered increase bilateral trade between the countries involved in the agreement, except for the Euromed agreement, which only improves MENA imports from Europe. We also found that the inclusion of agricultural liberalisation in the agreements could mitigate MENA concessions on industrial import liberalisation.

The rest of the paper is organized as follows. Section 1.2 describes the FTAs analysed in the paper, Section 1.3 revises the related literature, Section 1.4 presents the analytical framework. Section 1.5 specifies the empirical model, describes the data and presents the main results and Section 1.6 concludes.

² North-South FTA are: EUROMED, EFTAMED, USAMED, TUREU, ISRCAN and South-South FTA are: TURMED, GAFTA, AGADIR, ISRMEX and JORS GP.

1.2. Free Trade Agreements in MENA region

The main trading partner for MENA countries, especially for North African Countries, has been Europe, due to its geographical proximity and historical-colonial ties. The integration process between the South Mediterranean countries (SMC) and Europe started in 1969 with the Preferential Trade Agreements (PTAs) that liberalized industrial exports from Algeria, Morocco and Tunisia to EU countries. Within the framework of the “Global Mediterranean Policy”, which started in 1972, bilateral cooperation agreements between the EU and Morocco, Israel, Tunisia, Egypt, Jordan, Lebanon and Syria were signed in 1975. These agreements included non-reciprocal trade preferences liberalizing industrial exports from some MENA countries to Europe.

With the aim of re-launching Euro-Mediterranean integration, the Barcelona Process started in 1995. One of its main goals was to complete a Free Trade Area between the European Union (EU) and each MENA partner involved in the process by 2010³. The main vehicle to reach full liberalisation is the negotiation and enforcement of interim bilateral agreements between each South Mediterranean country and the EU. Within this framework, single interim bilateral agreements have already entered into force for seven countries. Tunisia was the first to sign the agreement in 1998, followed by Morocco and Israel in 2000, Jordan in 2002, Egypt in 2004, Algeria in 2005 and Lebanon in 2006. Syria initiated negotiations in 2008, but they were suspended due to the Arab democratic revolts, while Libya only has observer country status.

In addition to the Euromed Agreement, some MENA countries signed other FTAs with four northern countries that conform the European Free Trade Association (EFTA), namely EFTA countries. The FTA came into force with Turkey in 1992, Israel in 1993, Morocco in 1999, Jordan in 2002, Tunisia in 2005, Lebanon and Egypt in 2007. The coverage of the agreements is similar to the coverage of the Euromed Agreement and includes trade in industrial products, as well as trade in fish and other marine products and processed agriculture and also provisions relating to the elimination of other trade barriers. The agreements’ rules of origin are based on the Euro-Mediterranean model.

³ See Femise (2009), and Montanari (2007) for more details about the regional integration process the in Euro-Mediterranean area.

An additional NS FTA is that signed by Jordan and the USA⁴, which came into force in 2001 with the aim of promoting product and service exports between both countries. Each party shall progressively eliminate its customs duties over a period of ten years. Before this agreement, the two countries had signed an agreement for the creation of Qualifying Industrial Zones (QIZ) in 1998, which allowed products to enter the USA duty-free if 35 per cent of the appraised value was from Israel, Jordan, Egypt, or the West Bank and Gaza⁵. The decision to export under the FTA or QIZ framework depends on the rules of origin of each agreement. A similar FTA was signed by the USA and Morocco⁶, which came into force in 2006 and has a transition period of 18 years for the USA and 25 years for Morocco. The FTA includes trade liberalisation for goods and services. The agreement was signed after the end of the Multi-Fiber Agreement (MFA) on the 1st of January 2005 and was seen by Morocco as an opportunity to diversify its economy. Hufbauer and Brunel (2009) analyse the agreement in detail.

More recently, Turkey has signed a number of FTAs with MENA countries. In particular, an FTA with Israel came into force in 1997, with Tunisia in 2005, with Morocco in 2006 and with Egypt and Syria in 2007. The content of the agreements is also quite similar to the content of the Euromed framework, though with minor differences, one being that each country has different transition periods to complete full liberalisation.⁷ This shift in foreign policy in Turkey shows the new role that Turkey aims to play in Mediterranean relations, starting with ambitious trade integration plans in the region, (Balcer, 2013).

Apart from the bilateral agreements with Turkey, other varieties of South-South integration attempts have failed and efforts on behalf of the MENA countries have not been sufficient to develop successful arrangements⁸. In particular, Arab regional

⁴ See Ruebner (2000),Awad (2011), Rosen (2004) and Nugent and Abdel-Latif (2010) for more detail of the FTA and QIZ between Jordan and US.

⁵ It is worth mentioning that an FTA between Israel and US came into force in 1985, however our period of analysis starts in 1990. Therefore, we cannot estimate the effect of this agreement.

⁶ See Hufbauer and Brunel (2009) chapter 8, and Abdelmalki (2011) for more detail of the FTA between Morocco and US.

⁷ See Table A.1 in the Annex for more details about the liberalisation process of each agreement.

⁸ See Romagnoli, and Mengoni (2009) and FEMISE (2005; 2006; 2008; 2009) for a historical review of the MENA integration.

integration began in the 1950s after the creation of the Arab Common Market and under a number of treaties, conventions and councils⁹, which had no impact and were unable to increase intra-regional trade. For this reason, a new attempt was made in 1964 with the signing of "The Arab Common Market Agreement", which sought to create a free trade area through the establishment of a common external tariff. Once again, this initiative failed to pave the way to further integration in the region, Broude (2009). Other attempts were "The Gulf Cooperation Council (GCC)"¹⁰ in 1981 and "The Arab Maghreb Union"¹¹. It was only in the 1990s, when Arab countries entered a new phase of South-South integration highlighting two relevant agreements, the Great Arab Free Trade Area (GAFTA) and the Agadir Agreement.

The GAFTA agreement was signed in 1997 by 14 Arab countries in order to create a free trade area among its members, with a gradual 10% annual reduction in tariffs and taxes between 1998 and 2007, so they will be totally eliminated in ten years. But with the aim of accelerating integration in the region, the Social Council of the Arab League announced full liberalisation for 2005. This agreement not only included the elimination of tariffs, but also all administrative, quantitative and safety and health barriers, which are not tariff-related. It also aimed to develop partnerships in the fields of technology, services, research and development and intellectual property among its members. It currently has 17 partners¹², but has not yet achieved the objectives of the agreement, mainly due to problems with the rules of origin, lack of mechanisms to solve disputes, high transport costs and generally higher non-tariff barriers.¹³

Within this context of Pan-Arab integration, Egypt, Jordan, Morocco and Tunisia signed the Agadir agreement in Rabat in 2004 to promote trade integration parallel to other

⁹ 1950, Treaty for Joint Defense and Economic Cooperation; 1953, Convention on the Facilitation of Trade Exchange and the Regulation of Transit Trade; 1957, Economic Council that approved the text of the Arab Economic Unity Agreement (AEUA) and creation in 1964 of the Council of Arab Economic Unity (CAEU) that promoted the creation of the Arab Common Market (ACM).

¹⁰ The GCC include Saudi Arabia, United Arab Emirates, Oman, Kuwait, Qatar and Bahrain. We do not analyse this FTA because we only include FTAs concluded by the 10 countries selected. Some authors that analyse the impact of the GCC are Boughanmi (2008), Insel and Tekce (2011) and Abdmoulah (2011).

¹¹ The state members are Algeria, Libya, Mauritania, Morocco, and Tunisia and despite that the agreement has not yet taken off, the members have recently created an investment bank, which starting capital amounts to \$100 millions, to finance infrastructure projects in the region. Nouakchott (2013, 9 January) Reuters.

¹² Jordan, Morocco, Kuwait, United Arab Emirates, Syria, Tunis, Bahrain, Lebanon, Libya, Saudi Arabia, Iraq, Sudan, Oman, Egypt, Yemen, Qatar, Palestine.

¹³ See Zorob (2008) and Zarrouk (2000) for more details about the GAFTA agreement.

projects.¹⁴ The Agadir agreement entered into force in 2006 and aims to set up a free trade area between the signatory countries. The agreement establishes a free trade area and adopts the Pan-Euro-Med Rules of Origin, which allow the use of standardized inputs for the production of final goods from any country in the EU, EFTA or the signatories of the Agadir agreement itself to benefit from the exemption of tariffs with the EU. The agreement aims at providing full liberalisation of trade in industrial goods and agricultural products.

Another NS FTA came into force in 1997 between Israel and Canada. The agreement eliminates tariffs on all industrial products manufactured in both countries and also on a limited number of agricultural and fisheries products. Israel also concluded an FTA with Mexico that came into force in 2000 for industrial and some agricultural products. Both parties agreed to eliminate customs duties for a list of products and, at the beginning of the following year, for the rest of products, completing full liberalisation in 2005. Finally, Jordan signed an FTA with Singapore in 2004, including industrial and agricultural goods. The agreement eliminates tariffs for imports from Jordan to Singapore since 2005, while tariffs for imports from Singapore are progressively reduced over a timeframe of 5 to 10 years. The agreement also gives the possibility of diagonal accumulation with countries that have concluded free trade agreements with Jordan and Singapore.

1.3. Empirical works analysing MENA integration

After describing the main integration processes in which MENA countries are involved, the central question that emerges is to what extent these processes have been successful in promoting trade and economic integration. While most of the research published focuses on other regions like the European Union, North America, Latin America and more recently Asia, relatively few studies have turned their attention to the impact of FTAs on MENA trade flows. Table 1.1 summarize the main studies that analyse the impact of the FTA on MENA trade using gravity models.

¹⁴ See Wippel (2005) and Abedini and Peridy (2008) for more detail about the Agadir agreement.

Table 1.1. Ex-post studies analysing the impact of FTA on MENA trade using gravity models.

Authors	Aim	Period	FTA included in the abovementioned research	Results: Impact			Estimation method
Nugent and Yousef, 2005	Analyse, why the MENA countries trade too little.	1970, 1975, 1980, 1985, 1990 and 1992 for 186 countries	ASEAN EU GCC AMU ACM	Exports Positive Negative NS Negative ...	Imports Positive Negative NS Negative Positive ...	Pooled Positive Negative Negative Positive ...	Tobit procedure (Maximum Likelihood)
Peridy, 2005a	Analyse the impact of the EU-Mediterranean partnership and their implications for ASEAN countries	1975-2001 Exports from MENA to 42 countries.	REGijt (Regional agreement between EU and MENA countries)	Positive			Gravity model with $\eta_i + \delta_j + \psi_t$
Peridy, 2005b	Estimate the potential of trade between Agadir members to show potential gains or limitations of the agreement.	1975-2001 Exports from Agadir members plus Algeria to 42 countries	Inverse proxy for tariffs and NTB between EU and MENA countries	Higher border effects and lack of complementarity that limit the benefits to the Agadir agreement. EU agreement positive but no significant for the dynamic ABB			Gravity model with $\eta_i + \delta_j$
Ruiz and Villarubia, 2007	Analyse the impact of Euromed association agreements between EU and MENA countries and how the omission of time-varying multilateral trade resistance terms in the estimation of a gravity equation introduces important biases in the results	1976 to 2005 bilateral exports flows for a total of 102 countries	EU EUROMED	Negative Negative			Gravity model with $\eta_i + \delta_j + \psi_t$
Abedini and Peridy, 2008	Analyse the impact of the GAFTA agreement on member trade	1988-2005 Bilateral Exports from 56 countries	GAFTA EU MERCOSUR NAFTA EUROMED	Positive Positive NS NS Negative			Gravity model with $\eta_i + \delta_j + \psi_t + \phi_{ij}$
FEMISE, 2008	Analyse the GAFTA welfare and trade impact, 10 years after the implementation of this agreement	1988-2005 Bilateral Exports from 56 countries	Average bilateral tariffs EU NAFTA MERCOSUR EUROMED GAFTA	Negative Positive NS Positive Negative Positive			Gravity model with $\eta_i + \delta_j + \psi_t + \phi_{ij}$
De Wulf et al, 2009	Obtain the perception of the economic operators in the EU-MED region with respect to the present FTA and the prospects for future deeper integration	1970-2008 exports for 100 countries	EUMED AGADIR GAFTA USA-Chile, USA-Israel NAFTA, CAN, AFTA, EFTA PATCRA, CACM, CER, Mercosur, Euro	NS NS Positive NS Positive Positive NS NS NS			Gravity model with $\phi_{it} + \gamma_{jt} + \phi_{ij}$

Table 1.1. Ex-post studies analysing the impact of FTA on MENA trade using gravity models (continuation).

Authors	Aim	Period	FTA included in the abovementioned research	Results: Impact	Estimation method	
Cieslik and Hagemer, 2009	Analyse the impact of the new Eu association agreements with the MENA countries	1980-2004 Import and exports from 7 MENA countries to 196 countries	EUROMED EFTA Arab Maghreb Union GCC CEECs FTA American Partners Other arab FTA	Exports Negative NS Positive NS Positive NS Positive	Imports Positive Positive NS Positive Positive NS	Gravity model with $\eta_i + \delta_j + \psi_t + \varphi_{ij}$
Bergstrand et al, 2011	Analyse how six EU FTA have impacted on european imports and exports	1966-2008 Total Import and exports for 176 countries	EU-Chile EU- Mexico EU- South Africa EU-Tunisia EU-Morocco EU-Jordan	Exports Positive NS NS Positive Positive Non sig	Imports NS Positive Non sig Non sig Non sig Non sig	Gravity model with $\eta_i + \delta_j + \psi_t$
Montalbano and Nenci, 2012	An "ex ante" evaluation of the long-run "treatment" effect of ENP on the EU-MED Free Trade Area	1992-2008 Exports from 42 reporting countries and to 49 trading partners	EU members EA AA	Positive Positive Negative		Gravity model with $\eta_i + \delta_j + \psi_t + \varphi_{ij}$

* Country dummy specific effects: η_i , δ_j ; temporal dummy: ψ_t ; country-pair dummy: φ_{ij} ; and country and time dummy: ϕ_{it} , γ_{jt}
NS, means No significance

Kepaptsoglou et al. (2010) reviews empirical studies in the last 10 years that use gravity model specifications to analyse the impact of FTAs on international trade flows. In the literature that examines trade integration effects on MENA trade flows using gravity models, some studies exclusively focus on North-South integration, namely Peridy (2005a), Ruiz and Villarubia (2007), Bergstrand et al.(2011) and Montalbano and Nenci (2012) the rest include also South-South integration agreements. Overall, most of them only cover the late 1990s and early 2000s and analyse the impact of FTAs on exports alone using total values, not taking into account the nature of the agreements.

Peridy (2005a) analyses the impact of regional arrangements between the EU and seven Mediterranean countries for the period 1975-2001. He employs a gravity equation and uses different model estimators (Fixed effects, Random Effects, Hausman and Taylor Model and a dynamic estimation with GMM). His main findings indicate that the regional agreement between the EU and MENA countries has a positive and significant impact on exports from MENA countries to the European Union in all estimations, with

trade creation estimated at around 20%-27% for the static specifications and 36% in the dynamic version. Peridy (2005b) focuses on the effects of the Agadir agreement, analysing the impact of the regional trade agreement between 5 MENA countries and the EU from 1975 to 2001. His results show that despite the fact that the Agadir Agreement reduced trade barriers, the high border effects and lack of complementarities meant that the countries involved in the Agadir agreement obtained a limited benefit in terms of higher trade flows. Abedini and Peridy (2008) measured the impact that the GAFTA agreement has had on improving the exports of 15 member countries from 1988 to 2005, obtaining a positive and significant correlation in all estimates. They estimated a trade creation effect of around 16-24 per cent. Their study also evaluated the impact of the Association Agreements (AAs) with the European Union and the new Euromed agreement, obtaining a positive and significant effect for the AAs with the EU and a negative effect for the Euromed agreement. Cieslik and Hagemeyer (2009) also analyse both NS and SS FTAs using an augmented gravity model to estimate FTA effects on imports and exports for seven MENA countries between 1980-2004. Similar to Peridy (2005a), they include county pair-specific effects and time-specific effects and present different specifications to check for robustness, including OLS, two-way fixed effects and first differences. According to their findings, the EU-Association Agreement with MENA countries has a positive and significant effect on MENA imports from the EU, but does not help to increase MENA exports to the EU. In the case of FTAs with North American partners, they find a positive and significant effect on imports and exports, whereas the parameter estimates for Arab FTAs are mostly not statistically significant. Individual effects for each MENA country are also estimated, showing mixed results. Bergstrand et al. (2011) study the impact of six trade agreements for the European Union, including the FTA between the EU and Jordan, Morocco and Tunisia. They used a gravity model for bilateral trade flows among 176 pairs of countries for the period 1966-2008. Their results show that the FTAs have only improved exports from the EU to Tunisia and Morocco, but not in the opposite direction.

Our analysis is closely related to Cieslik and Hagemeyer (2009) but with three important improvements. First, we include more recent years in the analysis and consider new

FTAs which have come into force until 2010, allowing to compare the effect of NS and SS agreements and their impact on MENA imports and exports. Second, we differentiate between trade in industrial and agricultural products and estimate the effect of the agreements separately, which is reasonable given the remarkable differences in terms of trade liberalisation for these two types of products. Finally, another important addition to the previous literature is the use of up-to-date panel-data estimation techniques that allow us to isolate the impact of the agreements on bilateral trade and establish causality more accurately. In particular, we control for both the endogeneity of the trade agreement variable and multilateral resistance terms, as suggested by Baier and Bergstrand (2007).

1.4. Analytical framework

The gravity model of trade, which is one of the most well accepted models used to explain bilateral trade flows, has been selected as the analytical framework in this paper. As reported in the previous section, it has been extensively used to estimate the impact of trade policy actions on bilateral trade flows.

The basic model states that trade between two countries is proportional to the product of their economies, which can be measured using their respective GDPs (Gross Domestic Product), and inversely proportional to the distance between them, which is considered as a proxy for trade costs.

$$T_{ijt} = \alpha_0 Y_{it} Y_{jt} \text{Dist}_{ij} \quad (1)$$

This model has been augmented with other variables that may potentially affect trade between countries. More specifically, common language, colonial ties, common border and trade agreements are used as proxies for familiarity, information and reduction in artificial trade barriers. Typically, the gravity equation is specified in logarithmic linear form and is estimated using cross-section or panel data. According to the most recent literature, the use of panel data is highly recommended to control for the unobserved heterogeneity of various sources, the endogeneity of the FTAs and for multilateral resistance factors. Anderson and van Wincoop (2003) recommend accounting for “multilateral trade resistance” in the estimation of gravity equations. One way to control

for this is to add time-varying, directional, country-specific dummies, because bilateral trade flows depend on bilateral trade costs relative to multilateral trade costs.

Another important issue is that trade policy is not strictly exogenous and consequently any analyses of the effects of free trade agreements using the gravity equation can suffer from endogeneity bias, as pointed out by Baier and Bergstrand (2007). These authors recommend the use of panel data regression techniques and the inclusion of bilateral fixed effects (dyadic fixed effects) to capture unobservable time-invariant bilateral factors that can affect trade flows. They also include exporter-and-time and importer-and-time fixed effects to capture unobservable time-varying “multilateral price/resistance” terms of the exporter and importer countries.

The model that corrects for endogeneity bias and controls for multilateral resistance is given by,

$$\ln X_{ijt} = \beta_0 + \beta_1 FTA_{ijt} + \eta_{ij} + \delta_{it} + \psi_{jt} + \varepsilon_{ijt} \quad (2)$$

where η_{ij} denotes dyadic fixed effects, specified as dummy variables for each bilateral relationship and δ_{it} , ψ_{jt} are exporter-and-time and importer-and-time fixed effects. The inclusion of these fixed effects implies that we are not able to identify income and distance effects, but the target variable FTA_{ijt} , which denotes free trade agreements and varies bilaterally and over time will be correctly identified.

The treatment of zeros and missing values in trade data is another important issue. Zero trade could be present due to rounding errors when the value of trade is very small or close to zero, there could be missing data that are recorded as zero, or that could also represent a real absence of trade between two countries. In the latter case, if we want to use the logarithmic form of the gravity equation, we need to be sure that these zero values do not include relevant information about the absence of trade between countries, because zero values will be dropped from the estimation and we would be losing valuable information. Hence, a good knowledge of the reason why there are zeros in our database is necessary in order to select the most appropriate estimation method. In our case, around 10 per cent of values are missing and we test whether these values contain relevant information about the decision to trade between country pairs or whether they are only reporting errors (see Table A.2 and Table A.3 in Appendix A). In order to do

so, the following procedure is applied. First we try to identify how many zero trade flows are observed for several years in a row to determine the non-random nature of the zeros. What we find is that 63 per cent of zeros are located between two positive trade flows in the previous and following years. We also use a Heckman's two-step procedure to determine whether our data display selection bias. In the first step we estimate a Probit equation using MLE (Maximum Likelihood Estimation), namely a selection equation, where we include an additional variable¹⁵ that we assume affects the decision to enter a foreign market, but not the amount exported. In the second step we use a panel data model to examine the effect of the independent variables on the amount of trade and we include the inverse mills ratio¹⁶ obtained in the first step as an additional independent variable

1.5. Empirical application

1.5.1. Data description and empirical model

We use bilateral exports and imports from 10 MENA countries¹⁷ to 61 destinations (see Table A.4 in Appendix A), which represent around 90 per cent of their total trade, bilateral imports have been computed in CIF prices and bilateral exports in FOB prices, both in thousands USA dollars. Exports and imports are from the COMTRADE database for the period 1994-2010¹⁸ using the Standard International Trade Classification (SITC), Revision 3. We use sectoral data to estimate the impact of FTAs on total non oil trade, agricultural and industrial trade flows separately. In order to obtain total non oil trade we use total trade subtracting mineral fuel and lubricants (code 3, SITC revision 3). For agricultural trade flows we took the "food" standard definition from COMTRADE that considers the sum of sections 0, 1, 22 and 4 from the SITC revision 3 classification as total agricultural trade flows and we calculate industrial trade using the standard definition of "manufactures" from COMTRADE that considers the

¹⁵ In order to compare the robustness of our results, we use two different variables separately that affect the decision to export but not the amount exported. First we use an index of corruption for country *i* and *j* and we also use a dummy variable, namely "same religion", which takes a value of 1 when both countries have the same religion and zero otherwise. Results are presented using the last variable.

¹⁶ Calculated from the density and the distribution functions of a standard normal variable that determines whether the unobservable characteristics in the selection model are correlated with the amount of trade.

¹⁷ Algeria, Egypt, Israel, Jordan, Lebanon, Libya, Morocco, Syria, Tunisia and Turkey.

¹⁸ The period has been chosen taking into account the entry into force of the agreements and avoiding having a lot of zeros choosing years before 1994.

sum of sections 5,60,61,62,63,64,65,66,67,69,7 and 8 from the SITC revision 3 classification. Table 1.2 presents summary statistics for the variables used

Table 1.2. Summary statistics

Variable	Obs.	Mean	Std. Dev.	Min.	Max.
total	20400	245662.9	912233	0	2.23e+0 7 2.14e+0
manufactures	20400	195574.6	794462.5	0	7
agricultural	20400	25780.94	86372.5	0	2069366

total means the observation for total trade less oil products and fuels, *manufactures* means all manufactured trade and *agricultural* means all trade of agricultural products.

