Essays on trade policy in Arab League countries

by

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B.B.A., Baruch College, 2011
M.S., Brooklyn College, 2013
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AN ABSTRACT OF A DISSERTATION

submitted in partial fulfillment of the
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Abstract

This dissertation consists of three essays which use the Arab League countries as a natural setting for empirical research quantifying the effects of different features of this region's trade policies on member countries.

The first essay examines the effects of the different features of the Arab League's trade policy (preferential trade agreements, market power, and bound tariffs) on the multilateral tariffs applied by its member countries. Overall, our results suggest that preferential agreements have a building block effect on multilateral tariffs because Arab League members tend to lower their applied Most-Favored Nations (MFN) tariffs as they grant enhanced preferential access to their partners. Unlike earlier studies, we find that the formation of a customs union (CU) among Arab League members led to the same degree of external trade liberalization than forming a free trade area (FTA). Moreover, we find that high degree of importer market power tends to mitigate the building block effect of forming preferential trade agreements.

The second essay investigates the effects of trade policy uncertainty on the entry decisions of exporters to Arab League markets. Using a product-level dataset on World Trade Organization (WTO) members exporting to Arab League countries for the years 1998-2015, we provide empirical evidence that trade policy uncertainty, a result of significant gaps between tariff bindings and applied tariffs (tariff water), led to the reduced entry of exporters in Arab League markets. We then extend our analysis to investigate the effects of policy uncertainty combined with additional uncertainty related to falling incomes associated with the 2007-2010 worldwide economic downturn. Our results suggest that this macroeconomic shock has contributed to a considerably more uncertain economic environment, thereby affecting the decision to enter these markets. We also analyze exporter decisions to enter new markets when the Arab League importing country

exhibits high levels of market power. We find empirical evidence confirming that the effects of uncertainty on entry are magnified in the presence of high levels of market power.

The third essay examines the effects of trade preferences granted by members of the Arab League on these countries' international import prices. According to the international trade literature, preferential trade agreements (PTAs) lower trade barriers on imported goods from preferential partners, leading to consumer gains from better quality products, lower prices for existing products, and deteriorating terms of trade of the importing country relative to preferential partners. Using product-level data from 1998-2011 with information on quality-adjusted international import price indexes, applied MFN tariffs, preferential tariffs, and market power for eleven Arab League countries, we estimate the international import price effects of trade agreements formed by Arab League countries. We find that a one percentage point decrease in applied MFN tariffs leads to a fall in international import prices of about 0.16 percentage points, while domestic prices of imported goods, as well as those produced domestically if they are homogeneous, would fall by 0.84 percentage points. We also find that a one percentage point decrease in preferential tariffs leads to 0.084 percentage point increase in international prices, while domestic prices of imported goods decrease by 0.92 percentage points. Moreover, we find no significant effects of MFN tariffs and preferential tariffs on international import prices under a customs union. Furthermore, our results provide no evidence that market power affects this measure, the international import price index, of terms of trade.

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Dedication

To my parents, I put you through so much during my Ph.D. program, and so this is for you.

To Elena and Elisa, because you exist, I am what I am today.

In loving memory of my beloved grandfather, I wish you lived to witness this today. I will always love you, bahlou!

Chapter 1 - The Multilateral Trade Policy of the Arab League Countries: An Empirical Investigation

I. Introduction

The Arab League[1] was founded in the city of Cairo in 1945 by the delegates of its first seven members: Egypt, Iraq, Saudi Arabia, Jordan, Lebanon, Yemen, and Syria. Over time, more countries have joined the league, and it currently has 22 members[2]. The Arab League includes only countries whose people mainly speak Arabic or where Arabic is an official language, and its members are located either in North Africa or the Middle East. The league was created to strengthen ties between its members and to promote policy collaboration in areas like "economic and financial matters, including trade, customs, currency, agriculture, and industry…"[3] Since its creation, the Arab League has witnessed some significant changes among its members due to the increased complexity and competitiveness of the international economy. Consequently, members of the Arab League have become more integrated not just internally but with the rest of the world economy, as can be verified from their increased participation in negotiating trade agreements sponsored by the World Trade Organization (WTO) and its predecessor (The General Agreement on Tariffs and Trade, GATT).[4] Today, thirteen Arab League countries are members of the WTO, and an additional five of its members are in the process of joining this multilateral body.

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[1] Previously known as the League of Arab States.
[2] In addition to its seven original members, the League has accepted as members Morocco, Tunisia, Djibouti, Algeria, Libya, Oman, Kuwait, Qatar, United Arab Emirates, Bahrain, Sudan, Somalia, Mauritania, Palestine, and Comoros
[3] About LAS. (n.d.). Retrieved from http://www.lasportal.org/en/aboutlas/Pages/HistoricalOverView.aspx
[4] As stated by the former WTO Director Pascal Lamy during the Arab Economic and Social Development Summit in Kuwait in 2009 "because international trade is so vital to your economies (the Arab region), the WTO must also be vital to you."

In this paper, we investigate two key aspects of the Arab Leagues' trade policy in determining their applied multilateral tariffs. One key pillar of the WTO is the Most-Favored- Nation (MFN) principle, which requires each member to treat the other members equally. This principle requires that a tariff applied on imports from a member country must be extended to imports of the same product from other members. The tariffs applied under the MFN principle are the main multilateral trade policy that we will try to explain. However, member countries can form regional trade agreements (RTAs), also referred to as preferential trade agreements (PTAs), which correspond to reciprocal agreements between two or more partners where tariffs applied on trade between members are lower than the tariffs applied on trade with non-member countries.[5][6] The most common forms of PTAs are free trade areas (FTAs) and customs unions (CUs)[7]. The North American Free Trade Agreement (NAFTA) is a popular example of an FTA, while the European Union (EU) corresponds to a CU. Clearly, PTAs are exceptions to the MFN principle because the WTO allows PTA members to form if they comply with certain conditions.[8]

Notice that RTAs have become one of the most significant features of the international trade system, and the Arab League countries have participated fully in this worldwide trend. Since the mid-90s, the Arab League has increasingly participated in forming RTAs, with the stated intent of

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5 Source: WORLD TRADE ORGANIZATION. (n.d.). Retrieved February 26, 2017, from https://www.wto.org/english/tratop_e/region_e/rta_pta_e.htm .

6 In addition to the reciprocal preferential exchanges of market access, there are also several unilateral agreements. Under such agreements developed countries grant non-reciprocal preferential access to developing countries. Examples of these unilateral agreements include the Generalized System of Preferences (GSP), The African Growth and Opportunity Act (AGOA), Duty-free Tariff Preference for African LDCs-Morocco…etc. (source: https://www.wto.org/english/tratop_e/region_e/region_e.htm).

7 FTAs and CUs differ in how members handle their external tariffs. While the members of an FTA can independently set their external tariffs, CU members must comply with common external tariffs (*Saggi* et al., 2012).

8 The WTO has two important clauses that allow its members to move away from the MFN principle. Article XXIV of the GATT enables countries to form CUs or FTAs but requires members of the reciprocal agreement to eliminate duties on substantially all trade between members and an enabling clause that allows developing countries to adopt any trade policy for development including forming RTAs (Source: https://www.wto.org/english/tratop_e/region_e/region_e.htm).

strengthening member economic ties, as well as to facilitate, develop, and liberalize their trade regimes. Currently, members of the League are involved in 16 distinct PTAs, including some significant plurilateral trade agreements with each other, such as the Pan-Arab free trade area (PAFTA), the Gulf Cooperation Council (GCC), and the FTA that includes the Gulf Cooperation Council and Singapore. In addition to the plurilateral agreements, individual members of the League have also expanded their preferential trade relations with developed countries.[9] Thus, we have considerable variation in types of arrangements (FTAs versus CUs) and types of preferential partners (developing versus developed countries). As a result, one of our objectives is to investigate the role of RTAs among members of the Arab League in determining MFN tariffs.[10]

The second key characteristic of the trade policy used by members of the Arab League is the degree of flexibility with which its members can change applied MFN tariffs without violating their WTO obligations. As pointed out in *Nicita et al. (2018)* and *Ludema & Mayda (2013)*, WTO members negotiate the maximum tariffs they can apply, usually called bound tariffs, which are not the same as applied MFN tariffs. Thus, many countries (especially developing nations) have applied MFN tariffs lower than their bound tariffs giving them substantial leeway in changing MFN tariffs. That is exactly the case among Arab League countries. The overall average bound tariff for members of the Arab League is about 37 percentage points, while the average applied MFN tariff is about 12 percentage points. Likewise, about 88 percent of industries in these countries (defined at the ISIC level) have applied MFN tariffs at least three percentage points lower

9 For instance, the United States has bilateral agreements with Bahrain, Jordan, Morocco, and Oman; The European Union has bilateral agreements with Morocco, Tunisia, Egypt, Jordan, Algeria, and Lebanon.

10 The proliferation of preferential trade agreements within the Arab region is in line with the international experience and the overall growth of these type of arrangements across countries making regionalism a traditional form of liberalized trade among member countries (*Baldwin & Freund, 2011*). As of 2018, all of WTO's 164 members have become involved in PTAs. According to the WTO, during 1948-1994, there were 124 PTAs notified to the GATT and by 2018, the number of PTAs dramatically increased to more than 400 PTAs notified to the WTO of which 284 are currently in force.[10]

than their corresponding bound tariffs. Thus, members of the Arab League have significant policy space to modify applied MFN tariffs.[11] Thus, one of our main objectives is to investigate whether the flexibility in tariff schedules among these countries provide the opportunity to use non-cooperative MFN tariffs (i.e., tariffs that reflect importer market power).[12]

To carry out our empirical analysis, we construct a detailed dataset containing trade policy tools, including applied MFN, preferential tariffs, bound tariffs, membership in preferential agreements, bilateral trade flows, and measures of the degree of market power[13] for eleven members of the Arab League. In particular, we organize our data at the industry level (4-digit of the ISIC) and at the tariff line level (6-digit of the Harmonized System), which allows us to test the robustness of our results as well as enables us to compare our results with other research in the literature. Table 2 shows the descriptive statistics, which indicate that the average applied MFN tariffs is about 12 percentage points, while the average preferential tariffs is about 7 percentage points. Importantly, the share of products with a high preferential margin[14] is about 60 percent. Our dataset suggests that the average MFN tariffs applied by members of the Arab League have trended downward between 1998 and 2015, suggesting that Arab League countries have (on average) liberalized trade towards non-member countries. Our dataset suggests that average MFN (preferential) tariff applied by members of the Arab League was about 26 (24) percentage points

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11 Although article XXIV of the GATT requires that for members of a PTA to form and operate a CU or FTA, they should reduce or remove trade barriers on substantially all goods within the group and that trade with nonmembers should not be more restrictive than it was before forming the PTA, but this restriction is very poorly enforced.

12 Within the Arab League, we have two distinct groups based on when they joined the WTO. For instance, North African countries, as well as some Middle Eastern countries, are developing countries and are called old WTO members. According to *Subramanian & Wei (2007)* and *Nicita et al. (2018)*, this indicates that they could apply very high bound tariffs based on the enabling clause. On the other hand, other members of the league with access to the Persian Gulf are labeled as new WTO members (e.g., Saudi Arabia joined the WTO in 2005) and have faced far more demanding conditions to join the multilateral trade system sponsored by the WTO.

13 As explained in detail below, this measure corresponds to the inverse of the rest of the world's export supply elasticity faced by importers $\frac{1}{e}$.

14 Products are classified with a high-preference margin if the difference between applied MFN and preferential tariffs is equal to or greater than 2.5 percentage points.

in 1998; the average tariff dropped to about 9 (2) percentage points in 2015. This reveals that members of the Arab League have liberalized trade over the years towards members and non-members of the League, which suggests a positive correlation between preferential and multilateral liberalization.[15]

Furthermore, notice that Table 2 also shows the degree to which members of the Arab League countries can affect their terms-of-trade by imposing optimal (non-cooperative tariffs). This information indicates members of the Arab League have, on average, significant market power since their average non-cooperative tariff is about 13 percent. Notice that their degree of market power varies considerably from region to region, as well as across products. For example, our dataset suggests that some Middle Eastern countries like the United Arab Emirates, Oman, and Saudi Arabia face foreign export supplies that are very inelastic, which indicates high levels of market power, as opposed to the export supplies faced by Northern African countries. The average optimal tariff for the United Arab Emirates is 33 percent as opposed to Tunisia's, which is a far more modest 8 percent. In summary, because these countries are mostly not constrained by WTO bound tariffs, theory predicts that their applied MFN tariffs would be positively related to market power (*Broda et al., 2008).*

Our empirical strategy follows these main insights. In particular, using a panel data strategy, we investigate the main determinants of the applied MFN tariffs imposed by members of the Arab League. We control for the usual macroeconomic factors (exchange rate changes, economic growth, among others) by using country-level fixed effects that vary by year, while we control for political economy factors by using country-level fixed effects that vary by industry. Our empirical

[15] For example, in 2006, the average applied MFN tariff in Morocco was 26.66 percentage points, but by 2015, it fell to 13.75 percentage points. During that period, Morocco formed additional agreements with the United States and with Turkey. In the case of Morocco, the average preferential tariff dropped from 32.54 percentage points in 2000 to 3.03 percentage points in 2015.

strategy controls for the two main elements of the trade policy pursued by members of the Arab League. Our basic specification explores how preferential tariffs affect MFN tariffs applied by Arab League nations. Our results reveal the presence of endogeneity bias, for which we controlled using lagged values of preferential tariffs and, extensively, by using instrumental variables. We also extend our specification by controlling for other essential elements in the trade policy adopted by members of the Arab League. In particular, we control for possible different effects of RTAs (FTA versus CU), the presence of applied MFN tariffs below bound tariffs, and for the degree of market power of importing economies on MFN tariffs.

Our benchmark results suggest that the lower the preferential tariffs, the lower the applied MFN tariff tended to be. In our preferred specification, we use a Generalized Method of Moments (GMM) based instrumental variable approach to conclude that a one percentage point decrease in average preferential tariffs leads to a 0.506 percentage point decrease in applied MFN tariffs. Thus, we find that preferential trade liberalization is a building block to multilateral trade liberalization. Also, unlike previous studies, we find that the effects of liberalization through CUs differ little from the effects of liberalization through FTAs. They seem equally essential building blocks. Likewise, we also find that the building block effect related to preferential trade tends to decrease with the degree of market power of the importing nation. More specifically, we find that a one percentage point decrease in preferential tariffs tends to decrease by 0.650 percentage points the MFN tariff applied to products where an importer has low market power, but applied to products where an importer has high market power, the decrease in the MFN tariff is only 0.249 percentage points. A series of robustness tests involving data at 6-digits, including another set of fixed effects, using two different subsamples where we divide our data into Northern African countries and

Middle Eastern countries, both at the ISIC and at the 6 digits level, confirm preferential agreements as building blocks and the mitigating effects of higher levels of market power on this effect.

Our paper is related to two strands from the literature on the primary determinants of multilateral trade policy. On the one hand, our paper is related to papers that investigate whether forming RTAs represents a stumbling block or building block for multilateral trade policy. The literature has presented contradictory results on this strand. *Limão (2006)* states that U.S. preferential agreements create a stumbling block for U.S. multilateral tariffs because preferential access also has noneconomic objectives.[16] In this case, the non-economic objectives indicate that the U.S. must reciprocate the provision of non-economic goods with a significant preference margin, thus creating a stumbling block effect.[17] In contrast, *Estevadeordal et al. (2008)* note that preferential agreements involving developing countries (e.g., Latin America) do have a building block effect because participating in these agreements requires reciprocal exchange of market access. Moreover, *Estevadeordal et al. (2008)* conclude that multilateral tariffs tend to be lower under FTAs than CUs[18]. These conflicting results suggest that incentives to grant preferential access through FTAs may differ from incentives present under CUs; they may also point out that development status also helps to determine the effects of tariff preferences on multilateral tariffs.[19]

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16 Non-economic objectives involve small partners who provide public goods like spreading and enforcing democratic values, enforcing property rights, improving the rule of law, respecting labor standards, fighting against illegal immigration and drugs.

17 *Karacaovali & Limao (2008)* also clarify the effect of PTA on multilateral trade liberalization (MTL) using detailed tariff data for the European Union. Their findings also showed that PTAs slowed multilateralism.

18 *Calvo-Pardo et al. (2009)* examine the effect of the ASEAN FTA on multilateral trade liberalization and find tariff complementarity between changes in preferential tariffs and multilateralism.

[19] *Ketterer et al. (2014)* examined the impact of tariff preferences on Canada's multilateral tariffs. Their findings supported the building block effect of CUSFTA. They argued that their results showing the building block effect instead of the stumbling block effect reported in both *Limao (2006)* and *Karacaovali & Limao (2008)* for the US and EU is because the agreements involved in the US and EU were among developed nations granting preferential access to developing countries while having non-economic objectives.

Our paper is also related to the strand of the literature that explicates how market power helps determine applied MFN tariffs. *Broda et al. (2008)* show that non-WTO members apply tariffs that reflect their market power. *Bagwell & Staiger (2011)* show that, for a group of countries that have recently joined the WTO, tariffs are more cooperative after their accession process was concluded. Their results indicate that WTO membership is important in internalizing some terms-of-trade externalities that are present in countries not constrained by WTO policies. However, *Nicita et al. (2018)* show that the tariffs applied by WTO members reflect their market power when bound tariffs are higher than applied MFN tariffs (i.e., in the presence of tariff water). As they explain it, the average WTO member has bound tariffs three times higher than applied tariffs, allowing members to set tariffs reflecting their market power without violating their WTO obligations[20]. As we have already explained, our dataset consists of WTO members with bound tariffs significantly higher than applied tariffs, which, in principle, allows members to impose tariffs that reflect their market power.

Our strategy improves on the methods of previous studies in several ways. First, we investigate the effects of PTAs on applied MFN tariffs while also considering preferential agreements more in line with the de jure definition under the WTO. Notice that *Estevadoerdal et al. (2008)* report that granting preferential access under CUs neither generates a stumbling block nor a building block for multilateral tariffs applied by Latin American countries. It is possible that because these CUs have not been fully implemented, this has affected their results, but this may not be the case in agreements involving Arab League nations. For instance, the Gulf Cooperation Council was formed by Saudi Arabia, Kuwait, United Arab Emirates, Qatar, Bahrain, and Oman in 2003 under

[20] *Ludema & Mayda (2013)* find that, in the presence of market power, the MFN tariffs of WTO members tends to be higher.

WTO's Article XXIV. CUs created under Article XXIV must have duty-free trade among members and common external tariffs that are, on average, not higher than the tariffs applied by member countries before the CU was implemented.

Second, previous studies used data collected during the GATT years (i.e., before the WTO was created in 1994). Several countries had to reduce their applied tariffs to conform to the new tariff bindings determined during the Uruguay Round of negotiations that led to the creation of the WTO. Thus, two distinct situations have arisen depending on the time period: one situation where some tariffs were unbounded and the other where the tariffs were not only bounded but had to be reduced. This raises questions about whether the applied tariffs decreased because of the multilateral negotiations sponsored by the WTO or because of the effects of preferential trade agreements. This does not apply to our empirical strategy because we use data from 1998 to 2015; therefore, countries have had enough time to adjust their external tariffs in accordance with the bound tariffs negotiated under the Uruguay Round.

Finally, the countries involved in our study are all developing countries; their bound tariffs tend to be significantly higher than their applied MFN tariffs. Therefore, we are first to test whether the presence of market power is pivotal in determining multilateral tariffs in the presence of preferential trade agreements. We can test our results using data at the product level and the industry level. Moreover, we can test our results using agreements that involve only developing countries as well as agreements that involve both developing and developed countries. In the next section, we describe how the data is constructed and provide summary statistics. Section 3 presents our econometric methodology, while Section 4 presents our main econometric results and discusses robustness tests. In section 5, we conclude.