As regards FTAs, we consider all FTAs that entered into force for the ten considered MENA countries during the period and one customs union (Turkey-EU). These agreements include five North-South agreements: EUROMED, EFTAMED, USAMED, Israel-Canada and the Turkey-EU customs union; and five South-South agreements: AGADIR, GAFTA, Turkey-MED, Israel-Mexico and Jordan-Singapore. The data on FTAs are obtained from the World Trade Organization database (See Table A.1 in Appendix A, for a list of agreements with the country members and dates of their came into force).

The preferred model is a logarithmic version based on Anderson and van Wincoop (2003) proposed by Baier and Bergstrand (2007). We start by considering the most basic model specifications that account for both unobservable heterogeneity (time-invariant bilateral) and multilateral resistance, namely importer-and-time and exporter-and-time dummies as proposed by Baier and Bergstrand (2007). In this way we are able to control for all time-variant importer (δ_{it}) and exporter (ψ_{jt}) characteristics and for all bilateral time-invariant factors (η_{ij}) that affect bilateral trade between countries. The model specification is given by,

$$\ln T_{ijt} = \beta_0 + \beta_1 EUROMED_{ijt} + \beta_2 EFTAMED_{ijt} + \beta_3 USAMED_{ijt} + \beta_4 TURMED_{ijt} + \beta_5 GAFTA_{ijt} + \beta_6 AGADIR_{ijt} + \beta_7 TUREU_{ijt} + \beta_8 ISRCAN_{ijt} + \beta_9 ISRMEX_{ijt} + \beta_{10} JORS GP_{ijt} + \eta_{ij} + \delta_{it} + \psi_{jt} + \varepsilon_{ijt} \quad (3)$$

We have two dependent variables, where T_{ijt} denotes, in a first estimation, exports (manufactured exports, total non oil exports and agricultural exports alternatively) from country i to country j in year t , and also denotes imports (manufactured imports, total non oil imports and agricultural imports alternatively) from country i to country j in year t for a second estimation. The variables EUROMED_{ij,t}, EFTAMED_{ij,t}, USAMED_{ij,t}, TURMED_{ij,t}, GAFTA_{ij,t}, AGADIR_{ij,t}, TUREu_{ij,t}, ISRCAN_{ij,t}, ISRMEX_{ij,t}, and JORSGP_{ij,t} are FTA dummy variables which take a value of 1 when the importer i and exporter j are both members of the agreement, starting the year in which it came into force. η_{ij} is a country-pair fixed effect and δ_{it} and ψ_{jt} are importer-and-time and exporter-and-time fixed effects¹⁹.

A second specification introduces the first lag of the FTA variable and a third includes the second lag in addition to the first, in this way the delayed effects of the agreements are taken into account.

The next section presents the results of the estimation and discusses the effect that each agreement has had on bilateral trade flows for MENA countries.

1.5.2. Estimation and results

The model is estimated using fixed effects after rejecting the null hypothesis of the Hausman test²⁰ (orthogonality between the regressors and the bilateral unobserved heterogeneity). The main results are displayed in Tables 1.3 and 1.4 for manufactured, total non oil and agricultural imports and exports, respectively. Results for GAFTA and AGADIR are only estimated using import values because after comparing the export and import values reported by MENA countries we found greater differences between the value of imports at CIF prices and exports valued at FOB prices, imports sometimes recording values that were 300 or 500 per cent higher than export values. These differences cannot be explained by costs, insurance and freight alone, but rather are measurement errors. Therefore, to analyse the effect of intra-Arab agreements in which

¹⁹ See Table A.5 for data description.

²⁰ The model was also estimated using a Heckman approach to control for possible sample selection bias. The results of the Heckman two-step estimation show that after including the inverse Mills ratio in the estimations, most estimated coefficients stay almost the same in terms of sign and magnitude. We consequently conclude that correction do not affect the main results (see Table A.3 in Appendix A).

all the countries reported are also partners, we only use the value of imports among member countries of these agreements. Results from the first specification are in Table 1.3 for manufactures, total non oil trade and agricultural imports and exports, respectively.

Results from the second specification including a lagged variable for each FTA, results

Table 1.3. Panel gravity equations with bilateral fixed and country-and-time effects.

	Manufactures (1)		Total (1)		Agricultural (1)	
	Imp	Exp	Imp	Exp	Imp	Exp
EUROMED _{ij,t}	0.282*** (0.088)	-0.336*** (0.129)	0.234*** (0.078)	-0.262** (0.125)	-0.184 (0.120)	-0.219 (0.134)
EFTAMED _{ij,t}	0.315 (0.227)	-0.221 (0.269)	0.163 (0.221)	-0.158 (0.228)	0.330 (0.397)	-0.046 (0.384)
USAMED _{ij,t}	0.347 (0.514)	1.642 (1.076)	-0.018 (0.318)	1.487* (0.885)	0.338 (0.416)	0.473 (0.518)
TURMED _{ij,t}	0.387* (0.206)	0.163 (0.307)	0.383** (0.157)	-0.114 (0.488)	-0.219 (0.184)	0.505 (0.562)
GAFTA _{ij,t}	-0.067 (0.400)		-0.179 (0.353)		0.561* (0.338)	
AGADIR _{ij,t}	-0.086 (0.220)		0.153 (0.161)		0.543 (0.386)	
TUREU _{ij,t}	0.415** (0.192)	0.562** (0.274)	0.450** (0.206)	0.388 (0.263)	0.692*** (0.258)	-0.164 (0.196)
ISRCAN _{ij,t}	0.407*** (0.145)	-0.049 (0.236)	0.234 (0.161)	-0.162 (0.199)	-0.347 (0.386)	-0.710** (0.277)
ISRMEX _{ij,t}	0.852*** (0.310)	-0.518 (0.387)	0.345 (0.399)	-0.094 (0.430)	-0.450 (0.429)	0.522 (0.487)
JORSGP _{ij,t}	-0.001 (0.164)	0.197 (0.316)	0.095 (0.132)	0.307 (0.358)	1.388*** (0.256)	-2.125*** (0.563)
Nobs	9274	9103	9351	9200	8577	7955
Within R2	0.472	0.294	0.504	0.283	0.332	0.257
rmse	0.697	1.034	0.642	0.958	1.025	1.054
ll	-9247.772	-12651.71	-8558.05	-12092.32	-11812.2	-11126.96

***, **, * indicate significance at 1%, 5% and 10%, respectively. Robust standard errors are presented below the coefficients. eumed denotes the FTA between MENA countries involved in the agreement and the EU, eftamed denotes the FTA between MENA countries involved in the agreement and EFTA countries, USAMED denotes the FTA between Morocco and Jordan, turmed denotes the FTA between MENA countries involved in the agreement and Turkey, gafta denotes the FTA between Arab counties involved in the Great Arab Free Trade Area, agadir denotes the Agadir agreement between Morocco, Tunisia, Egypt and Jordan. TUREU denotes the custom union between the EU and Turkey, ISRCAN denotes the FTA between Israel and Canada, ISRMEX denotes the FTA between Israel and Mexico and JORSGP denotes the FTA between Jordan and Singapore

from the third specification including two lagged variables and specification four, which controls for strict exogeneity by including two lagged values and one lead value of FTA, are in Table A1.6, A1.7 and A1.8 in Appendix A for manufactures, agricultural products and total nonoil trade.

Table 1.4 presents the average treatment effect (ATE) of each FTA for manufactured and Table 1.5 for agricultural products, where ATE is the sum of all statistically significant coefficient estimates of each FTA. For a complete table with all the coefficients estimates from the equation see Table A.6, A.7 and A.8 in Appendix A.

When discussing the results of a specific FTA, MENA countries or the MENA region refers to all MENA countries that are members of the agreement in question, but not all the MENA countries included in the study.

As expected, the results in Table 1.4 indicate that the Euromed FTA has a positive and significant impact on MENA imports from EU countries and negative and significant effect for MENA exports to the EU. Both results are similar to those in Cieslik and Hagemeyer (2009), who obtained that the FTA decreases MENA exports to Europe by 19 per cent and increases MENA imports from Europe by 41 per cent. The agreement has been especially beneficial for manufactured imports from the EU (Table 1.4, column 1), indicating that the presence of an FTA between the EU and Euromed partners increases manufactured imports by 32.6²¹ per cent, other factors remaining constant. When we add lagged variables to capture the delayed effect of the FTA, we observe that the average treatment effect remains very similar to the coefficients without lagged variables. Indeed, the lagged variables are not statistically significant in the case of imports. It is worth noting that liberalisation for industrial European products started when the agreement came into force and particularly after the second, fourth, and fifth years of the FTA up until full liberalisation twelve years later, and only two lagged variables of the Euromed FTA are not enough to capture the delayed effect of the agreement.

²¹ $(e^{0.282}) - 1 = 0.326$

Table 1.4. Average treatment effect (ATE) of an FTA between a country pair for manufactured products

Variable	Manufactures							
	Imp (1)	Imp (2)	Imp (3)	Imp (4)	Exp (1)	Exp (2)	Exp (3)	Exp (4)
EUROMED _{ij,t}	0.282***	0.310***	0.299***	0.131	-0.336***	-0.236*	-0.233*	-0.330***
EUROMED _{ij,t-1}		-0.043	-0.028	-0.010		-0.121	0.043	0.033
EUROMED _{ij,t-2}			-0.026	-0.021			-0.182*	-0.243**
EUROMED _{ij,t+1}				0.218**				0.061
Total ATE	0.282	0.310	0.299	0.218	-0.336	-0.236	-0.415	-0.573
EFTAMED _{ij,t}	0.315	0.056	0.005	0.336	-0.221	-0.333*	-0.288	0.015
EFTAMED _{ij,t-1}		0.341	0.548	0.593		0.193	-0.320	-0.346
EFTAMED _{ij,t-2}			-0.263	-0.272			0.602*	0.631*
EFTAMED _{ij,t+1}				-0.374				-0.332
Total ATE						-0.333	0.602	0.631
USAMED _{ij,t}	0.347	-0.332	-0.370	0.003	1.642	0.796	0.852	0.678***
USAMED _{ij,t-1}		0.726	0.718	0.681		1.038**	0.158	0.154
USAMED _{ij,t-2}			-0.001	0.029			1.053***	1.176***
USAMED _{ij,t+1}				-0.404				0.242
Total ATE						1.038	1.053	1.854
TURMED _{ij,t}	0.387*	0.252*	0.202	0.181	0.163	0.150	0.165	0.184
TURMED _{ij,t-1}		0.1	-0.021	-0.012		0.136	0.112	0.110
TURMED _{ij,t-2}			0.129	0.202			0.052	-0.021
TURMED _{ij,t+1}				0.044				-0.070
Total ATE	0.387	0.252						
GAFTA _{ij,t}	-0.067	-0.126	0.036	-0.017				
GAFTA _{ij,t-1}		0.477*	0.003	0.011				
GAFTA _{ij,t-2}			0.435*	0.434*				
GAFTA _{ij,t+1}				0.103				
Total ATE		0.477	0.435	0.434				
ISRCAN _{ij,t}	0.407***	0.502***	0.497**	0.488**	-0.049	0.192	0.320*	0.310
ISRCAN _{ij,t-1}		-0.132	-0.294*	-0.290*		-0.096	-0.005	0.004
ISRCAN _{ij,t-2}			0.176	0.222			-0.099	-0.136
ISRCAN _{ij,t+1}								
Total ATE	0.407	0.502	0.203	0.198			0.320	
ISMEX _{ij,t}	0.852***	1.617***	1.836***	1.074***	-0.518	-0.306	-0.309	-0.052
ISMEX _{ij,t-1}		-0.862*	-0.372	-0.355		-0.398	-0.433*	-0.432*
ISMEX _{ij,t-2}			-0.541	-0.548*			0.032	0.056
ISMEX _{ij,t+1}				0.986***				-0.391
Total ATE	0.852	0.755	1.836	0.526			-0.433	-0.432
JORSGP _{ij,t}	-0.001	0.024	-0.008	-0.418***	0.197	-0.086	0.068	0.329
JORSGP _{ij,t-1}		-0.008	0.400**	0.417**		0.492*	0.851***	0.857***
JORSGP _{ij,t-2}			-0.513**	-0.479**			-0.461	-0.403
JORSGP _{ij,t+1}				0.454**				-0.301
Total ATE			-0.113	-0.443		0.492	0.851	0.857

*ATE is the sum of all statistically significant estimates of each FTA. "ns" means that coefficients are not significant. (1) are regressions with only FTA (t), (2) are regressions with FTA(t) and FTA(t-1), (3) are regressions with FTA(t) FTA(t-1) and FTA(t-2) and (4) with FTA(t) FTA(t-1) and FTA(t-2) and FTA(t+1)

Table 1.5. Average treatment effect (ATE) of an FTA between a country pair for agricultural products

Variable	Agricultural							
	Imp (1)	Imp (2)	Imp (3)	Imp (4)	Exp (1)	Exp (2)	Exp (3)	Exp (4)
EUROMED _{ij,t}	-0.184	-0.267**	-0.250*	-0.373***	-0.219	-0.141	-0.171	-0.130
EUROMED _{ij,t-1}		0.081	0.108	0.121		-0.050	0.078	0.065
EUROMED _{ij,t-2}			-0.042	-0.010			-0.173	-0.123
EUROMED _{ij,t+1}				0.170				-0.023
Total ATE		-0.267	-0.250	-0.373				
EFTAMED _{ij,t}	0.330	0.318	0.258	0.052	-0.046	-0.004	-0.006	-0.128
EFTAMED _{ij,t-1}		0.016	0.221	0.283		-0.123	0.086	0.115
EFTAMED _{ij,t-2}			-0.281	-0.315			-0.239	-0.242
EFTAMED _{ij,t+1}				0.235				0.125
Total ATE								
USAMED _{ij,t}	0.338	0.743***	0.768***	0.496***	0.473	0.133	0.188	0.361
USAMED _{ij,t-1}		-0.422	-0.358	-0.373		0.439**	0.223	0.217
USAMED _{ij,t-2}			-0.060	-0.156			0.275	0.263
USAMED _{ij,t+1}				0.304				-0.187
Total ATE		0.743	0.768	0.496		0.439		
TURMED _{ij,t}	-0.219	-0.277	-0.350*	-0.157	0.505	0.523	0.532	0.641*
TURMED _{ij,t-1}		0.020	-0.050	-0.034		0.024	-0.294	-0.324
TURMED _{ij,t-2}			0.033	0.010			0.501	0.307
TURMED _{ij,t+1}				-0.283				-0.130
Total ATE			-0.350					0.641
GAFTA _{ij,t}	0.561*	-0.233	-0.193	-0.276				
GAFTA _{ij,t-1}		0.817**	-0.088	-0.084				
GAFTA _{ij,t-2}			0.914***	0.919***				
GAFTA _{ij,t+1}				0.115				
Total ATE	0.561	0.817	0.914	0.919				
ISRCAN _{ij,t}	-0.347	-0.967***	-1.780***	-1.798***	-0.710**	-0.215	-0.142	-0.141
ISRCAN _{ij,t-1}		1.193***	1.268***	1.256***		-0.322	-0.149	-0.150
ISRCAN _{ij,t-2}			-0.112	-0.048			-0.184	-0.197
ISRCAN _{ij,t+1}								
Total ATE		0.226	-0.512	-0.542	-0.710			
ISMEX _{ij,t}	-0.450	-0.784	-0.391	-1.024**	0.522	-0.233	-0.410*	-0.417**
ISMEX _{ij,t-1}		0.714*	-0.037	-0.033		0.424	-0.581*	-0.615**
ISMEX _{ij,t-2}			0.826**	0.801**			1.121***	1.106***
ISMEX _{ij,t+1}				0.816				0.039
Total ATE		0.714	0.826	-0.223			0.130	0.074
JORSGP _{ij,t}	1.388***	1.809***	1.784***	0.526*	-2.125***	-0.559	-0.389	0.325
JORSGP _{ij,t-1}		-0.476	-0.370	-0.358		-1.845**	-0.504	-0.496
JORSGP _{ij,t-2}			-0.147	-0.152			-1.679**	-1.324*
JORSGP _{ij,t+1}				1.413***				-0.813**
Total ATE	1.388	1.809	1.784	1.939	-2.125	-1.845	-1.679	-2.137

*ATE is the sum of all statistically significant estimates of each FTA. "ns" means that coefficients are not significant. (1) are regressions with only FTA (t), (2) are regressions with FTA(t) and FTA(t-1), (3) are regressions with FTA(t) FTA(t-1 and FTA(t-2) and (4) with FTA(t) FTA(t-1 and FTA(t-2) and FTA(t+1)

Despite this, the total effect of the FTA is captured when it came into force in year t . When we test for strict exogeneity by adding forward FTA values and observe that changes in $EUMED_{ij,t+1}$ are correlated with actual trade, we consider that it is the expected outcome because despite the absence of trade liberalisation for European exports to the MENA countries before the Euromed FTA, Europe was already the first exporter in the region. As regards MENA industrial exports to EU markets, they had already been liberalized under previous bilateral cooperation agreements at the beginning of the 70s, so the new trade agreement should not be reason to increase MENA industrial exports to the EU. The negative and statistically significant impact that we obtain of the FTA on MENA exports to European markets could be due to the increase in European manufactured imports to local markets after the liberalisation of European imports, and the consequently stronger competition faced by MENA firms, in particular by dual firms that are mainly selling to the domestic market and have to close down because its sales abroad did not represent an important part of its activities. In this context, some local firms are no longer productive and tend to disappear, negatively affecting MENA exports. This effect increased when we included the lagged effect of the agreement, reflecting a higher negative effect two years after the agreement came into force, revealing an adjustment effect.

For the EFTAMED agreement, we found a statistically positive impact on MENA manufactured exports. Table 1.4 shows that this effect appears two years after the agreement came into force. The liberalisation schedule of the agreement is quite similar to Euromed and MENA exports were duty free when the agreement for industrial products came into force, while EFTA exports shall be progressively liberalized. Hence, the positive effect obtained for the second lagged value of the FTA could be explained as follows: the agreement has an effect on trade two years after it comes into force.

The FTA concluded between the USA and Jordan and later with Morocco have a positive and significant effect on MENA exports (see Table 1.4). Similar to the effect obtained for the EFTAMED agreement, the second lagged variable of the FTA is statistically significant, meaning the effect appears two years after the FTA came into force. Due to the adaptation of Jordan exports from QIZ to the new FTA. The USA FTA includes trade liberalisation for certain agricultural products and has been very

beneficial to USA agricultural products. In fact, the FTA has increased MENA imports from the USA by 110 per cent and MENA exports to the USA by 55 per cent. As Hufbauer and Brunel (2009) show, the FTA has been very beneficial for traditional USA agricultural exports like wheat, corn and oilseeds, but also for other products linked to the FTA, such as livestock feed, dairy products, fruit and vegetables and live animals for breeding and for Morocco exports of Miscellaneous edible products and preparations; Essential oils and resinoids and perfume materials and Fish (not marine mammals), crustaceans, molluscs but trends remain very similar to those before the agreement.

In relation to the effect of the FTA between some MENA countries and Turkey, the results in Table 1.3 show that it has a positive and significant impact on imports from Turkey and a positive but not significant effect on manufactured MENA exports. The FTA with Turkey has a similar nature to those with the EU. Customs duties for MENA industrial products were abolished in Turkey with the entry into force of the agreement, but results do not show that the increase in MENA exports in Turkey is caused by the agreement. Furthermore, some Turkish industrial products entered MENA countries duty free after the agreement came into force and others will be progressively liberalized. Our results show that Turkey exports to MENA countries increased by around 47 per cent when the agreement came into force.

When the agreement between Israel and Canada came into force, tariffs on all industrial products manufactured in Canada and Israel were eliminated as well as on a limited number of agricultural and fisheries products. The results show that the FTA increased manufactured Israeli imports from Canada by around 23 per cent²² and Israeli exports by around 37 per cent. The Israel-Mexico free trade agreement included liberalisation for industrial and agricultural products when the agreement came into force. The findings in Table 1.4 and 1.5 show that the FTA concluded between both countries increased Mexican manufactured and agricultural exports and negatively affected Israeli manufactured exports, but had a positive impact on agricultural exports the year after the agreement came into force.

²² $(e^{0,203})-1=0,225$ and $(e^{0,320})-1=0,377$

The agreement between Jordan and Singapore included trade liberalisation for manufactured and agricultural products. In our analysis we found that the agreement decreased MENA manufactured imports from Singapore, but increased agricultural imports. After analysing the make-up of MENA agricultural imports and comparing it to the agricultural products included in the agreement, we found that this increase is due to the reduction in tariffs on agricultural preparations, cereals, spices and palm oil, all of which are included in the FTA. In addition, the FTA has a positive and significant impact on Jordan manufactured exports, but negatively affects agricultural exports.

Regarding the effect of intra-Arab integration, we analyse the effect of the GAFTA agreement and the Agadir agreement. The GAFTA free trade agreement involves trade liberalisation for all products. As observed in Table 1.4 the GAFTA FTA has a positive and significant effect on trade two years after the agreement came into force, collecting the phased effect of liberalisation, since tariffs were reduced by an annual 10% until 2005, when liberalisation was fully completed. This result is similar to that obtained by Abedini and Peridy (2008). We also find that the FTA has a positive impact on agricultural products (as shown in Table 1.5).

In relation to the Agadir agreement, the results do not show any impact on manufactured or agricultural imports, as we can see in Table A.6, A.7 and A.8 of Appendix A. One reason could be that the period analysed is too short and includes a period of economic crisis.

1.6. Conclusions

This paper investigates the impact of several North-South and South-South FTAs on trade flows for ten MENA countries during the period 1994-2010. We use an augmented gravity model which we estimate using up-to-date panel data techniques that allow us to control for all the factors that influence bilateral trade and which are time-invariant (unobserved heterogeneity), as well as for the so-called multilateral resistance terms. We undertake the analysis not only for aggregate trade but also for trade in industrial products and trade in agricultural products separately.

The results presented show that both NS-FTA and SS-FTA have a similar impact on trade in MENA countries showing greater global market integration. We found in general that FTAs that include agricultural products, which is where they have the greatest comparative advantage and could help to restructure their trade balance, are more desirable for MENA countries than those that only include industrial products. Therefore, MENA countries need special attention when negotiating future agreements. Efforts towards establishing better integration among Arab countries show satisfactory progress. The Great Arab Common Market (GAFTA) in particular has been fruitful to help to increase bilateral trade between Arab countries, while we do not find the same effect in the case of the Agadir agreement because it was implemented too recently for a consistent evaluation. This turn towards greater Arab integration represents new opportunities for Arab countries to promote dialogue between them and establish new economic opportunities in the region.

In the case of Euromed integration the results show that the FTA promotes EU exports to MENA countries, but does not have a positive impact on MENA exports to the EU. Despite this fact, Europe is still the most important trading partner of some MENA countries and a reduction in the trade imbalance between the two regions is desirable. While settlement negotiations do not include trade liberalisation in agricultural products, where MENA countries are more competitive, MENA countries need to orient their industrial policy to profit from tariff reductions in intermediate inputs to increase their productivity and be more competitive in international markets.

In this context, new partners for MENA countries, like Turkey, appear in the Mediterranean relationship context, where the FTA has fostered increases in Turkish manufactured exports to the MENA region. FTAs with the USA also promote industrial exports to the USA and increase agricultural imports to MENA countries, especially wheat. The rest of the FTAs show how the inclusion of agricultural products in the liberalisation is fairer for MENA countries than only including industrial products, as in the case of Euromed or the FTA signed with Turkey.