II. Data Description

a. Overview of Preferential Trade Agreements in the Arab League region

Since the mid-90s, the Arab League countries have relied more on bilateral and multilateral trade agreements that strengthen their economic ties to one another and further develop their trade regimes. In Table 1, we present the eleven members of the Arab League considered in our study. Table 1 also shows the various trade agreements among these countries. The information in Table 1 came from the WTO's RTA database and also includes the list of members involved in each RTA. Notice that some members of the Arab League could not be included in our dataset given the limited available information about their trade policies. Table 1 shows that among the Arab League members considered in this paper, only Lebanon is not a member of the WTO. [21] The table also shows that members of the Arab League have several regional trade agreements, with some of the most significant agreements involving only members of the Arab League.

[21] Lebanon is an observer in the WTO

Table 1-1. Major Preferential Trade Agreements within the Arab League and with Developed Countries

Country[22]	WTO	PAFTA	GCC	FTA with Singapore	FTA with EFTA	FTA with EU	FTA with USA	FTA with Turkey	FTA with Canada	Number of memberships PTA
Bahrain	X	X	X	X			X			5
United Arab Emirates	X	X	X	X						4
Kuwait	X	X	X	X						4
Oman	X	X	X	X			X			5
Qatar	X	X	X	X						4
Saudi Arabia	X	X	X	X						4
Morocco	X	X			X	X	X	X		6
Tunisia	X	X			X	X		X		5
Egypt	X	X			X	X		X		5
Jordan	X	X			X	X	X	X	X	7
Lebanon		X			X	X				3

Source: World Trade Organization (WTO)[23]

[22] Note that there are 22 members of the Arab League although we only used data on eleven because of data availability.
[23] www.rtais.wto.org

The first comprehensive regional trade agreement created by members of the Arab League was the Pan-Arab Free Trade Area (PAFTA). This regional trade agreement was formed by 14 members of the Arab League in 1998 although it has expanded to include an additional 4 members of the League since its inception. In line with the primary directives of the Arab League, one of the PAFTA's main provisions is to accelerate removing tariffs and non-tariff barriers on intra-PAFTA trade[24] while strengthening the economic ties of the League with the rest of the world. Another plurilateral, regional trade agreement involving only members of the Arab League corresponds to the Gulf Cooperation Council (GCC). This regional trade agreement was formed in 2003, and, as can be seen in Table 1, it involves six members of the Arab League with direct access to the Persian Gulf (Bahrain, Saudi Arabia, Kuwait, United Arab Emirates, Qatar, and Oman). Notice that the GCC is a CU, thus requiring that its members apply a common external tariff, while the PAFTA does not have this requirement. In this case, applying a common external tariff among GCC members may not be politically costly given all these economies are significantly reliant on specific mineral products (oil and gas). Note that both regional agreements were created under WTO's Article XXIV, indicating that trade among members must be significantly duty-free and that average MFN tariffs cannot rise above pre-agreement levels.

Several agreements among members of the Arab League and other countries have been created since PAFTA and the GCC were created. More recently, members of the GCC formed an FTA with Singapore. In addition to the plurilateral agreements, specific members of the League have also expanded their preferential trade relations to form bilateral agreements with developed countries. For instance, Table 1 indicates that the United States has agreements with Bahrain,

[24] Full liberalization was scheduled to take place on July 21, 2007. However, the process was accelerated, and tariffs were fully removed by 2005. Non-tariff barriers among members was completed by 2010.

Jordan, Morocco, and Oman, while the European Union has agreements with Morocco, Tunisia, Egypt, Jordan, Algeria, and Lebanon. As a result, our dataset has considerable variation in the type of preferential arrangements (FTA versus CU) and in the mix of members involved (developed versus developing).

b. Data sources

For our empirical analysis, we construct a comprehensive dataset with bilateral information on members of the Arab League and their trade partners, which includes information on applied MFN tariffs, preferential (bilateral) applied tariffs, and bound tariffs. Preferential tariffs imposed by importers equal their MFN tariffs applied on imports from countries where no preferential treatment is granted. Information on applied MFN tariffs and preferential tariffs allow us to investigate whether forming PTAs among members of the Arab League act as a building block or a stumbling block for the multilateral tariffs applied by these countries. As will become clear below, our empirical strategy requires information on applied MFN tariffs and preferential tariffs over a number of years to better identify the relationship between preferential tariffs and applied MFN tariffs. For this reason, we organize a dataset with information on tariffs from 1998 to 2015 for the eleven Arab League members identified in Table 1. Information on applied MFN tariffs and preferential tariffs came from the UNCTAD-TRAINS (Trade Analysis and Information Systems) database while information on bound tariffs was provided by the WTO. Information on tariffs is organized initially using the 6-digit code of the Harmonized system (HS6), but we also aggregate tariff measures using the 4-digit of the International Standard Industry Classification (ISIC4, Revision 2). The aggregation procedure used is detailed below.

Note that the information on PTAs used in this paper include only CUs and FTAs, while we disregarded Partial Scope Agreements (PSAs). The information on the PTAs considered in this

study can be found in Table 1. PSAs were excluded because it would be challenging to determine the degree of market access because only part of the trade between member countries is duty-free. Many industries have been excluded from these partial agreements. Our empirical strategy involves creating dummy variables to identify if a country-pair is part of the same PTA. We implement this strategy by creating two main binary variables: The variable called ***PTA*** equals one if a country-pair is part of the same CU or FTA and zero otherwise; the variable ***CU*** equals one if the country-pair belongs to the same CU and zero otherwise. By including these ***PTA*** and the ***CU*** dummy variables, we can control for cases where countries are members of the same preferential trade agreement, as well as control for the type of agreement (FTA versus CU).

Collecting data on tariffs for different members of the Arab League over the years proved to be a challenge because some countries in our sample do not consistently report tariffs. The problem of missing observations is common in the literature but is mitigated by following some general steps. First, we filled in several missing MFN applied tariffs and preferential tariffs by combining information obtained using the UNCTAD-TRAINS dataset with the dataset used in *Nicita et al. (2018)*. However, this first step still came up short in filling in many missing preferential tariffs. Thus, our second step consists of replacing missing preferential tariffs[25] with applied MFN tariffs if variable ***PTA*** equals zero because, if that is the case, the country-pair in question is not a member of any particular preferential trade agreement. Furthermore, our second step also set the preferential tariff as equal to zero if MFN is equal to zero and the variable ***PTA*** is equal to one. Third, we replace preferential tariffs with zero if the value for ***PTA*** is one, the current year is higher than the phase-out year, and the MFN tariff is not missing.

[25] Preferential tariff is the tariff imposed on the exporting country when there is preferential agreement between the countries involved and is strictly lower than MFN.

Our empirical strategy requires relating the degree of preferential market access to the applied MFN tariff. This indicates that we need to aggregate different preferential tariffs described in our bilateral trade dataset to a level that shows how they relate to the MFN tariffs, which do not vary by trade partner. Thus, we use information on bilateral preferential tariffs and imports to collapse the bilateral trade dataset to a dataset with information varying by Arab League importer, product (HS6), and year. In this case, we aggregate preferential tariffs by importer, product, and year using their average across exporters that belong to the same preferential trade arrangement (or ***PTA*** equal to one), or using the minimum tariff across exporters rather than the average. However, applied MFN tariffs are aggregated at the importer, product, and year level using the median across exporters because multilateral tariffs should not vary by trade partner, while we add up trade flows across exporters to obtain aggregated import levels[26].

As discussed in the introduction, the degree of flexibility is a fundamental aspect of the trade policy adopted by members of the Arab League. As indicated by *Nicita et al. (2018)*, countries with flexibility in their tariff schedules may apply tariffs that reflect their market power. To control for this possibility, we add the measures of the elasticity of export supply faced by importers estimated by *Nicita et al. (2018)* to our dataset organized using the 6-digit of the Harmonized System. We can then control for the degree of market power of the Arab League importers using the distribution of the non-cooperative optimal tariffs, which is given by the inverse of the elasticity of export supply faced by importers.

Note that one of the objectives of our study is to compare our results to other studies in the literature. For this reason, we also aggregate our dataset using the 4-digit code of the ISIC

[26] After aggregation, our dataset still omitted a number of preferential tariffs from the bilateral, product, and year level to an importer, product, and year level. We inferred values for missing preferential tariffs by using averages of those tariffs by country, HS4, and year in addition to using averages by country, HS2, and year. This procedure was followed when the importer-product-year observation presents at least one preferential partner in the bilateral trade data.

(Revision 2). Applied MFN tariffs, preferential tariffs, and bound tariffs were aggregated using a simple average of the 6-digit codes of the HS that belong to a particular industry at the 4-digit of the ISIC. Instead, we use the median value of the elasticity of export supply faced by importers across the 6-digit codes of the HS that belong to the same industry at the 4-digit of the ISIC following the procedure used in *Bown & Crowley (2013)*.

Once we convert our data to the ISIC 4-digit codes, we construct additional variables to use for our benchmark and robustness results. For instance, it is widely accepted that tariff preferences (i.e., the difference between applied MFN tariff and preferential tariffs) are economically meaningful if preferential access is significant. We calculated a binary (dummy) variable ***MRG*** that equals one if the preferential margin, measured in this case using the average bilateral preferential tariffs, is greater than or equal to 2.5 percentage points. Likewise, we obtain another variable that we label ***MRG1***, which equals one if the preference margin, which uses preferential tariffs measured using the minimum bilateral preferential tariff, is greater than or equal to 2.5 percentage points. To capture the degree of flexibility in tariff schedules, we construct another dummy variable to indicate the existence of tariff water[27]. We label this variable ***BIND***; it equals one if the difference between bound tariffs and applied MFN tariffs is less than or equal to 3 percentage points. This variable can be used to test the effects of preferential trade on MFN tariffs when member countries can increase their MFN tariffs on non-members.

c. Descriptive statistics

Table 2 reports summary statistics of the main variables we use in our study. Overall, *Panel A* indicates that the average applied MFN (preferential) tariff is about 12.32 (7.29) percentage points over the whole period. Likewise, *Panel A* of Table 1 suggests that the average preferential tariff

[27] The difference between bound tariffs and applied most favored nation tariff.

based on minimum bilateral tariffs is 5.92 percentage points over the period under consideration. This indicates that the average preference margin ranges between 5 percentage points and 6.4 percentage points depending on how we measure preferential tariffs. Notice that the average bound tariff is 37 percent, indicating the presence of significant tariff water in our sample, with only 12 percent of tariffs deemed close enough to their bindings.

Notice that in Table 2, the variable ***MRG*** suggests that 60 percent of our sample has preference margins greater than or equal to 2.5 percentage points, and, similarly, the variable ***MRG1*** suggests that 66 percent of the sample has preference margins greater than or equal to 2.5 percentage points. As indicated above, satisfying the Rules of Origin[28] established by an RTA can be costly and, therefore, if the preferential margin is not significant, countries would prefer to export using the MFN regime. Notice that restricting the sample to observations with significant preferential margins (i.e., ***MRG*** variable equals one) led to an average increase of 13 percentage points in MFN tariffs (see *panel B*), with 11 percent of the sample having applied tariffs constrained by bound tariffs.

[28] Rules of Origin (RoOs) represent the criteria used to determine whether a good exported by one RTA member is eligible for duty free access in another member country's market (https://www.wto.org/english/tratop_e/roi_e/roi_info_e.htm). In the case of FTAs, member countries can apply different external tariffs, which creates an incentive to import a product through the low-tariff member country and re-export it to the high-tariff member country. For example, a country can import a good at 5% and export it to another country at 15%. To prevent duty-free transshipments, RoOs support independent tariff setting under FTAs. *Anson et al. (2005)* show that satisfying RoOs imply substantial compliance costs. In their paper, they argue that firms may decide not to rely on the preferential export regime if the preferential margin (difference between MFN and preferential tariff) is not greater than 2.5%; thus, preferential margins are meaningful if they are greater than 2.5%.

Table 1-2. Descriptive Statistics

A*: *Full Sample

Variable	N	Mean	S.D.	Min	0.25	Median	0.75	Max
MFN	14178	12.32	15.65	0.00	5.00	5.00	15.00	200.00
avgpref	14174	7.29	12.93	0.00	0.14	2.86	8.38	200.00
L_avgpref	14178	8.24	13.52	0.00	0.30	4.00	10.00	200.00
minpref	14174	5.92	12.02	0.00	0.00	1.37	5.47	200.00
L_minpref	14178	6.89	12.76	0.00	0.08	2.25	7.10	200.00
bound	12746	37.2	47.71	0.38	14.92	26.52	40.00	2145.71
BIND	14178	0.12	0.33	0.00	0.00	0.00	0.00	1.00
L_BIND	14178	0.14	0.34	0.00	0.00	0.00	0.00	1.00
optimal	12054	0.13	0.46	0.00	0.03	0.07	0.11	10.05
MRG	14178	0.60	0.49	0.00	0.00	1.00	1.00	1.00
MRG1	14178	0.66	0.47	0.00	0.00	1.00	1.00	1.00

***B*. *Sample with Preference Margin* ≥ 2.5**

Variable	N	Mean	S.D.	Min	0.25	Median	0.75	Max
MFN	8567	13.01	16.13	2.5	5.00	5.00	16.45	200.00
avgpref	8563	4.82	10.43	0.00	0.00	0.50	5.24	160.83
L_avgpref	8567	6.51	12.01	0.00	0.04	1.59	7.57	180.00
bound	8056	38.6	42.77	5.00	15.00	30.00	40.01	2145.71
BIND	8567	0.11	0.31	0.00	0.00	0.00	0.00	1.00
L_BIND	8567	0.11	0.32	0.00	0.00	0.00	0.00	1.00
optimal	7175	0.14	0.50	0.00	0.03	0.07	0.11	10.05

C*. *subsample with Customs Union only

Variable	N	Mean	S.D.	Min	0.25	Median	0.75	Max
MFN	7437	6.94	12.29	0.00	4.83	5.00	5.00	125.00
Avgpref	7435	1.67	6.39	0.00	0.00	0.11	1.43	125.00
L_avgpref	7437	1.67	6.24	0.00	0.00	0.09	1.54	125.00
Minpref	7435	1.45	6.01	0.00	0.00	0.04	1.05	125.00
L_minpref	7437	1.44	5.85	0.00	0.00	0.00	1.08	125.00
bound	7275	35.44	37.55	0.38	13.74	15.00	35.00	200.00
BIND	7437	0.09	0.28	0.00	0.00	0.00	0.00	1.00
L_BIND	7437	0.10	0.30	0.00	0.00	0.00	0.00	1.00
MRG	7437	0.67	0.47	0.00	0.00	1.00	1.00	1.00
MRG1	7437	0.70	0.46	0.00	0.00	1.00	1.00	1.00
optimal	5618	0.16	0.39	0.00	0.03	0.08	0.14	5.85

Source: *Author using data from the UNCTAD-TRAINS, WTO,* and *Nicita et al. (2018)*

Furthermore, Table 2 shows the aggregate figures in *panel A* differ from *panel C*, indicating that, for the members of the Arab League, customs unions may lead to different levels of applied MFN and preference margins than FTAs. *Panel C* suggests that applied MFN tariffs are much lower than the measures found on *Panel A*, averaging about 7 percentage points, while preferential tariffs using different methods also seem to be significantly lower under a customs union, averaging between 1.5 and 2 percentage points. In the case of a customs union, the average preference margins are 5.27 percentage points for ***MRG***, and 5.52 percentage points for ***MRG1***, while 9 percent of the applied MFN tariffs are constrained by tariff bindings[29].

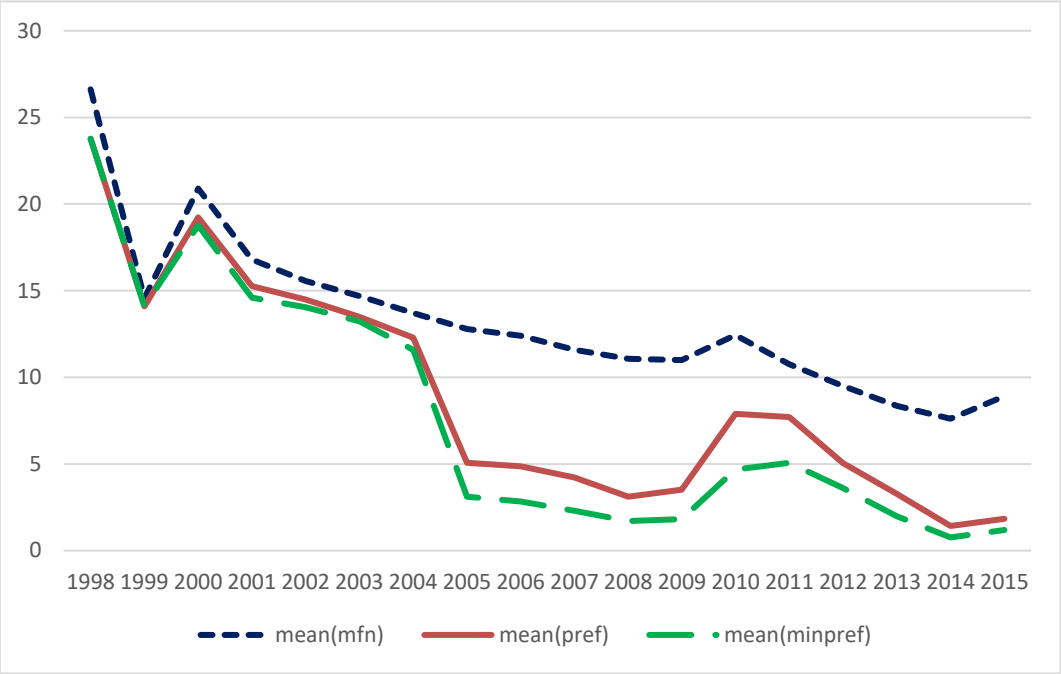
The fundamental differences between panels *A* and *C* is related to the fact that North African countries have been members of the GATT for several decades, and thus, many of them had the flexibility to set high applied MFN tariffs and very high tariff bounds because of the enabling clause. However, many GCC countries were never members of the GATT, and once they became members of the WTO, their external tariffs had to be closer to their relatively lower tariff bounds. Historically, the GCC countries have maintained low external tariff barriers because of their narrow production base and their oil wealth. Furthermore, the customs union formed in 2003 brought even further declines in their overall external tariffs, requiring common external tariffs of 5 percent on most imported goods and zero percent on essential goods[30].

Our dataset suggests that members of the Arab League may have, at least on average, promoted intra-trade flows among members of its regional trade agreements without explicitly discouraging trade with non-member countries. Thus, we find a positive correlation between MFN tariffs and preferential tariffs where a downward trend for both sequences is present. As Figure 1 shows, the

[29] See Appendix A for information on minimum tariffs.
[30] World Bank Middle East and North Africa Region October 2010 "economic Integration in the GCC"

initial average external tariff was about 27 percentage points, and, in 2015, it dropped to about 9 percentage points. Likewise, the 1998 average preferential tariff was about 24 percentage points and fell to 2 percentage points in 2015, the last year from which we collected data.

Figure 1-1. Overall Average MFN, Average and Minimum Preferential Tariffs



Source: *data taken from the UNCTAD-TRAINS and WTO*

These tariff adjustments were achieved through a series of steps that involved reducing maximum multilateral tariffs as well as reducing the preferential tariffs encouraged by RTAs. For example, the average MFN tariff applied by Morocco declined from 33 percentage points in 2000, when the Morocco-EU FTA took effect, to 28 percentage points in 2005. In 2006, the average MFN tariff applied by Morocco was 27 percentage points, but by 2015, it fell to 14 percentage points. During this latter period, Morocco formed two additional bilateral RTAs, one with the United States and the other with Turkey, both in 2006. Morocco's average preferential tariffs decreased from an average of 33 percentage points in 2000 to 3 percentage points in 2015. We

find similar evidence for members of the GCC, which succeeded in reducing common external tariffs from an average of 12 percentage points in 1999 to 5 percentage points in 2015. Thus, we find evidence of a correlation between external (MFN) and preferential tariffs. However, that does not imply causality. Our econometric strategy, described below, explores the causality issue with a well-founded statistical approach.