Chapter 2

Imported intermediates inputs and Egyptian exports: Exploring the links

2.1. Introduction

In recent years, there has been a growing interest in the study of the internationalization strategies of small- and medium-size firms in developing countries. According to the related trade literature, a high proportion of trading firms are engaged in both importing and exporting activities. Kasahara and Lapham (2013) show that this is due to the presence of cost complementarities in both activities. Once one of the activities is carried out, the second becomes easier. These cost complementarities have motivated a new strand of research that further investigates the relationship between a firm's import and export activities, especially those focused on the use of imported intermediates and their role in enhancing exports. For example, Muûls and Pisu (2009) analysed Belgian firms, Bas (2012) examined Argentinian firms, Aristei et al (2013) focused on firms in Eastern European and Central Asian countries, Kasahara and Lapham (2013) on Chilean firms, and Lo Turco and Maggioni (2013) analysed Italian manufacturing firms.

While most of the existent literature has focused on developed countries, the literature concerning developing countries is still scarce. In particular, it is still unclear whether importing intermediates generates productivity gains that add to the gains arising from learning-by-exporting. Similarly, it is yet to be established to what extent this is a more important source of gains for developing countries, which may profit more than others from having access to intermediates from abroad. Therefore, we aim to extend the evidence by investigating export and import activities of firms located in Egypt, a country that to the best of our knowledge has not yet been investigated.

In this paper, we aim to explore the links between Egyptian firms' exporting and importing activities using panel data over a five-year period. To this end, we estimate the determinants of the decision to export/import using static and dynamic panel-Probit models. To analyse the extensive margin of trade, we employ a novel technique based on Rabe-Hesketh and Skrondal (2013) that is able to deal with the endogeneity problem of the lagged dependent variable and that controls for initial conditions. We also test if the same determinants are important in determining the trade intensity. We focus our study on Egypt for two reasons. Firstly, it is one of the most important countries in the MENA (Middle East and North African) region in terms of population and gross domestic product (GDP), and secondly, it is a developing country. According to Smeets

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and Warzynski (2010) and Bas and Strauss-Kahn (2011), developing countries are able to profit more than developed countries from the benefits of importing intermediate inputs, which they cannot always produce due to the existence of supply side restriction.

The period analysed spans the years from 2003 to 2007, during which time the country experienced reductions in tariff barriers and important changes in trade policy. Bensassi et al. (2011) found that a decrease in trade costs generated by more flexible rules of origin (RoO) for products traded with the EU had a positive effect on Egyptian exports. This is partly because the new RoO will allow firms to access cheaper imported inputs from the EU. Simultaneously, the bilateral interim agreement between the EU and Egypt, signed in 2004, will gradually eliminate tariffs on imported products from the EU and eventually increase competition, thus forcing some firms to exit the market.

This paper is organized as follows: Section 2.2 describes the related literature, Section 2.3 presents the sample used in the analysis and some descriptive data, Section 2.4 introduces the theoretical background and the empirical strategy and outlines the main results, and Section 2.5 concludes.

2.2. Literature review

With the introduction of firm heterogeneity in models of international trade by the seminal paper of Melitz (2003), the empirical trade literature studying the link between trade and productivity has dynamically evolved over time. According to Melitz's model there is a fixed cost of exporting and firms can enter an industry by paying it. They then ascertain their level of productivity and if it is too low to be profitable, they are forced to leave the market. Hence, trade liberalization results in an increase in average productivity. This seminal theory has been extended in several directions, one of which is closely related to our research and introduces the importance of importing activities in the internationalization process of the firm.

In this section, we focus on a number of papers that consider importing as a factor that also affects exporting activities and that is closely related to the firm's productivity. From a theoretical perspective, Kasahara and Lapham (2013) extended Melitz's (2003) model with imported inputs and showed the existence of some productivity gains

stemming from importing inputs, which allow importers to start exporting. As a result, a cost complementarity effect emerges between import and export activities.

Moving to the related empirical literature, most studies that focus on foreign intermediates use different ways to explain the role that imports play in determining firm productivity and consequently its export decisions. In what follows, we classify and summarize these works. In order to produce final goods, firms can decide to use imported inputs, use domestic inputs or combine both, and their decision to import/export is linked to the associated import/export fixed costs.

Whereas some empirical investigations find evidence confirming the self-selection hypothesis (only firms with high productivity levels become exporters), others support the learning-by-exporting hypothesis (firm productivity increases after they start exporting). Most investigations focus on the export side, although most recent papers also consider an import perspective²³.

Among the studies that focus on the export side, Bernard and Jensen (1999), Delgado et al. (2002), Arnold and Hussinger (2005) and Aw et al. (2000) find support for the self-selection hypothesis for exports, finding that only the most productive firms are able to start exporting, whereas De Loecker (2007), Bustos (2011), Van Biesebroeck (2005), Rizov and Walsh (2009) and Clerides et al. (1998) find evidence of learning-by-exporting. Nevertheless, the results remain mixed and mainly depend on the characteristics of the countries considered in the analysis.

A few authors have investigated the self-selection and learning hypotheses from an import perspective and have analysed the role played by intermediate imports in increasing productivity. On the one hand, Halpern et al. (2011), Amiti and Konings (2007) and Kasahara and Rodrigue (2008) find support for a learning-by-importing effect. On the other hand, Wagner (2007) analyses both hypotheses, and only finds evidence to support the self-selection hypothesis.

Surprisingly, only a few papers analyse the self-selection and learning hypotheses for both importing and exporting activities. Among the empirical applications, Altomonte

²³ See Silva et al., (2012) for a survey of the learning-by-exporting literature and Singh (2010) for a detailed literature review about the effects of international trade on productivity and economic growth at the macro- and micro-levels.

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and Bekes (2009), Castellani et al. (2010), Bernard et al. (2007) and Muûls and Pisu (2009) provide mixed results, each of them focusing on the links between productivity and export/import activities. On the one hand, Altomonte and Bekes (2009) find that the previous literature that analyses the export-productivity link without taking import decisions into account overestimates the export gains. On the other hand, Bernard et al. (2007) find that two-way traders are better performers with respect to all firm characteristics. Finally, Muûls and Pisu (2009) find that firms that only import have higher labour productivity than those than only export.

The abovementioned literature finds different channels through which imported inputs affect firm productivity. Some authors find that firms that import have access to a wider variety of inputs than firms that only use domestic providers; this in turn leads to firms easily adapting their products to the foreign market. Indeed, Kugler and Verhoogen (2009) show that access to imports increases the availability of different types of inputs. They find that plants which are more productive purchase higher-quality inputs, and that despite import prices being higher than domestic prices for the same input category in the same plant and year, firms still use foreign inputs due mainly to their higher quality. Halpern et al. (2011) find that firms that import all of their inputs have a 12 per cent higher productivity in comparison to firms that import only part of them. Access to foreign inputs also means that firms are able to use inputs that are cheaper and of higher quality than domestic inputs, especially in developing countries. Goldberg et al. (2010) show how the combined use of foreign and domestic inputs increases the product scope of Indian firms, and that better access to foreign inputs after trade liberalization is more important than the price reduction effect produced by the decrease in trade costs.

Another important aspect worth mentioning is that the diffusion of modern technologies through the use of foreign intermediate goods appears especially beneficial for developing countries, which benefit the most from these technological spillovers. Meanwhile, the origin of the imported inputs and their impact on productivity have also been analysed in order to understand the technology transfer linked to imported intermediates. In their analysis, Smeets and Warzynski (2010) distinguish between inputs from the OCDE and those from low-income economies, analysing their impact on total factor productivity (TFP). The authors find that both affect productivity in a

similar way. However, Bas and Strauss-Kahn (2011), compare imported inputs from developed and developing countries for French firms, and find that foreign intermediates from developed countries increase TFP 20 per cent more than inputs from less-developed countries. They also find that importing more varieties of intermediate inputs increases TFP and also the number of exported varieties of French firms.

Other authors have focused their attention on analysing how trade liberalization in intermediate inputs affects productivity. Amiti and Konings (2007) was one of the first studies to estimate the relationship between productivity and the effects of trade liberalization on imported inputs. Using Indonesian data, they analyse the productivity gains that result from reducing tariffs on final goods and on intermediate inputs separately, showing that a ten per cent reduction in input tariffs led to a productivity gain of 12 per cent for firms that use imported inputs, and that this gain was twice as large as gains from reducing tariffs on final goods. Bas (2012) studies the impact of input-trade liberalization on Argentinian firms' export decisions, finding that a reduction in input-tariff on foreign intermediates enhances Argentinian firms' performance in the export market and also increases the percentage of exports. Goldberg et al. (2010) provide evidence indicating that trade liberalization increases productivity not only due to the access to cheap inputs but also due to the opportunity to access new intermediate inputs that allow firms to create new varieties in the domestic market.

Despite the increasing number of studies that investigate the relationship between trade and imported intermediates using micro data, only a few of them focus on firms located in MENA countries. Related to the role that imported intermediates could play in technological diffusion, Brach (2010) assesses the role of technological readiness in the MENA region and the implications for Egypt. The author takes a closer look at the technological progress and innovative activities in the MENA region and within this context investigates the implications for economic development and job creation, as well as the main economic policy recommendations. She finds that one of the major constraints to improving economic performance and sustainable job creation is a general lack of technological capabilities of the MENA countries. Innovation in these countries is mainly linked to the adaptation and modification of existing technologies, and the low

level of technological readiness negatively impacts innovation and productivity. Hence, the use of foreign intermediates can be a good way to transfer modern technologies from foreign markets to MENA countries. In another study, Atiyas (2011) summarizes the research that uses firm-level data in MENA countries to analyse productivity and its relation to trade, trade policy and financial constraints. He also identifies the main research questions that could be addressed in the near future using the firm-level data available from the World Bank. He emphasizes the fact that researchers have not yet utilized the recently available firm-level data covering MENA countries provided by the World Bank Enterprise Survey (WBES) in order to investigate the relationship between trade and productivity. For this reason, we want to exploit the availability of this dataset to run our analysis, taking advantage of the raw data characteristics. Our work aims to analyse the relationship between exporting and importing activities in Egyptian firms. In doing so, we hope to produce some policy recommendations for this country concerning their participation in regional integration processes and their industrial policies after the Arab Spring revolution.

2.3. Data and descriptive statistics

2.3.1. Database

Data on Egyptian firms are obtained from the World Bank Enterprise Survey dataset²⁴. The dataset includes 3,129 firms for the years 2004, 2005 and 2007. For some variables, namely sales, exporting and importing status we are able to use information for an additional year per questionnaire, since each firm is asked in the questionnaire about the value of sales and the export/import status in the year of the questionnaire and the previous year. Some firms are only included in one or two years, whereas 554 firms are included in the three questionnaires. Therefore, using the available information for these firms we build a panel dataset from 2003 to 2007 obtaining 2,770 observations. Table 2.1 shows that firms involved in international activities perform better than domestic-

²⁴ The data comes from a firm-level survey based on a representative sample of manufacturing Egyptian firms classified using ISIC codes 15-37, 45, 50-52, 55, 60-64, and 72 (ISIC Rev.3.1). Formal (registered) companies with 5 or more employees are targeted for interviews and firms with 100% government/state ownership are not eligible to participate in the Enterprise Survey. Business owners and top managers answer the Enterprise Survey from the World Bank. Sometimes the survey respondent calls company accountants and human resource managers into the interview to answer questions concerning the sales and labour sections of the survey, which covers a broad range of business environment topics including access to finance, corruption, infrastructure, crime, competition, and performance measures. Typically, 1200-1800 interviews are conducted in larger economies, 360 interviews in medium-sized economies, and only 150 interviews in small economies. See World Bank (2012) for more details.

only firms. If we distinguish between the three types of international firms, we observe that firms with higher productivity are more often two-way traders than export-only firms or import-only firms, and domestic firms have the lowest average productivity. It is also worth noting that two-way traders are bigger in size than import-only and export-only firms and invest more. We also observe that firms owned by foreigners are more focused on international activities.

Table 2.1. Descriptive statistics by trade status

Variable	Obs	Mean	Std.	Min	Max
Export-only firms					
TFPlp _{i,t}	182	7.11	1.68	0.95	10.35
llabp _{i,t}	200	4.11	1.67	-2.68	11.49
work _{i,t}	188	251.45	478.84	8	2,800
foreignowner _{i,t}	191	0.10	0.31	0	1
px _{i,t}	191	39.92	32.91	0.5	100
pm _{i,t}	191	0	0	0	0
capital _{i,t}	180	20,229.64 124,822.6	53,644.1	50	531,419
investment _{i,t}	185	0	1,541,717	0	2.10e+07
Import-only firms					
TFPlp _{i,t}	258	6.98	1.61	-0.95	11.39
llabp _{i,t}	281	4.12	1.55	-3.48	10.68
work _{i,t}	281	250.75	907.84	8	13,695
foreignowner _{i,t}	281	0.06	0.23	0	1
px _{i,t}	281	0	0	0	0
pm _{i,t}	281	50.84	31.19	1	100
capital _{i,t}	253	192,808.4 119,439.1	1,446,639	0	1.57e+07
investment _{i,t}	262	0	1,228,527	0	1.46e+07
Two-way traders					
TFPlp _{i,t}	297	7.83	1.76	0.98	14.37
llabp _{i,t}	317	4.11	1.60	-2.84	10.44
work _{i,t}	314	634.40	1206.94	0	13,15
foreignowner _{i,t}	316	0.11	0.31	0	1
px _{i,t}	316	39.02	33.81	0.9	100
pm _{i,t}	316	47.25	29.08	2	100
capital _{i,t}	298	129,055.7 0	698,418.30	5	9,800,000
investment _{i,t}	297	163,132.0 0	1,734,164	0	2.67e+07
Domestic					
TFPlp _{i,t}	1646	5.44	1.48	1.41	12.93
llabp _{i,t}	1745	3.33	1.31	-2.74	11.14
work _{i,t}	1770	69.11	427.99	0	10,500
foreignowner _{i,t}	1783	0.02	0.12	0	1
px _{i,t}	1783	0	0	0	0
pm _{i,t}	1783	0	0	0	0
capital _{i,t}	1639	33,258	476,477.50	0	1.22e+07
investment _{i,t}	1686	9014.56	159,121.50	0	6,305,686

Notes: Obs denotes number of observations; Std. Dev denotes standard deviation and Min and Max are the minimum and maximum value of each variable. $tfp_{i,t}$ is total factor productivity, obtained using the Levinsohn-Petrin (2003) procedure. We explain the choice of this methodology and the estimation in Appendix A.2; $work_{i,t}$ is the average number of workers; $foreignowner_{i,t}$ is a dummy variable that takes the value of 1 if the firm is owned by foreigners and 0 otherwise; $px_{i,t}$ is the percentage of total exports by sales and $pm_{i,t}$ is the percentage of total imports by sales

2.3.2. Trade status description

Table 2.2 shows the evolution over time of the exporting and importing status of Egyptian firms. The percentages of export-only firms and import-only firms remain quite stable over time, around 8 and 11 per cent on average, respectively. We observe that only 7 per cent of all firms in our sample were involved in both importing and exporting activities in 2003. This number has increased over time and has reached 16 per cent of the number of total firms in 2007. The last part of Table 2.2 shows the percentage of the imported inputs used by import-only firms and two-way traders, showing that on average, more than half of the inputs used in production are imported. In addition, the share has not increased over time and it is relatively stable for both types of firm.

Table 2.2. Sample composition by trade status and percentage of imported inputs

Year	Percentage of firms that are:				% of imported intermediate goods	
	Export-only firms	Import-only firms	Two-way traders	Domestic	Import-only firms	Two-way traders
2003	7%	13%	7%	73%	54%	49%
2004	7%	12%	13%	68%	57%	48%
2005	6%	10%	15%	69%	50%	46%
2006	10%	9%	10%	71%	48%	49%
2007	9%	11%	16%	64%	51%	48%
Average	8%	11%	12%	69%	52%	48%

Note: Authors' elaboration using data from the World Bank Enterprise Survey. *Export-only firms* denotes firms that sell in the local market and also export, *Import-only firms* denotes firms that sell into domestic market and also import, *Two-way traders* refers to firms that sell into the domestic market and also export and import and *Domestic* indicate firms that only sell in the local market and are not engaged in international activities.

Table 2.3 displays the relative importance of each industry in the sample. Firms are classified into nine industrial categories, of which three comprise 66 per cent of the interviewed firms, namely, other industries, metal industries and textiles. The majority of them are focused on the domestic market. In particular, in terms of the garment industry, non-metal industries and other industries, around 70-80 per cent of their activity is domestic, followed by textiles and metal industries, which are close to 70 per cent domestic activity.

Table 2. 3. Number of firms by industry and trade patterns

	Agro industries	Chemicals	Electronics	Garments	Machinery & Equipments	Metal industries	Non metal industries	Other industries	Textiles	Total
Num. firms	45	185	35	325	65	520	280	835	480	2,770
% of total	2%	7%	1%	12%	2%	19%	10%	30%	17%	100%
Importers	16%	22%	36%	5%	22%	13%	9%	8%	12%	
Exporters	11%	9%	0%	7%	11%	8%	7%	8%	7%	
Both	13%	26%	0%	8%	20%	11%	8%	13%	13%	
Domestic	60%	43%	64%	80%	48%	68%	76%	71%	68%	
Total	100%	100%	100%	100%	100%	100%	100%	100%	100%	

Note: Authors elaboration.

Despite the fact that Egyptian firms are very focused on the domestic market, those that are involved in international activities tend to engage in both import and export activities, rather than in only one of them. There are only a few exceptions in some industries in which one of the international activities is more important than the other. This is the case in the electronics industry, where import of intermediate goods represents a higher share than exports. It seems that firms in this industry import intermediate goods mainly to produce products for the local market. Also, the chemical industry shows a higher share of importers than exporters. This descriptive analysis shows that the nature of the different industries might influence the decision to import/export; indeed, some industries are more likely to participate in international markets. For this reason, we need to take industry effects into account in our analysis.

- **How different are Egyptian traders?**

The empirical literature shows that international firms differ from domestic-only firms in several aspects. After Bernard and Jensen's (1999) seminal work, many authors have been interested in analysing the relationship between export activity and firms' characteristics. Some of them have studied the causality between firm export activity and firm productivity, trying to link both activities. Two basic hypotheses serve to explain this relationship. The first is the self-selection hypothesis, which assumes that only the most productive firms can start to export due to the various export costs in effect. The second hypothesis, learning-by-exporting, suggests that firms involved in international trade need to deal with more competition than domestic firms and that they have access to new knowledge driven by customers, competitors or technology, which increases their firm productivity. Initially, authors focused only on better understanding exporting activity, neglecting to analyse importing activity due to the limitation of imports data availability. This shortcoming was highlighted by Bernard et al (2007), and using data from the United States, they compare the characteristics of export and

import firms, determining importer and exporter premia, higher for two-way traders and followed by export-only firms than import-only firms. After the Bernard et al (2007) paper, interest in analysing the role of imports and firm behaviour grew, especially the links between importing activity and firm productivity. Along the same lines, the self-selection hypothesis and learning-by-importing are also used to explain the relationship between imports and firms productivity.

Following studies that analyse how firm trade status affects firm characteristics, we obtain the exporter and importer premia for Egyptian firms. Exporter/importer premia are conventionally determined by regressing the dependent variable, traditionally expressed as TFP, labour productivity, wages, number of workers or capital, among others, on an exporter/importer dummy and other control variables as explanatory variables using OLS estimations. The estimated coefficients of the dummy trade variable show the exporter/importer premia meaning simple correlations between the dependent variable and the trade dummy variables used. At this point, a causal interpretation of the results must be used carefully. The main idea is to confirm the existence of an export/import premium for Egyptian international firms that will be in accordance with the related empirical literature and to better understand the international Egyptian firms' behaviour. To the best of our knowledge, only Kiendrebeogo (2012) analyses the Egyptian manufacturing sector and how Egyptian firms perform better depending on their export activity. He finds that exporter firms are larger, more capital-intensive and more productive than domestic-only firms. He also examines the self-selection and learning-by-exporting hypotheses, showing that exports have a positive impact on firm productivity of Egyptian firms and that pre-entry differences in productivity do not explain firms' export decisions.

Our aim is to test if these results are still robust when we also include import activity. Both activities may be taking place simultaneously, and some exporters are also importers. Conversely, for this reason—as per to Altomonte and Bekés (2010), Muûls and Pisu (2009)—we distinguish between import-only firms, export-only firms and two-way traders to better understand the characteristics of international Egyptian firms compared with domestic-only firms.

We obtain the importer and exporter premia, estimating an equation where the dependent variables are different measures of firm performance, and we include as explanatory variables their import and export status and other control variables explained below. The estimated equation is:

$$\ln F_{i,t} = \alpha_0 + \alpha_1 d_{i,t}^{xo} + \alpha_2 d_{i,t}^{mo} + \alpha_3 d_{i,t}^{xm} + \ln work_{i,t} \beta + \gamma_k + \delta_t + \varepsilon_{i,t} \quad (1)$$

where $\ln F_{i,t}$ is a vector of firm characteristics using as dependent variables the TFP ($\ln \text{TFP}_{i,t}$)²⁵, labour productivity measured as average number of sales by worker ($\ln \text{labp}_{i,t}$), and the firm size proxied by the average number of workers ($\ln \text{work}_{i,t}$). Also, we analyse capital ($\ln \text{capital}_{i,t}$) and investment ($\ln \text{investment}_{i,t}$). As explanatory variables we include $d_{i,t}^{xo}$, a dummy variable taking the value of 1 if the firm only exports. $d_{i,t}^{mo}$ takes the value of 1 if the firm only imports and $d_{i,t}^{xm}$ takes the value of 1 if the firms are two-way traders. As a control variable, when the dependent variable is not employment, we include the size of the firm $\ln work_{i,t}$ measured as the average number of workers. We also include industry dummies and year dummies to take into account any fixed effects common across industries and to control for potential measurement errors as well as to control for business cycles. We estimate simple OLS fixed effects regressions.

Table 2.4 presents the estimated trade status premia obtained from a pooled OLS regression for all industries.

²⁵ TFP has been obtained using the Levinsohn-Petrin (2003) methodology and it is obtained using *levpet* command in Stata13.

Table 2.4. Exporter and importer premia

Dependent Variable	Log labp _{i,t}		Log TFP _{i,t}		Log work _{i,t}	Log capital _{i,t}	Log investment _{i,t}
Export-only firms	0.619***	0.624***	1.383***	0.624***	1.011***	0.575***	0.793***
	0.130	0.138	0.161	0.138	0.132	0.192	0.185
Import-only firms	0.507***	0.512***	1.233***	0.512***	1.037***	0.823***	0.603***
	0.113	0.116	0.134	0.116	0.108	0.176	0.161
Two-way traders	0.611***	0.620***	2.033***	0.620***	1.943***	0.794***	0.740***
	0.125	0.142	0.147	0.142	0.125	0.200	0.186
Log work _{i,t}		-0.004		0.683***		0.535***	0.859***
		0.034		0.034		0.051	0.045
Year Dummies	yes	yes	yes	yes	yes	yes	yes
Industry Dummies	yes	yes	yes	yes	yes	yes	yes
Observations	2383	2383	2383	2383	2547	1850	2372
R2	0.20	0.20	0.27	0.20	0.51	0.19	0.27

OLS fixed effect regression, robust and standard errors reported below each coefficient. *** denotes statistical significance at the 0.01 level. TFP_{i,t} is total factor productivity, obtained using the Levinsohn-Petrin (2003) procedure using *levpet* command in Stata13. *Export-only firms* denotes firms that sell into the domestic market and only export; *Import-only firms* denotes firms that sell into the domestic market and only import; *Two-way traders* refers to firms that sell into the domestic market and also export and import.

The results show similar estimated coefficients for labour productivity and TFP when we control for firm size. In general, we observe, as do Bekés et al (2011) and Altomonte and Bekés (2010), that firms involved in international trade, irrespective of their trade pattern, have higher productivity, are larger, own more capital, and invest more than domestic-only firms. If we analyse which firms perform better in function of their international trade pattern, we observe that export-only firms and two-way traders have similar estimated coefficients: export-only firms are the most productive, with 87 per cent²⁶ higher productivity than domestic-only firms, whereas two-way traders show 86 per cent higher productivity compared with domestic-only firms. Import-only firms show less productivity than the other international firms, but still 67 per cent more than domestic firms.

2.4. Theoretical background and empirical strategy

2.4.1. Theoretical background imports and exports complementarities

Kashara and Lapham (2013) develop a model for an open economy with heterogeneous final goods producers. In this model, the firm makes the decision to simultaneously

²⁶ Percentages obtained as $((e^{coef})-1)*100$

export their output and to use imported intermediates. The authors extend the Melitz (2003) model by incorporating importing costs and using it to test the relationships between plant productivity and the export and import status of Chilean firms.

The model is based on an open economy in which the final goods sector is composed of monopolistically competitive firms producing horizontally differentiated goods using labour and an intermediate good. Firms have to pay a fixed cost to enter into the foreign market in order to import and export. The authors also introduce the productivity of the firm, the transport costs for importing intermediates and for exporting final goods, and take into account the trade status of the firm in order to capture the observed changes in the firm's trade status over time in the data. That is, they consider whether a firm is import-only, export-only, both or only sells in the domestic market. They assume that two-way traders necessarily face higher trade costs, and for this reason only the most productive firms are able to operate as such. However, if there is a common fixed cost for both activities, the firms that are one-way traders are more likely to start exporting and, in due course, become two-way traders.

2.4.2. Modelling the decision to export and import

2.4.2.1. Extensive margin of trade

In order to estimate the determinants of export and import decisions, we model the probability of exporting/importing as a function of TFP, size of the firm and ownership structure. In order to account for correlations between exporting and importing activities, we extend the models by introducing past import-status in the exporting equation and past export-status in the import equation. The estimated equations for exports and imports are given by,

$$\Pr(x_{i,t} = 1) = f[m_{i,t-n}, \ln(TFP_{i,t-n}), \ln(work_{i,t-n}), foreignowner_{i,t}, \gamma_k, \delta_t, \varepsilon_{i,t}] \quad (2)$$

$$\Pr(m_{i,t} = 1) = f[x_{i,t-n}, \ln(TFP_{i,t-n}), \ln(work_{i,t-n}), foreignowner_{i,t}, \gamma_k, \delta_t, \varepsilon_{i,t}] \quad (3)$$

where \ln denotes natural logarithms, the subscript i indexes firms; t , indexes time and n takes a value of 0 when the values of the variable are used in the current year and takes the value of 1 if the first lag of the variable is included. The dependent variable in equation (1), $\Pr(x_{i,t}=1)$, denotes the probability of exports and is a dummy variable that takes the value of 1 if firm i exports in year t , and 0 otherwise and the dependent

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variable in equation (2), $PR(m_{i,t}=1)$, is the probability of importing, which takes the value of 1 if firm i imports in year t , and 0 otherwise. $m_{i,t-n}$ is a dummy variable reflecting the import status of the firm in year $t-n$ and $x_{i,t-n}$ is a dummy variable indicating the exporting status of the firm in year $t-n$, TFP_{it-n} is total factor productivity of the firm. It has been obtained the Levinsohn-Petrin (2003) methodology²⁷. $work_{it-n}$ denotes the average number of workers in $t-n$, and $foreigner_{i,t}$ is a dummy variable that takes the value of 1 if the firm is owned by foreigners and 0 otherwise²⁸. These variables have been commonly included as control variables in models used to estimate the determinants of the decision to export; see, for example, Greenaway et al (2007).

Industry (λ_k) and time dummies (δ_t) have also been included in the model to proxy for factors that are industry specific and time-invariant and for those that vary over time and are common to all firms. The parameters of equations (1) and (2) are estimated using a panel-Probit model²⁹ based on the maximum likelihood estimation techniques for the period 2003-2007.

Table 2.5 shows the results of estimating equations (1) and (2). Two sets of results are presented for the extensive margin of exports (columns 1-2) and imports (columns 3-4). The first specification for both models includes the first lag of the independent variables and the results indicate that the use of imported intermediates increases the probability of starting exporting (column 1, Table 2.5). Exports in the past year also increase the probability of importing in the current year (column 2, Table 2.5). Size, TFP and being owned by foreigners also increase the probability of being involved in international trade, where foreign ownership affects export activity more than import. Also, the use of intermediates is more important to export than exports to explain imports. Industry and time dummies are included in the regression, and we observe that firms in the chemical, garment, machinery and equipment industries, among others, show a higher probability of exporting in comparison to the default category (agro-industries)³⁰. In addition, firms show less probability of importing intermediates in 2006 in comparison to 2003 and

²⁷ The TFP variable used in our empirical analysis is based on the Levinsohn-Petrin (2003) procedure.

²⁸ We also used alternatively the percentage of the firm owned by a foreigner, but since high and low percentage of foreign ownership have approximately the same effect, we decided to create a 1/0 dummy.

²⁹ Results are obtained using *xtpobit* command in Stata11.

³⁰ Electronics is not included due that firms on the sample are not exporters

2004, due to the major fiscal reforms that were introduced in 2005 in Egypt to increase tax filing by individuals and corporations. Perhaps the reduced tax rate incentivised firms to move to the formal economy and to afford the payment the firms reduced in this year the purchase of foreign goods.

Despite the fact that current productivity can lead to some endogeneity problems, we introduce the current and past TFP with the aim of identifying the channel through which imports affect exports. When we control for current productivity, we also include the lagged values of the independent variables. We observe that for exports (column 2), the past import status is not significant, which implies that past status is correlated with past productivity and that only imports in the current year affect the probability of export in the same year. Otherwise, we observe in column 4 that when we control in the import model for past productivity, we find that past and current productivity increase the probability of importing, thus productivity offers an explanation as to Egyptian firms' decisions on whether to import in the current year. We also observe that past productivity is correlated with past export status but not with the current exports. Accordingly, firms might be importing intermediates in one year in order to produce a final good that could be exported in the following year. Alternatively, firms might import intermediate goods because they profited from exporting in the previous year and they are able to achieve higher productivity levels through exporting.

Table 2.5. Probit baseline results (Extensive margin for exports and imports)

	P(x _{it} =1)	P(x _{it} =1)	P(m _{it} =1)	P(m _{it} =1)
lwork _{i,t-t}	0.390*** (0.050)	0.080 (0.071)	0.373*** (0.050)	0.006 (0.072)
lwork _{i,t}		0.441*** (0.071)		0.516*** (0.078)
lftp _{i,t-t}	0.134*** (0.035)	0.043 (0.043)	0.163*** (0.036)	0.134*** (0.045)
lftp _{i,t}		0.172*** (0.044)		0.089* (0.047)
m _{i,t-1}	0.378*** (0.124)	-0.014 (0.159)		
m _{i,t}		1.308*** (0.165)		
x _{i,t-1}			0.288** (0.128)	-0.182 (0.171)
x _{i,t}				1.488*** (0.179)
foreignowner _{i,t}	0.893*** (0.241)	0.492* (0.293)	0.440* (0.252)	-0.306 (0.319)
chemicals	1.119** (0.464)	1.250** (0.576)	0.554 (0.431)	0.480 (0.561)
garments	0.851* (0.452)	1.233** (0.567)	-0.489 (0.425)	-0.869 (0.565)
machinery & equipment	1.047* (0.543)	1.133* (0.685)	0.205 (0.541)	-0.248 (0.723)
metal industries	0.704 (0.431)	0.833 (0.537)	-0.096 (0.394)	-0.262 (0.513)
non metal industries	0.598 (0.454)	0.839 (0.566)	-0.676 (0.430)	-1.028* (0.563)
other industries	0.707* (0.424)	0.901* (0.527)	-0.410 (0.386)	-0.774 (0.505)
textiles	0.638 (0.434)	0.772 (0.541)	-0.158 (0.397)	-0.410 (0.519)
2005	-0.062 (0.127)	0.007 (0.152)	-0.047 (0.124)	-0.006 (0.151)
2006	-0.133 (0.126)	-0.214 (0.160)	-0.372*** (0.126)	-0.592*** (0.163)
2007	-0.089 (0.130)	-0.099 (0.153)	-0.185 (0.127)	-0.244 (0.154)
cons	-4.255*** (0.490)	-6.028*** (0.666)	-3.186*** (0.441)	-4.374*** (0.617)
obs	1883.000	1850.000	1885.000	1852.000
aic	1448.464	1164.991	1531.713	1256.998
bic	1537.114	1269.927	1620.38	1361.954

Notes: Dependent variables are dummy variables for the exporter and importer status. t-1 means lagged values of these variables. Standard error in brackets where *** p<0.001, **p<0.05, * p<0.01. Industrial and year dummies included. tfp_{it} means total factor productivity, it is obtained using the Levinsohn-Petrin (2003) procedure; tfp_{it-1} are lagged value of ; tfp_{it}; work_{it} means the average number of workers and work_{it-1} are aged value of the variable; x_{it} are a dummy variable that takes the value of 1 if the firm is exporting and 0 otherwise, x_{it-1} are the lagged value and foreignowner_{it} are a dummy variable that takes the value of 1 if the firm is owned by foreigners and 0 otherwise

To further investigate the dynamics of models (1) and (2), we add the lagged left hand side variables as explanatory variables. In this way, we will be able to investigate the existence of state dependence, also termed hysteresis, in the export and import status. In other words, we assume that there is some sort of persistence affecting the decision to export final outputs and import intermediates, and we would like to disentangle the effect of past status from the firm's initial condition as exporter/importer. The inclusion in the model of the lagged values of the dependent variables has been considered by several authors as a way to introduce a measure of the sunk costs (Bernard and Jensen, 2004; Muûls and Pisu, 2009; and Roberts and Tybout, 1997).

The main complication of explicitly allowing for lagged effects is that the correlation between the unobserved heterogeneity and the lagged dependent variable in the dynamic binary choice model makes the lagged dependent variable endogenous. Hence the estimators used before will not be consistent. A familiar alternative approach is based on Wooldridge (2005), which builds on the random effects specification and basically adds the initial condition and the averages over time of the time variable variables as additional regressors. This technique has been improved by Rabe-Hesketh and SkronDAL (2013).

Therefore, we follow a similar strategy to Aristei et al (2013) and Muûls and Pisu (2009) but use instead a more reliable estimation technique that will enable us to disentangle the effect of the initial conditions from the effect of the past export/import status of the firm on the decision to export/import.

We use the approach proposed by Rabe-Hesketh and SkronDAL (2013) to deal with the so-called "initial condition" problem (basically, we cannot observe the first dependent observation in the data-generating process, hence we cannot treat the stochastic process from its starting point and consequently we cannot treat it as fixed). Previous related literature used Wooldridge's auxiliary model to deal with the problem. However, as stated by Rabe-Hesketh and SkronDAL (2013), Wooldridge's (2005) method performs poorly for short panels, mainly because if the means are based on all periods, the initial conditions are also used to compute those means, and this induces endogeneity. The authors suggest including the initial-period as explanatory variable and calculate the

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mean only using the remaining periods, that is t+1 until n. We follow this strategy and estimate the following models:

$$\Pr(x_{i,t} = 1) = f[(x_{i,t-1}), (m_{i,t-1}), \ln(tfp_{i,t-n}), \ln(work_{i,t-n}), (foreignowner_{i,t}), \gamma_k, \delta_t, u_{i,t}] \quad (3)$$

$$\Pr(m_{i,t} = 1) = f[(m_{i,t-n}), (x_{i,t-n}), \ln(tfp_{i,t-n}), \ln(work_{i,t-n}), (foreignowner_{i,t}), \gamma_k, \delta_t, u_{i,t}] \quad (4)$$

where the dependent variables are binary variables that take a value of 1 when a firm exports (imports) and 0 otherwise. As independent variables we include the lagged dependent variable and the lagged importer (exporter) status. As control variables we include the same control variables as in models (1) and (2): TFP, size of the firm and a dummy variable indicating whether a firm is owned by foreigners; all the control variables apart from $foreignowner_{i,t}$ are in logs. We also include industrial and time dummies (γ_k, δ_t), and those other firm-level specific effects that are unobserved are captured by u_i, ε_i . As in Wooldridge (2005), we assume that $u_i, (\varepsilon_i)$, the firm specific effects are determined by,

$$u_i (\varepsilon_i) = \beta_0 + \beta_1 x|m_{i0} + \beta_2 \overline{ltfp}_i + \beta_3 \overline{lwork}_i + \mu_{i,t} \quad (5)$$

where μ_i is an independently and normally distributed error term and the control variables are now the firm-level average of each variable over time (calculated by excluding the initial period). However, as Rabe-Hesketh and Skrondal (2013) suggest, the firm-level average must be obtained excluding the initial period and then adding a dummy in the regression (ie_i), (ii_i) capturing whether the firm imports/exports in the first period of the sample. If we now include equation (5) in equations (3) and (4) we obtain:

$$\Pr(x_{i,t} = 1) = \gamma_0 + \beta_0 x_{i,t-1} + \beta_1 \ln(tfp_{i,t-1}) + \beta_2 \ln(work_{i,t-1}) + \beta_3 foreignowner_{i,t} + \beta_4 m_{i,t-1} + \beta_5 \overline{ltfp}_i + \beta_6 \overline{lwork}_i + \mu_i + ie_i + ii_i + \gamma_k + \delta_t + u_{i,t} \quad (6)$$

$$\Pr(m_{i,t} = 1) = \gamma_0 + \beta_0 m_{i,t-1} + \beta_1 \ln(tfp_{i,t-1}) + \beta_2 \ln(work_{i,t-1}) + \beta_3 foreignowner_{i,t} + \beta_4 x_{i,t-1} + \beta_5 \overline{ltfp}_i + \beta_6 \overline{lwork}_i + \mu_i + ie_i + ii_i + \gamma_k + \delta_t + u_{i,t} \quad (7)$$

As per Muûls and Pisu (2009) and Aristei et al (2012), we test the existence of sunk costs in import and export activity. To measure the importance of these sunk costs, we estimate the parameters of the two dynamic Probit models from equations (6) and (7) individually, and we interpret the estimated coefficients for the dependent lagged

variable as a measure of the importance of sunk costs, as per the authors cited above. We argue that sunk costs generate hysteresis in the export, import market participation. The results from equation (6) are shown in Table 2.6, and those from equation (7) are shown in Table 2.7.

The first columns of Tables 2.6 and 2.7 include only the lagged value of the dependent variable. It shows that the past import/export status does indeed explain the current import/export status. Similarly, as we obtained in the previous estimations, foreign ownership also affects both the export and import status of the firm. However, TFP affects the probability of importing but not of exporting, and the size of the firm affects export but not import. It could be that TFP is more important for import than for export decisions although a deeper analysis is needed to better understand these results. Perhaps the sunk costs that firms face to import intermediates are higher than those needed to export due to the protection of foreign products. Indeed, liberalization of imports started progressively in 2004 with the entry into force of the FTA with the EU, whereas exports were already liberalized in 1972 with the bilateral cooperation agreements. Also in 2007, Egypt started a progressively liberalization with Turkey.

There is also a different effect of the variable firm size on the probability of exporting and importing. Firm size has a positive effect on the decision to start exporting only. This could be explained by the fact that larger firms are able to serve the domestic and the foreign market because they have a higher production capacity than smaller firms. However, firm size does not affect the probability of importing indicating that firms import intermediates probably because these are not available in the domestic market.

Next, in order to analyse how the combination of both export and import activities affect the probability of importing/exporting, we include both activities in columns (2) in Table 2.6 and (2) in Table 2.7.

According to the results, we find that previous export and import status affects current export and import status positively, whereas past exports do not affect current imports and past imports do not affect current exports. However, we observe the lagged dependent variable and find that past export and import participation has a high degree of hysteresis, where firms face higher sunk costs for import than for export. The results

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are similar to those obtained from Muûls and Pisu (2009), where exporter/importer status in the previous year has a positive effect on the probability of also exporting/importing in the current year, where the positive effect was more notable in terms of importing activity. On the contrary, we do not find that past imports affect the probability of exporting in the current year nor that past exports affect the probability of importing in the present year. This is due to the fact that the lagged variables of import and export activity do not have statistical significance. The effect appears when we include the current importer and exporter status. The results are shown in column 3 of Tables 2.6 and 2.7, and they suggest that actual import status positively affects the probability of exporting and that export in the current year also affects the possibility of importing. Nevertheless, past experience in the same activity is still the most important determinant of continuance in the same activity.

Table 2.6. Probit dynamic panel model controlling for initial conditions (Exports)

	P(x _{it-1} =1)	P(x _{it-1} =1)	P(x _{it-1} =1)
x _{i,t-1}	1.489*** (0.112)	1.492*** (0.117)	1.408*** (0.136)
m _{i,t-1}		-0.027 (0.106)	
m _{i,t}			1.219*** (0.135)
lwork _{i,t-t}	0.130** (0.056)	0.134** (0.057)	0.071 (0.062)
foreignowner _{i,t}	0.625*** (0.175)	0.621*** (0.175)	0.600*** (0.202)
lftp _{i,t-1}	0.041 (0.036)	0.041 (0.036)	0.034 (0.039)
lftp mean _{i,t-1}	0.097 (0.060)	0.102* (0.060)	0.012 (0.069)
lwork mean _{i,t-t}	0.072 (0.073)	0.068 (0.074)	0.096 (0.083)
baseExp	-0.060 (0.122)	-0.065 (0.122)	0.162 (0.157)
chemicals	0.782** (0.325)	0.786** (0.327)	0.696* (0.366)
garments	0.760** (0.323)	0.754** (0.324)	0.856*** (0.365)
machinery & equipment	0.761** (0.368)	0.756** (0.370)	0.793* (0.418)
metal industries	0.675** (0.309)	0.672** (0.310)	0.711** (0.345)
non metal industries	0.596* (0.323)	0.591* (0.324)	0.785*** (0.364)
other industries	0.648** (0.304)	0.641** (0.306)	0.759*** (0.341)
textiles	0.610** (0.311)	0.609* (0.312)	0.649* (0.348)
2005	-0.182 (0.121)	-0.192 (0.121)	-0.150 (0.135)
2006	-0.180 (0.115)	-0.191* (0.116)	-0.042 (0.128)
2007	-0.033 (0.119)	-0.045 (0.120)	0.059 (0.133)
cons	-3.424*** (0.381)	-3.432*** (0.387)	-3.352*** (0.478)
obs	1889	1880	1882
aic	1293.017	1292.134	1148.389
bic	1398.349	1402.915	1259.191

Notes: Dependent variables are dummy variables for the exporter and importer status. t-1 means lagged values of these variables. Standard error in brackets where *** p<0.001, **p<0.05, * p<0.010. baseImp means initial importer dummy. ftp_{i,t} means the lagged value of the total factor productivity, it is obtained using the Levinsohn-Petrin (2003) procedure; work_{i,t-1} are the lagged value of the average number of workers; m_{i,t} is a dummy variable that takes the value of 1 if the firm is importing and 0 otherwise, m_{i,t-1} are the lagged value; x_{i,t} are a dummy variable that takes the value of 1 if the firm is exporting and 0 otherwise and foreignowner_{i,t} are a dummy variable that takes the value of 1 if the firm is owned by foreigners and 0 otherwise

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Table 2.7. Probit dynamic panel model controlling for initial conditions (Imports)

	P(m _{it-1} =1)	P(m _{it-1} =1)	P(m _{it-1} =1)
m _{i,t-1}	1.591*** (0.114)	1.622*** (0.118)	1.427*** (0.140)
x _{i,t-1}		-0.124 (0.106)	
x _{i,t}			1.342*** (0.140)
lwork _{i,t-1}	0.057 (0.055)	0.068 (0.056)	-0.003 (0.064)
foreignowner _{i,t}	0.319* (0.177)	0.324* (0.178)	0.047 (0.218)
ltfp _{i,t-1}	0.063* (0.036)	0.065* (0.036)	0.059 (0.041)
ltfp mean _{i,t-1}	0.094 (0.061)	0.100 (0.061)	0.067 (0.075)
lwork mean _{i,t-1}	0.070 (0.074)	0.066 (0.074)	0.046 (0.088)
baseImp	0.029 (0.118)	0.017 (0.118)	0.347** (0.170)
chemicals	0.092 (0.249)	0.114 (0.250)	-0.202 (0.315)
garments	-0.296 (0.249)	-0.277 (0.250)	-0.683** (0.317)
machinery & equipment	-0.201 (0.322)	-0.188 (0.323)	-0.574 (0.409)
metal industries	-0.189 (0.227)	-0.182 (0.228)	-0.447 (0.285)
non metal industries	-0.456* (0.249)	-0.452* (0.249)	-0.775** (0.318)
other industries	-0.281 (0.222)	-0.272 (0.222)	-0.601** (0.279)
textiles	-0.214 (0.230)	-0.204 (0.230)	-0.454 (0.288)
2005	-0.205* (0.118)	-0.199* (0.119)	-0.203 (0.134)
2006	-0.406*** (0.116)	-0.395*** (0.116)	-0.445*** (0.133)
2007	-0.006 (0.117)	-0.004 (0.117)	-0.043 (0.134)
cons	-2.290*** (0.316)	-2.358*** (0.321)	-1.972*** (0.418)
obs	1867	1863	1863
aic	1322.391	1321.338	1175.859
bic	1427.501	1431.937	1286.458

Notes: Dependent variables are dummy variables for the exporter and importer status. t-1 means lagged values of these variables. Standard error in brackets where *** p<0.001, **p<0.05, * p<0.010. baseImp means initial importer dummy. tfp_{it} means the lagged value of the total factor productivity; it is obtained using the Levinsohn-Petrin (2003) procedure; work_{i,t-1} are the lagged value of the average number of workers; m_{it} are a dummy variable that takes the value of 1 if the firm is importing and 0 otherwise, m_{it-1} is the lagged value; x_{it} is a dummy variable that takes value 1 if the firm is exporting and 0 otherwise and foreignowner_{it} are a dummy variable that takes the value of 1 if the firm is owned by foreigners and 0 otherwise

2.4.2.2. Intensive margin of trade (static and dynamic approach)

In order to extend our analysis and provide greater robustness to our results, we analyse the impact on the intensive margin of trade measured as the log of the percentage of exports on total sales of firm and the percentage of material purchases imported. The estimated model is given by equations (8) and (9), similar to equations (1) and (2) used in the extensive margin; the only difference is that the dependent variable is $exp_{i,t}$ proxy by the intensive margin of trade in Egypt, as the percentage of exports on total sales of firm i in year t , and $imp_{i,t}$ proxy by the intensive margin of trade in Egypt, as the percentage of total purchases of materials inputs imported from firm i in year t . Similar to equations (1) and (2), we propose two alternative specifications; one including only lagged values of the explanatory variables (8) and the second including current and lagged values (9).

$$imp_{i,t} = f[\ln(imp_{i,t-n}), \ln(ITFP_{i,t-n}), \ln(work_{i,t-n}), foreignowner_{i,t}, \gamma_k, \delta_t, \epsilon_i] \quad (8)$$

$$exp_{i,t} = f[\ln(exp_{i,t-n}), \ln(ITFP_{i,t-n}), \ln(work_{i,t-n}), foreignowner_{i,t}, \gamma_k, \delta_t, \epsilon_i] \quad (9)$$

In this case, the parameters of the model are estimated using a Tobit procedure. The election of this estimation has been due to the fact that our dependent variable is continuous and positively distributed, taking censored values from 0 to 100. As stated in Wooldridge (2010), highlight the use of lineal models are not recommended in this case where corner solutions are present, and a censored regression model is more recommended in this setting. In our sample approximately 80 per cent of the observations in the dependent variable take the value of 0.