III. Econometric Methodology

In the introduction, we discussed several empirical strategies for investigating the effects of different features of the international trade system (preferential trade agreements, market power, and tariff overhang, among others) on multilateral tariffs. We will rely on those empirical models as guidelines to help us analyze the relationship between these features and applied MFN tariffs.

Table 1 shows that Arab League countries are involved in various preferential trade agreements, and, as a result, tariff preferences granted by each of these countries may vary across preferential partners. Thus, our econometric model relies on two major approaches to address the degree of preferential access granted by members of the Arab League. The first method calculates the simple average preferential tariff applied by an importing country. This approach is inspired by empirical work that usually measures trade barriers using the simple average of tariffs. [31] The second method relies on the minimum preferential tariff as in *Estevadeordal et al. (2008)*. The following expressions describe these two approaches:

$$\boldsymbol{avgpref_{ijt}} = \underbrace{avg}_{P}\{\tau_{ijt}^{P}\}\text{ , and}$$

$$\boldsymbol{minpref_{ijt}} = \underbrace{\min}_{P}\{\tau_{ijt}^{P}\} \quad , \qquad \textbf{(1)}$$

[31] *Kee et al. (2008)* indicate that using average MFN tariffs can be quite misleading because these measures can differ significantly from a welfare-concerned measure of trade restrictiveness. Moreover, average tariffs may vary widely depending on how the averages are constructed.

where τ_{ijt}^{P} denotes the preferential tariff (in percentage points) applied by country *j* on imports from preferential partner *P* in sector *i* at year *t*. Our empirical model explicates the effects of two key features of the trade policy implemented by Arab League countries on applied MFN tariffs. On one hand, we want to investigate the effects of preferential access on applied MFN tariffs while, on the other hand, we consider how the flexibility in these countries' tariff schedules affect their application of market power in setting tariffs. To investigate the effects of RTAs on multilateral tariffs, our benchmark specification uses the following empirical model:

$$MFN_{ijt} = \alpha_{ji} + \theta_{jt} + \beta_1\left(avgpref_{ijt}\right) + \epsilon_{ijt} \quad \text{, and} \quad \textbf{(2)}$$

$$MFN_{ijt} = \alpha_{ji} + \theta_{jt} + \beta_1\left(minpref_{ijt}\right) + \epsilon_{ijt} \quad , \quad \textbf{(3)}$$

where $\boldsymbol{MFN_{ijt}}$ represents the non-discriminatory tariff applied by importing country *j* on imports of sector *i*. As indicated above, our benchmark results aggregate tariffs at the industry level using the 4-digit the ISIC, but we also test our predictions using data aggregated at a much finer level (6-digit of the HS), in which case subscript *i* should be understood as a product rather than an industry or sector. The explanatory variables $\boldsymbol{avgpref_{ijt}}$ and $\boldsymbol{minpref_{ijt}}$ are defined by expression (1), and empirical models (2) and (3) explore the differences between these two measures of preferential access.

Many other factors other than preferential tariffs can affect a country's external tariffs. For instance, macroeconomic shocks, political economy, and historical considerations could also affect multilateral tariffs. Ideally, we would like to introduce variables to control for all these factors, but, in practice, information (for instance) on industry-level capital-labor ratios and political organization are not systematically available across these countries. Thus, we control for these additional factors by introducing country-industry denoted by $\boldsymbol{\alpha_{ji}}$ and country-year fixed effects denoted by $\boldsymbol{\theta_{jt}}$ in expressions (2) and (3). The term $\boldsymbol{\epsilon_{ijt}}$ denotes the error term.

The coefficient of interest in specifications (2) and (3) is $\boldsymbol{\beta_1}$. A positive and statistically significant $\boldsymbol{\beta_1}$would support the building block effect of preferential trade on multilateral tariffs. A positive sign for β_1 indicates that as countries lower their preferential tariffs, they also tend to lower their MFN tariffs. On the other hand, a negative value for β_1 would lend support to the idea that preferential trade agreements represent a stumbling block to multilateral trade liberalization. As indicated in the introduction, other articles have reported different results over time, but we are better equipped to shed light on this issue because of our ability to test this question using data with different aggregation levels, RTAs of different types, and preferences exchanges between countries with different economic development status.

Furthermore, we test how flexibility in the tariff schedules of the Arab League members affected their multilateral tariffs. In particular, the introduction refers to several articles suggesting that flexibility in setting tariffs may lead countries to exercise their market power. In this case, we expect tariffs to be higher if the market power of the importing country is high. To test this hypothesis, we use the following specifications:

$$MFN_{ijt} = \alpha_{ji} + \theta_{jt} + \beta_1\left(avgpref_{ijt}\right) + \beta_2(avgpref_{ijt} * PWR_{ij}) + \epsilon_{ijt} \text{ , and} \quad \textbf{(4)}$$

$$MFN_{ijt} = \alpha_{ji} + \theta_{jt} + \beta_1\left(minpref_{ijt}\right) + \beta_2(minpref_{ijt} * PWR_{ij}) + \epsilon_{ijt} \text{ ,} \quad \textbf{(5)}$$

where variable $\boldsymbol{PWR_{ij}}$ is a binary variable equaling one if the inverse of the elasticity of export supply faced by country *j* in sector *i* is greater than a certain cutoff (the 67th, 70th, and 75th percentile) of the distribution of market power for country *j*'s sectors. This approach follows *Broda et al. (2008)*, *Nicita et al. (2018)*, among others, who use the distribution of market power to determine products or industries where power is more relevant. In this case, our prior assumption is that coefficient β_2 should be negative, suggesting that the potential building block effect of

preferential tariffs tend to be lower, or even become a stumbling block, for products where the importer has greater market power relative to products with lower market power.[32]

We test several extensions to specifications (2) through (5). First, we also use the lagged average (minimum) preferential tariffs as our main explanatory variable, showing that our results are robust to the presence of predetermined preferential tariffs. Second, *Ornelas (2007)* and *Facchini et al. (2013)* model different types of PTAs and show that external tariffs under an FTA may be lower than under a CU. Because Arab League members have different types of agreements with other members, including FTAs like the PanArab FTA, and a CU, the Gulf Cooperation Council, we test whether external tariffs under an FTA are affected differently by preferential tariffs than under a CU. This objective is achieved by extending expressions (2) and (3) with an additional explanatory variable representing the interaction between variable $\boldsymbol{avgpref_{ijt}}$ ($\boldsymbol{minpref_{ijt}}$) and a dummy indicating whether importing country *j* is part of a CU at year *t*. If the coefficient of this variable is statistically significant, then we can conclude that external tariffs under an FTA are not affected by preferential tariffs in the same way as external tariffs under a CU.

We use specifications (2) through (5) to investigate the effects of preferential tariffs on applied MFN tariffs. Our basic strategy relies on OLS estimates of these specifications. However, the literature suggests that different sources of endogeneity might bias our estimates. First, *Limao (2006)*, *Ketterer et al. (2014)*, and *Estevedeordal et al. (2008)* indicate that applied MFN tariffs and negotiated tariff bounds may affect preferential tariffs. Moreover, *Broda et al. (2008)*, *Ludema & Mayda (2013)*, and *Nicita et al. (2018)* posits that tariffs may not only affect the degree of market

[32] Notice that power does not vary by year. As such, variable $\boldsymbol{PWR_{ij}}$ is absorbed by country-industry fixed effects.

power, but missing controls for political economy factors correlated with market power may bias estimates of the effects of power on applied MFN tariffs.

To address potential endogeneity, we use 2SLS and GMM instrumental variable strategies with two different sets of instrumental variables. The first set uses the average or the minimum preferential tariffs of regional trading partners, and the same strategy was followed to obtain the instruments for the variable ***avgpref*** as it interacted with the power dummy; for the second set of instrumental variables, we chose a main trading partner (among members of the Arab League) by region and uses the main partner's preferential tariff as the instrument. Members of the Arab League fall into two regions: (i) North Africa, which includes Morocco, Tunisia, Egypt, Lebanon, and Jordan; and (ii) the Gulf Cooperation Council, which includes the United Arab Emirates, Saudi Arabia, Qatar, Oman, Kuwait, and Bahrain. The main partner of each Arab League country is chosen using the highest correlation of preferential tariffs between two members within a region.[33] We use tests to verify the quality of our instruments, including tests for weak instruments and tests to check that our instruments are orthogonal to the error term[34].

IV. Estimation Results and Robustness Tests

a. Results

Table 3 reports the results of estimating equations (2) and (3). As discussed, our dependent variable corresponds to the applied MFN tariffs expressed in percentage points, and the key

[33] Note that preferential tariffs each country grants to its partners may differ, but they correlate highly within the same trading block because member countries tend to reciprocate any preferential tariffs (*Estevadeordal et al., 2008*).

[34] Our instruments are orthogonal to the error term because since the countries exchange preferential access, it is expected that preferences, for example, granted by Morocco to be positively correlated with the tariffs Egypt implement. However, we do not have a clear link between the preferential tariffs in Egypt with the MFN tariffs applied by Morocco except through preferential tariffs. Therefore, we believe that the instruments are orthogonal to the error term.

independent variable is the preferential tariff measured using the average and minimum preferential tariffs. All regressions shown in Table 3 include country-industry and country-year fixed effects to control for macroeconomic and political economy factors. Our standard errors are clustered at the country-industry level.

Columns 1 and 2 of Table 3 show the results of estimates using equation (2) for Column 1 and equation (3) for Column 2 using ordinary least squares (OLS). Thus, the results shown in columns (1) and (2) measure the correlation between preferential tariffs and applied MFN tariffs. The positive and statistically significant coefficient on ***avgpref*** in Column 1 and on ***minpref*** in Column 2, show that preferential tariffs have a building block effect on multilateral tariffs. The coefficients described in Column 1 (2) indicate that a one percentage point decrease in the average (minimum) preferential tariffs leads to a reduction in external tariffs of 0.479 (0.083) percentage points.

As mentioned in the previous section, our model may suffer from endogeneity. We tested for endogeneity using the Haussman test and confirm that endogenous explanatory variables are present in our specifications. As a result, we run the equivalents of columns 1 and 2 in columns 3 and 4 using a GMM-based instrumental variables approach. As discussed in the previous section, the instruments used to estimate the specifications shown in Column 3 of Table 3 corresponds to the average preferential tariffs of regional partners and Column 4 corresponds to the minimum preferential tariffs of regional partners. Controlling for endogeneity creates a stronger building block effect than the building block effect using OLS. The coefficients in columns 3 and 4 are positive and statistically significant at the 1 percent level. The coefficients shown in Column 3 suggest that a one percentage point reduction in preferential tariffs lead to a decrease of 0.67 in MFN tariffs, and the coefficients in Column 4 lead to a decrease of 0.44 percentage points in MFN

tariffs.[35] Please note the p-value of the Kleibergen-Paap LM test indicates that our instruments are strong, while the p-value of Hansen J over-identification statistic indicates that our instruments are orthogonal to the error term (Table 3 shows both statistics).

Columns 5 and 6 in Table 3 show the OLS estimation results equivalent to columns 1 and 2 where we use lagged values of the variables ***avgpref*** and ***minpref***. This strategy allows us to control for the possibility that preferential tariffs may be predetermined relative to MFN. This strategy may also partly address concerns with endogeneity. The results in columns 5 and 6 show that the coefficient on preferential tariffs is positive and statistically significant, again lending support for the building block effect of preferential agreements on multilateral trade policy. The specifications estimated in columns 7 through 10 use instrumental variable approaches to control for any endogeneity issues remaining in the estimates shown in columns 5 and 6.

In particular, the specifications estimated in columns 7 and 8 rely on a 2SLS instrumental variable approach, while the specifications estimated in columns 9 and 10 rely on a GMM-based instrumental variable approach. Both approaches provide broadly similar conclusions about the building block effect of preferential trade on multilateral tariffs. For instance, the results shown in Column 7 suggest that a decrease of one percentage point on the average preferential tariffs reduces the applied MFN tariff by 0.49 percentage points, more than the 0.337 percentage points obtained using OLS in Column 5. Similarly, the results shown in Column 8 using minimum preferential tariffs show similar support for the building block hypothesis.

[35] The partial R-squares from the first stage regressions are 0.12 for Column 3 and 0.04 for Column 4, and the F-test rejects the hypothesis that the excluded instruments are equal to zero at the 1 percent significance level (the first stage results are reported in Appendix A 2).

Table 1-3. Baseline Results for MFN and Preferential Tariffs

MFN	**OLS-avg**[36]	**OLS-min**[37]	**GMM-avg**	**GMM-min**	**OLS-avg**	**OLS-min**	**2SLS-avg**	**2SLS-min**	**GMM-avg**	**GMM-min**	**GMM-RoO**[38]	**GMM-RoO**
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**	**(9)**	**(10)**	**(11)**	**(12)**
avgpref	0.479***		0.666***									
	(0.0322)		(0.105)									
minpref		0.083***		0.443***								
		(0.0127)		(0.0886)								
L_avgpref					0.337***		0.490***		0.506***		0.477***	
					(0.0251)		(0.0948)		(0.0927)		(0.128)	
L_minpref						0.237***		0.339***		0.355***		0.381***
						(0.0436)		(0.0806)		(0.0714)		(0.110)
Constant	8.863***	12.06***	7.410***	9.868**	9.828***	10.97***	8.574***	10.27***	8.447***	10.16***	9.023***	10.28***
	(0.251)	(0.0841)	(0.816)	(0.534)	(0.206)	(0.302)	(0.780)	(0.557)	(0.763)	(0.493)	(1.051)	(0.753)
Hansen J-Statistic			0.906	0.113			0.627	0.178	0.627	0.178	0.961	0.828
			[0.341]	[0.736]			[0.428]	[0.673]	[0.428]	[0.673]	[0.327]	[0.363]
Kleibergen-Paap rk LM Statistic			61.322	44.047			50.473	89.360	50.473	89.360	49.787	91.379
			[0.00]	[0.00]			[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]
Observations	15,238	15,238	14,999	14,999	14,178	14,178	13,945	13,945	13,945	13,945	8,478	9,321

Notes: Country-industry and country-year fixed effects are included in all regressions. Robust standard errors are reported in parentheses adjusted for clustering at the country-industry level. P-values are reported in brackets.
***Significant at 1%, **Significant at 5%, *Significant at 10%.

[36] Avg: average.
[37] Min: minimum.
[38] RoO: Rules of Origin.

To test for efficiency in our 2SLS estimators, we check for heteroscedasticity [39] and we find that the estimated error terms of our estimates in columns 7 and 8 display this particular characteristic. We use a GMM-based instrumental variable approach in columns 9 and 10 and confirm the building block effect of preferential tariffs on MFN applied tariffs. The presence of heteroscedasticity in the error terms led us to adopt the GMM-based approach to control for possible endogeneity concerns onwards. As such, columns 11 and 12 of Table 3 show the GMM-based estimation results using equations (2) and (3) while eliminating any observations from our dataset for which the preference margin is less than 2.5 percentage points. This is an important test of robustness because small preferential margins should have little to no impact on trade flows in the presence of significant compliance costs of rules of origin. We expected that constraining our data to include only cases with significant preference margins would generate more profound effects on the external tariff reduction. However, the results shown in columns 11 and 12 do not suggest a greater building block effect than the results suggest in columns 9 and 10.

As explained in the description of our dataset, the Arab League members have different types of trade agreements, including different FTAs and a CU. The literature suggests that common external tariffs under CUs are higher than external tariffs under FTAs because CUs require coordinating external tariffs, where the interests of the different partner members are clearly internalized while FTAs require setting tariffs independently. In Table 4, we interact the variable measuring preferential tariffs with a binary variable (***CUdum***) to indicate whether the importing country is part of a CU (i.e., Gulf Cooperation Council). Moreover, Table 4 shows the robustness of some of our results to different instrumental variables. We also test our results by applying

[39] We use the command "ivhettest" in stata to test for the presence of heteroscedasticity.

instruments based on the main partner approach, not the regional averages as done in Table 3. The first two columns in Table 4 show the results of estimating specifications using equations (2) and (3) with the addition of the interaction between preferential tariffs and the ***CUdum*** variable using OLS. The coefficient on the lagged preferential tariff (***L_avgpref*** and ***L_minpref)***, is positive and statistically significant, which indicates again a building block effect of tariff preferences on applied MFN tariffs. These results are similar to the results shown in Table 3.

The impact of preferential tariffs under a CU is the sum of the coefficient for the variable measuring preferential tariffs and the coefficient of its interaction with the binary variable for the presence of CUs ***(L_avgprefCUdum*** and ***L_minprefCUdum)***. The results shown in columns 1 and 2 suggest that preferential tariffs under a CU also have a building block effect although the building bloc effect tends to be lower than the effect under an FTA.[40]

[40] We exclude the ***CU*** dummy variable from both regressions in columns 1 and 2 because it is perfectly collinear with country-year fixed effects.

Table 1-4. Customs Union versus Free Trade Areas and IV Robustness

MFN	**OLS-avg** **(1)**	**OLS-min** **(2)**	**GMM-avg Regional** **(3)**	**GMM-min Regional** **(4)**	**GMM-avg Main** **(5)**	**GMM-min Main** **(6)**	**GMM-MRG Main** **(7)**	**GMM-MRG Main** **(8)**
L_avgpref	0.358***		0.483***		0.520***		0.459***	
	(0.025)		(0.067)		(0.099)		(0.153)	
L_avgprefCUdum	-0.103**		0.164		-0.035		0.160	
	(0.052)		(0.101)		(0.127)		(0.227)	
L_minpref		0.243***		0.336***		0.345***		0.308***
		(0.047)		(0.049)		(0.066)		(0.106)
L_minprefCUdum		-0.044		0.213*		0.140		0.692
		(0.058)		(0.123)		(0.211)		(0.706)
Constant	9.748***	10.96***	8.492***	10.14***	8.366***	10.13***	9.063***	10.29***
	(0.204)	(0.312)	(0.579)	(0.374)	(0.743)	(0.447)	(1.088)	(0.775)
Test: L_avgpref + L_avgprefCUdum=0	22.82		23.75		28.37		18.66	
	[0.00]		[0.00]		[0.00]		[0.00]	
Test: L_minpref + L_minprefCUdum =0		11.44		15.28		5.53		2.11
		[0.00]		[0.00]		[0.02]		[0.14]
Hansen J-Statistic			0.958	0.406	4.65	2.83	3.289	1.214
			[0.62]	[0.82]	[0.10]	[0.24]	[0.19]	[0.55]
Kleibergen-Paap rk LM Statistic			53.218	73.187	56.374	80.459	45.699	3.780
			[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.29]
Observations	14,178	14,178	13,945	13,945	11,266	11,266	7607	8268

Notes: Country-industry and country-year fixed effects are included in all regressions. Robust standard errors are reported in parentheses adjusted for clustering at the country-industry level. P-values are reported in brackets.
***Significant at 1%, **Significant at 5%, *Significant at 10%.

The results in Table 3 highlight the presence of estimation biases due to endogeneity as well as the presence of estimated errors with heteroscedasticity. As a result, we estimate the same specifications in columns 1 and 2 of Table 4 using the GMM-based instrumental variable approach. Results show that our main coefficients of interest are positive, which may suggest that tariff preferences under CUs may have a building block effect greater than FTAs as shown in columns 1 and 2. However, the coefficient of the interaction between preferential tariffs and the dummy indicating the presence of a CU is not consistently significant statistically. We interpret these results as indicating that preferential tariffs under a CU have a similar building block effect as an FTA.