The results are presented in Table 2.9 for the intensive margin of exports and imports, where we can observe in columns 1 and 2 that when we include the lagged values of the independent variables, the percentage of past imports and exports affect the percentage of the other activity positively. We also find that the size, ownership and TFP are correlated with the dependent variable. Nevertheless, when we include their current values, columns 2 and 4, we highlight a causality problem. Only past and current TFP are significant for the percentage of imported intermediates, but not for the percentage

exported, underlining the importance of TFP to the import activity of firms in comparison. In general, the results are still similar to those for the extensive margin.

Table 2. 8. Tobit baseline results (Intensive margin for exports and imports)

	$exp_{i,t}$	$exp_{i,t}$	$imp_{i,t}$	$imp_{i,t}$
$lwork_{i,t-t}$	12.653*** (1.823)	-0.642 (1.932)	13.922*** (1.862)	-0.462 (2.141)
$lwork_{i,t}$		16.620*** (2.029)		17.545*** (2.254)
$ltpf_{i,t-1}$	5.715*** (1.365)	2.290* (1.261)	7.113*** (1.432)	3.664*** (1.393)
$ltpf_{i,t}$		4.984*** (1.282)		4.708*** (1.418)
$imp_{i,t-1}$	0.230*** (0.074)	0.109 (0.071)		
$imp_{i,t}$		0.359*** (0.069)		
$exp_{i,t-1}$			0.256*** (0.089)	-0.006 (0.096)
$exp_{i,t}$				0.527*** (0.093)
foreignowner $_{i,t}$	30.886*** (9.030)	30.693 (19.894)	21.344** (9.845)	18.175 (18.018)
Chemicals	34.083* (20.043)	31.406 (19.409)	19.018 (18.088)	-30.757* (18.199)
Garments	32.145* (19.447)	26.342 (23.801)	-23.676 (17.959)	-5.309 (23.063)
Machinery & Equipment	36.384 (23.617)	14.585 (18.592)	1.765 (22.654)	-11.762 (16.619)
Metal industries	18.631 (18.666)	16.374 (19.533)	-9.871 (16.648)	-37.250** (18.182)
Non metal industries	18.005 (19.637)	18.536 (18.215)	-34.717* (18.220)	-24.496 (16.307)
Other industries	21.365 (18.305)	22.654 (18.645)	-20.995 (16.323)	-15.498 (16.803)
Textiles	26.130 (18.725)	-1.108 (4.099)	-8.268 (16.773)	-1.501 (4.426)
2005	-1.788 (4.666)	-8.972** (4.434)	-3.683 (4.828)	-19.651*** (4.828)
2006	-2.779 (4.689)	-4.435 (4.208)	-13.753*** (4.960)	-9.583** (4.525)
2007	-5.133 (4.797)	-181.266*** (20.781)	-10.615** (4.935)	-145.231*** (18.826)
obs	1883	1850	1885	1852
aic	5206.462	4893.465	5901.713	5601.873
bic	5300.653	5003.924	5995.922	5712.353

Notes: Dependent variables are dummy variables for the exporter and importer status. t-1 means lagged values of these variables. Standard error in brackets where *** p<0.001, **p<0.05, * p<0.01. Industrial and year dummies included. $tfp_{i,t}$ means total factor productivity, it is obtained using the Levinsohn-Petrin (2003) procedure; $tfp_{i,t-1}$ are lagged value of ; $tfp_{i,t}$; $work_{i,t}$ means the average number of workers and $work_{i,t-1}$ are aged value of the variable; $x_{i,t}$ are a dummy variable that takes value 1 if the firm is exporting and 0 otherwise, $x_{i,t-1}$ are the lagged value and $foreignowner_{i,t}$ are a dummy variable that takes the value of 1 if the firm is owned by foreigners and 0 otherwise

Following the strategy from the extensive margin of trade, we also obtain a dynamic model for the extensive margin using a Tobit procedure. Equations (10) and (11) are similar to equation (6) and (7). The only difference is that dependent variables are now the percentage of the sales exported (10) and imported (11).

$$imp_{i,t} = \gamma_0 + \beta_0 imp_{i,t-1} + \beta_1 \ln(tfp_{i,t-1}) + \beta_2 \ln(work_{i,t-1}) + \beta_3 foreignowner_{i,t} + \beta_1 exp_{i,t-1} + \beta_2 \overline{tfp}_i + \beta_3 \overline{work}_i + \mu_i + ie_i + ii_i + \gamma_k + \delta_t + u_i \quad (10)$$

$$exp_i = \gamma_0 + \beta_0 exp_{i,t-1} + \beta_1 \ln(tfp_{i,t-1}) + \beta_2 \ln(work_{i,t-1}) + \beta_3 foreignowner_{i,t} + \beta_1 imp_{i,t-1} + \beta_2 \overline{tfp}_i + \beta_3 \overline{work}_i + \mu_i + ie_i + ii_i + \gamma_k + \delta_t + u_i \quad (11)$$

The results are presented in Table 2.8, 2.9 and 2.10, and we obtain similar results to the extensive margin of trade. We find a high degree of hysteresis, where the past percentage of exports and imported intermediates explains the current levels of each activity. Past TFP is still important to explain the level of the use of imported intermediates by Egyptian firms, and foreign ownership is still important for exports.

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Table 2.9. Tobit dynamic panel model controlling for initial conditions (Exports)

	$exp_{i,t-1}$	$exp_{i,t-1}$	$exp_{i,t-1}$
$exp_{i,t-1}$	0.493*** (0.025)	0.491*** (0.026)	0.430*** (0.031)
$imp_{i,t-1}$		-0.001 (0.022)	
$exp_{i,t}$			
$imp_{i,t}$			0.286*** (0.020)
$lwork_{i,t}$	0.035*** (0.011)	0.035*** (0.012)	0.018 (0.011)
$foreignowner_{i,t}$	0.179*** (0.039)	0.177*** (0.039)	0.153*** (0.038)
$ltfp_{i,t-1}$	0.011 (0.007)	0.011 (0.007)	0.007 (0.007)
$ltfp\ mean_{i,t-1}$	0.011 (0.011)	0.012 (0.012)	-0.005 (0.011)
$lwork\ mean_{i,t}$	0.016 (0.015)	0.016 (0.015)	0.016 (0.014)
baseExp	-0.015 (0.026)	-0.016 (0.027)	0.022 (0.028)
Chemicals	0.126** (0.052)	0.127** (0.053)	0.100* (0.052)
Garments	0.121** (0.049)	0.120** (0.049)	0.135*** (0.049)
Machinery & Equipment	0.112* (0.065)	0.111* (0.065)	0.097 (0.064)
Metal industries	0.102** (0.047)	0.101** (0.047)	0.107** (0.047)
Non metal industries	0.085* (0.049)	0.084* (0.050)	0.118** (0.049)
Other industries	0.099** (0.046)	0.098** (0.046)	0.122*** (0.046)
Textiles	0.096** (0.047)	0.096** (0.048)	0.105** (0.047)
2005	-0.035 (0.022)	-0.037* (0.022)	-0.029 (0.020)
2006	-0.050** (0.021)	-0.053** (0.022)	-0.026 (0.020)
2007	-0.011 (0.022)	-0.013 (0.022)	-0.001 (0.020)
cons	-0.278*** (0.060)	-0.279*** (0.061)	-0.177*** (0.060)
obs	1889	1880	1882
aic	1047.417	1050.728	841.0867
bic	1158.293	1167.047	957.4285

Notes: Dependent variables are the percentage total sales exported. t-1 means lagged values of these variables. Standard error in brackets where *** p<0.001, **p<0.05, * p<0.010. baseExp means initial importer dummy. $tfp_{i,t}$ means the lagged value of the total factor productivity, it is obtained using the Levinsohn-Petrin (2003) procedure; $work_{i,t-1}$ are the lagged value of the average number of workers; $m_{i,t}$ are a dummy variable that takes the value of 1 if the firm is importing and 0 otherwise, $m_{i,t-1}$ are the lagged value; $x_{i,t}$ are a dummy variable that takes the value of 1 if the firm is exporting and 0 otherwise and $foreignowner_{i,t}$ are a dummy variable that takes the value of 1 if the firm is owned by foreigners and 0 otherwise

Table 2.10. Tobit dynamic panel model controlling for initial conditions (Import)

	imp _{i,t-1}	imp _{i,t-1}	imp _{i,t-1}
exp _{i,t-1}		-0.036 (0.023)	
imp _{i,t-1}	0.525*** (0.026)	0.533*** (0.027)	0.436*** (0.032)
exp _{i,t}			0.306*** (0.021)
imp _{i,t}			
lwork _{i,t-t}	0.019 (0.012)	0.022* (0.012)	0.002 (0.011)
foreignowner _{i,t}	0.080** (0.039)	0.081** (0.040)	0.013 (0.039)
ltfp _{i,t-1}	0.016** (0.007)	0.016** (0.007)	0.010 (0.007)
ltfp mean _{i,t-1}	0.012 (0.012)	0.013 (0.012)	0.006 (0.012)
lwork mean _{i,t-t}	0.012 (0.015)	0.012 (0.015)	0.004 (0.015)
baseImp	0.018 (0.026)	0.015 (0.026)	0.061** (0.028)
Chemicals	0.023 (0.054)	0.028 (0.054)	-0.028 (0.055)
Garments	-0.060 (0.051)	-0.056 (0.051)	-0.105** (0.051)
Machinery & Equipment	-0.042 (0.067)	-0.038 (0.067)	-0.086 (0.068)
Metal industries	-0.048 (0.048)	-0.047 (0.048)	-0.082* (0.049)
Non metal industries	-0.092* (0.051)	-0.092* (0.051)	-0.119** (0.051)
Other industries	-0.063 (0.047)	-0.061 (0.047)	-0.098** (0.048)
Textiles	-0.051 (0.049)	-0.050 (0.049)	-0.081* (0.049)
2005	-0.037* (0.022)	-0.036 (0.022)	-0.030 (0.020)
2006	-0.095*** (0.022)	-0.093*** (0.022)	-0.083*** (0.020)
2007	-0.005 (0.022)	-0.005 (0.022)	-0.006 (0.021)
cons	-0.072 (0.063)	-0.090 (0.063)	0.064 (0.064)
obs	1867	1863	1863
aic	1102.709	1102.284	897.3467
bic	1213.35	1218.413	1013.476

Notes: Dependent variables are the percentage total sales imported. t-1 means lagged values of these variables. Standard error in brackets where *** p<0.001, **p<0.05, * p<0.010. baseImp means initial importer dummy. tfp_{i,t} means the lagged value of the total factor productivity, it is obtained using the Levinsohn-Petrin (2003) procedure; work_{i,t-1} are the lagged value of the average number of workers; m_{t,i} are a dummy variable that takes the value of 1 if the firm is importing and 0 otherwise, m_{t,i-1} are the lagged value; x_{t,i} are a dummy variable that takes the value of 1 if the firm is exporting and 0 otherwise and foreignowner_{i,t} are a dummy variable that takes the value of 1 if the firm is owned by foreigners and 0 otherwise

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2.5. Conclusions

Theoretical and empirical works highlight that firms involved in international activities are larger and more productive than domestic-only firms. Using firm-level data for 554 manufacturing companies in Egypt, we estimate the import and export premia, finding that firms involved in international activities have higher productivity, are larger, own more capital and invest more than domestic-only firms. We observe that export-only firms and two-way traders have similar estimated coefficients; export-only firms are the most productive, and import-only firms are less productive compared with the other international firms.

The paper investigates the relationship between exporting and importing activity for Egyptian firms and uses a static and dynamic Probit model for the extensive margin of trade, in which both imports and exports are used as dependent variables. We confirm that both activities are significantly interrelated and that sunk costs are higher for import activity than for export. In this case, TFP explains the decisions to import, but we cannot explain the causality between productivity and export; further research is needed to deal with possible endogeneity problems. Our results show how past experience is the most important factor determining continuance in the same activity. The results are similar for the intensive margin of trade.

Chapter 3

Business environment constraints on Egyptian firms

3.1. Introduction

Based on the literature relating to business environment quality and firm productivity, this paper investigates the role of the business and institutional environment in determining differences in the Total Factor Productivity (TFP) of Egyptian manufacturing firms. From a theoretical perspective, the business environment has an impact on a firm's productivity (domestic- and foreign-owned) due to its effect on investment decisions. It is important to highlight that the factors which constitute this environment could affect a firm's investment decisions in several ways, depending on the sector and industry of the firm, as well as its size, location, and ownership, among other factors. As indicated by Augier et al (2012), the use of firm-level data instead of country-level data allows us to better analyse the impact of the business environment on firm productivity, by enabling us to control for firm heterogeneity.

Since the Egyptian revolution in 2011, Egypt has undergone a major political and social transition, the initial aim of which was to generate economic and social opportunities that would pave the way to economic growth and employment growth. However, the process has been plagued by difficulties and political hindrances which have generated additional constraints, among them increasing political uncertainty. Hence, Egypt still faces important structural challenges that impede the smooth development of private activities. There has traditionally been a system of government intervention in place, which in the past limited their economic challenges faced by Egyptian firms'. Nowadays, Egypt is facing a major challenge to create new and better economic opportunities for a new era. Within this context, identifying the biggest constraints that hinder the operations and growth of Egyptian firms is an important objective.

Institutional and economic conditions are an important determinant of a country's economic development. A better understanding of firms' growth processes is a key objective, as well as designing effective policies to boost economic and employment growth. There are numerous theoretical and empirical studies in the relevant literature that focus on firm productivity and its determinants. This paper contributes to the existing empirical literature in that it aims to shed some light on how the business environment affects firm performance.

A number of recent studies have used firm-level productivity as a measure of firm performance in order to analyse the effect of various business environment factors, for example, Augier et al (2012), Kinda et al (2011), Hallward-Driemeier et al (2006) and Dollar et al (2006). Other authors, including Hallward-Driemeier et al (2006), Dinh et al (2010) and Aterido et al (2011), focused instead on labour market variables, such as employment growth. Other, alternative measures of firm performance, such as sales growth and investment rate, have also been studied by Hallward-Driemeier et al (2006). The use of alternative measures of firm productivity has mainly been motivated by the difficulty of finding the data required to determine TFP.

To the best of our knowledge, Augier et al (2012) and Kinda et al (2011) are the only authors focusing on Middle East and North African (MENA) countries to analyse the impact of business environment constraints on firm productivity. More specifically, Augier et al (2012), using data from Moroccan manufacturing firms from the period 1997 to 2004, analysed the effects of two dimensions of business environment on Moroccan firms' performance. The authors investigated the effect of finance factors on TFP, as well as other types of business obstacles such as taxes, administrative constraints and water outages. Their results indicate that finance and taxes are the main obstacles affecting the TFP of Moroccan companies. The paper also examines how differences in firm characteristics affect the different obstacles and finds that for larger firms and foreign-owned exporting companies, financial indicators are a less significant obstacle than for small firms and for non-exporters. Finally, Kinda et al (2011) analyse firm productive performance in Morocco, Saudi Arabia, Algeria, Egypt and Lebanon, and compare it with seventeen other developing countries. They also analyse the impact of different Investment Climate (IC) indicators on firm productivity. Their data comes from the World Bank Investment Climate Assessment (ICA) and they use only four categories of the seven available to analyse to what extent the quality of the infrastructure, business-government relations, financing constraints and human capacity affect firm productivity. Their results show that the level of workers' education, overdraft facility and access to internet are the most important determinants of firm performance. In addition, the sectors most affected by the business environment constraints are metal and machinery, as well as textiles and garments.

The main contribution of our paper to the existing literature is the use of firm-level data to identify business environment constraints on Egyptian firms' productivity. The results could serve to inform some policy recommendations for the country, in this historical period of economic, social and political change.

The paper is structured as follows: Section 3.2 reviews the existing literature, Section 3.3 describes the data and the methodology used to determine TFP. We also analyse the most significant obstacles declared by Egyptian firms and investigate how differences in firms' characteristics affect the perception of each business environment variable as an obstacle. Section 3.4 presents the econometric model used in the empirical analysis and outlines the main results. Finally, conclusions are presented in Section 3.5.

3.2. Literature review

There is a growing body of literature that analyses the impact of the business environment or investment climate on firm performance and economic growth. In general, this literature provides evidence that a good business climate favours growth by encouraging investment and higher productivity. However, Dethier et al (2010) point out that although overall the results are in general agreement, some contradictory results and weak evidence have been produced, suggesting flaws in the methodology or questionnaire design.

The variables generally used to define the investment climate are those related to infrastructure, security, access to finance and the regulatory framework. These variables can be measured either by objective or subjective measures. With subjective measures, variables generally take categorical values, where a firm's owner or managers identify the main environmental constraint on their firm. For example, they would classify the constraint, from 0 to 4, where 0 signifies no constraint and 4 means a very severe constraint if the variable is the most significant obstacle to their firm's activity. Objective measures are quantitative variables that can be used as a proxy for a business constraint, for example, the value of taxes paid by the firm serves as a proxy for a tax constraint, or the number of days to clear customs as a proxy for customs constraints. Authors that measure business obstacles in a subjective way include Beck et al (2005) or Gelb et al (2007), while authors that use objective and subjective measures in the same analysis include Aterido et al (2011), Dinh et al (2010) or Gelb et al (2007), where

Gelb et al (2007) show that both subjective and objective measures of IC are highly correlated.

In general, the existing macroeconomic literature finds that business climate affects economic performance. Some authors analyse how various factors such as infrastructure or institutions and policy environment affect economic growth. Nevertheless, the robustness of these macroeconomic results has been questioned and some authors such as Dethier et al (2010) or Durlauf, et al (2008) underline that macroeconomic studies of business climate have a number of considerable limitations. Accordingly, they encourage authors to carry out firm/industry-level analysis to provide more useful and robust results.

Papers that use firm-level data include Batra et al (2003) and Ayyagari et al (2006), which take data from the World Business Environment Survey (WBES). Other authors such as Dollar et al (2005), Fisman and Svensson (2006), Reinikka and Svensson (2002), Bigsten and Soderbin (2006), use firm-level data from the World Bank's Enterprise Survey, which give more detailed information about firms and workers.

Authors employ different variables to proxy firm performance. For example, Aterrido et al (2009), Dinh et al (2010), and Hallward-Driemeier et al (2006) use employment growth as a dependent variable and other authors such as Bastos and Nasir (2004), Dollar et al (2005), and Carlin et al (2006) use TFP. Beck et al (2005), Dollar et al (2005), Fisman and Svensson (2007) and Commander and Svejnar (2007) use sales. Some authors, such as Aterido and Hallward-Driemeier (2007) and Escribano and Guasch (2005), include different dependent variables to extend and compare results. In our case, we use TFP and we also use sales and workers as a sensitivity analysis.

The empirical research also stresses the importance of investigating the different ways in which business obstacles affect firms' growth, depending on the type of firm or its location within the country. Investment climate affects countries, regions, firms or industries differently, given the complexity of how it affects investment decisions. The empirical literature like Galindo and Micco (2007), Love and Mylenko (2005) Beck et al (2005), Aterido et al (2009, 2010), Gelb et al (2007) shows that the impact differs significantly depending on different firm characteristics such as size, ownership, international trade. Gelb et al (2007) find that small African firms complain more about access to finance and access to land than larger firms do. Aterido et al (2009), find

differences relating to size categories of firms, where micro and small firms have less access to finance and pay more bribes than larger firms.

It is not possible to make generalised conclusions from the results of the different empirical studies due to extensive heterogeneity in methods and samples. Nevertheless, we list the variables that are commonly identified as firms' main obstacles in the business environment. Firstly, some empirical works show that inadequate electricity or power losses affect firm performance, especially in developing countries, for example, Aterido et al (2007) use data from 102 developing countries to show that electricity is an important constraint on employment growth in firms. Dollar et al (2005) find that power losses negatively affect the TFP of firms in Bangladesh, China, India and Pakistan. Likewise, Aterido and Hallward-Driemeier (2007) find that power outages negatively affect employment growth for African firms. Other works point to the impact of taxes, for example, Carlin et al (2006) use data from 59 countries (lower, middle and high income) to show that tax administration and tax rate affect firm productivity. Similarly, Gelb et al (2007) use data from African firms to highlight that tax administration is a particular problem. Authors such as Carlin et al (2006) and Gelb et al (2007) highlight cost of and access to finance variables as important constraints. Dinh et al (2010) reveal similar findings by using data from 98 countries. Finally, Carlin et al (2006) find that policy uncertainty and macroeconomic stability also act as significant obstacles.

3.3. Data description and TPF estimation

3.3.1. Data sources

Data on Egyptian firms are obtained from the World Bank Enterprise Survey dataset. The data come from a firm-level survey based on a representative sample of Egyptian manufacturing firms classified using ISIC codes 15-37, 45, 50-52, 55, 60-64, and 72 (ISIC Rev.3.1). Formal (registered) companies with five or more employees are targeted for interviews and firms with 100% government/state ownership are not eligible to participate in the Enterprise Survey. Business owners and top managers provided the answers for the World Bank Enterprise Survey although the survey respondent occasionally called company accountants and human resource managers into the interview to answer questions concerning the sales and labour sections of the survey.

The survey covers a broad range of business environment topics, including access to finance, corruption, infrastructure, crime, competition, and performance measures. Typically, 1200-1800 interviews are conducted in larger economies, 360 interviews in medium-sized economies, and only 150 interviews in small economies³¹. The Egyptian dataset includes 3,129 firms for the years 2004, 2005 and 2007. For some variables, namely sales, exporting and importing status, we are able to use information for an additional year per questionnaire, since each firm is asked in the questionnaire for the value of sales and the export/import status in the current and the previous year. Some firms are only included in one or two years, whereas 554 firms are included in all three questionnaires. Hence, using the available information for these firms, we build a panel dataset from 2003 to 2007 with 2,770 observations. We had to omit 34 firms that had declared an average number of workers lower than five; according to the Enterprise World Bank methodology only firms with five or more employees can be included.

The data set also includes information about the investment climate constraints on Egyptian firms. To measure the investment climate constraints on the firms, we use data measuring the obstacles that firms identify as the main constraints on their operations and business growth. Respondents rank twenty-two obstacles on a scale of 0 to 4, where 0 means 'No obstacle' and 4 is the maximum value meaning 'very severe obstacle'. See Table C.1 in the Appendix C for a detailed description of the variables.

3.3.2. Firm performance measures

We use a firm's TFP as a principal measure of firm performance. To estimate TFP we use a traditional Cobb-Douglas production function, which is given by:

$$l\text{salesdef}_{i,t} = \beta_0 + \beta_l l\text{work}_{i,t} + \beta_m l\text{materialsdef}_{i,t} + \beta_k l\text{capitaldef}_{i,t} + \omega_{i,t} + \eta_{i,t} \quad (1)$$

where all the variables are in natural logarithms, $\text{salesdef}_{i,t}$ is total sales of firm i in year t , in thousands of Egyptian pounds. As independent variables we include $\text{work}_{i,t}$ defined as the average number of workers, $\text{materials}_{i,t}$ denotes the total purchases of raw materials and intermediate goods, $\text{capital}_{i,t}$ denotes the total fixed tangible assets

³¹ See World Bank (2012) for more details.

of the firm and the error term is decomposed into $\omega_{i,t}$, which indicates productivity shocks and an i.i.d. component given by $\eta_{i,t}$. We deflate firm-level sales and input expenditures ($sales_{def_{i,t}}$, $work_{i,t}$) using the industry-level production price index for manufacturers with 2005 as base year. The data comes from the International Financial Statistics (IFS and UN) for manufacturing.

Given that the available methodologies deal with different biases, we follow Van Beveren (2012)³² and, in Table 3.1, we present a number of alternative estimates of the production function coefficients used to determine TFP, which overcome the abovementioned biases.

Column 1 in Table 3.1 shows the classical OLS estimates, purely for comparative purposes, since they are subject to endogeneity and selection biases. In column 2, the model is estimated with firm-fixed effects, controlling for time-invariant unobserved heterogeneity with firm-specific effects. The third alternative, (column 3), was proposed by Levisohn and Petrin (2003), to estimate the production function using inputs to control for unobservables. Finally, column 4 shows the coefficients estimated by using the Olley-Pakes (1996) method. Olley and Pakes (1996) propose a three-step procedure. In the first step, the unobserved productivity is determined for each firm using their level of investment; in the second step, we determine the survival probability of the firm; and the last step employs the outcomes of the previous two steps to control for simultaneity and selection biases. Consistent and unbiased estimates of the production function are used to obtain unbiased estimates of TFP, which is computed as the residual of the estimated production function. We decided to use TFP estimated using the Levisohn-Petrin (2003) methodology as an independent variable for our export models as this methodology controls for two important biases, namely simultaneity bias and measurement error. This is important since data availability does not allow us to obtain accurate values of firm investments.

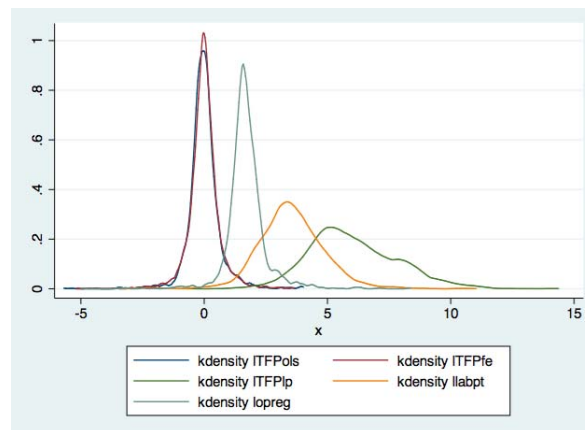
³² For a review of the available estimation techniques see Van Beveren (2012).

Table. 3.1. Product function estimates

	OLS	FE	LEV reg	OP reg
$lcapitaldef_{i,t}$	0.085*** (0.011)	0.081*** (0.012)	0.055*** 0.010	0.081*** (0.029)
$lwork_{i,t}$	0.350*** (0.020)	0.372*** (0.025)	0.363*** 0.019	0.606*** (0.042)
$lmaterialsdef_{i,t}$	0.603*** (0.012)	0.611*** (0.014)	0.608*** 0.012	0.315*** (0.043)
Nobs	2429	2429	2429	2480

Note: where OLS denotes Ordinary Least Squares, FE denotes OLS fixed effects, LEV denotes, Levinsohn and Petrin, and OP denotes Olley and Pakes. *** p<0.01, ** p<0.05, * p<0.1. Robust standard errors in parentheses.

Figure 3.1. Kernel Density for each TFP

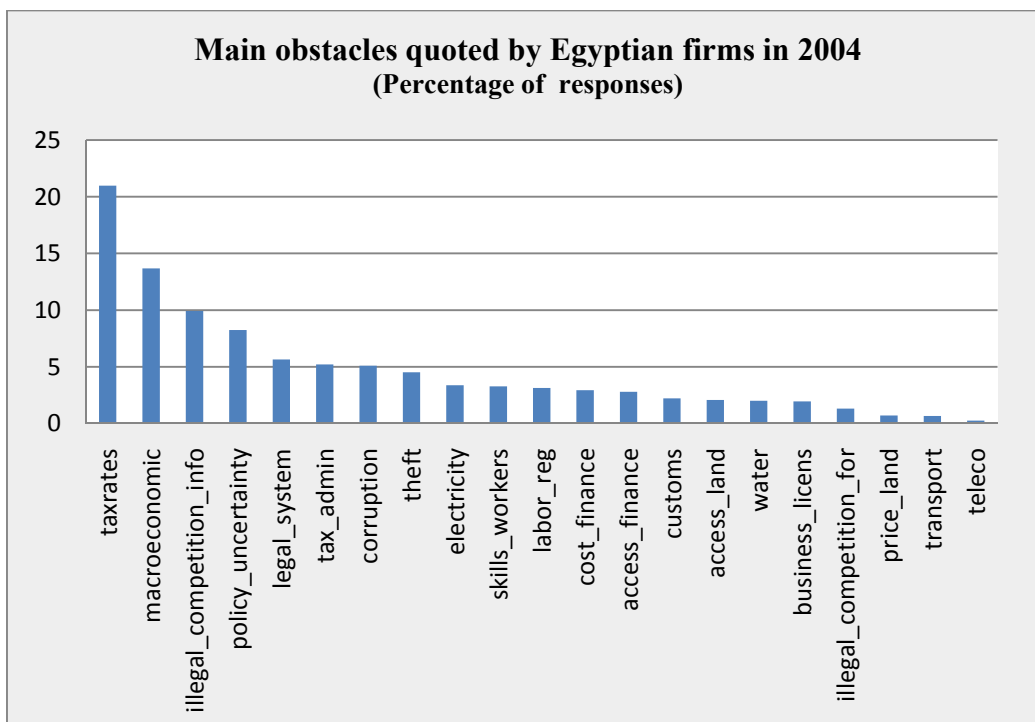


3.3.3. Measuring the most important obstacles for Egyptian firms

In order to identify the main obstacles that affect operations and growth of Egyptian companies, we use firms' answers to each questionnaire, and obtain the average value per constraint and year. Questions related to the business environment are only available for the year specific to each questionnaire, therefore, we can only construct explanatory variables for the years 2004, 2005 and 200: the years in which the surveys were conducted. We decide use the variables from 2004 in order to compare if the obstacles declared by firms at the beginning of the period explains variations on the TFP of firms along the five year period.

Figure 3.1 shows the main obstacles declared by Egyptian firms in 2004. In particular, tax rates, macroeconomic uncertainty, illegal competition and the regulatory policy uncertainty are shown to be relevant. In order to improve business climate in Egypt, some reforms were taken in 2005 with the aim of increasing trade, facilitating doing business, and promoting growth. Tax rates in Egypt were one of the biggest constraints for firms from the 90's, for this reason the government decided to reduce personal and corporate income tax rates in 2005, jointly with a modernisation of their tax administration. The macroeconomic situation was also declared by firms as one of the main obstacles in Egypt for doing business. As indicated by the Egyptian Ministry of Finance (2005), inflation has been a major macroeconomic problem for the country. Indeed, the consumer price index was around 11.7 in 2003 and 2004 remaining close to 8 points until 2008 and with a external debt of 31 per cent of GDP and a fiscal deficit of 10.6. Illegal competition from the informal market appeared also as an important constraints for Egyptian firms. As highlighted by Wahba (2009), many small and medium firms operate in the informal sector. Finally, policy uncertainty was also a main obstacle quoted by firms. It is well known that the political situation in Egypt after decolonisation has been turbulent and although a number of attempts to achieve democratisation have been made, none of them has been entirely satisfactory. The most recent related event has been the uprisings of the Arab Spring.

Figure 3.1. Main obstacles quoted by Egyptian firms in 2004



Source: World Bank Enterprise Survey; Author calculations

Note: *access_finance* means access to finance; *access_land* means access to land; *business_licens* means business licensing and operating permits; *corruption* means corruption; *cost_finance* means cost of financing (ex: interest rates); *customs* means customs and trade regulations; *electricity* means electricity; *illegal_competition_for* means illegal competition from the formal market; *illegal_competition_info* means illegal competition from the informal market; *labor_reg* means labor regulations (ex: social insurance); *legal_system* means legal system/ conflict resolution; *macroeconomic* means macroeconomic uncertainty (ex: inflation, exch. rate); *other* means other obstacles; *policy_uncertainty* means regulatory policy uncertainty; *price_land* means price of land; *skills_workers* means Skills and Education of Available Workers; *tax_admin* means Tax Administration; *taxrates* means Tax Rates; *teleco* means Telecommunications; *theft* means theft, disorder and crimes; *transport* means transportation and *water* means water.

It is important to note that firms' responses concerning the major obstacles may be affected by firms' characteristics; some obstacles may be more important for small firms than for larger firms, or for foreign firms than for domestic firms. Hence, we examine how each obstacle varies across the different types of firms. In order to examine this, we run simple OLS to show simple correlations between the different obstacles and some firms' characteristics. The model estimated is:

$$IC_{i,t} = \beta_0 + \beta_1 MES_{i,t} + \beta_2 LGs_{i,t} + \beta_3 exp_{i,t} + \beta_4 for1_{i,t} + \delta_k + \varepsilon_{i,t} \quad (2)$$

where $IC_{i,t}$ denotes each of the 22 obstacles identified in the questionnaires and takes values from 0 to 4. $MES_{i,t}$ is a dummy variable taking the value of 1 if firms employ

between 250 and 500 employees and 0 otherwise. $LGs_{i,t}$ is a dummy variable taking the value of 1 if firms employ more than 500 employees and 0 otherwise. The omitted category for firm size is $SMs_{i,t}$ taking the value of 1 for firms that employ between 5 and 50 employees. We also include as firm characteristics those that affect the perception of the different obstacles depending on whether firms are exporters or not, including $exp_{i,t}$ as a dummy variable taking the value of 1 when a firm exports more than 10% of their total sales. $for1_{i,t}$, takes the value of 1 if the firm is owned by foreigners and 0 otherwise, and we control for industrial dummies, δ_k . We are not able to control for firm location because relevant data are not completely reliable.

Table 3.2. Firm characteristics and business environment obstacles (OLS- Regression)

	ilegalcomfo										
	crime	other	laws	r	llegalcom info	corrupt	macroe	finacc	fincost	licence	skills
MEs	-0.051	-0.242**	-0.068	-0.182	-0.274***	-0.138	0.094	-0.416**	-0.394**	-0.107	-0.013
	0.083	0.112	0.108	0.125	0.100	0.092	0.082	0.163	0.162	0.082	0.097
LGs	-0.076	-0.662***	-0.242*	0.064	-0.036	-0.002	0.062	-0.229	-0.329	-0.049	0.135
	0.097	0.139	0.133	0.146	0.124	0.114	0.101	0.211	0.211	0.101	0.119
exp	0.069	0.342***	0.173	-0.125	-0.022	0.019	-0.019	0.055	0.105	-0.101	-0.083
	0.090	0.119	0.114	0.135	0.104	0.098	0.086	0.169	0.170	0.085	0.101
for1	-0.022	0.058	-0.191	-0.055	0.126	-0.071	-0.274	-0.687*	-0.946***	0.070	0.095
	0.164	0.228	0.226	0.248	0.210	0.189	0.169	0.367	0.359	0.170	0.201
cons	0.424***	1.283***	1.218***	1.179***	2.734***	2.363***	3.036***	2.305***	2.646***	0.956***	1.852***
	0.041	0.055	0.055	0.062	0.055	0.046	0.042	0.096	0.093	0.043	0.051
obs	1028	2486	2529	1020	2549	2566	2566	1928	1935	2573	2575
rmse	0.887	1.889	1.740	1.305	1.543	1.542	1.333	2.045	2.075	1.301	1.550

Notes: Dependent variables are each business environment obstacle. Standard error in brackets where *** p<0.001, **p<0.05, * p<0.01. Industrial and year dummies included. Omitted variable for firm size is SMs, which takes the value of 1 if firms have between 5 and 50 workers.

Table 3.2. Firm characteristics and business environment obstacles (OLS- Regression), (Continuation).

	laborreg	customs	taxadm	taxrate	policy	landpr	landacc	water	trans	elec	tel
MEs	-0.100	-0.439***	-0.166*	-0.246***	-0.185*	-0.254*	-0.272*	-0.149	-0.022	0.062	-0.093
	0.089	0.159	0.101	0.093	0.096	0.148	0.142	0.120	0.068	0.087	0.060
LGs	0.044	-0.724***	-0.368***	-0.381***	-0.293**	-0.159	-0.168	-0.264*	0.152*	0.040	-0.028
	0.110	0.206	0.124	0.115	0.119	0.188	0.177	0.151	0.084	0.107	0.074
exp	0.051	0.663***	0.169	0.234**	0.021	-0.050	-0.113	-0.019	-0.110	-0.084	0.176***
	0.093	0.166	0.107	0.100	0.101	0.152	0.148	0.124	0.071	0.089	0.062
for1	0.173	-0.174	-0.234	-0.264	-0.015	-0.392	-0.490	0.197	-0.047	-0.124	0.018
	0.184	0.347	0.211	0.196	0.200	0.320	0.304	0.256	0.141	0.183	0.126
cons	1.393***	2.360***	2.101***	2.707***	2.625***	2.093***	1.849***	1.115***	0.585***	1.090***	0.316***
	0.046	0.095	0.051	0.045	0.050	0.081	0.078	0.067	0.036	0.048	0.033
obs	2577	2061	2554	2557	2552	2158	2284	2374	2572	2579	2564
rmse	1.437	2.107	1.646	1.601	1.548	2.054	2.047	1.769	1.081	1.336	.922

Notes: Dependent variables are each business environmental obstacle. Standard error in brackets where *** p<0.001, **p<0.05, * p<0.01. Industrial and year dummies included. Omitted variable for firm size is SMs, which takes the value of 1 if firms have between 5 and 50 workers.

Table 3.2 shows the results obtained from estimating specification (2). We observe that firm size is not consistent across all the business environment obstacles and there are some obstacles that exert less constraint on medium and large firms than on small firms. These include, for example, the legal system and water by which large firms are less constrained than small firms, contrarily, larger firms are more affected by transport constraints. As regards medium firms, they are less constrained than small firms by illegal competition from the informal sector; access to and cost of finance; and access to and price of land. The obstacles that affect small firms more, are customs, tax administration, tax rates and regulatory policy uncertainty. In addition, exporters identify customs, tax rates and telecommunications as important constraints on their business. This is to be expected since these obstacles are related to internationalisation activities. Finally, firms owned by foreigners attribute less importance than domestic firms to constraints related to access and cost of finance, which is also to be expected. Results are comparable to those obtained by Augier et al (2012) and Aterido et al (2011).

3.4. Business environment constraints and firms' performance

3.4.1. Empirical strategy

In order to investigate how the business and institutional environment affect firm performance of Egyptian firms, we estimate the following equation:

$$\ln Y_{i,t} = \beta_0 + \beta_1 IC_{i,2004} + \beta_2 lworkt_{i,t-2} + \beta_3 for1_{i,t} + \delta_k + \delta_t + \epsilon_{i,t} \quad (3)$$

We test whether and to what extent the obstacles perceived by firms in the initial year of our panel (2004) impact the TFP level on the year t . The dependent variable is firm performance, for which we use TFP. TFP has been determined using Levinsohn-Petrin (2003) methodology as explained in the previous section and it is included in natural logarithms. The target variable is $IC_{i,2004}$, which denotes each of the business obstacles declared by firms in the year 2004. To avoid multicollinearity we follow a sequential estimation and include each variable one-by-one in the model. We have 22 different variables of IC: tel, elec, trans, water, landacc, landpr, policy, taxrate taxadm, customs,

laborreg, skills, licence, fincost, finacc, macroe, corrupt, ilegalcom_info, ilegalcom_for, laws, crime and other constraints.³³ We also include as controls some firm characteristics that are likely to influence firm performance. These include the lagged number of workers in t-2 in logarithms ($lworkt_{i,t-2}$) and a dummy $for1_{i,t}$ taking the value of 1 when a firm is owned by foreigners and 0 otherwise. Industry (δ_k) and time dummies (δt) have also been included in the model to proxy for factors that are industry specific and time-invariant, and factors that vary over time and are common to all firms. Equation (3) is estimated using panel estimation techniques.³⁴

3.4.2. Main results

Table 3.3 shows the results obtained from specification (3). The main results show the effect of each business environment variable on the firm TFP. The first column contains estimated coefficients for each individual business environment constraints, the second and third columns show estimated coefficients for the control variables (average number of workers in t-2 and a dummy variable indicating foreigner ownership). As we can observe, access to and cost of finance have a negative and statistically significant impact on firm TFP. We also find that tax rates, regulatory policy uncertainty, land price, water and electricity constraints have a negative impact on TFP. When comparing these results with those obtained in Table 3.2, the main obstacles reported by firms, we observe that only tax rates and regulatory policy uncertainty were reported as important obstacles, while the rest: water, electricity, price of land, tax rates, and regulatory policy uncertainty were only reported by a few firms as major obstacles.

Our results are in line with those presented in the Doing Business Report (2013) focus on Egyptian economy. Firstly, it is worth mentioning that Egypt is ranked 128th out of a total of 189 economies in the Doing Business Rank for 2014³⁵, (DB-WR) meaning that obstacles to doing business in Egypt are important. If we compare Egypt with some other MENA countries (see Table C.3 in Appendix C), only Algeria is lower-ranked. Egypt is however, better positioned than the other MENA countries selected in terms of

³³ See annex for more detail about each variable

³⁴ *xtreg* command in Stata13.

³⁵ The Doing Business World Bank Rank is only available for 2013 and 2014 for the Egyptian economy. As we do not have information for our analysed period, we need to use this information carefully.

access to credit. Despite this fact, our results suggest that access to and cost of finance negatively affect firm productivity in Egypt. Accordingly, more effort should be made to overcome finance constraints in the country. Table 3.3 indicates that water and electricity constraints negatively affect TFP. Access to reliable and affordable electricity is vital for businesses and in Egypt, getting electricity requires 7 procedures, takes 54 days and costs 337.4% of income per capita. The country is ranked 105th out of 189 economies for the ease of getting electricity, hence an effort to ensure safety in the connection process is needed, while keeping connection costs reasonable. This must be a major objective for the future government (see Table C.2 in Annex C). Other important business obstacles that influence TFP are tax rates. Clearly taxes are essential to the proper functioning of the economy, therefore the government must choose their tax rates carefully in order to foster consumption and consequently support investment decisions of firms and individuals.

As we can observe in Table C.2 in the Appendix C, Egyptian firms make 29 tax payments per year; spend 392 hours per year filing the required documentation, preparing and paying taxes; and pay total taxes amounting to 42.6% of their profit. Indeed, the country ranks 148th out of 189 economies on the ease of paying taxes. Our results also highlight that tax rates negatively affect firm productivity of Egyptian manufacturing companies; in light of this the Egyptian government should review their fiscal policy to promote firm competitiveness of manufacturing firms.

Table 3.3. Impact of business obstacles on TFP

Dependent variable: TFP	IC	lworkt_2	foreignowner	cons	obs	rho
other4	-0.012 (0.024)	0.397*** (0.039)	0.022*** (0.004)	5.883*** (0.461)		1.486 0.33
laws4	-0.031 (0.023)	0.399*** (0.039)	0.021*** (0.004)	5.929*** (0.462)		1.480 0.33
illegalcom_info4	0.005 (0.029)	0.402*** (0.039)	0.022*** (0.004)	5.835*** (0.464)		1.483 0.33
illegalcom_info4	0.005 (0.029)	0.402*** (0.039)	0.022*** (0.004)	5.835*** (0.464)		1.483 0.33
corrupt4	-0.016 (0.032)	0.398*** (0.039)	0.022*** (0.004)	5.895*** (0.464)		1.489 0.33
macroe4	0.019 (0.037)	0.397*** (0.039)	0.022*** (0.004)	5.814*** (0.468)		1.492 0.33
finacc4	-0.062*** (0.019)	0.392*** (0.039)	0.021*** (0.004)	5.965*** (0.456)		1.488 0.33
fincost4	-0.047** (0.020)	0.391*** (0.039)	0.021*** (0.004)	5.987*** (0.460)		1.488 0.33
licence4	-0.052 (0.035)	0.393*** (0.039)	0.022*** (0.004)	5.880*** (0.458)		1.492 0.33
skills4	-0.049 (0.034)	0.396*** (0.039)	0.022*** (0.004)	5.955*** (0.462)		1.489 0.33
laborreg4	0.018 (0.035)	0.399*** (0.039)	0.021*** (0.004)	5.828*** (0.463)		1.492 0.33
customs4	-0.024 (0.019)	0.395*** (0.039)	0.021*** (0.004)	5.943*** (0.462)		1.492 0.33
taxadm4	-0.022 (0.031)	0.399*** (0.039)	0.022*** (0.004)	5.934*** (0.471)		1.488 0.33
taxrate4	-0.072* (0.039)	0.397*** (0.039)	0.021*** (0.004)	6.136*** (0.480)		1.492 0.33
policy4	-0.067** (0.032)	0.388*** (0.039)	0.022*** (0.004)	6.044*** (0.465)		1.486 0.33
landpr4	-0.033* (0.020)	0.395*** (0.039)	0.021*** (0.004)	5.898*** (0.458)		1.486 0.33
landacc4	-0.027 (0.019)	0.395*** (0.039)	0.021*** (0.004)	5.906*** (0.459)		1.489 0.33
water4	-0.055*** (0.021)	0.391*** (0.039)	0.021*** (0.004)	5.924*** (0.456)		1.492 0.33
trans4	-0.058 (0.047)	0.396*** (0.039)	0.021*** (0.004)	5.912*** (0.461)		1.483 0.33
elec4	-0.081** (0.035)	0.395*** (0.039)	0.022*** (0.003)	6.138*** (0.471)		1.492 0.33
tel4	-0.045 (0.047)	0.399*** (0.039)	0.022*** (0.004)	5.858*** (0.458)		1.492 0.33

Notes: Dependent variable is TFP. Standard error in brackets where *** p<0.001, **p<0.05, * p<0.01. Industrial and year dummies included, iobtained using Levinsohn-Petrin (2003) procedure; lworkt_2,t-2 means the average number of workers lagged in two periods and foreignowner_{it} is a dummy variable that takes the value 1 if the firm is owned by foreigners and 0 otherwise. time and industrial dummies are not reported due to space restrictions.