In columns 5 and 6, we tested the sensitivity of our results using instrumental variables based on the main partner approach. The results shown in columns 5 and 6 indicate that preferential tariffs under CUs have a similar, and statistically significant, building block effect as FTAs. These results confirm the results in columns 3 and 4. Moreover, the quality of the instrumental variables seem good using either of the strategies in columns 3 through 6 with the exception of the borderline orthogonality test in column 5. In columns 7 and 8, we estimate the same specifications in columns 5 and 6 using only observations with preferential margins greater than or equal to 2.5 percentage points. The results in columns 7 and 8 confirm that Arab League CUs and FTAs tend to generate an economically similar building block effect on multilateral tariffs.

Our findings agree with *Estevadeordal et al. (2008)* and *Ketterer et al. (2014)* in that FTAs generate a building block effect on multilateral tariffs. On the other hand, our results differ from *Estevadeordal et al. (2008)* in that we find that both CUs and FTAs generate similar building block effects. One possible explanation for this difference is that the Gulf Cooperation Council was formed under Article XXIV, while the CUs in *Estevaderodal et al. (2008)* were formed under the

Enabling Clause. This indicates that the members of the CUs in *Estevadeordal el al. (2008)* have much more flexibility in setting external tariffs and in the degree of internal liberalization than members of the Gulf Cooperation Council.

As discussed above, a key characteristic of the trade policy implemented by members of the Arab League is its degree of flexibility. In essence, countries in the Arab League can usually increase their applied MFN tariffs significantly (see Table 2) without violating their WTO obligations. We thus test the potential importance of WTO's binding tariffs because the difference between bound tariffs and applied MFN tariffs may affect potential adjustments of applied MFN tariffs. In Table 5, we test how flexibility in the trade policies of these countries affect their multilateral tariffs. In columns 1 through 6 we test whether having adequate policy space to increase tariffs changes how preferential tariffs affect applied MFN tariffs. To achieve this objective, we extend specification (1) by including a dummy variable ***BIND***, which is equal to one when the difference between the value of the bound tariffs and applied MFN tariffs is less than a certain threshold. In columns 1 and 2, we use a threshold of 5 percent, while in columns 3 and 4, we use a threshold of 3 percent. In columns 5 and 6, we use a threshold of 1 percent. We then provide OLS estimates in columns 1, 3, and 5, while in columns 2, 4, and 6, we use the GMM-based approach. The results in columns 2, 4, and 6 suggest that the coefficient for the variable ***BIND***, and for its interaction with the lagged value of preferential tariffs, is not statistically significant[41]. Moreover, our preferred specification, found in Column 9 of Table 3, is statistically superior to specifications that include the binary variable[42].

[41] In all cases, the GMM results failed the weak instrument test.
[42] Also, using the Akaike's information criterion and the Basian information criterion, the model without the binary variable ***BIND*** fits the data better.

Table 1-5. Features of Trade Policy Setting and their effect on Preferential Trade Liberalization

	$BIND \leq 5\%$		$BIND \leq 3\%$		$BIND \leq 1\%$		67th Percentile		70th Percentile		75th Percentile	
MFN	OLS	GMM	OLS	GMM	OLS	GMM	OLS	GMM	OLS	GMM	OLS	GMM
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**	**(9)**	**(10)**	**(11)**	**(12)**
L_avgpref	0.337***	0.265**	0.338***	0.293**	0.337***	0.271**	0.350***	0.665***	0.348***	0.650***	0.349***	0.590***
	(0.027)	(0.113)	(0.027)	(0.128)	(0.027)	(0.111)	(0.025)	(0.138)	(0.026)	(0.131)	(0.025)	(0.127)
L_avgprefBND	-0.045*	0.367	-0.038*	0.258	-0.044*	0.322						
	(0.025)	(0.341)	(0.023)	(0.345)	(0.025)	(0.302)						
L_BIND	3.479***	3.396	2.801***	6.583	3.445***	5.239						
	(0.599)	(14.90)	(0.488)	(12.57)	(0.599)	(15.20)						
L_avgprefPWR							0.029	-0.432**	0.035	-0.401**	0.042	-0.310*
							(0.031)	(0.196)	(0.031)	(0.176)	(0.049)	(0.179)
	9.610***	9.451***	9.524***	8.717***	9.609***	9.323***	9.646***	8.319***	9.650***	8.256***	9.647***	8.397***
	(0.22)	(1.08)	(0.22)	(1.46)	(0.22)	(1.08)	(0.19)	(0.86)	(0.19)	(0.87)	(0.20)	(0.89)
Test: L_avgpref + L_avgprefBND =0	106.16	4.33	118.28	3.88	106.07	4.76						
	[0.00]	[0.04]	[0.00]	[0.05]	[0.00]	[0.03]						
Test: L_avgpref + L_avgprefPWR =0							148.01	2.74	145.81	3.27	114.68	3.43
							[0.00]	[0.09]	[0.00]	[0.07]	[0.00]	[0.06]
Hansen J-Statistic		3.146		2.956		3.416		0.605		0.616		1.819
		[0.36]		[0.39]		[0.33]		[0.74]		[0.73]		[0.40]
Kleibergen-Paap rk LM Statistic		9.155		7.445		6.207		24.056		26.753		35.245
		[0.06]		[0.11]		[0.18]		[0.00]		[0.00]		[0.00]
Observations	14,178	13,945	14,178	13,945	14,178	13,945	12,054	11,749	12,054	11,749	12,054	11,749

Notes: Country-industry and country-year fixed effects are included in all regressions. Robust standard errors are reported in parentheses adjusted for clustering at the country-industry level. P-values are reported in brackets.
***Significant at 1%, **Significant at 5%, *Significant at 10%.

In columns 7 to 12, we test if market power affects how preferential tariffs change multilateral tariffs. To achieve this objective, we estimate specification using Equation (3) using a dummy variable (*PWR*) that indicates observations where the importer has high market power. More specifically, PWR is equal to one if the inverse of the export supply elasticity faced by importers in a particular industry is higher than the 67^{th}, 70^{th}, and 75^{th} percentiles of the distribution of inverse elasticity (market power) by importing country. In Columns 7, we estimate our model using OLS, and in Column 8, we estimate our model using GMM, while measuring the dummy variable *PWR* based on the 67^{th} percentile of this distribution. Similarly, in columns 9 and 10, we use the 70^{th} percentile of the distribution, while in columns 11 and 12, we use the 75^{th} percentile.

The results shown in columns 7 through 12 indicate that the coefficient of ***L_avgpref*** is always positive and significant at the 1 percent level. This suggests that preferential tariffs have a strong building block effect when an importer of goods has low market power. However, the GMM-based estimates suggest that the coefficient of the interaction between preferential tariff and market power (***L_avgprefPWR)*** is negative and statistically significant, suggesting that the building block effect is not as high for products where the importer has more market power. For example, in Column 10, a one percentage point decrease in preferential tariff leads to a 0.65 percentage point decrease in MFN tariffs when the importing country shows low market power. However, when an importing country has high levels of market power, a one percentage point decrease in preferential tariff leads to a 0.249 percentage point decrease in MFN tariffs. Basically, market power mitigates the building block effect. Thus, our estimates suggest that the building block effect of preferential trade is significantly mitigated in industries where importers have higher market power.

b. Robustness Analysis

Table 6 shows results of a series of robustness tests for our main findings. First, we test whether the results are robust across different aggregation levels. Notice that WTO members negotiate and report tariffs at the product level, which corresponds to the 6-digit level of the HS. In Tables 3-5, we rely on average tariffs calculated at the industry level (ISIC) to represent the degree of external liberalization and this approach may introduce biases as explained in *Kee et al. (2008)*. Furthermore, our measures of market power are originally estimated at the 6-digit level of the HS by *Nicita et al. (2018).* Differing results in the literature show that aggregation levels may help explain multilateral tariffs applied across countries. For example, *Limão (2006)*, using data at the 8-digit level of the HS, finds a stumbling block effect from U.S. PTAs on bound tariffs negotiated by the U.S., while *Estevadeordal et al. (2008)* find that PTAs formed by Latin American countries do have a building block effect on their applied MFN tariffs. Interestingly, *Ludema & Mayda (2013)* find that forming PTAs does have a building block effect at the product level (6-digit level of the HS), but not at the industry level (4-digit level of the ISIC).

Thus, we investigate the robustness of our results for different data aggregation levels by estimating specification (2) using data at the product level (6-digit level of the HS). In addition, we test the robustness of our results by estimating equation (2) while controlling for product fixed effects that vary by year (HS6 x year). This augmented specification controls for the potential presence of sensitive products, those products whose characteristics are similarly important across countries. The results of estimating these specifications can be found in columns 1 and 2 and 3 and 4 of Table 6, respectively.

Table 6 also reports the robustness of our results in the presence of heterogeneous trade policy, as that policy is related to the degree of commitment of Arab League countries during WTO

negotiations. As mentioned in the previous section, North African countries, as well as some Middle Eastern countries, are old WTO members, which indicates that they can set very high bound tariffs based on the Enabling Clause, while other members of the league with access to the Persian Gulf are new WTO members, and, therefore, faced more demanding constraints in joining the WTO. We test how important this type of heterogenity is by using product level data (6-digit level of the HS) and industry level data (4-digit level of the ISIC). The results can be found in columns 5 through 12.

We have highlighted throughout this paper the degree of flexibility enjoyed by Arab League members in setting applied tariffs while still complying with WTO rules. They have significant leeway to set applied MFN tariffs given the presence of high levels of tariff waters on their tariff schedules (see Table 2). Thus, multilateral tariffs may also reflect their degree of market power (see Table 5). We test whether market power matters in setting tariffs for Arab League members (see columns 1 through 6 in Table 7). We use product-level data to estimate specifications using Equation (2) and define the presence of high-degree of market power using different thresholds following the strategy adopted in Table 5.

The econometric results in Table 6 confirm all previous results in tables 3 through 5. All specifications used in tables 6 and 7 follow the same GMM-based instrumental variable approach used in previous tables, as well as the instrumental variables used. Columns 1 and 2 confirm preferential agreements had a building block effect on multilateral tariffs for Arab League members at the product level. This can be verified because the coefficient for preferential tariffs is positive and statistically significant at the 1 percent level. Economically speaking, the results suggest that a one percentage point decrease in preferential tariffs leads to a 0.96 (0.90) percentage point decrease in MFN tariffs in column 1 (2). These results suggest that the building block effect

from forming PTAs is much higher when using product-level data than industry-level data; a comparison with column 9 (10) of Table 3 indicates this conclusion.

The results shown in columns 3 and 4 include an additional set of fixed effects (industry-year) and strongly confirm the building block effect. However, controlling for an additional set of fixed effects is very demanding, and, as a result, our results suggest that our instruments may not be orthogonal to error terms as desired. Columns 5 through 12 focus on possible heterogeneity in multilateral trade policies of old versus new WTO members. Columns 5 and 6 show results using data for GCC countries at the industry level, while columns 7 and 8 report the results for the same subsample using data at the product level. The coefficient in column 5 (6) is positive and statistically significant at the 1 percent level, so a one percentage point reduction in preferential tariffs at the industry level for GCC countries reduced external tariffs to 0.52 (0.51) percentage points. Columns 7 and 8 show a slightly higher building block effect for GCC at the product level. We estimate the same specifications for North African countries at the industry level in columns 9 and 10 and at the product level in columns 11 and 12. These results confirm the building block effect for PTAs among North African countries regardless of the degree of aggregation of the data, although clearly, the greater building bloc effect for the entire sample, as found in columns 1 through 4 is driven by results related to countries in North Africa, as can be seen in columns 11 and 12.

Finally, columns 1 through 6 in Table 7 show the results of estimating specification (4) where we include the interaction of variables ***avgpref*** and ***PWR*** dummy (***avgprefPWR***). The ***PWR*** dummy is measured using the same strategy applied in Table 5; the 67^{th}, 70^{th}, and 75^{th} percentile of the distribution of market power were used for each member of the Arab League at the product level. The coefficient for ***avgpref (L_avgpref)*** is significant at the 1 percent level, suggesting that

preferential tariffs have strong building block effects on products where the importer has a lower degree of market power. This supports our findings in Table 5 where we use data at the industry level. Note the coefficient of ***avgprefPWR (L_avgprefPWR***) is negative and statistically significant at both the 5 and 10 percent levels, indicating that the building block effect diminishes with market power. When controlling for different sources of heterogeneity, the results shown in Table 7 confirm the results in Table 5.

Table 1-6. Robustness Tests of Baseline Results on the Relationship between MFN and Preferential Tariffs

MFN	6-digits level		6-digits adding industry-year fixed effects		GCC subsample at the ISIC level		GCC subsample at the 6-digits level		North Africa subsample at the ISIC level		North Africa subsample at the 6-digits level	
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**	**(9)**	**(10)**	**(11)**	**(12)**
avgpref	0.964***		1.587***		0.519***		0.630***		0.427***		0.920***	
	(0.045)		(0.066)		(0.089)		(0.183)		(0.061)		(0.040)	
L_avgpref		0.903***		1.403***		0.514***		0.587***		0.399***		0.869***
		(0.045)		(0.057)		(0.069)		(0.164)		(0.064)		(0.037)
Constant	4.739***	4.690***	0.609	1.119***	8.560***	8.384***	6.950***	6.935***	9.258***	9.311***	5.039***	4.950***
	(0.298)	(0.318)	(0.436)	(0.405)	(0.694)	(0.573)	(1.214)	(1.172)	(0.478)	(0.533)	(0.270)	(0.265)
Hansen J-Statistic	6.151	7.536	5.242	12.22	5.151	1.547	7.938	2.09	0.254	0.441	5.619	8.466
	[0.01]	[0.01]	[0.02]	[0.00]	[0.02]	[0.21]	[0.01]	[0.15]	[0.61]	[0.51]	[0.02]	[0.003]
Kleibergen-Paap rk LM Statistic	111.284	117.502	59.221	76.619	13.430	12.450	17.459	21.069	131.058	119.898	95.309	99.179
	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]
Observations	627,092	566,892	627,092	566,892	7,989	7,413	344,341	310,568	7,010	6,532	282,751	256,324

Notes: Country-industry and country-year fixed effects are included in all regressions. Robust standard errors are reported in parentheses and adjusted for clustering at the country-industry level. P-values are reported in brackets.
***Significant at 1%, **Significant at 5%, *Significant at 10%.

Table 1-7. Robustness Tests for Baseline Results on the Relationship between MFN and Preferential Tariffs

MFN	67th Percentile 6-digits level **(1)**	67th Percentile 6-digits level **(2)**	70th Percentile 6-digits level **(3)**	70th Percentile 6-digits level **(4)**	75th Percentile 6-digits level **(5)**	75th Percentile 6-digits level **(6)**
avgpref	1.027***		1.029***		1.035***	
	(0.041)		(0.041)		(0.042)	
avgprefPWR	-0.027**		-0.031**		-0.027*	
	(0.013)		(0.014)		(0.016)	
L_avgpref		1.004***		1.003***		1.012***
		(0.039)		(0.040)		(0.042)
L_avgprefPWR		-0.023*		-0.028**		-0.023*
		(0.0120)		(0.013)		(0.014)
Constant	4.311***	3.956***	4.297***	3.974***	4.232***	3.883***
	(0.285)	(0.288)	(0.288)	(0.295)	(0.297)	(0.309)
Test: avgpref + avgprefPWR=0	548.21 [0.00]		523.95 [0.00]		490.49 [0.00]	
Test: L_avgpref + L_avgprefPWR=0		633.07 [0.00]		580.39 [0.00]		533.55 [0.00]
Hansen J-Statistic	7.368 [0.03]	6.940 [0.03]	7.113 [0.028]	7.713 [0.02]	6.579 [0.04]	6.690 [0.35]
Kleibergen-Paap rk LM Statistic	108.364 [0.00]	98.503 [0.00]	111.384 [0.00]	97.648 [0.00]	114.460 [0.00]	104.731 [0.00]
Observations	219,942	205,100	219,942	205,100	219,942	205,100

Notes: Country-industry and country-year fixed effects are included in all regressions. Robust standard errors are reported in parentheses and adjusted for clustering at the country-industry level. P-values are reported in brackets.
***Significant at 1%, **Significant at 5%, *Significant at 10%.

V. Conclusion

In this paper, we report on our investigation of the effects of the different features of the international trade system (preferential trade agreements, market power, and bound tariffs) on multilateral trade liberalization. Using data at the industry level, we find that as countries grant preferential access through FTAs to their regional partners, they also liberalize trade with non-members. Empirically, our results indicate that a one percentage point decrease in average (minimum) preferential tariffs leads to a reduction in external tariffs by about 0.51 (0.36) percentage points. Moreover, we find that creating a CU with Arab League members leads to a degree of external trade liberalization similar to creating FTAs. This result represents a departure from the existing literature, but we interpret this as a natural result of the Arab League creating CUs with other members of the league under Article XXIV rather than using the more flexible Enabling Clause. Our findings do suggest that more studies on this issue are warranted.

We also find that, for Arab League members, market power in some industries mitigates the building block effects of forming PTAs. For instance, in industries where countries have low degrees of market power, a one percentage point decrease in preferential tariffs leads to a decrease of 0.65 percentage points in MFN tariffs. However, in industries where market power is high, countries exercise their market power by setting higher MFN tariffs, thereby decreasing the building block effect. We also test the robustness of our results using product level data and different subsamples as well as testing the effects of market power on multilateral tariffs. All results agree with our findings at the industry level. Our findings suggest that preferential trade agreements, whether CUs or FTAs if fully implemented under Article XXIV, seem to lead to a building block effect. Because of that, whether or not the tariff is close to the bounds does not matter because the tariffs are falling.

Chapter 2 - Trade Policy Uncertainty: Evidence from the Arab League Countries

I. Introduction:

Recent events have raised concerns in policy circles about the potential adverse effects of uncertainty about trade policy commitments on trade flows and investments. Some events of note include the departure of the United Kingdom from the European Union (EU) (*Crowley et al.*, 2019), known as Brexit, the United States leaving the Trans-Pacific Partnership (TTP) (*Davis,* 2014) and threatening to leave the World Trade Organization (WTO) (*Paletta & Swanson*, 2017), the trade war between the United States and China (*Carballo et al.*, 2018), the renegotiation of NAFTA, and the deteriorating quality of institutions in some countries. As a result, more of the literature strives to examine the effects of trade policy uncertainty on trade and investment flows following the threat of reversal of existing trade commitments in recent years. As we know, the World Trade Organization (WTO) strives to promote cooperation and to diminish policy uncertainty.[43]

A principal policy instrument used to pursue predictability and cooperation in market access is to negotiate binding tariffs through which the WTO members make commitments not to increase the applied tariffs above the negotiated ceiling tariff rates (also known as bound tariffs). However, uncertainty can persist if significant gaps between bound tariffs and applied MFN tariffs are pervasive across countries; this discrepancy in tariffs is very common especially in developing

[43] WORLD TRADE ORGANIZATION. (n.d.). Retrieved from https://www.wto.org/english/thewto_e/whatis_e/whatis_e.htm

countries where applied MFN tariffs are significantly lower than bound tariffs (*Subramanian &Wei*, 2007, *Ludema & Mayda, 2013*, and *Nicita* et al., 2018). Therefore, changing tariffs in the presence of water is a major problem in the developing world. However, not a single measure using uncertainty index has explored the effect of trade policy uncertainty in developing countries relative to developed countries. For example, following Baker et al. (2016), Carballo et al. (2018) develop a newspaper-based index of trade policy uncertainty to examine the interaction of economic and policy uncertainty for the U.S.

Recent studies have shown that trade policy uncertainty may negatively affect trade flows. Using a trade model with heterogeneous firms for Australia, *Handley (2014)* shows that trade policy uncertainty delays the entry into export markets, making firms less sensitive to reductions in applied tariffs. He finds that if Australia reduces all bindings to the current level of applied MFN tariffs, the number of traded products would increase by 8.9%. In addition, *Handley & Limao (2015)* show that Portugal increased its exports to the European Union (EU) upon accession even in sectors where applied MFN tariffs remained unchanged, which implies that the accession of Portugal to the EU has reduced the risk that Portuguese exporters anticipate before the membership. *Pierce & Schott (2015)* show that China's accession to the WTO has reduced trade policy uncertainty, contributing to a large drop in the US manufacturing jobs while *Handley & Limao (2017*) conclude that this reduction in trade policy uncertainty can explain about 22-30% of Chinese exports to the US after WTO accession.

This paper is the first to investigate how trade policy uncertainty may affect firms' decision to export to developing countries. The focus of our analysis is the Arab League markets because this is not only an understudied region but where most uncertainty exists. As pointed out by *Nicita et al. (2018)* and *Ludema & Mayda (2013),* many developing countries tend to have applied MFN

tariffs much lower than their bound tariffs, therefore creating a significant source of policy uncertainty since this tariff gap gives them a substantial leeway to change their tariffs without violating WTO commitments. In our sample, the overall average bound tariff is about 28 percentage points, while the average applied MFN tariffs are about 10 percentage points; thus, these Arab League countries are characterized by a confluence of quality data and policy variation that is relevant to uncertainty. To that end, we define trade policy uncertainty as the gap between bound tariffs and applied tariffs, the so-called tariff water or tariff overhang, and we use it to test its effects on the probability a product is exported to a member of the Arab League.

Furthermore, *Bloom (2014)* suggests that economic downturns affect the degree of policy uncertainty, so our empirical strategy also examines the effects of trade policy uncertainty on the decision to export by considering added uncertainty related to falling incomes associated with the 2007-2010 economic shock. Likewise, because all Arab League countries considered in our sample are involved in various preferential trade agreements (PTAs), we also test whether preferential access affects the exporters' decision to enter the markets.

The paper also analyzes the magnitude of the effects of trade policy uncertainty associated with importers exercising their market power[44] because the possibility of a policy change matters to potential exporters if the prices they face change because of changes in the importers' trade policies. As pointed out by *Broda et al. (2008)*, non-WTO countries could increase their external tariffs on goods for which they have high degrees of market power. This is relevant to our study even though our countries of interest are all WTO members although they do have the gap in their tariff schedule. Moreover, *Nicita et al. (2018)* show that WTO members exercise their market

[44] The inverse of the rest of the world's export supply elasticity faced by importers and is estimated by *Nicita et al. (2018).*

power when bound tariffs are higher than applied tariffs, as is the case in many developing countries, where the bound tariffs tend to be significantly higher than the applied tariff. With a sample of Arab league members consisting of new and old WTO members, some of which are high-income countries like Qatar and the United Arab Emirates and others are developing like Morocco and Tunisia; this is where significant gaps exist. Thus, they can increase their multilateral tariffs according to their market power without violating the WTO commitments.

To carry out our analysis, we construct a comprehensive panel dataset containing information on bound tariffs, applied MFN tariffs, preferential tariffs, bilateral trade flows, a measure of the degree of market power and import demand elasticities for ten WTO members within the Arab league countries[45]. Our data is organized at the product level (6-digits of the Harmonized System). Thus, because the countries in our sample include developing and high-income countries as well as new and old WTO members, their bound tariffs vary, and as a result, we have a variation in the gap across countries. We defined the difference between bound tariffs and applied tariffs as the gap or tariff water that we use as a measure of trade policy uncertainty. We are the first to test the effects of trade policy uncertainty on the decision to export to Arab League markets. We also test the contribution of other factors on the decision to export to these markets, such as the 2007-2010 economic shock and the presence of market power that could magnify the effect of trade policy uncertainty on the decision to enter.

Our findings suggest that an increase in trade policy uncertainty reduces the probability a product is exported. In particular, we find that a one standard deviation change in water yields a change in the probability a product is traded by about 0.025 while a one standard deviation in

[45] Note that there are 22 members of the Arab League, but we only include ten because of the data availability and membership in the WTO.

applied MFN tariffs results in a change in the probability a product is exported by about 0.012. We also find that eliminating uncertainty by bringing the bound tariffs to the level of applied MFN tariffs leads to an increase in the probability a product is traded by 0.021, which is approximately an 18 percent increase based on the overall average probability (0.118) of exported products. Eliminating uncertainty through a general move to free trade, where both the bound tariffs and applied MFN tariffs are brought down to zero, results in an increase in the probability a product is exported by 0.031, which constitutes an approximate increase of 26 percent based on the overall average probability (0.118) of a product being exported. Likewise, we also find that controlling for the financial crisis of 2007-2010 increased the magnitude of trade policy uncertainty. In addition, we find that trade policy uncertainty declines in magnitude in the presence of different levels of market power by the importing country. For the robustness of our main findings, we use a theoretical definition of uncertainty measure and find that our results remain consistent with our baseline results.

The rest of the paper is organized as follows: Section 2 describes how data is constructed and provides summary statistics. Section 3 presents our empirical analysis, and Section 4 discusses robustness tests. Section 5 offers concluding remarks.

II. Data Description:

Our empirical analysis is based on a panel data of more than 5000 products organized at the 6-digit level of the Harmonized System (HS), which can be exported from any WTO member to any of the ten Arab League countries during the period of 1998-2015. To this end, we construct a comprehensive dataset at the 6-digit HS level by merging three data sources. First, we start by collecting information on applied MFN tariffs, bilateral preferential tariffs, and imports trade values from UNCTAD's Trade Analysis and Information Systems (TRAINS) via the World

Integrated Trade System (WITS) database. Second, information on bound tariffs was collected from the WTO's Integrated Database (IDB). Information on applied MFN tariffs and bound tariffs allows us to examine the effects of trade policy uncertainty on the decision of exporters to enter new markets. Finally, information on ROW's elasticity of export supply faced by importers allows us to determine in which goods a country is deemed to have high or low levels of power. This task is accomplished by considering the measures of the inverse of export supply elasticity faced by importers, which were estimated by *Nicita et al. (2018).* This additional measure allows us to test the magnitude of trade policy uncertainty when the importing country has the flexibility to change its trade policy while controlling for its degree of market power.

Moreover, because our objective is to estimate the effect of trade policy uncertainty for WTO members, we exclude countries that became members after 2006. In addition, we exclude the sample of products whose median import value is less than $10,000 *(Handley, 2014).* Finally, we exclude exporters for which median total import trade value is less than $500,000 (*Subramanian & Wei,* 2007); this removes the very small trading countries like Eretria, Croatia, Chad, Myanmar, and Somalia. These added changes reduced our data by approximately 73 percent.

We then construct tariff line measures $\left((\text{i.e.}, ln(1 + \frac{tariff\ rate}{100})\right)$ for ***Applied MFN*** tariffs, bound tariffs, and ***preferential tariffs***, tariffs granted to a PTA partners that are usually strictly lower than the applied MFN tariffs. We measure trade policy uncertainty in two different ways. First, we measure it as the ratio between ***bound*** tariffs and ***Applied MFN*** tariffs, also known as tariff water, which is the key variable in our analysis. Algebraically, we label this variable ***Water***[46] and define it across product ***k*** for country pair ***ij*** at time **t** as follows:

[46] We set the ratio to equal one if the applied MFN tariff is greater than the bound tariff. We then take the natural log of the ratio.

$$\boldsymbol{Water_{ijkt}} = ln\left(\frac{bound_{ikt}}{Applied\ MFN_{ikt}}\right) \qquad \textbf{(1)}$$

This uncertainty[47] measure reflects the risk that exporting countries take in whether to export or delay export to countries with perceived uncertainty. The fact that the gap exists indicates that a country can freely increase its applied tariffs up to the bounds, which may have a great impact on entry decision of exporters. Thus, the presence of the gap between the bound tariffs and applied MFN tariffs makes trade policy less predictable and thus leads to more uncertainty. The second measure reflects the theoretical prediction of uncertainty based on a definition provided by *Handley (2014)* as shown by the variable ***Bind_uncertainty*** below:

$$\boldsymbol{Bind\_uncertainty} = \frac{(\text{Applied MFN}_{\text{ijkt}})^{-\sigma} - (\text{bound}_{\text{ikt}})^{-\sigma}}{(\text{Applied MFN}_{\text{ikt}})^{-\sigma}} \qquad \textbf{(2)}$$

when using the estimated measure for $\boldsymbol{\sigma}$, constant elasticity of substitution, from *Nicita et al. (2018)*. The estimates of sigma are given at the 6-digit level, which vary by country and by product. We define industry at the 2-digit level code of the harmonized system (HS2) or sector at the 1-digit level code (HS1). We compute the median elasticity by importer and HS2 and by importer and HS1 resulting in the elasticity of substitution for varieties within HS2 or HS1. In our analysis, we also take commitments under PTAs into account to measure the effect of preferential trade agreements on the probability of exporters entering Arab League markets, and we use this additional control to test whether the presence of PTAs reduces the cost of doing trade.

[47] We believe that this uncertainty measure affects firms directly because they know the level of tariffs they have to pay. However, there are other uncertainties, such as political uncertainty that some firms may or may not be able to fully understand and assess the impact on their exports and sales.

Table 2-1. Summary Statistics

Variable	N	Mean	SD	Max	Min
Product Traded (binary)	38,879,440	0.118	0.323	1.000	0.000
Product Traded_10 (binary)	38,879,440	0.107	0.309	1.000	0.000
Applied MFN (ln)	38,879,440	0.088	0.113	3.434	0.000
Bound Tariffs (ln)	38,879,440	0.221	0.187	3.434	0.000
Water (ln)	38,879,440	0.138	0.164	3.434	0.000
Water07 (ln)	38,879,440	0.090	0.150	3.434	0.000
Pref_Marg (ln)	34,838,634	-0.009	0.043	0.000	-3.434
Bind_uncertainty (HS2)	32,935,716	0.099	0.098	1.000	0.000
Bind_uncertainty (HS1)	34,038,172	0.097	0.090	0.961	0.000

Source: *Data taken from the UNCTAD-TRAINS, WTO-IDB*, and *Nicita et al. (2018)*

The final sample contains 38,879,440 importer-exporter-product and year observations for the years 1998 to 2015. Table 1 reports summary statistics of our main variables of interest. ***Product Traded*** is a binary variable, which is equal to one if a product is exported (or traded) and zero otherwise. Thus, our sample contains about 12 percent of traded products. We also construct another dependent variable, ***Product Traded_10***, which is also a binary variable for which we consider certain products as not traded if the average traded products across all countries and years is less than a certain threshold[48].

The key independent variable, ***Water*** calculated as in expression (1), implies that the average level of the gap between bound tariffs and applied MFN tariffs is approximately 13.8 log percentage points. The average ***Applied MFN*** tariffs is approximately 8.8 log percentage points while the average ***bound*** tariff is approximately 22.1 log percentage points, more than twice the ***applied tariffs***, which are somewhat in line with *Handley (2014).* In our sample, applied MFN tariffs and bound tariffs vary across products, countries, and years causing a variation in the level of tariff water. For instance, we have cases where the tariff water is negative, and in other cases,

[48] For this threshold, we compute the lowest 10 percentiles of all traded products across all countries and years and replace it to equal zero, too small to be counted as traded. A similar methodology was used in *Evenett & Venables* (2002).

we have applied MFN tariffs that are higher than 100%.[49] The variation in the tariff schedules of the Arab League countries is because North African countries as well as some Middle Eastern countries, are old WTO members and thus have high MFN tariffs that they must adjust over time in accordance with the WTO requirements. Others are new WTO members facing more demanding constraints after joining WTO. The level of uncertainty measure using the theoretical definition of uncertainty as shown by the variable ***Bind_uncertainty,*** calculated in expression (2), is approximately 10 percentage points when using the elasticity of substitution between varieties within HS2 and 9.7 when using the elasticity of substitution between varieties within HS1. Furthermore, most country-pairs considered in our analysis are involved in preferential trade agreements. Thus, we use the variable ***Pref_Marg***[50] to test the effect of the presence of preferential trade agreements on the decision to export a product to a member of the Arab League.

III. Empirical Analysis:

We assess the effects of trade policy uncertainty on entry decisions of exporters to Arab League markets by estimating the following model:

$$p_{ijkt} = \alpha + \beta_1 \ln(Water_{ijkt}) + \beta_2 \ln(Applied\ MFN_{ikt}) + \delta_{ijt} + \gamma_{ijk} + \epsilon_{ijkt} \qquad \textbf{(3)}$$

Where $\boldsymbol{p_{ijkt}}$ denotes the probability of whether product $\boldsymbol{k}$ is exported from country $\boldsymbol{j}$ to a member of the Arab League $\boldsymbol{i}$ at time $\boldsymbol{t}$. $\boldsymbol{Water_{ijkt}}$ as described in the data description is our main variable of interest, capturing the level of trade policy uncertainty faced by country $\boldsymbol{j}$ when exporting product $\boldsymbol{k}$ to country $\boldsymbol{i}$ at time $\boldsymbol{t}$. $\boldsymbol{Applied\ MFN_{ikt}}$ is a tariff that country $\boldsymbol{i}$ imposes on country $\boldsymbol{j}$ on product $\boldsymbol{k}$ at time $\boldsymbol{t}$. To control for other factors, such as exchange rates, aggregate wages, and price

[49] Egypt has applied MFN tariffs that are higher than 100% for Spirits.
[50] ***Pref_Marg:*** stands from preference margin and is the difference between ***Applied MFN*** tariffs and ***preferential tariffs***

index that could affect a country's decision to enter new markets, we use a comprehensive set of importer-exporter-year fixed effects denoted by $\boldsymbol{\delta_{ijt}}$. We also control for other time-invariant, unobserved heterogeneity such as fixed costs, including sunk costs that non-exporters must incur to enter foreign markets; *Roberts & Tybout (1997)* note, "the combination of sunk cost and uncertainty about future market conditions can create an option value to waiting"; costs to upgrade, expand, or build new facilities to satisfy importer demands; costs associated with hiring and firing of employees (*Bloom, 2009; Schaal, 2013)*; and costs to adopt technology (*Bessen, 2002*). The presence of such costs could contribute to the entry decision of the exporting country, and as a result, we use importer-exporter-product fixed effects denoted by $\boldsymbol{\gamma_{ijk}}$. The term $\boldsymbol{\epsilon_{ijkt}}$ represents the error term.

We use specification (3) to investigate the effects of trade policy uncertainty on the entry decision of exporters to Arab League markets. Because we include a large set of fixed effects in our regression, to avoid any computational problems and inconsistencies in our estimates, we estimate specification (3) using a linear probability model[51]. In all the regressions, robust standard errors are clustered at the importer-product-year level. The coefficients of interest in specification (3) are β_1 and β_2. A negative and statistically significant β_1 would imply that trade policy uncertainty induces firms to wait, postponing entry into Arab League markets. A negative and statistically significant β_2 suggests that higher applied MFN tariffs in county $\boldsymbol{i}$ are negatively related to the probability of exporting from country $\boldsymbol{j}$ to country $\boldsymbol{i}$; in other words, higher current costs (applied MFN tariffs) induce firms not to enter.

[51] The high dimensional set of fixed effects that we include in our model means that a standard Probit model would be inconsistent and not computationally feasible. Thus, we assume that our function is linear and estimate the model using LPM.

a. Baseline Results:

We first analyze the effect of trade policy uncertainty on trade using the overall sample; we then test to see if the effect of uncertainty on entry varies across the ten Arab League countries by estimating our model using a measure of uncertainty defined in expression (1) at the country level data trying to identify factors that could lead to that variation. Table 2 reports results of the linear probability model estimated using equation (3). Our dependent variable is again the binary variable that corresponds to zero if a product is not traded and one if it is traded. The estimated model then yields the probability whether product **k** is exported by country ***j*** to a member of the Arab League country ***i*** at year ***t***. The key explanatory variables are $\boldsymbol{Water_{ijkt}}$, and $\boldsymbol{Applied\ MFN_{ijkt}}$, and both variables are used in their logarithmic form as described in expression (1) of Section 2.

Table 2-2. Probability a Product is Traded

Dependent variables	**Product Traded**			**Product Traded_10**		
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
Water (ln)	0.029***	-0.061***	**-0.151*** **	0.017***	-0.054***	**-0.136*** **
	(0.001)	(0.002)	**(0.012)**	(0.001)	(0.002)	**(0.011)**
Applied MFN (ln)	-0.042***	0.008***	**-0.103*** **	-0.043***	0.001	**-0.095*** **
	(0.002)	(0.002)	**(0.011)**	(0.002)	(0.002)	**(0.009)**
Constant	0.118***	0.126***	**0.148*** **	0.108***	0.114***	**0.134*** **
	(0.000)	(0.000)	**(0.003)**	(0.000)	(0.000)	**(0.002)**
F-test	676.53 [0.00]	561.44 [0.00]	112.72 [0.00]	593.21 [0.00]	505.31 [0.00]	115.37 [0.00]
Fixed Effects:						
Importer-Exporter-Year	NO	YES	**YES**	NO	YES	**YES**
Importer-Exporter-Product	NO	NO	**YES**	NO	NO	**YES**
Observations	38,879,440	38,879,440	38,879,440	38,879,440	38,879,440	38,879,440

Note: Robust standard errors are reported in parentheses adjusted for clustering at the **importer-product-year** level. P-values are reported in brackets. ***Significant at 1%, **Significant at 5%, *Significant at 10%.

Columns 1 to 3 report the results from estimating equation (3) using the full sample, and columns 4 to 6 report the results from estimating equation (3) with the dependent variable computed slightly differently, by considering products traded in small amounts as not traded. *Feenstra (1994)*, *Hummels & Klenow (2005)*, and *Borda & Weinsten (2006)* treat a good as nontraded if the trade flow is zero, while *Evenett & Venables (2002)* report a good as nontraded if it is less than $50,000 of trade. Additionally, *Kehoe & Ruhl (2013)* consider goods with zero trade as well as goods with very small amounts of trade as nontraded goods. The standard errors in all the regressions are clustered at the importer-product-year level. Columns 1 and 4 provide OLS estimates with no fixed effects. The coefficient on $\boldsymbol{log\ Water}$ is statistically significant at the one percent level of significance. However, the positive sign suggests that as the trade policy uncertainty reflected on the gap between bound tariffs and applied MFN, or as the uncertainty level increases, the probability that a product is exported (or traded) increases, which is not economically reasonable. However, the coefficient on the $\boldsymbol{log\ Applied\ MFN}$ is negative and statistically significant, suggesting that higher applied MFN tariffs in country $\boldsymbol{i}$ are negatively related to the probability that a product is exported from country $\boldsymbol{j}$ to country $\boldsymbol{i}$ as we would expect.

Furthermore, in columns 2 and 5, we include one set of fixed effects, importer-exporter-year fixed effects to handle all importer, exporter, and year specific factors like wages, exchange rates, and price levels. Doing so changed the results. While the effects of the uncertainty measure, $\boldsymbol{log\ Water,}$ remains statistically significant at the one percent level of significance, the sign on its coefficient in both columns 2 and 5 is now negative as expected. Also, the coefficient on $\boldsymbol{log\ Applied\ MFN_{ijkt}}$ remains statistically significant in column 2 but positive, while insignificant and positive in column 5. Thus, using this set of fixed effects allows us to eliminate

a key source of omitted variable bias, namely importer, exporter, and year specific factors as mentioned above.