3.4.3. Sensitivity analysis

To test the robustness of our results we use alternative measures of firm performance. We re-estimate the model (3) using two alternative dependent variables ($lY_{i,t}$), namely the average number of workers ($lworkt_{i,t}$) and total sales ($lsales_{i,t}$). The explanatory and control variables are the same as in specification (3), except that when we use $lworkt_{i,t}$ as the dependent variable we include firm size as the control variable and vice versa.

The main results obtained by using the average number of workers in Egyptian companies as the dependent variable are presented in Table 3.4 and results with total sales as the dependent variable are shown in Table 3.5. We include, as previously, each obstacle individually in the model to avoid problems of multicollinearity and we only present those obstacles that are statistically significant. We find that the obstacles that affect firm performance measured as total sales or using the average number of workers also affect firms' TFP, and the coefficients are still quite similar. The obstacles common to the three specifications are access to finance, cost of finance and water constraints.

Table 3.4. Impact of business obstacles on total sales

Dependent variable $lsales_{i,t}$	IC	lworkt_2	foreignowner	cons	obs	rho
finacc4	-0.070*** (0.022)	0.549*** (0.045)	0.025*** (0.004)	6.677*** (0.532)	1.491	0.33
fincost4	-0.054** (0.023)	0.549*** (0.045)	0.026*** (0.004)	6.705*** (0.536)	1.491	0.34
taxrate4	-0.080* (0.046)	0.556*** (0.045)	0.026*** (0.004)	6.862*** (0.561)	1.495	0.34
policy4	-0.072* (0.038)	0.545*** (0.046)	0.027*** (0.004)	6.759*** (0.543)	1.489	0.34
water4	-0.066*** (0.024)	0.548*** (0.045)	0.026*** (0.004)	6.635*** (0.532)	1.495	0.34
elec4	-0.089** (0.041)	0.553*** (0.045)	0.026*** (0.004)	6.864*** (0.550)	1.495	0.34

Notes: Dependent variable is total sales in year t. Standard error in brackets where *** p<0.001, **p<0.05, * p<0.01. Industrial and year dummies included, TFP is obtained using Levinsohn-Petrin (2003) procedure; $lworkt_{i,t-2}$ means the average number of workers lagged in two periods and $foreignowner_{i,t}$ is a dummy variable that takes the value of 1 if the firm is owned by foreigners and 0 otherwise

Table 3.5. Impact of business obstacles the average number of workers

Dependent variable $lworkt_{i,t}$	IC	lsales_2	foreignowner	cons	Nobs	rho
finacc4	-0.032* (0.018)	0.169*** (0.020)	0.014*** (0.003)	2.847*** (0.454)	1.387	0.58
fincost4	-0.032* (0.019)	0.169*** (0.020)	0.014*** (0.003)	2.877*** (0.456)	1.387	0.58
water4	-0.055*** (0.020)	0.167*** (0.020)	0.015*** (0.003)	2.860*** (0.451)	1.393	0.58

Notes: Dependent variable is average number of workers in year t. Standard error in brackets where *** p<0.001, **p<0.05, * p<0.01. Industrial and year dummies included, TFP is obtained using Levinsohn-Petrin (2003) procedure; $lworkt_{i,t-2}$ means the average number of workers lagged in two periods and $foreignowner_{i,t}$ is a dummy variable that takes the value of 1 if the firm is owned by foreigners and 0 otherwise

3.5. Conclusions

In this paper we investigate the extent to which twenty-two different business environment constraints affect TFP of Egyptian firms. To this end, we use a panel data set for Egyptian manufacturing firms over a five-year period from 2003 to 2007, taken from the World Bank Enterprise Survey. More specifically, we test whether a number of firm characteristics, namely firm size, involvement in international trade and foreign ownership, have an impact on the perception of each business environment obstacle. Our results are in line with existing research in finding that larger firms, international firms and foreign firms are less affected by business environment obstacles than small, domestic and non-foreign firms.

The analysis also indicates that access to and cost of financing, followed by tax rates and water constraints, are the most significant factors affecting Egyptian manufacturing firms' performance. Our results point to the importance of designing new policies that develop basic infrastructure in the country and provide better access to water and electricity. Also, we highlight the fact that Egyptian policy makers should revise their fiscal policies and improve access to and cost of finance in order to facilitate economic and employment growth in Egypt by improving business competitiveness. We leave for further research the identification of the different types of firms that are more affected by the abovementioned factors. A more in depth analysis could be a next step in better

understanding how a firm's characteristics, location and managerial structure influence the effect of tax rates, access to and cost of finance, water and electricity constraints and policy uncertainty on firm productivity. Such a detailed analysis is necessary if governments want to design effective policies.

Conclusiones generales

Las primeras protestas populares iniciadas en Túnez en diciembre de 2010, encendieron la mecha de la conocida Primavera Árabe. Ciudadanos de Túnez, Egipto, Libia, Siria...entre otros, salieron a la calle protestando contra el régimen de su país, pidiendo la democratización del sistema y una mayor modernización de sus economías y sociedades. Este nuevo panorama político posrevolucionario ha estado dominado por un clima de tensión política y social donde a pesar de iniciarse reformas en los regímenes de algunos de los países como Túnez o Egipto, todavía reina un clima de inestabilidad. A pesar de ello, este nuevo panorama político se presenta como una oportunidad de cambio y renovación para estos países, en espera de que sirva de marco para la modernización económica de sus economías y fortalezca las relaciones comerciales con el exterior.

A lo largo de estos tres capítulos se han analizado aspectos relacionados con la integración de los países mediterráneos en el contexto económico internacional, aspectos que resultan de especial interés para esta región puesto que son claves para su desarrollo económico, por tanto su estudio es particularmente relevante para evaluar las políticas llevadas a cabo, así como para rediseñar aquellas que no están siendo todo lo efectivas que se preveía.

En un primer lugar se ha analizando el impacto que han tenido los acuerdos de libre comercio celebrados por diez países del Norte de África y Oriente Próximo sobre su comercio exterior, con el objetivo de comparar los efectos de una mayor integración Sur-Sur con una vinculación más estrecha con los mercados del Norte. Se diferencia entre productos industriales y agrícolas, ya que permite llevar a cabo un estudio más profundo y específico del contenido de dichos acuerdos.

Los resultados muestran que la integración entre países árabes está generando ya resultados positivos, en particular el acuerdo GAFTA está intensificando el intercambio bilateral entre los países miembros. Esta apuesta hacia una mayor integración árabe representa una nueva oportunidad para muchos países y puede servir de puente para promover el dialogo y establecer nuevas oportunidades en la región. Sin embargo, los acuerdos Norte-Sur celebrados no han ayudado a incrementar en la medida esperada las

exportaciones entre ambas regiones. En el caso del acuerdo de libre comercio con la Unión Europea, los resultados muestran que se han obtenido mejoras en las exportaciones de la UE hacia la región MENA, pero no en sentido inverso, en línea con lo que obtienen estudios anteriores. Lo novedoso de nuestros resultados aparece con el acuerdo firmado entre Estados Unidos y Jordania y entre Estados Unidos y Marruecos, dicho acuerdo muestra un efecto positivo para las exportaciones de ambos países incluidos para el caso de los productos agrícolas. Así pues, de los resultados empíricos obtenidos se extrae que los países de la cuenca sur del Mediterráneo deberían considerar una estrategia de negociación en la liberalización de su comercio que concentre la misma en aquellos productos donde su competitividad es mayor. Ello requerirá un mayor equilibrio en la articulación de dichos acuerdos, en los que la producción agrícola e industrial configure un patrón sectorial de exportaciones acordes con su estructura productiva. Del mismo parece razonable apostar por una mayor integración intra-árabe, a pesar de las dificultades evidentes que esto conlleva, especialmente en un contexto político y social tan turbulento como el actual.

Otro aspecto analizado es el papel que tiene el comercio internacional en la competitividad de las empresas. Tal y como se ha desarrollado en el segundo capítulo, entender las estrategias de internacionalización de las empresas es de particular relevancia, en especial si se quiere diseñar políticas efectivas que sirvan de apoyo a las industrias nacionales. En el estudio llevado a cabo se ha analizado la relación existente entre las actividades de importación y exportación de las empresas manufactureras egipcias. Los resultados muestran que las empresas cuando exportan o importan mejoran su competitividad y alcanzan un mayor tamaño en comparación con las empresas que únicamente operan en el mercado nacional. Se observa igualmente un alto grado de histéresis, donde el posicionamiento previo en los mercados internacionales explica una buena parte de la actividad internacional actual, en este sentido si la empresa tiene experiencia exportadora en los años anteriores, esto afectará de forma positiva a que la consolide en la actualidad y lo mismo ocurre para el caso importador. Con los datos y análisis realizado en este segundo capítulo no podemos establecer un nexo de causalidad entre ambas actividades dejando esto para futuras líneas de investigación, aun así se constata que los costes hundidos para las importaciones son

mayores que los que se deben hacer frente para la exportación. A pesar de que este resultado parece poco intuitivo ante la lógica del comercio internacional donde la actividad de exportación aparece como algo más costoso para las empresas que la importación, para el caso concreto de Egipto parece tomar sentido desde un punto de vista donde las exportaciones de las empresas del país se han liberalizado completamente desde la entrada en vigor de los acuerdos de libre comercio mientras que la liberalización de las importaciones se ha producido de forma progresiva. Un análisis más exhaustivo resulta necesario para llegar a resultados más concluyentes, aun así parece tener solidez la argumentación de que las empresas que se incorporan en el comercio internacional aprovechan dicha apertura y las relaciones comerciales que esto conlleva para desarrollar operaciones en ambos sentidos.

Después de analizar en los capítulos anteriores aspectos relacionados con el comercio internacional, consideramos necesario abordar cómo el entorno político-institucional está influyendo sobre el comportamiento de las empresas en la región. En el tercer y último capítulo se analizan los obstáculos a los que las empresas egipcias han tenido que hacer frente en los años anteriores a la revolución. De los resultados obtenidos se constata que el acceso y coste a la financiación, los altos impuestos, el precio de la tierra, la situación de inestabilidad política o suministros básicos como el agua o la luz son los principales obstáculos para llevar a cabo la actividad empresarial en Egipto, especialmente en el caso de las empresas más pequeñas y que no cuentan con capital extranjero. En términos de política económica las conclusiones parecen evidentes, se hace indispensable una estrategia de mejora en las infraestructuras básicas como el agua o la electricidad y de la modernización del sistema fiscal, así como del sistema financiero, con los efectos positivos que esto supondrá en términos de financiación empresarial donde los resultados a medio y largo plazo serán un incremento de la competitividad empresarial que favorecerá el crecimiento económico y la generación de empleo.

En definitiva los estudios llevados a cabo y que configuran el núcleo de esta tesis doctoral pretenden analizar y evaluar la integración de los países del Norte de África y Oriente Próximo en el contexto económico internacional y examinar aspectos clave para la mejora de la competitividad de las empresas de la región, concretamente centrand

los dos últimos capítulos en Egipto, debido al interés que despierta el país por la situación política actual.

Es evidente que el marco de análisis en el que nos hemos movido no está cerrado a nuevas investigaciones, muy al contrario, los cambios político y sociales que se están produciendo actualmente en la región requerirán la intensificación en el futuro de trabajos e investigaciones que permitan conocer mejor los fundamentos económicos y los factores determinantes de las políticas y estrategias necesarias para un desarrollo económico armónico y sostenido de la región. El objetivo es seguir en esta línea de trabajo centrandó el interés en la región y en aspectos relacionados con el comercio internacional y la competitividad empresarial de la región.

A. Appendix – Chapter 1

Table A. 1. List of FTA and country members

FTA	Country (i)	Year of entry into force (t)	Full liberalisation	Country (j)
EUMED	Tunisia	1998	12 years after the FTA came into force plus 3 years of derogation beyond the initial transitional period. 4 for Egypt	Since 1995: Belgium, Germany, France, Luxemburg, Italy, Netherlands, United Kingdom, Ireland, Denmark, Greece, Spain, Portugal, Austria, Sweden and Finland. (UE15) Since 2004: Cyprus, Czech Republic, Estonia, Hungry, Lithuania, Latvia, Malta, Poland, Slovak Republic y Slovenia. (UE25) Since 2007: Rumania y Bulgaria (UE27)
	Israel	2000		
	Morocco	2000		
	Jordan	2002		
	Egypt	2004		
	Algeria	2005		
	Lebanon	2006		
EFTAMED	Morocco	1999	12 years after the came into force	Iceland, Liechtenstein, Norway and Switzerland
	Jordan	2002		
	Tunisia	2005		
	Lebanon	2007		
	Egypt	2007		
USAMED*	Jordan	2001	2010 14 years after the FTA came into force for Morocco and 24 years for USA	United States
	Morocco	2006		
TURMED	Israel	1997	2000	Turkey
	Tunisia	2005	2014	
	Morocco	2006	2015	
	Egypt	2007	2020	
	Syria	2007	2019	
GAFTA	Egypt	1998	Full liberalisation in 2005	Arabia Saudi, Algeria, Egypt, Arab Emirates, Iraq, Libya, Jordan, Kuwait, Lebanon, Morocco, Syria, Tunisia
	Tunisia	1998		
	Morocco	1998		
	Jordan	1998		
	Libya	1998		
	Lebanon	1998		
	Algeria	1998		
Syria	1998			
ISR*	Israel	1997	1999	Canada Mexico
		2000	2005	
JORSGP	Jordan	2005	2015	Singapore
AGADIR	Morocco	2006	2006	Morocco, Jordan, Egypt, Tunisia
	Jordan	2006		
	Egypt	2006		
	Tunisia	2006		
TUREU	Turkey	1996	1996	EU27

It is worth mentioning that an FTA between Israel and USA came into force in 1985, however our period of analysis starts in 1990. Therefore, we cannot estimate the effect of this agreement

Table A. 2. Description of zero trade flows

Variable	Missing	Total	% Missing
manufactures	1,849	20,400	9.06
total	2,023	20,400	9.92
agricultural	3,868	20,400	18.96

Table A. 3. Dealing with zero trade. Heckman procedure.

	1st step (xtprobit)	2nd step (OLS)	1st step (xtprobit)	2nd step (OLS)	OLS without lambda	OLS without lambda
	(Imports)	(Imports)	(Exports)	(Exports)	(Imports)	(Exports)
lyp	0.260** (0.102)	0.654*** (0.017)	0.416*** (0.094)	1.016*** (0.026)	0.636*** (0.017)	0.983*** (0.026)
lyr	0.634*** (0.076)	1.366*** (0.014)	0.559*** (0.067)	1.041*** (0.019)	1.323*** (0.014)	0.994*** (0.018)
ld	0.103 (0.134)	-1.173*** (0.024)	-0.034 (0.122)	-0.921*** (0.035)	-1.198*** (0.024)	-0.941*** (0.035)
lycp	-0.050 (0.150)	0.046 (0.029)	-0.324** (0.139)	0.399*** (0.043)	0.041 (0.029)	0.429*** (0.042)
lycr	0.507*** (0.105)	0.190*** (0.022)	0.569*** (0.096)	0.165*** (0.033)	0.124*** (0.022)	0.112*** (0.032)
border	-1.099** (0.518)	-1.571*** (0.137)	-1.031** (0.488)	-0.523*** (0.156)	-1.003*** (0.131)	-0.239 (0.151)
lang	-0.709** (0.305)	0.126** (0.056)	-0.139 (0.295)	1.239*** (0.077)	0.341*** (0.055)	1.321*** (0.076)
colony	0.568 (0.695)	0.441*** (0.120)	1.269* (0.704)	0.962*** (0.143)	0.288** (0.120)	0.872*** (0.143)
fta	0.666*** (0.110)	0.407*** (0.042)	1.095*** (0.119)	0.840*** (0.066)	0.361*** (0.043)	0.750*** (0.064)
samereligion	-0.847*** (0.294)		-0.756*** (0.281)			
lambda		1.860*** (0.134)		1.579*** (0.235)		
Constant	-24.739*** -2.553	-35.269*** (0.560)	-24.477*** -2.290	-42.564*** (0.894)	-32.753*** (0.529)	-40.000*** (0.810)
N.Obs	10190	9265	10190	9097	9265	9097

Notes: ***, **, * indicate significance at 1%, 5% and 10%, respectively. Robust standard errors are presented below coefficients

Table A. 4. Country list

United Arab Emirates	France	Morocco
Argentina	United Kingdom	Mexico
Australia	Greece	Malta
Austria	Hong Kong	Netherlands
Belgium-Luxemburg	Hungary	Norway
Bulgaria	Indonesia	New Zealand
Brazil	India	Poland
Canada	Ireland	Portugal
Switzerland	Iran	Romania
Chile	Iceland	Russia
China	Israel	Saudi Arabia
Cyprus	Italy	Singapore
Czech Republic	Jordan	Slovakia
Germany	Japan	Slovenia
Denmark	Korea, Republic	Sweden
Algeria	Kuwait	Syria
Egypt	Lebanon	Thailand
Spain	Libya	Tunisia
Estonia	Lithuania	Turkey
Finland	Latvia	Ukraine
		United States

Table A. 5.Data description

Variables	Description	Measure	Data Source
Dependent Variable			
Imp, Exp (Manufactures)	Manufactured Imports / Exports (SITC.rev3)	In thousands of USA dollars	COMTRADE (United Nations Commodity Trade Statistics Database)
Imp, Exp (Total)	Total imports less fuel (cod.3 SITC rev.3)		
Imp, Exp (Agricultural)	Agricultural exports SITC. rev3 (Product codes: 0, 1, 22 and 4)		
Independent Variable			
FTA _{ij,t}	This variable takes a value of 1 when countries i and j are both member of the agreement (as describe in Table A.1)	Dummy variable	WTO (www.wto.org)

Table A. 6. Panel gravity equations with bilateral fixed and country-and-time effects comparing with one lagged, two lagged and one lead variables of FTA, for manufactured trade.

	Manufactures (2)		Manufactures (3)		Manufactures (4)	
	Imports	Exports	Imports	Exports	Imports	Exports
EUMED _{ij,t}	0.310*** (0.084)	-0.236* (0.135)	0.299*** (0.086)	-0.233* (0.135)	0.131 (0.088)	-0.330*** (0.122)
EUMED _{ij,t-1}	-0.043 (0.074)	-0.121 (0.113)	-0.028 (0.073)	0.043 (0.114)	-0.01 (0.073)	0.033 (0.115)
EUMED _{ij,t-2}			-0.026 (0.072)	-0.182* (0.110)	-0.021 (0.070)	-0.243** (0.110)
EUMED _{ij,t+1}					0.218** (0.084)	0.061 (0.143)
EFTAMED _{ij,t}	0.056 (0.406)	-0.333* (0.181)	0.005 (0.401)	-0.288 (0.185)	0.336 (0.345)	0.015 (0.211)
EFTAMED _{ij,t-1}	0.341 (0.501)	0.193 (0.314)	0.548 (0.485)	-0.320 (0.397)	0.593 (0.475)	-0.346 (0.400)
EFTAMED _{ij,t-2}			-0.263 (0.275)	0.602* (0.325)	-0.272 (0.206)	0.631* (0.324)
EFTAMED _{ij,t+1}					-0.374 (0.269)	-0.332 (0.218)
USAMED _{ij,t}	-0.332 (0.305)	0.796 (0.687)	-0.370 (0.325)	0.852 (0.725)	0.003 (0.139)	0.678*** (0.199)
USAMED _{ij,t-1}	0.726 (0.480)	1.038** (0.491)	0.718 (0.732)	0.158 (0.407)	0.681 (0.702)	0.154 (0.404)
USAMED _{ij,t-2}			-0.001 (0.544)	1.053*** (0.163)	0.029 (0.541)	1.176*** (0.159)
USAMED _{ij,t+1}					-0.404 (0.333)	0.242 (0.672)
TURMED _{ij,t}	0.252* (0.137)	0.150 (0.294)	0.202 (0.132)	0.165 (0.290)	0.181 (0.133)	0.184 (0.150)
TURMED _{ij,t-1}	0.1 (0.151)	0.136 (0.142)	-0.021 (0.117)	0.112 (0.137)	-0.012 (0.117)	0.110 (0.139)
TURMED _{ij,t-2}			0.129 (0.169)	0.052 (0.219)	0.202 (0.163)	-0.021 (0.196)
TURMED _{ij,t+1}					0.044 (0.175)	-0.070 (0.262)
GAFTA _{ij,t}	-0.126 (0.257)		0.036 (0.224)		-0.017 (0.274)	
GAFTA _{ij,t-1}	0.477* (0.282)		0.003 (0.238)		0.011 (0.238)	
GAFTA _{ij,t-2}			0.435* (0.245)		0.434* (0.247)	
GAFTA _{ij,t+1}					0.103 (0.369)	
AGADIR _{ij,t}	-0.292 (0.228)		-0.151 (0.188)	-0.282 (0.232)	-0.069 (0.168)	-0.083 (0.175)
AGADIR _{ij,t-1}	0.259 (0.225)		0.086 (0.151)	0.149 (0.193)	0.088 (0.152)	0.159 (0.193)
AGADIR _{ij,t-2}			0.22 (0.146)	0.173 (0.219)	0.185 (0.144)	0.113 (0.217)
AGADIR _{ij,t+1}					-0.089 (0.230)	-0.245 (0.274)

Table A. 6 (Continuation) Panel gravity equations with bilateral fixed and country-and-time effects comparing with one lagged, two lagged and one lead variables of FTA, for manufactured trade.

	Manufactures (2)		Manufactures (3)		Manufactures (4)	
	Imports	Exports	Imports	Exports	Imports	Exports
TUREUij,t	0.629*** (0.186)	0.458 (0.304)	0.559** (0.224)	0.435 (0.347)	0.352 (0.324)	-0.054 (0.263)
TUREUij,t-1	-0.287* (0.168)	0.027 (0.153)	-0.337 (0.209)	0.128 (0.160)	-0.297 (0.212)	0.122 (0.166)
TUREUij,t-2			0.037 (0.176)	-0.102 (0.157)	0.081 (0.173)	-0.116 (0.161)
TUREUij,t+1					0.266 (0.284)	0.544** (0.270)
ISRCANij,t	0.502*** (0.176)	0.192 (0.219)	0.497** (0.246)	0.320* (0.193)	0.488** (0.244)	0.310 (0.193)
ISRCANij,t-1	-0.132 (0.179)	-0.096 (0.234)	-0.294* (0.150)	-0.005 (0.282)	-0.290* (0.15)	0.004 (0.283)
ISRCANij,t-2			0.176 (0.137)	-0.099 (0.301)	0.222 (0.138)	-0.136 (0.294)
ISRCANij,t+1					omitted	omitted
ISMEXij,t	1.617*** (0.381)	-0.306 (0.624)	1.836*** (0.409)	-0.309 (0.520)	1.074*** (0.414)	-0.052 (0.516)
ISMEXij,t-1	-0.862* (0.479)	-0.398 (0.516)	-0.372 (0.385)	-0.433* (0.252)	-0.355 (0.375)	-0.432* (0.251)
ISMEXij,t-2			-0.541 (0.336)	0.032 (0.425)	-0.548* (0.327)	0.056 (0.468)
ISMEXij,t+1					0.986*** (0.320)	-0.391 (0.307)
JORSGPij,t	0.024 (0.201)	-0.086 (0.416)	-0.008 (0.192)	0.068 (0.389)	-0.418*** (0.130)	0.329 (0.214)
JORSGPij,t-1	-0.008 (0.191)	0.492* (0.297)	0.400** (0.167)	0.851*** (0.322)	0.417** (0.166)	0.857*** (0.320)
JORSGPij,t-2			-0.513** (0.205)	-0.461 (0.430)	-0.479** (0.221)	-0.403 (0.398)
JORSGPij,t+1					0.454** (0.222)	-0.301 (0.388)
Nobs	8807	865	8319	8182	7759	7624
Within R2	0.461	0.282	0.462	0.275	0.447	0.267
rmse	0.694	1.022	0.681	1.008	0.67	0.995
ll	-8741.198	-11928.11	-8093.69	-11159.34	-7423.308	-10292.01

Notes: ***, **, * indicate significance at 1%, 5% and 10%, respectively. Robust standard errors are presented below coefficients

Table A. 7. Panel gravity equations with bilateral fixed and country-and-time effects comparing with one lagged, two lagged and one lead variables of FTA, for agricultural trade.