Consequently, our preferred estimates are shown in columns 3 and 6 where we include two large sets of fixed effects, the importer-exporter-year fixed effects and the importer-exporter-product fixed effects to control for time-invariant unobserved heterogeneity, such as sunk costs, that could affect the entry decision of the exporting countries. As expected, we find negative and statistically significant effects for both $\boldsymbol{log\ Water}$ and $\boldsymbol{log\ Applied\ MFN}$[52]. The results show that an increase in trade policy uncertainty as captured by the $\boldsymbol{log\ Water}$ variable reduces the probability to export. The coefficient on $\boldsymbol{log\ Applied\ MFN}$ shows that higher applied MFN tariffs in country $\boldsymbol{i}$ are negatively related to the probability that a product is exported from country $\boldsymbol{j}$ to country $\boldsymbol{i}$. The estimates in both columns 3 and 6 have some significant economic effects. For example, in Column 3, a one standard deviation change in water yields a change in the probability a product is traded by about 0.025.[53] In addition, a one standard deviation change in applied MFN tariffs results in a change in the probability a product is traded by about 0.012.[54] These findings are meaningful for Australia relative to *Handley* (2014) where a one standard deviation change in water yields a change in the probability a product is traded by 0.004 while a one standard deviation change in applied MFN tariffs yields a change in the probability a product is traded by 0.008. Our results then indicate that the adverse effect of uncertainty on the number of products traded is higher for developing countries, where most of the uncertainty resides, than developed countries.

[52] Considering products traded in small amounts does not alter the results we obtain using full sample.
[53] Computed by multiplying the coefficient of $\boldsymbol{log\ Water}$ by its standard deviation (see summary statistics). Algebraically: $0.151 \times 0.164 = 0.025$.
[54] Computed by multiplying the coefficient of $\boldsymbol{log\ Applied\ MFN}$ by its standard deviation (see summary statistics). Algebraically: $0.103 \times 0.113 = 0.012$.

From a policy perspective, it may be more interesting to consider a situation where WTO negotiations eliminate this particular source of uncertainty by reducing the bound tariffs to the level of applied MFN tariffs. Our results in Column 3 suggest that eliminating uncertainty by bringing bound tariffs to the current level of applied MFN yields an increase in the probability a product is traded by about 0.021[55]. This constitutes about an 18[56] percent increase based on the overall average probability (0.118) of a product being traded[57], which is in an order of magnitude greater than the estimates of *Handley & Limao* (2017) for China. Our findings from our preferred estimates are all in line with the theoretical predictions that trade policy uncertainty hinders trade because it induces some firms to delay entry into new markets. Thus, the exporting countries are more likely to export when the applied MFN tariffs of the importing country are lower and when the tariff water is also lower so that any potential increase in tariffs would limit their losses. Alternatively, we consider a situation of a general move to free trade where both the bound tariffs and applied MFN tariffs are brought down to zero. Our results in Column 3 suggest that fully liberalizing trade yields an increase in the probability a product is traded by about 0.031[58], which is significant considering that it is about 26[59] percent increase based on the overall average probability (0.118) of a product being exported.

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[55] Computed by multiplying the coefficient of $\boldsymbol{log\ Water}$ by its mean value (see summary statistics). Algebraically: $0.151 \times 0.138 = 0.021$.

[56] Computed by multiplying the coefficient of $\boldsymbol{log\ Water}$ by its mean value divided by the overall average probability (0.118) of a product being traded (see summary statistics). Algebraically: $\frac{0.151 \times 0.138}{0.118} \times 100\% \approx 18\%$.

[57] Handley's findings for Australia, where uncertainty was eliminated by bringing the bound tariffs to the current level of applied MFN lead to 8.8 percent increase in exported products (*Handley,* 2014).

[58] Computed by multiplying the coefficient of $\boldsymbol{log\ Water}$ by its mean value plus the coefficient of ***log Applied MFN*** multiplied by its mean value (see summary statistics). Algebraically:
$(0.151 \times 0.138) + (0.103 \times 0.088) = 0.031$.

[59] Computed by multiplying the coefficient of $\boldsymbol{log\ Water}$ by its mean value plus the coefficient of ***log Applied MFN*** multiplied by its mean value divided by the overall average probability (0.118) of a product being traded (see summary statistics). Algebraically:
$\frac{(0.151 \times 0.138) + (0.103 \times 0.088)}{0.118} \times 100\% \approx 26\%$.

To test our results to see if they are consistent across the ten Arab League countries, we run our analysis using specification (3) by members of the Arab League. Thus, our fixed effects capture exporter-year and exporter-product fixed effects. The OLS results from estimating equation (3) using subsamples, based on geographical locations of the member countries as well as their accession to the WTO, are shown in Table 3. Uncertainty is related to the gap between the bound tariffs and applied MFN tariffs. The gap exists primarily in North Africa and some Middle Eastern countries; because these countries are old WTO members, they can set very high bound tariffs based on the Enabling Clause that allows developing countries to adopt any trade policy for their development. However, other members of the League, in particular, GCC countries, are new WTO members that faced a far more demanding process to join the WTO *(Subramanian & Wei, 2007)*[60]. Given the variation in the trade policies of the member countries, we can test the extent of the effect of trade policy uncertainty of on the exporters decision to enter individual markets.

The results in Table 3 are similar to those in Table 2. Our preferred results are shown in columns 3, 6, 9, and 12. The results imply that the higher the tariff water and applied MFN tariffs the lower the probability to export to the Arab League countries, not only to the major economies shown in Table 3 but also to other countries as shown in Table 3A in the appendix. The coefficients on $\boldsymbol{log\ Water}$ and $\boldsymbol{log\ Applied\ MFN}$ are negative and statistically significant in all countries except Kuwait.

Furthermore, our analysis of the economic effects of trade policy uncertainty, as shown in Table 3, were no surprise. Our findings suggest that the representatives of North African countries

[60] For example, Kuwait, Egypt, and Morocco joined the GATT in 1963, 1970, and 1987, respectively, and their corresponding average tariff water, or gap, is 62.7, 12.1, and 18.5 log percentage points. The GCC countries such as Qatar, Oman, and Saudi Arabia, who joined the WTO in 1994, 2000, and 2005, respectively, have average tariff water equal to 9.4, 6.9, and 4.3 log percentage points.

in Table 3, namely Morocco and Egypt, are among the most affected by trade policy uncertainty. For example, in the case of Morocco, the results in Column 6 of Table 3 indicate that eliminating uncertainty by reducing the bound tariffs to the level of applied MFN tariffs increases the probability a product is exported by about 0.056[61] which is very high considering that the average value of the dependent variable (***Product Traded***) for Morocco is 0.096, which constitutes nearly a 58[62] percent increase over the unconditional probability a product is exported. The significant effect was because, as we mentioned before, North African countries, as well as some Middle Eastern countries, have high levels of tariff water resulting in high levels of trade policy uncertainty. However, for some Arab League countries, the tariff water is not as high as for North African countries because of the restrictive conditions they faced in joining the WTO and also possibly because their trade policy commitments are different. The magnitudes of the coefficients of $\boldsymbol{log\ Water}$ and $\boldsymbol{log\ Applied\ MFN}$ tariffs in both Table 3 and Tables 1 and 2 in Appendix B vary compared to Table 2. Nonetheless, the elimination of trade policy uncertainty even for those countries would be significant, potentially leading to an increase in the probability of exporting a product to these markets.

[61] Computed by multiplying the coefficient of ***Water*** by its mean value. Algebraically: $\mathbf{0.303} \times 0.185 = 0.056$.
[62] Computed by multiplying the coefficient of ***Water*** for Tunisia by its mean value divided by the overall average probability (0.105) of a product being traded. Algebraically: $\frac{\mathbf{0.303} \times 0.185}{0.096} \times 100\% \approx 58\%$.

Table 2-3. Probability a Product is Traded – Sample of Major Economies in North Africa and the Middle East

	North Africa						GCC					
Product Traded	**Egypt**			**Morocco**			**Qatar**		**.**	**Kuwait**		
	(1)	(2)	**(3)**	(4)	(5)	**(6)**	(7)	(8)	**(9)**	10	(11)	**(12)**
Water (ln)	0.088***	0.086***	**-0.033***	-0.122***	-0.117***	**-0.303*** **	0.103***	0.092***	**-0.308*** **	-0.169***	-0.165***	**-0.079**
	(0.005)	(0.005)	**(0.018)**	(0.004)	(0.004)	**(0.023)**	(0.017)	(0.017)	**(0.076)**	(0.012)	(0.011)	**(0.094)**
Applied MFN (ln)	0.017***	0.019***	**-0.024***	-0.090***	-0.080***	**-0.235*** **	-0.070***	-0.064***	**-0.088***	0.139**	0.122**	**0.036**
	(0.002)	(0.003)	**(0.014)**	(0.003)	(0.003)	**(0.022)**	(0.017)	(0.016)	**(0.052)**	(0.060)	(0.058)	**(0.099)**
Constant	0.087***	0.088***	**0.107*** **	0.134***	0.131***	**0.191*** **	0.159***	0.159***	**0.198*** **	0.269***	0.268***	**0.217*** **
	(0.001)	(0.001)	**(0.004)**	(0.001)	(0.001)	**(0.008)**	(0.002)	(0.002)	**(0.009)**	(0.008)	(0.008)	**(0.063)**
F-test	157.75	157.9	**1.98**	511.4	483.67	**205.18**	22.79	18.14	**20.82**	100.98	108.92	**5.20**
	[0.00]	[0.00]	**[0.13]**	[0.00]	[0.00]	**[0.00]**	[0.00]	[0.00]	**[0.00]**	[0.00]	[0.00]	**[0.01]**
Fixed Effects:												
Exporter-Year	NO	YES	**YES**	NO	YES	**YES**	NO	YES	**YES**	NO	YES	**YES**
Exporter-Product	NO	NO	**YES**	NO	NO	**YES**	NO	NO	**YES**	NO	NO	**YES**
Observations	7,262,845	7,262,845	**7,262,845**	4,544,785	4,544,785	**4,544,785**	2,548,880	2,548,880	**2,548,880**	2,292,388	2,292,388	**2,292,388**

Note: Robust standard errors are reported in parentheses adjusted for clustering at the product-year level. P-values are reported in brackets.
***Significant at 1%, **Significant at 5%, *Significant at 10%.

b. Trade Policy Uncertainty During the Economic Crisis of 2007-2010:

During 2007-2010, the world economy experienced one of its most severe economic and financial crises, resulting in a 12.2 percent[63] decline in world trade in 2009, the largest since WWII. Subsequently, falling incomes as a result of the economic shock led to a widespread fear of protectionism in the trade system *(Limao & Maggi, 2015)*. Falling incomes may amplify policy uncertainty due to the presence of tariff water. Our next step is then to analyze the potential effect of the great recession of 2007-2010 on the decision to enter Arab League markets. In Table 4, we interact the variable measuring trade policy uncertainty, ***Water***, with a binary variable (***after07***) to indicate the potential additional effect of trade policy uncertainty during the financial crisis of 2007 and beyond. In some specifications, we also add the preference margin control, ***Pref_Marg***, to test the effect of preferential trade agreements on the decision to enter Arab League markets. This additional control is included because all Arab League countries in our analysis have preferential trade agreements.

In columns 1, 2, 4, and 5 of Table 4, we use the ***Water*** variable as defined by expression (1). Moreover, because the way in which the ***Water*** variable is defined is relevant to exporters, we run the equivalents of columns 2 and 5 as shown in columns 3 and 6 using an alternative definition of the ***Water***[64] variable. Instead of measuring trade policy uncertainty as the degree of flexibility provided by the multilateral trade agreements, we use actual bilateral tariffs that control for the possible presence of preferential trade agreements. Preferential tariffs are usually lower than applied MFN tariffs, so the alternative method of computing the ***Water*** variable will result in larger

[63] World Trade Organization. World trade report 2010: Trade in natural resources. In: *Geneva: World trade organization, 2010, pp. 252.;* 2010:252.

[64] The $\boldsymbol{Water}$ variable is computed as follows: $\boldsymbol{Water_{ijkt}} = \frac{bound_{ikt}}{Pref_{ijkt}}$.

gap, or more uncertainty. Column 1 reports the results of the linear probability model estimated in equation (3) with the added interaction term, ***Water07***. The estimated uncertainty measure before the financial crisis is indicated by the coefficient on ***log Water***, which is negative and statistically significant as expected. This indicates that a one standard deviation change in water tariff leads to a change in the probability a product is traded by about 0.021. However, to determine the effect of uncertainty after the financial crisis we sum up the coefficient for the variable measuring trade policy uncertainty (***log Water***) and the coefficient of its interaction with the binary variable for the period during and after the crisis (***log Water07***). We find that a one standard deviation change in water during the crisis results in a change of 0.025 of the probability a product is traded. The results are negative and statistically significant indicating that controlling for the financial crisis dramatically increases the magnitude of trade policy uncertainty. Also, the coefficient on ***log Applied MFN*** is negative and statistically significant as in our baseline results.

Referring to Column 1, the results suggest that eliminating uncertainty before the financial crisis, by reducing the bound tariffs to the level of applied MFN tariffs, results in an increase in the probability a product is traded by about 0.018, which is about a 15 percent increase over the unconditional probability of exporting. However, the effect of eliminating uncertainty after the crisis is significant because it results in an increase in the probability of a product being traded by about 0.021, which is more than an 18 percent increase in the probability a product is exported (or traded). Because of the additional risk the crisis entails, the responsiveness of entry to uncertainty elimination is substantial when bringing the bound tariffs to the applied tariffs levels. Similar results are found in Column 4 when the least traded products are treated as untraded.

Table 2-4. The Effects of the Economic Crisis of 2007 and the Presence of PTAs on the Probability a Product is Traded

Dependent Variables	**Product Traded**			**Product Traded_10**		
	Main Definition		**Alternative Definition**	**Main Definition**		**Alternative Definition**
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
Water (ln)	**-0.127*** **	**-0.132*** **	**-0.177*** **	**-0.115*** **	**-0.122*** **	**-0.163*** **
	(0.013)	(0.014)	(0.011)	(0.011)	(0.012)	(0.010)
Water07 (ln)	**-0.027*** **	**-0.032*** **	**-0.027*** **	**-0.023*** **	**-0.027*** **	**-0.021*** **
	(0.002)	(0.003)	(0.003)	(0.002)	(0.002)	(0.002)
Applied MFN (ln)	**-0.093*** **	**-0.075*** **	**-0.093*** **	**-0.086*** **	**-0.072*** **	**-0.089*** **
	(0.011)	(0.011)	(0.008)	(0.009)	(0.010)	(0.007)
Pref_Marg (ln)		**0.225*** **	**0.066*** **		**0.190*** **	**0.047*** **
		(0.006)	(0.009)		(0.005)	(0.008)
Constant	0.146***	0.151***	0.159***	0.132***	0.137***	0.144***
	(0.003)	(0.003)	(0.002)	(0.002)	(0.002)	(0.002)
F-test	171.32	469.16	475.55	161.51	424.13	431.91
	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]
PTAs	NO[65]	YES[66]	YES	NO	YES	YES
Observations	38,879,440	34,838,634	34,838,634	38,879,440	34,838,634	34,838,634

Note: All regressions include importer-exporter-year and importer-exporter-product fixed effects. Robust standard errors are reported in parentheses adjusted for clustering at the importer-product-year level. P-values are reported in brackets.
***Significant at 1%, **Significant at 5%, *Significant at 10%.

[65] Not controlling for preference margin.
[66] Controlling for preference margin.

As mentioned before, all Arab League countries considered in our analysis are involved in a variety of preferential trade agreements. Therefore, we run our model by including a variable that controls for the presence of PTAs, ***Pref_Marg***, to test whether the presence of preferential trade agreements reduces the cost of doing trade because as explained in the earlier sections, preferential trade agreements are designed to just do that. The results are presented in columns 2 and 5 of Table 4. Controlling for preference margin uncertainty continues to play a role that we expect. The coefficients of ***log Water*** and of its interaction with the binary variable for the period during and after the crisis as well as the coefficient on the ***log Applied MFN*** continue to be negative and statistically significant. The coefficient on ***log Pref_Marg*** is positive and statistically significant indicating that the presence of preferential trade agreements reduces the cost of doing trade. The greater the margin, the greater the entry. However, controlling for the presence of preferential agreements has not changed the effect of uncertainty (***Water***) over entry decision, which continues to be negative.

The economic effects of eliminating trade policy uncertainty when we control for the economic shock as well as the presence of PTAs are significant. Using the results shown in Column 2, eliminating trade policy uncertainty by reducing the bound tariffs to the level of applied MFN tariffs during the period before the crisis results in an increase in the probability a product is traded by around 0.018 or (1.8 percent), which constitutes an approximately 15 percent increase based on the average probability (0.118) of a product being traded. Alternatively, eliminating trade policy uncertainty during the period of crisis, as presented by the summation of the coefficient of ***log Water*** and its interaction, is very significant because it leads to an increase in the probability a product is traded by about 0.023 percent, which is an approximately 20 percent increase over the unconditional probability of exporting. The coefficient on ***log Pref_Marg*** is positive and

statistically significant indicting that a one standard deviation change in preference margin leads a change in the probability a product is traded by about 0.01 (or 1 percent). Thus, by controlling for the preference margin, uncertainty continues to be negative as we would expect, but the preference margin does promote trade by decreasing the cost of doing trade. Columns 3 and 6 present the results when the alternative definition of tariff water is used as in expression (2). The results are all in line with those obtained using the main definition of uncertainty, water, suggesting that no matter how we measure the uncertainty variable, the results are similar.

The effect of trade policy uncertainty should be related to the degree to which the importing country can affect external prices. Thus, our expectation is that uncertainty will be higher if the importing country exhibits high market power. Thus, in Table 5, we test the effects of uncertainty on the decision of exporters to enter new markets while controlling for the presence of different levels of market power. To do this, we create a dummy variable (***PWR***) to indicate observations for which the importer has high or low market power. More specifically, ***PWR*** is equal to one if the inverse of the export supply elasticity faced by the importer at the product level is higher than the median or the 67th percentile of the distribution of the inverse elasticity (market power) by the importing country and zero otherwise. In creating the ***PWR*** dummy variable, we had to limit our sample size to include only observations for which the elasticities were available. Columns 1 through 4 present results when the dependent variable includes all products traded, while columns 5 through 8 treat the least traded products as untraded. The coefficients of ***log Water*** and ***log Applied MFN*** are always negative and statistically significant in all columns, differing only in magnitude. For example, comparing the results in columns 1 and 2, a one standard deviation change in water results in a change in the probability a product is exported by about 0.052 when

the exporter is faced with an importer with high market power and 0.037 with an importer with low market power. The Wald test shows the two are statistically different.

Table 2-5. Probability a Product is Traded under Different Levels of Market Power

Dependent Variables	**Product Traded**				**Product Traded_10**			
	High Power Median	**Low Power Median**	**High Power 67th**	**Low Power 67th**	**High Power Median**	**Low Power Median**	**High Power 67th**	**Low Power 67th**
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**
Water (ln)	**-0.315*** **	**-0.228*** **	**-0.288*** **	**-0.256*** **	**-0.295*** **	**-0.198*** **	**-0.263*** **	**-0.230*** **
	(0.019)	(0.028)	(0.024)	(0.026)	(0.017)	(0.025)	(0.021)	(0.024)
Applied MFN (ln)	**-0.244*** **	**-0.165*** **	**-0.220*** **	**-0.189*** **	**-0.232*** **	**-0.146*** **	-0.204***	**-0.173*** **
	(0.017)	(0.028)	(0.021)	(0.026)	(0.015)	(0.025)	(0.018)	(0.024)
Constant	0.183***	0.164***	0.178***	0.170***	0.168***	0.147***	0.161***	0.154***
	(0.004)	(0.006)	(0.005)	(0.006)	(0.004)	(0.006)	(0.004)	(0.005)
F-test	148.92	90.7	93.84	131.56	163.73	83.83	96.36	126.33
	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]
Observations	9,364,409	9,366,417	6,177,105	12,553,721	9,364,409	9,366,417	6,177,105	12,553,721

Note: All regressions include importer-exporter-year and importer-exporter-product fixed effects. Robust standard errors are reported in parentheses adjusted for clustering at the importer-product-year level. P-values are reported in brackets.
***Significant at 1%, **Significant at 5%, *Significant at 10%.

Furthermore, referring to Column 1, when an exporter is faced with an importer that exhibits high market power, a one standard deviation change in applied MFN tariffs results in a change in the probability a product is traded by about 0.028[67], while 0.019[68] if the exporting country is faced with an importer that exhibits low market power as shown in Column 2; this comparison implies that the presence of high market power magnifies the effects of trade policy uncertainty. Based on the results in column 1, eliminating trade policy uncertainty in markets where the exporter is facing an importer with high market power results in an increase in the probability a product is exported by about 0.0434[69] which is very significant, an approximately 28 percent increase based on the high-powered products average of the unconditional probability of 0.15 a product is exported. Notwithstanding, eliminating trade policy uncertainty even in markets with low market power, as shown in Column 2, results in an increase in the probability a product is traded by about 0.031, which is approximately 22 percent based on the low-powered products average of the unconditional probability of 0.143 a product is exported. Eliminating trade policy uncertainty when the importing countries exhibit high or low market power results in a significant increase in the probability a product is traded compared to the results from Table 2. The reason for this difference is that the measure of market power was not available for all products, as can be seen from the difference in sample sizes. Similar results were obtained when considering the 67th percentile in determining products with high and low market power as shown in columns 3 and 4.

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[67] Computed by multiplying the coefficient of $\boldsymbol{log\ applied\ MFN}$ by its standard deviation (see summary statistics). Algebraically: $0.244 \times 0.113 = 0.028$.

[68] Computed by multiplying the coefficient of $\boldsymbol{log\ applied\ MFN}$ by its standard deviation (see summary statistics). Algebraically: $0.165 \times 0.113 = 0.019$.

[69] Computed by multiplying the coefficient of $\boldsymbol{log\ Water}$ by its mean value (see summary statistics). Algebraically: $0.315 \times 0.138 = 0.0434$.

[69] Computed by multiplying the coefficient of $\boldsymbol{log\ Water}$ by its mean value divided by the overall average probability (0.118) of a product being traded (see summary statistics). Algebraically: $\frac{0.315 \times 0.138 = 0.0434}{0.15} \times 100\% \approx 28\%$.

Moreover, treating the least traded goods as untraded, as shown in columns 5 through 8, results in similar effects as when we consider least traded goods as traded.

IV. Robustness:

Table 6 shows the robustness tests for our main findings using the theoretical definition of the uncertainty measure in expression (2). For the following analysis, our key explanatory variables will be the ***Bind_uncertainty*** and ***Applied MFN*** tariffs. We run a series of robustness tests using the estimated measure of sigma[70] from *Nicita et al. (2018)*. Because the theoretical measure of uncertainty depends on the industry level (HS2) elasticity of substitution and sector level (HS1), we estimate our model as shown in Table 6 with varying estimates of sigma. Two important features stand out. First, the results are the same regardless of what definition of uncertainty we use. Second, the preference margin effect is much larger than the results from Table 4.

In columns 1 and 2 of Table 6 the signs and significance of the coefficient of the uncertainty measure, ***Bind_uncertainty***, are unchanged compared to the results in Table 2. The results continue to imply a negative effect on entry. However, aggregating sigma from industry level to sector level, as in columns 1 and 2, tends to increase the magnitude of the estimated coefficients of the uncertainty measure. In columns 3 and 4, we control for the presence of preferential tariffs, and the results continue to hold like those obtained in Table 4. However, using the theoretical measure of uncertainty at different aggregation levels of sigma increased the effect of preferential tariffs on the cost of doing trade, but uncertainty continues to play its role as expected. Columns 5 to 8 report results when we consider the least traded goods as untraded. Nevertheless, our results remain consistent with our baseline results as obtained in Tables 3 and 4.

[70] σ: price elasticity of imports demand

To investigate the sensitivity of the two measures of uncertainty as defined in expressions (1) and (2) from a policy point of view, we compare their economic effects when the source of uncertainty is removed. Our results in Column 1 suggest that eliminating trade policy uncertainty by bringing the bound tariffs to the current level of applied MFN increases the probability a product is traded by about 0.01[71]. This constitutes about a 6[72] percent increase based on the overall average probability (0.118) of a product being traded, which is in the same order of magnitude as in *Handley (2014)* for Australia. However, these findings are much lower than in Table 2, where we find that eliminating trade policy uncertainty leads to an approximately 18 percent increase in the probability a product is traded. Column 2 suggests that eliminating trade policy uncertainty would result in an increase in the probability a product is traded by 0.016, which is an approximately 14 percent increase based on the overall average probability (0.118) of a product being traded; these findings are comparable in the order of magnitude to the same estimates in *Handley* & *Limao (2017)* for the US and to our findings from Table 2. Thus, from an economic point of view, the way in which sigma is aggregated matters in determining the effect of trade policy uncertainty.

[71] Computed by multiplying the coefficient of ***Bind_uncertainty*** by its mean value. Algebraically: $0.0712 \times 0.099 = 0.01$.

[72] Computed by multiplying the coefficient of ***Bind_uncertainty*** by its mean value divided by the overall average probability (0.118) of a product being exported. Algebraically: $\frac{0.0712 \times 0.099}{0.118} \times 100\% \approx 6\%$.

Table 2-6. Probability a Product is Traded using the Theoretical Definition of Uncertainty

Dependent Variable	**Product Traded**				**Product Traded_10**			
	HS2 level	**HS1 level**	**HS2 level**	**HS1 level**	**HS2 level**	**HS1 level**	**HS2 level**	**HS1 level**
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Bind_uncertainty	**-0.071*** **	**-0.116*** **	**-0.115*** **	**-0.172*** **	**-0.065*** **	**-0.107*** **	**-0.106*** **	**-0.159*** **
	(0.008)	(0.012)	(0.010)	(0.013)	(0.007)	(0.011)	(0.008)	(0.011)
Applied MFN (ln)	**-0.026*** **	**-0.052*** **	0.009	**-0.022*** **	**-0.026*** **	**-0.050*** **	0.004	**-0.025*** **
	(0.006)	(0.008)	(0.007)	(0.008)	(0.005)	(0.007)	(0.006)	(0.007)
Pref_Marg (ln)			**0.390*** **	**0.397*** **			**0.345*** **	**0.353*** **
			(0.007)	(0.007)			(0.006)	(0.006)
F-test	104.26	114.44	1278.75	1372.39	93.09	108.7	1232.27	1318.22
	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]
PTAs	NO	NO	YES	YES	NO	NO	YES	YES
Observations	32,927,893	34,029,791	29,029,994	30,101,383	32,927,893	34,029,791	29,029,994	30,101,383

Note: All regressions include Importer-Exporter-Year and Importer-Exporter-Product fixed effects. Robust standard errors are reported in parentheses adjusted for clustering at the importer-product-year level. P-values are reported in brackets.
***Significant at 1%, **Significant at 5%, *Significant at 10%.

V. Conclusion:

This paper contributes to the emerging economic literature that studies the effect of trade policy uncertainty on the decision to export by providing empirical evidence of how uncertainty affects the decision to export to Arab League countries. Using product level data, we find that trade policy uncertainty reduces exporter entry to Arab League markets. Economically, our results suggest that eliminating uncertainty by reducing the bound tariffs to the level of applied MFN increases the probability a product is exported by about 18 percent while fully liberalizing trade by bringing both tariffs to zero increases the probability a product is exported by about 26 percent based on the overall average probability (0.118) of a product being exported.

We also find that the 2007-2010 financial crisis has contributed to more policy uncertainty, further affecting the entry decision of exporters into Arab League markets. Our analyses also suggest that when the importing country exhibits high levels of market power, the effects of uncertainty on exporters entry into Arab League markets are magnified. Our findings imply that the effects of trade policy uncertainty on the number of products traded is higher in developing countries, where most of the uncertainty resides, than in developed countries.

Chapter 3 - The Price Effects of the Trade Agreements Formed by Arab League Countries

I. Introduction:

Over the past two decades, the Arab League countries have been involved in a variety of preferential trade agreements (PTAs), including free trade areas (FTAs) and a customs union (CU), with the intent to strengthen their economic ties and liberalize their trade regimes among other objectives. The proliferation of trade agreements, not only among the Arab League countries but throughout the entire world, has raised concerns among trade policy analysts that PTAs may undermine the multilateral regime. According to the international trade literature, preferential trade agreements (PTAs) lower trade barriers on imported goods from preferential partners, leading to consumer gains from better quality products, lower prices for existing products, and deteriorating terms of trade for the importing country relative to preferential partners (*Berlingieri et. al, 2018*).

Economic theory emphasizes the terms of trade effects, while simulation models illustrate the theory with statistical measures of terms of trade due to tariff changes *(Anderson & Yotov, 2011).* However, little empirical evidence shows the effect of trade agreements on the terms of trade, and much of the literature has focused on how the terms of trade may change for non-PTA members. For example, *Chang & Winters (2002)* examine the effect of Mercosur, specifically with Brazil eliminating tariffs for Mercosur members, on the export prices of countries excluded from the agreement. They find that creating Mercosur was associated with significant declines in prices of nonmember exports to the region. Brazil grants preferential access to its Mercosur partners from tariffs, resulting in a competitive pressure that led other exporters to reduce their prices. This means, according to theory, that trade diversion is worsening the terms of trade of excluded

countries. However, there is a little evidence on the effects of trade agreements on the importing countries' terms of trade.

This paper focuses on Arab League countries because this is an understudied region with considerable variation in types of agreements, including CUs and FTAs. *Silva* & *Benaddi (2018)* study the Arab League countries, where they examine the effects of preferential tariffs on applied Most-Favored Nations (MFN) tariffs, and they find a building block effect. In other words, they find that the lower the preferential tariffs, the lower the applied MFN tariffs. However, this does not guarantee that nonmembers will benefit from this decrease in tariffs. Not only that, when countries grant each other preferential access, their terms of trade tend to deteriorate as they import from their partners but improve as they export to them. Thus, this paper is, to the best of our knowledge, the first that examines the effects of trade preferences granted by members of the Arab League on their international import prices, an essential component of the terms of trade. Because countries are affected through price changes, this is a fundamental question to tackle.

Furthermore, *Silva* & *Benaddi (2018)* find that members of the Arab League countries have, on average, significant market power. They also find that market power matters in determining the building block effect. More specifically, they find that when the importing country shows high levels of market power the building block effect of preferential tariffs tends to be mitigated. Moreover, they find that the degree of market power of the member countries varies from region to region and across products. Since most members of the League are developing countries and old WTO members, they are mostly not constrained by WTO bound tariffs, and theory predicts that their applied MFN tariffs would be positively related to market power *(Broda et al., 2008)*. Therefore, this additional set of information is crucial to investigating the effects on international prices.

To answer our questions, we construct a comprehensive dataset containing information on applied MFN tariffs, preferential tariffs, and import values. In addition, we obtain information on the international import price index and quality-adjusted import price index from *Feenstra* & *Romalis (2014)* at 6-digit level code (HS). Finally, a measure of the inverse of the export supply elasticity faced by importers, estimated by *Nicita et al. (2018),* is then added to our dataset, also organized at the 6-digit level (Harmonized System; HS). This additional measure allows us to examine the effect of importer market power on international prices.

Using a panel data strategy, we investigate the effects of applied MFN tariffs and preferential tariffs imposed by members of the Arab League on international prices. We control for the usual macroeconomic factors (exchange rate changes, economic growth, among others) by using country-year fixed effects, while we control for political economy factors by using country-industry fixed effects. Our basic specification investigates how preferential tariffs and MFN tariffs applied by Arab League members affect import prices. Moreover, we extend our specification by controlling for any possible differences in the effects of CUs and FTAs as well as the presence of market power.

Our baseline results suggest that a one percentage point decrease in applied MFN tariffs leads to a fall in international import prices of approximately 0.16 percentage points, while domestic prices of imported goods, as well as those goods produced domestically if they are homogeneous or perfect substitutes to imported goods, fall by 0.84 percentage points. We also find that a one percentage point decrease in preferential tariffs leads to 0.084 percentage point increase in international prices while domestic prices of imported goods decreased by 0.92 percentage points. Moreover, we find no significant effects of MFN tariffs and preferential tariffs on the terms of

trade under a CU. Also, we test the effect of the two tariffs on import price index using a Wald test and find that their effect is not statistically different, implying that the two are equally important.

The remainder of the paper is organized as follows: Section 2 describes the data that we use and summary statistics; Section 3 describes the empirical strategy; Section 4 concludes.

II. Data Description:

a. Data Sources:

We estimate our empirical model using a comprehensive dataset that includes information on more than 5000 products organized at the 6-digit level of the HS that could be exported to any of the eleven Arab League countries from 1998 to 2011. Our dataset is constructed by merging three data sources. First, we collect information on applied MFN tariffs, bilateral preferential tariffs, and import trade values from UNCTAD Trade Analysis and Information Systems (TRAINS) via the World Integrated Trade System (WITS) database. Second, information on import price index and quality-adjusted import price index was obtained from *Feenstra & Romalis (2014)* and is concorded from the Standard International Trade Classification (SITC Revision 2) product level code to 6-digit level code (HS). Finally, information on world export supply elasticity as faced by importers allows us to determine the effects of tariffs applied by countries with varying degrees of market power on international prices. This task is carried out by adding a measure of the inverse of export supply elasticity faced by importers, which were estimated by *Nicita et al. (2018)* to our dataset organized at the 6-digit level (HS).

b. Descriptive Statistics:

Before we start our analysis, we construct the tariff line measures $\left(i.e.,\left(1+\frac{tariff\ rate}{100}\right)\right)$ for both ***Applied MFN*** tariffs and ***preferential tariffs***. Table 1 provides the summary statistics of the main variables of interest. Our final sample contains 523,813, year, product, and importer

observations from 1998 to 2011. For our dependent variable, we use two different variables: (i) the ***import price index*** (***IPI)***[73], calculated based on the price of the exporter at the origin excluding tariffs) and (ii) the ***quality-adjusted-import price index.*** The mean value for the ***import price index*** is 0.9713 (or 97.13) while the mean value for the ***quality-adjusted import price index*** is at approximately 0.8293 (or 82.93).

Table 3-1. Descriptive Statistics

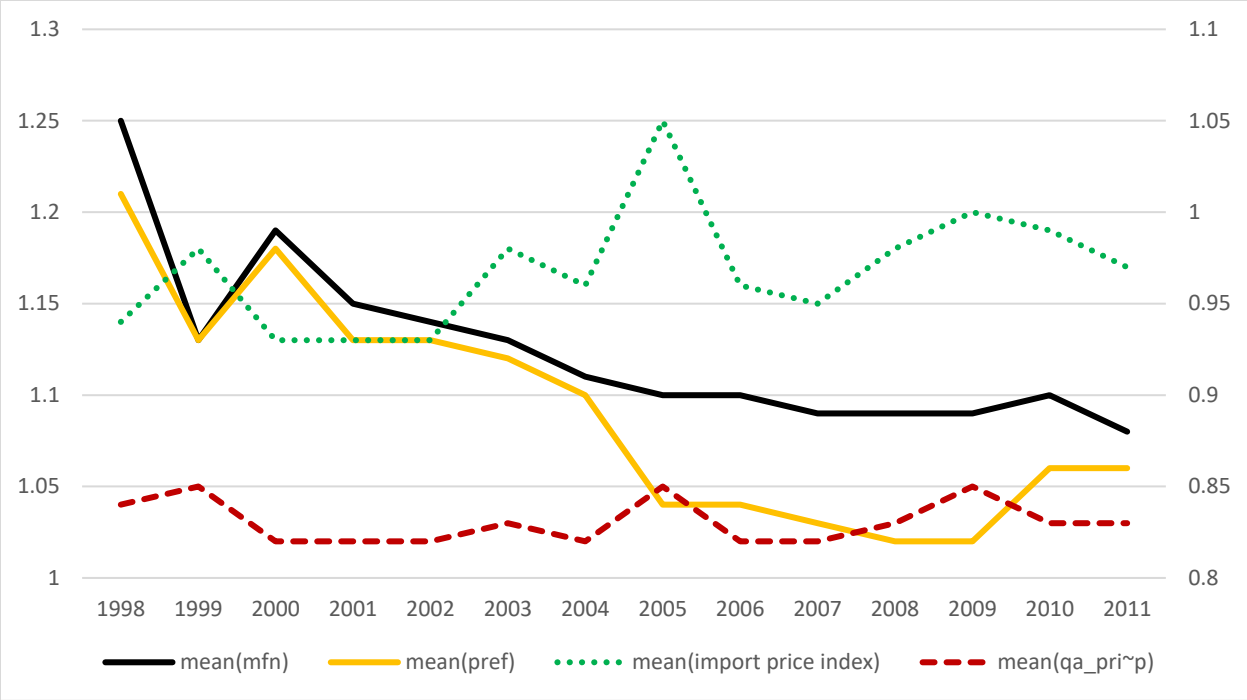
Variable	N	mean	sd	max	min
Import price index	519303	0.9713	0.7843	71.7793	0.0037
Import price index (ln)	519303	-0.1792	0.5227	4.2736	-5.5902
Quality adj. import price index	519303	0.8293	0.2152	4.2009	0.1789
Quality adj. import price index (ln)	519303	-0.2176	0.2454	1.4353	-1.7207
Applied MFN	523813	1.1136	0.1421	3	1
Applied MFN (ln)	523813	0.1009	0.1113	1.0986	0
Avg. preferential tariff	521459	1.0749	0.1229	3	1
Avg. preferential tariff (ln)	521459	0.0669	0.0997	1.0986	0

Table 1 also shows that on average, ***applied MFN*** tariffs are approximately 11.36 percentage points while the ***average preferential tariff*** is approximately 7.49 percentage points, implying that the average preference margin is approximately 3.87 percentage points.

Our initial analysis of the data suggests an inverse relationship between trade liberalization and international prices adjusted and not for quality; this, however, does not imply causality and our methodology next explores the causality issues.

[73] Constructed using the Fisher Ideal Price Index which is the geometric mean of Laspeyres and Paasche indices $P_{ijgt}^{F} = \left(P_{ijgt}^{L} \times P_{ijgt}^{A}\right)^{0.5}$. Then the GEKS import price index of country I relative to country k: $P_{ikgt}^{GEKS} = \prod_{j=1}^{C}\left(P_{ijgt}^{F} \times P_{ikgt}^{F}\right)^{\frac{1}{C}}$

Figure 3-1. Relationship between Import Price Index, Quality-Adjusted Import Price Index and Tariffs



Source: *data taken from the UNCTAD-TRAINS and WTO*

III. Empirical Analysis:

In studying the effects of preferential trade agreements formed by Arab League countries for applied MFN tariffs, *Silva* & *Benaddi (2018)* find a building block effect, which implies that as these countries reduce preferential tariffs for their PTA members, they also reduce tariffs on non-members. We also find that the building block effect is mitigated when the importing county exhibits high levels of market power. However, the effect on PTA members and non-members depends on how tariff changes affect the prices they face. However, because both tariffs fall, the effect on non-members is uncertain. Thus, our econometric model relies on two primary approaches where we use two different dependent variables: one based on the raw import price index and the other on the quality-adjusted import price index. Specifically, we estimate the following specifications:

$$IPI_{ijt} = \beta_1 Applied\ MFN_{ijt} + \beta_2 Avg.pref_{ijt} + \alpha_{it} + \gamma_{ij} + \epsilon_{ijt} \quad \textbf{(1)}$$

$$Qual.adj.IPI_{ijt} = \beta_1 Applied\ MFN_{ijt} + \beta_2 Avg.p\ ref_{ijt} + \alpha_{it} + \gamma_{ij} + \epsilon_{ijt} \quad \textbf{(2)}$$

Where the dependent variable $\boldsymbol{IPI_{ijt}}$ represents raw imports price index based on the price of the exporter at the origin imposed on the importing country $\boldsymbol{j}$ in sector $\boldsymbol{i}$ at time $\boldsymbol{t}$. $\boldsymbol{Qual.adj.IPI_{ijt}}$ refers to the quality-adjusted import price index. The explanatory variable $\boldsymbol{Applied\ MFN_{ijt}}$ is a tariff that country $\boldsymbol{j}$ imposes on imports on sector $\boldsymbol{i}$ at time $\boldsymbol{t}$. $\boldsymbol{Avg.pref_{ijt}}$ denotes the average preferential tariff applied by country $\boldsymbol{j}$ on imports from a preferential partner in sector $\boldsymbol{i}$ at time $\boldsymbol{t}$. Additionally, a host of factors other than MFN and preferential tariffs may affect international prices for which information is not available across countries. Thus, we control for these additional factors, such as macroeconomic shocks, overall economic, historical, and political factors by introducing importer-year fixed effects denoted by $\boldsymbol{\alpha_{it}}$ and importer-industry fixed effects by $\boldsymbol{\gamma_{ij}}$, where an industry is defined at the 2-digit HS level. The term $\boldsymbol{\epsilon_{ijt}}$ represents the error term.