	Agricultural (2)		Agricultural (3)		Agricultural (4)	
	Imports	Exports	Imports	Exports	Imports	Exports
EUMED _{ij,t}	-0.267** (0.129)	-0.141 (0.138)	-0.250* (0.131)	-0.171 (0.143)	-0.373*** (0.132)	-0.13 (0.14)
EUMED _{ij,t-1}	0.081 (0.128)	-0.050 (0.137)	0.108 (0.154)	0.078 (0.145)	0.121 (0.155)	0.065 (0.145)
EUMED _{ij,t-2}			-0.042 (0.141)	-0.173 (0.145)	-0.010 (0.142)	-0.123 (0.142)
EUMED _{ij,t+1}					0.170 (0.14)	-0.023 (0.138)
EFTAMED _{ij,t}	0.318 (0.322)	-0.004 (0.285)	0.258 (0.326)	-0.006 (0.294)	0.052 (0.348)	-0.128 (0.312)
EFTAMED _{ij,t-1}	0.016 (0.216)	-0.123 (0.189)	0.221 (0.263)	0.086 (0.251)	0.283 (0.261)	0.115 (0.258)
EFTAMED _{ij,t-2}			-0.281 (0.276)	-0.239 (0.331)	-0.315 (0.300)	-0.242 (0.357)
EFTAMED _{ij,t+1}					0.235 (0.398)	0.125 (0.292)
USAMED _{ij,t}	0.743*** (0.255)	0.133 (0.493)	0.768*** (0.232)	0.188 (0.536)	0.496*** (0.178)	0.361 (0.376)
USAMED _{ij,t-1}	-0.422 (0.280)	0.439** (0.204)	-0.358 (0.243)	0.223 (0.205)	-0.373 (0.257)	0.217 (0.207)
USAMED _{ij,t-2}			-0.060 (0.179)	0.275 (0.229)	-0.156 (0.181)	0.263 (0.229)
USAMED _{ij,t+1}					0.304 (0.257)	-0.187 (0.301)
TURMED _{ij,t}	-0.277 (0.181)	0.523 (0.593)	-0.350* (0.203)	0.532 (0.546)	-0.157 (0.129)	0.641* (0.369)
TURMED _{ij,t-1}	0.02 (0.334)	0.024 (0.289)	-0.050 (0.307)	-0.294 (0.43)	-0.034 (0.299)	-0.324 (0.422)
TURMED _{ij,t-2}			0.033 (0.208)	0.501 (0.445)	0.010 (0.238)	0.307 (0.372)
TURMED _{ij,t+1}					-0.283 (0.283)	-0.130 (0.682)
GAFTA _{ij,t}	-0.233 (0.479)		-0.193 (0.484)		-0.276 (0.568)	
GAFTA _{ij,t-1}	0.817** (0.391)		-0.088 (0.398)		-0.084 (0.399)	
GAFTA _{ij,t-2}			0.914*** (0.317)		0.919*** (0.319)	
GAFTA _{ij,t+1}					0.115 (0.475)	
AGADIR _{ij,t}	0.457 (0.418)		-0.234 (0.396)	0.286 (0.43)	-0.031 (0.274)	0.406 (0.384)
AGADIR _{ij,t-1}	0.075 (0.411)		-0.027 (0.236)	0.131 (0.31)	-0.03 (0.237)	0.126 (0.31)
AGADIR _{ij,t-2}			0.613*** (0.183)	-0.063 (0.351)	0.623*** (0.18)	0.117 (0.34)
AGADIR _{ij,t+1}					-0.191 (0.350)	-0.147 (0.393)

Table A. 7. (Continuation) Panel gravity equations with bilateral fixed and country-and-time effects comparing with one lagged, two lagged and one lead variables of FTA, for agricultural trade

	Agricultural (2)		Agricultural (3)		Agricultural (4)	
	Imports	Exports	Imports	Exports	Imports	Exports
TUREU _{ij,t}	1.220*** (0.354)	-0.081 (0.215)	1.490*** (0.395)	-0.185 (0.244)	0.822 (0.527)	-0.283 (0.239)
TUREU _{ij,t-1}	-0.552* (0.327)	-0.068 (0.183)	-0.613 (0.497)	0.02 (0.181)	-0.682 (0.508)	0.016 (0.189)
TUREU _{ij,t-2}			0.132 (0.473)	-0.133 (0.187)	0.105 (0.479)	-0.103 (0.184)
TUREU _{ij,t+1}					0.65 (0.399)	0.122 (0.217)
ISRCAN _{ij,t}	-0.967*** (0.227)	-0.215 (0.226)	-1.780*** (0.376)	-0.142 (0.233)	-1.798*** (0.381)	-0.141 (0.235)
ISRCAN _{ij,t-1}	1.193*** (0.402)	-0.322 (0.239)	1.268*** (0.339)	-0.149 (0.193)	1.256*** (0.340)	-0.150 (0.193)
ISRCAN _{ij,t-2}			-0.112 (0.376)	-0.184 (0.292)	-0.048 (0.374)	-0.197 (0.295)
ISRCAN _{ij,t+1}					omitted	omitted
ISMEX _{ij,t}	-0.784 (0.601)	-0.233 (0.237)	-0.391 (0.559)	-0.410* (0.240)	-1.024** (0.455)	-0.417** (0.194)
ISMEX _{ij,t-1}	0.714* (0.426)	0.424 (0.336)	-0.037 (0.497)	-0.581* (0.315)	-0.033 (0.494)	-0.615** (0.301)
ISMEX _{ij,t-2}			0.826** (0.372)	1.121*** (0.308)	0.801** (0.367)	1.106*** (0.290)
ISMEX _{ij,t+1}					0.816 (0.626)	0.039 (0.294)
JORSGP _{ij,t}	1.809*** (0.340)	-0.559 (0.806)	1.784*** (0.347)	-0.389 (0.822)	0.526* (0.301)	0.325 (0.677)
JORSGP _{ij,t-1}	-0.476 (0.290)	-1.845** (0.817)	-0.370 (0.313)	-0.504 (0.702)	-0.358 (0.318)	-0.496 (0.700)
JORSGP _{ij,t-2}			-0.147 (0.219)	-1.679** (0.679)	-0.152 (0.239)	-1.324* (0.759)
JORSGP _{ij,t+1}					1.412*** (0.315)	-0.813** (0.353)
Nobs	8165	7570	7726	7175	7196	6668
Within R2	0.329	0.258	0.331	0.259	0.307	0.24
rmse	1.022	1.048	1.018	1.038	1.01	1.019
ll	-11218.4	-10546.98	-10581.36	-9924.116	-9798.668	-9093.102

Notes: ***, **, * indicate significance at 1%, 5% and 10%, respectively. Robust standard errors are presented below coefficients

Table A. 8. Panel gravity equations with bilateral fixed and country-and-time effects comparing with one lagged, two lagged and one lead variables of FTA, for total nonoil trade.

	Total (2)		Total (3)		Total (4)	
	Imports	Exports	Imports	Exports	Imports	Exports
EUMED _{ij,t}	0.206*** (0.073)	-0.159 (0.123)	0.198*** (0.075)	-0.145 (0.125)	0.11 (0.068)	-0.239** (0.117)
EUMED _{ij,t-1}	0.002 (0.066)	-0.113 (0.095)	0.006 (0.066)	0.040 (0.095)	0.019 (0.065)	0.045 (0.097)
EUMED _{ij,t-2}			-0.014 (0.068)	-0.170* (0.099)	-0.003 (0.068)	-0.204** (0.100)
EUMED _{ij,t+1}					0.117* (0.063)	0.082 (0.146)
EFTAMED _{ij,t}	0.066 (0.462)	-0.266 (0.219)	0.030 (0.454)	-0.193 (0.198)	0.200 (0.439)	0.019 (0.202)
EFTAMED _{ij,t-1}	0.134 (0.535)	0.160 (0.266)	0.323 (0.481)	-0.095 (0.245)	0.322 (0.480)	-0.113 (0.250)
EFTAMED _{ij,t-2}			-0.234 (0.214)	0.328* (0.190)	-0.220 (0.153)	0.327* (0.198)
EFTAMED _{ij,t+1}					-0.164 (0.271)	-0.231 (0.206)
USAMED _{ij,t}	-0.072 (0.138)	0.715 (0.586)	-0.076 (0.148)	0.732 (0.605)	0.102 (0.094)	0.558** (0.255)
USAMED _{ij,t-1}	0.225* (0.121)	0.954** (0.391)	0.095 (0.106)	0.146 (0.363)	0.088 (0.104)	0.139 (0.362)
USAMED _{ij,t-2}			0.152 (0.141)	0.965*** (0.150)	0.134 (0.125)	1.054*** (0.149)
USAMED _{ij,t+1}					-0.213 (0.159)	0.239 (0.467)
TURMED _{ij,t}	0.219* (0.124)	-0.087 (0.329)	0.163 (0.122)	-0.046 (0.288)	0.167 (0.111)	0.124 (0.114)
TURMED _{ij,t-1}	0.129 (0.141)	0.136 (0.144)	0.014 (0.097)	0.181 (0.128)	0.020 (0.099)	0.187 (0.124)
TURMED _{ij,t-2}			0.120 (0.152)	-0.046 (0.18)	0.173 (0.15)	-0.029 (0.225)
TURMED _{ij,t+1}					0.008 (0.168)	-0.217 (0.308)
GAFTA _{ij,t}	-0.205 (0.257)		-0.183 (0.223)		-0.238 (0.233)	
GAFTA _{ij,t-1}	0.399 (0.284)		-0.135 (0.246)		-0.129 (0.247)	
GAFTA _{ij,t-2}			0.516** (0.234)		0.506** (0.24)	
GAFTA _{ij,t+1}					0.116 (0.249)	
AGADIR _{ij,t}	-0.049 (0.195)		-0.068 (0.182)	-0.103 (0.198)	-0.119 (0.107)	0.013 (0.143)
AGADIR _{ij,t-1}	0.232 (0.165)		0.120 (0.094)	0.010 (0.131)	0.119 (0.094)	0.015 (0.13)
AGADIR _{ij,t-2}			0.243** (0.12)	0.32 (0.216)	0.262** (0.121)	0.329 (0.205)
AGADIR _{ij,t+1}					0.064 (0.171)	-0.142 (0.207)

Table A. 8. (Continuation) Panel gravity equations with bilateral fixed and country-and-time effects comparing with one lagged, two lagged and one lead variables of FTA, for total nonoil trade.

	Total (2)		Total (3)		Total (4)	
	Imports	Exports	Imports	Exports	Imports	Exports
TUREUij,t	0.555*** (0.193)	0.299 (0.296)	0.531** (0.232)	0.255 (0.340)	0.519 (0.321)	-0.160 (0.302)
TUREUij,t-1	-0.158 (0.16)	0.008 (0.139)	-0.29 (0.200)	-0.084 (0.122)	-0.281 (0.201)	-0.087 (0.129)
TUREUij,t-2			0.134 (0.167)	0.120 (0.145)	0.145 (0.172)	0.122 (0.147)
TUREUij,t+1					0.019 (0.355)	0.458* (0.250)
ISRCANij,t	-0.004 (0.130)	0.152 (0.143)	-0.028 (0.180)	0.218 (0.156)	-0.042 (0.180)	0.211 (0.157)
ISRCANij,t-1	0.288 (0.242)	-0.085 (0.227)	0.046 (0.139)	0.038 (0.107)	0.05 (0.139)	0.044 (0.107)
ISRCANij,t-2			0.259 (0.206)	-0.135 (0.248)	0.302 (0.202)	-0.144 (0.245)
ISRCANij,t+1						
ISMEXij,t	0.893* (0.481)	-0.231 (0.581)	1.066** (0.525)	-0.143 (0.511)	0.511 (0.508)	-0.281 (0.511)
ISMEXij,t-1	-0.458 (0.523)	0.067 (0.502)	-0.743 (0.640)	-0.209 (0.287)	-0.735 (0.640)	-0.208 (0.286)
ISMEXij,t-2			0.319 (0.237)	0.302 (0.395)	0.292 (0.232)	0.395 (0.420)
ISMEXij,t+1					0.714** (0.312)	0.142 (0.202)
JORSGPij,t	0.159 (0.199)	-0.298 (0.406)	0.121 (0.190)	-0.144 (0.381)	-0.256** (0.118)	0.040 (0.179)
JORSGPij,t-1	-0.067 (0.195)	0.864** (0.363)	0.214 (0.154)	0.867*** (0.187)	0.219 (0.155)	0.870*** (0.189)
JORSGPij,t-2			-0.356* (0.200)	-0.024 (0.357)	-0.310 (0.212)	0.084 (0.350)
JORSGPij,t+1					0.427** (0.193)	-0.221 (0.432)
Nobs	8.877	8743	8385	8262	7823	7701
Within R2	0.501	0.276	0.508	0.272	0.488	0.256
rmse	0.629	0.951	0.613	0.941	0.606	0.933
ll	-7.940.895	-11423.93	-7290.687	-10704.77	-6702.115	-9906.745

Notes: ***, **, * indicate significance at 1%, 5% and 10%, respectively. Robust standard errors are presented below coefficients

B. Appendix – Chapter 2

Table B. 1 Variables description

	Variable	Description	Question	Question num
International Trade	$x_{i,t}$	Dummy variable that take value 1 if firm export in year t	What percentage of your establishment's sales were exported directly in current year	Authors creation
	$m_{i,t}$	Dummy variable that take value 1 if firm import inputs in year t	What percentage of establishment's purchases of materials inputs and supplies were purchased through direct imports in the current year?	Authors creation
	$exp_{i,t}$	Percentage of total sales exported in t	What percentage of your establishment's sales were exported directly in current year	q19b1
	$pm_{i,t-1}$	Percentage of purchases of materials inputs imported	What percentage of establishment's purchases of materials inputs and supplies were purchased through direct imports in the current year?	q26b_1
Size of the firm	$work_{i,t}$	Average number of workers in t	Refers only to permanent workers of your establishment. Permanent workers are defined as all (paid) long term (i.e. for one year or more) employees with guarantee of renewal of employment contract.	q107c
Total Factor productivity (TFP)	$lftp_{i,t}$	Levinsohn and Petrin (2003) TFP	Levinsohn and Petrin (2003)	Authors creation
	$capital_{i,t}$	Total fixed tangible assets	Value of your total assets?	q128a1 and q128a2
	$capitaldef_{i,t}$	Total fixed tangible assets deflated by the Production price index for manufactures	$Capital_{i,t} / PPI$	Authors creation
	$material_{i,t}$	Total purchases of raw material and intermediate goods	Total purchases of raw material and intermediate goods (whether used in production or not), including finished goods for resale	q122b2 and q122b1
	$materialsdef_{i,t}$	Total purchases of raw material and intermediate goods deflated by the Production price index for manufactures	$material_{i,t} / PPI$	Authors creation
	$salesdef_{i,t}$	Total sales in t. Value in thousands of Egyptian pounds. We deflate sales using the Production price index for manufactures using 2005 year as a base years.	$salet_{i,t} / \text{Production price index for manufactures}$	Authors creation
	$sales_{i,t}$	Total sales in t. Value in thousands of Egyptian pounds. Not deflated	Total sales	q122a2
	$sales_{i,t-1}$	Total sales in t. Value in thousands of Egyptian pounds. Not deflated	Total sales	q122a1
Sector	$nameindustry_{i,t}$	Coded value for each sector	What is the main activity of your establishment?	sector_str
Ownership	$foreignowner_{i,t}$	Percentage of the firm owned by a foreign Arabic owner and by other foreign owner	What is the percentage of the firm owned by a foreign Arabic owner? What is the percentage of the firm owned by other foreign owner?	q11a2+ q11a3

C. Appendix – Chapter 3

Table C.1 Variable description

		Description	Question	Question num
International Trade	$exp_{i,t}$	Dummy variable that take value 1 if firm export more than 10 per cent in year t	What percent of your establishment's sales were exported directly in current year	Authors creation from variable q19b1
Size of the firm	$sales_{i,t}$	Total sales in t. Value in thousands of Egyptian pounds. Not defalted	Total sales	q122a2
	$workt_{i,t}$	Average number of workers in t	Refers only to permanent workers of your establishment. Permanent workers are defined as all (paid) long term (i.e. for one year or more) employees with guarantee of renewal of employment contract.	q107c
Total Factor productivity (TFP)	$capital_{i,t}$	Total fixed tangible assets	Value of your total assets?	q128a1 and q128a2
	$capitaldef_{i,t}$	Total fixed tangible assets deflated by the Production price index for manufactures	$capital_{i,t} / PPI$	Authors creation
	$material_{i,t}$	Total purchases of raw material and intermediate goods	Total purchases of raw material and intermediate goods (whether used in production or not), including finished goods for resale	q122b2 and q122b1
	$materialsdef_{i,t}$	Total purchases of raw material and intermediate goods deflated by the Production price index for manufactures	$material_{i,t} / PPI$	Authors creation
	$wages_{i,t}$	Total cost of labor, including wages, salaries and bonuses	Total cost of labor, including wages, salaries and bonuses	q122c2 and q122c1
	$wagesdef_{i,t}$	Total cost of labor, including wages, salaries and bonuses deflated by the Production price index for manufactures	$wages_{i,t} / PPI$	Authors creation
	$investments_{i,t}$	Net book value of machinery and equipment (We don't know the depreciation rate)	What was the net book value of machinery and equipment?	q126a3 and q126a2
Ownership	$totalforeignowner_{i,t}$	Percentage of the firm owned by a foreign Arabic owner and by other foreign owner		q11a2+ q11a3

Table C.1 (Continuation) Variable description

	Variable	Description	Question	Question num
Investment Climate Constraints (Business environment)	tel _{i,t}	Telecommunications	Please tell us if any of the following issues are a problem for the operation and growth of your business. If an issue poses a problem, please judge its severity as an obstacle on a four-point scale where:	q3
	elec _{i,t}	Electricity		q31b
	trans _{i,t}	Transportation		q31c
	water _{i,t}	Water		q31d
	landacces _{i,t}	Access to Land		q31e
	landprice _{i,t}	Price of land		q31f
	policy _{i,t}	Regulatory Policy Uncertainty		q31g
	taxrate _{i,t}	Tax Rates		q31h
	taxadm _{i,t}	Tax Administration		q31i
	customsandtrade _{i,t}	Customs and Trade Regulations		q31j
	laborreg _{i,t}	Labor Regulations (Like Social Insurance)		q31k
	skillswork _{i,t}	Skills and Education of Available Workers		q31l
	licence _{i,t}	Business Licensing and Operating Permits		q31m
	financeacces _{i,t}	Access to Financing (Ex: Collateral)		q32a
	financecost _{i,t}	Cost of Financing (Ex: interest rates)		q32b
	macro _{i,t}	Macroeconomic Uncertainty (Ex: inflation, exch. rate)		q32c
	corruption _{i,t}	Corruption		q32d
	ilegalcomptinf _{i,t}	Illegal Competition from the informal sector/smuggling and dumping		q32e
	ilegalcomptfor _{i,t}	illegal Competition from the formal sector		q32f
	laws _{i,t}	Legal System/ Conflict Resolution		q32g
	crime _{i,t}	theft,disorder and crimes	q32h	
other _{i,t}	Other (Specify like government subsidies...)	q32oth		
firstobs _{i,t}	the biggest obstacle for your establishment	Among all of the above alternatives in parts a and b, please indicate which one constitutes	q33a	
secondobs _{i,t}	The second biggest obstacle for your establishment		q33b	
thirdobst _{i,t}	The third biggest obstacle for your establishment		q33c	

Table C. 2. Doing Business rank of Egypt (Getting Electricity, Getting Credit and Paying Taxes)

Economy	Year	Ease of Doing Business Rank	Getting Electricity				Getting Credit					Paying Taxes							
			Rank	Procedures (number)	Time (days)	Cost (% of income per capita)	Rank	Strength of legal rights index (0-10)	Depth of credit information index (0-6)	Public registry coverage (% of adults)	Private bureau coverage (% of adults)	Rank	Payments (number per year)	Time (hours per year)	Profit tax (%)	Labor tax and contributions (%)	Other taxes (%)	Total tax rate (% profit)	
Egypt	2004	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Egypt	2005	..	..	..	..	..	3	2	1.0	0.0	..	..	..	..	..	..	..	..	..
Egypt	2006	..	..	..	..	..	3	2	1.2	0.0	..	42	504	..	..	..	..	..	54.3
Egypt	2007	..	..	..	..	..	3	2	1.5	0.0	..	41	596	..	..	..	..	..	46.4
Egypt	2008	..	..	..	..	..	3	4	1.7	0.0	..	36	711	..	..	..	..	..	45.1
Egypt	2009	..	..	..	..	..	3	5	2.2	4.7	..	29	711	..	..	..	..	..	44.0
Egypt	2010	..	..	7	54	575.9	..	3	6	2.5	8.2	..	29	480	..	..	..	..	43.0
Egypt	2011	..	..	7	54	509.9	..	3	6	2.9	10.3	..	29	433	..	..	..	..	42.6
Egypt	2012	..	..	7	54	455.5	..	3	6	3.5	13.7	..	29	433	..	..	..	..	43.6
Egypt	2013	127	104	7	54	396.0	82	3	6	4.3	16.4	149	29	392	13.2	25.8	3.6	..	42.6
Egypt	2014	128	105	7	54	337.4	86	3	6	5.3	19.6	148	29	392	13.2	25.8	3.6	..	42.6

Spource: Doing Business World Bank (2014)

Table C. 3. Doing Business rank for different MENA countries

	Ease of Doing Business Rank					Getting Electricity					Getting Credit					Paying Taxes				
	DZA	EGY	JOR	LBN	MAR	DZA	EGY	JOR	LBN	MAR	DZA	EGY	JOR	LBN	MAR	DZA	EGY	JOR	LBN	MAR
2013	151	127	119	105	95	139	104	39	48	95	126	82	167	105	105	173	149	35	36	115
2014	153	128	119	111	87	148	105	41	51	97	130	86	170	109	109	174	148	35	39	78

DZA mean Algeria, EGY means Egypt, JOR means Jordan, LBN means Lebanon, MAR mean Morocco

Source: Doing Business World Bank (2014)

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Maria Dolores Parra Robles
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