The coefficients of interest in specifications (1) and (2) are β_1 and β_2. Negative and statistically significant β_1 and β_2 imply that reducing tariffs cause the importing country's import price index (constructed before the tariffs) to increase. Earlier studies looked at how trade policies affect traditional measures of terms of trade, which can be misleading because unit values of internationally traded goods are heavily influenced by quality. However, we are better equipped to supply more accurate results on the effects of trade policies on terms of trade using quality-adjusted import price index.

IV. Empirical Results

In this paper, we will not provide a full analysis of the effects of tariff policy changes on a country's terms of trade, which involves exports and imports; instead we focus on the import side,

which is an essential component to understanding how countries are affected through changes in prices they face. Table 2 reports the baseline results of estimating equations (1) and (2) using ordinary least squares (OLS) with and without fixed effects. Columns 1-4 show results of estimates using Equation (1) with and without the logarithmic transformation, while estimates in columns 5-8 are obtained using Equation (2), also with and without the logarithmic transformation. The standard errors in all regressions are clustered at the product-year level. Consistent with theoretical predictions, the key coefficients in our regressions are negative and statistically significant. These findings imply that a multilateral tariff fall will promote demand for imported goods. A decrease in preferential tariffs, on the other hand, will increase demand for imported goods from PTA partners. The findings also suggest that trade liberalization, a result of gradual tariff reductions, induces less productive firms to enter export markets and thus charge higher prices, resulting in an overall increase in the import price index *(Melitz, 2003)*.

The coefficient on ***Applied MFN Tariff***, as described in Column 1, suggests that a one percentage point decrease in applied MFN tariff leads to a 0.19 percentage point increase in international prices (as measured by import price index); this in turn implies that if domestic and foreign goods are perfectly substitutable, or homogeneous, then that reduces domestic prices by 0.81 percentage points. When countries form PTAs, preferential partners can export at a preferential rate, thereby increasing the external price faced by the importing preferential member. The opposite may happen for exporters based outside a preferential agreement given the MFN tariff. Column 1 suggests that as Arab League countries reduce their preferential tariffs by one percentage point, international prices (the import price index) increase by 0.17 percentage points, and domestic prices of these imported goods then decrease by approximately 0.83 percentage points. These findings suggest that trade liberalization leads to lower consumer prices. Column 2

presents the results of estimating Equation (1) in a logarithmic form; the sign on both the coefficient of ***log Applied MFN*** and ***log Avg. Pref*** is negative, as we would expect, and remains statistically significant at the one percent level.

Furthermore, we run the equivalents of columns 1 and 2 as shown in columns 3 and 4 to control for importer-year and importer-industry fixed effects for the reasons previously discussed. Our main specifications are those that control for the full set of fixed effects (importer-year and importer-industry). Estimates in Column 4, for example, imply that a one percent decrease in applied MFN tariffs results in a 0.16 percent increase in the import price index, while a decrease in preferential tariffs by one percent leads to a 0.08 percent increase in the import price index.

Our results are consistent when running the equivalent of Equation (1) using the quality-adjusted import price index as a dependent variable, as shown in Equation (2) when we control for fixed effects. The results in columns 5-8 show that the coefficients on ***Applied MFN*** and ***Avg. Pref*** are all in the same direction as those in columns 1-4. However, the coefficients are smaller. For example, the estimates in Column 8 reveal that a one percent decrease in applied MFN tariffs leads to a 0.07 percent increase in quality-adjusted import price index, which is much lower than the increase of 0.16 percent shown in Column 4. Similarly, a one percent decrease in preferential tariffs leads to a 0.04 percent increase in the quality-adjusted import price index compared to 0.08 from Column 4. The overall quality of imported products can be higher or lower. If the existing most productive firms export more high-quality products due to lower tariffs, then the overall quality will be higher. However, if low production new exporters export more low-quality products, then the overall quality will be lower. Our findings, however, suggest that lower tariffs increase the quality-adjusted import price index by a smaller amount, which implies that the

international prices faced by the importing Arab League member rise with a decrease in tariffs but also suggest improved overall quality of imported goods.

Table 3-2. The Impact of Trade Agreements on Import Prices and Quality-Adjusted Import Prices

Dependent Variables	Imports Price Index (IPI)				Quality-Adjusted Imports Price Index (QAIPI)			
	IPI[74]	IPI(ln)	IPI	IPI(ln)	QAIPI[75]	QAIPI (ln)	QAIPI	QAIPI(ln)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Applied MFN	-0.189***		-0.134***		0.003		-0.039***	
	(0.041)		(0.034)		(0.015)		(0.013)	
Avg. Pref	-0.174***		-0.070*		-0.032		-0.028*	
	(0.057)		(0.041)		(0.022)		(0.015)	
Applied MFN (ln)		-0.204***		-0.161***		-0.002		-0.074***
		(0.053)		(0.039)		(0.024)		(0.019)
Avg. Pref (ln)		-0.219***		-0.084**		-0.047		-0.040*
		(0.076)		(0.042)		(0.034)		(0.021)
Constant	1.368***	-0.144***			0.859***	-0.214***		
	(0.043)	(0.009)			(0.014)	(0.004)		
Fixed Effects:								
Importer-Year	No	No	Yes	Yes	No	No	Yes	Yes
Importer-Industry	No	No	Yes	Yes	No	No	Yes	Yes
Observations	517,062	517,062	517,061	517,061	517,062	517,062	517,061	517,061

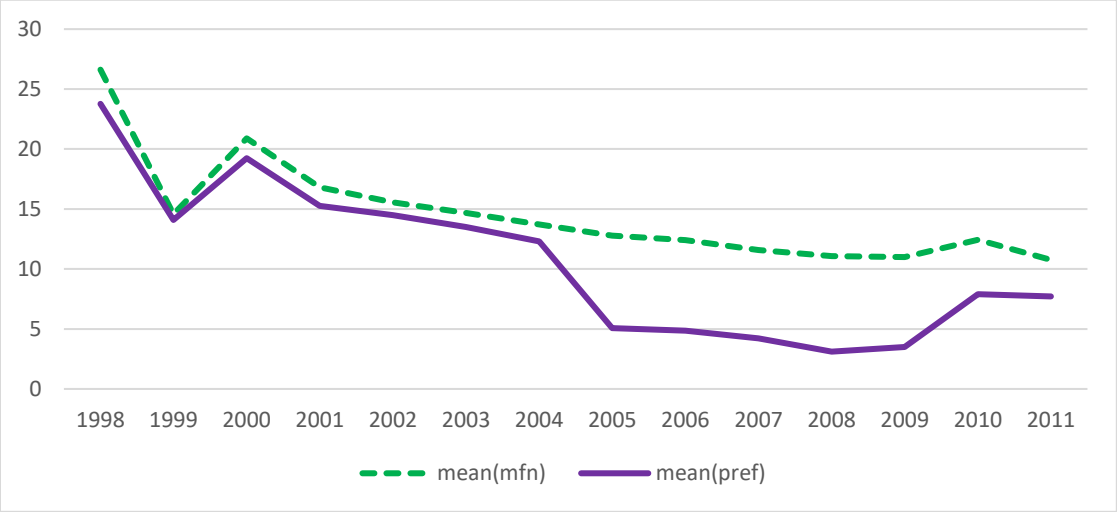
Note: Robust standard errors are reported in parentheses adjusted for clustering at the **product-year** level.
***Significant at 1%, **Significant at 5%, *Significant at 10%.

[74] IPI: import price index.
[75] QAIPI: quality-adjusted import price index.

Preferential tariffs and applied MFN tariffs fall at different rates[76] and in some cases may even go on opposite directions[77]. Findings from a study on Arab League countries, suggests that when members of this league form preferential trade agreements, it leads to a building block effect *(Silva & Benaddi, 2018).* That study reports that a one percentage point decrease in average preferential tariffs leads to 0.51 percentage points decrease in applied MFN tariffs. Our findings in this paper suggest that the fall in both applied MFN tariffs and preferential tariffs lead to a deterioration in the terms of trade of the importing country because imports have become more expensive after liberalizing trade. Column 3 suggests that a one standard deviation increase in applied MFN tariffs leads to a 0.019[78] percentage point decrease in import price index while a one standard deviation increase in average preferential tariffs leads to a 0.009[79] percentage point increase in the import price index. However, using a Wald test, we find that the effect of the two tariffs on import price index is not statistically different, implying that the two are equally important.

[76] *Estevaderodal et. al (2008), Pardo et. al. (2009), Ketterer et. al. (2014).*
[77] *Limao (2006)* and *Limao and Karakaovali (2008).*
[78] The effect on import price index is measured by the product between the standard deviation of applied MFN tariff (see Table 1) and its coefficient (see Column 3 of Table 2): 0.1421*0.134=0.019.
[79] The effect on import price index is measured by the product between the standard deviation of average preferential tariffs (see Table 1) and its coefficient (see Column 3 of Table 2): 0.1229***0.0702**=0.009.

Figure 3-2. The Evolution of Average MFN and Preferential Tariffs



Source: *data taken from the UNCTAD-TRAINS and WTO*

Figure 1 clearly shows that average preferential tariffs fall by much more than applied MFN tariffs for the sample period. To confirm our findings on the effects of MFN tariffs and preferential tariffs, we test the difference between the effects of a change in average MFN tariffs over the sample period and that of preferential tariffs on import price index[80] of the same period, and we find, once again, that the effect of the two trade policies are not statistically different, confirming that the two are equally important.

Previous literature argues that the effects of PTAs depends on the type of agreement, whether CU or FTA. Because Arab League countries are involved in both types of agreement, we test whether preferential tariffs and MFN tariffs affect import price index under a CU differently than under an FTA. This objective is achieved by extending expressions (1) and (2) with two additional explanatory variables representing the interaction between variable $\boldsymbol{Applied\ MFN}$ and $\boldsymbol{Avg.Pref}$ and a binary variable indicating whether importing country $\boldsymbol{j}$ is part of a CU (i.e., Gulf

[80] $Coefficient_{MFN} \times (avg.MFN_{2011} - avg.MFN_{1998}) - Coefficient_{Pref}(avg.pref_{2011} - avg.pref_{1998})$

Cooperation Council) at year ***t***. If the coefficient of this variable is statistically significant, then we can conclude that import price index under an FTA is not affected by preferential tariffs and applied MFN tariffs in the same way as import price index under a CU. Table 3 shows the robustness of some of our results compared to the findings of *Silva* & *Benaddi (2018)* in that the CU formed by Arab League countries has a similar effect as an FTA.

The first two columns in Table 3 show results of estimating specifications using equations (2) and (3) with the addition of the interaction between $\boldsymbol{Applied\ MFN}$ and $\boldsymbol{Avg.Pref}$ and the $\boldsymbol{CU}$ dummy variable using OLS with and without fixed effects. The coefficients on the $\boldsymbol{Applied\ MFN}$ and $\boldsymbol{Avg.Pref}$ in columns 1-4 are negative and statistically significant, which indicate that tariffs under FTAs lead to a deterioration of terms of trade for the importing country. These results are in line with Table 2. However, under a CU, the effect of the tariffs on import price index is ambiguous. For example, in Column 3, the effect of the CU, which is given by the summation of the coefficient of applied MFN and its interaction with a CU, leads deteriorating terms of trade. However, the preferential tariffs under a CU, given by the summation of the coefficient of average preferential tariffs and its interaction with a CU, leads improved terms of trade. More specifically, we find that a one percentage point increase in preferential tariffs leads to a 0.325[81] percentage point increase in import price index, which does not agree with the FTA results. Our findings here suggest that applied MFN tariffs and preferential tariffs lead to deteriorating terms of trade, but under the CU, the results are either insignificant or slightly positive, unlike the results under FTA, depending on what specification is used.

Furthermore, when we consider quality adjusted import price index as a dependent variable,

[81] The effects of a CU is the summation of the coefficients of ***Avg. Pref*** and ***Avg. Pref*CU***= -0.177+0.432=0.325

applied MFN tariffs follow previous patterns, negative and statistically significant, mainly when we use the full set of fixed effects. Results in Column 5 show that the CU does not affect the import price index. In Column 7, the effect of a CU as given by the summation of the coefficient of applied MFN and its interaction with a CU is negative but not statistically significant and is in line with previous findings in columns 2, 4, 5, and 8. The effect of preferential tariffs under the CU is slightly positive and significant, suggesting that preferential access under a CU leads to improved terms of trade. Our findings on the CU lack statistical consistency.

Table 3-3. The Impact of Customs Union and Free Trade Areas on International Prices

Dependent Variables	Imports Price Index (IPI)				Quality-Adjusted Imports Price Index (QAIPI)			
	IPI	IPI(ln)	IPI	IPI(ln)	QAIPI	QAIPI (ln)	QAIPI	QAIPI (ln)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
MFN	-0.151***		-0.109***		0.001		-0.040***	
	(0.041)		(0.038)		(0.016)		(0.014)	
MFN*CU	-0.055		-0.177		-0.011		0.015	
	(0.103)		(0.116)		(0.040)		(0.038)	
Avg. Pref	-0.134***		-0.107**		-0.039*		-0.033**	
	(0.052)		(0.043)		(0.020)		(0.016)	
Avg. Pref*CU	0.107		0.432***		0.005		0.105**	
	(0.109)		(0.167)		(0.042)		(0.042)	
MFN (ln)		-0.213***		-0.152***		0.007		-0.079***
		(0.047)		(0.039)		(0.022)		(0.020)
MFN*CU (ln)		0.264*		-0.058		-0.128**		0.078
		(0.136)		(0.136)		(0.061)		(0.069)
Avg. Pref (ln)		-0.191***		-0.098**		-0.065**		-0.041*
		(0.068)		(0.044)		(0.031)		(0.022)
Avg. Pref*CU (ln)		0.125		0.181		0.039		0.086
		(0.231)		(0.142)		(0.113)		(0.062)
Constant	1.263***	-0.151***			0.873***	-0.212***		
	(0.041)	(0.009)			(0.0131)	(0.004)		
Test: MFN + MFN*CU =0	[0.05]		[0.00]		[0.80]		[0.48]	
Test: Avg. Pref + Avg. Pref*CU =0	[0.82]		[0.05]		[0.44]		[0.07]	
Test: MFN (ln)+ MFN*CU (ln)=0		[0.73]		[0.11]		[0.07]		[0.98]
Test: Avg. Pref (ln)+Avg. Pref*CU (ln)=0		[0.79]		[0.54]		[0.83]		[0.44]
Fixed Effects:								
Importer-Year	No	No	Yes	Yes	No	No	Yes	Yes
Importer-Product	No	No	Yes	Yes	No	No	Yes	Yes
Observations	517,062	517,062	517,061	517,061	517,062	517,062	517,061	517,061

Note: Robust standard errors are reported in parentheses adjusted for clustering at the product-year level.
***Significant at 1%, **Significant at 5%, *Significant at 10%.

Next, we turn our attention to the role of market power of the importing country in explaining the results we have thus far. According to the theory of terms-of-trade countries tend to apply higher tariffs on products where they have greater market power in situations where international agreements do not constrain them. As a result, products and industries in which country ***j*** has high import market power may be less likely to cut external tariffs and preferential tariffs. However, when countries adopt an FTA, some legitimate expectations under the GATT suggest country j will liberalize tariffs on "substantially all goods" with their PTA partners even where country ***j*** may have more import market power than their PTA partners[82]. However, developing countries can implement FTAs and CUs under the GATT's Enabling Clause, which does not have such a stringent requirement that internal tariffs must be liberalized on "substantially all goods." If this is the case, then we may observe preferential tariff liberalization but not external liberalization in sectors in which country ***j*** has significant import market power. *Silva* and *Benaddi (2018)* find the building block effects of PTAs formed by Arab League countries mitigated for products and industries in which they have high market power. Specifically, they find that a one percentage point decrease in preferential tariffs leads to a 0.25 percentage point decrease in external tariffs in industries where the importing country exhibits high market power, while if the importing country shows low market power, we see a 0.65 percentage point decrease. What we do next is examine whether changes in country ***j***'s tariffs affect import prices more or less in the presence of high or low market power.

In Table 4, we test if market power affects how trade agreements change international prices. To achieve this objective, we estimate our main specifications using equations (1) and (2) using a

[82]And this is basic requirement of Article 24 of the GATT, which is an exception to the MFN principle that allows the formation of FTAs and CUs.

dummy variable (***PWRMed)*** that indicates observations where the importer has high market power. More specifically, ***PWRMed*** is equal to one if the inverse of the export supply elasticity faced by the importer in a particular industry is higher than the median, 67^{th} and 70^{th} percentile of the distribution of the inverse elasticity (market power) by the importing country. In all columns, we estimate our model using OLS with and without fixed effects and with and without a logarithmic form.

Table 3-4. The Effects of Market Power Interacting with Trade Agreements on International Prices

Dependent Variables	Imports Price Index (IPI)				Quality-Adjusted Imports Price Index (QAIPI)			
	IPI	IPI(ln)	IPI	IPI(ln)	QAIPI	QAIPI(ln)	QAIPI	QAIPI(ln)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
MFN	-0.170***		-0.244***		-0.034**		-0.099***	
	(0.043)		(0.036)		(0.016)		(0.014)	
MFN_PWRMed	0.004		0.067*		-0.003		0.016	
	(0.034)		(0.035)		(0.013)		(0.011)	
Ave.Pref	-0.072		0.022		-0.003		0.013	
	(0.057)		(0.047)		(0.022)		(0.015)	
Avg.Pref_PWRMed	-0.012		-0.072**		0.008		-0.012	
	(0.035)		(0.036)		(0.013)		(0.012)	
MFN (ln)		-0.205***		-0.291***		-0.073***		-0.176***
		(0.058)		(0.045)		(0.025)		(0.022)
MFN_PWRMed(ln)		0.008		0.062**		0.040**		0.053***
		(0.034)		(0.027)		(0.018)		(0.015)
Avg.Pref(ln)		-0.105		0.026		0.005		0.020
		(0.079)		(0.046)		(0.035)		(0.022)
Avg.Pref_PWRMed(ln)		-0.043		-0.056		-0.017		-0.021
		(0.042)		(0.035)		(0.022)		(0.018)
Constant	1.198***	-0.161***			0.866***	-0.208***		
	(0.036)	(0.009)			(0.014)	(0.004)		
Test: MFN+ MFN_PWRMed=0	[0.00]		[0.00]		[0.05]		[0.00]	
Test: Avg.Pref+ Avg.PrefPWRMed(ln)=0	[0.16]		[0.43]		[0.82]		[0.93]	
Test: MFN (ln)+ MFN_PWRMed(ln)=0		[0.00]		[0.00]		[0.19]		[0.00]
Test: Avg.Pref(ln)+ Avg.Pref_PWRMed(ln)=0		[0.09]		[0.55]		[0.76]		[0.99]
Fixed Effects:								
Importer-Year	No	No	Yes	Yes	No	No	Yes	Yes
Importer-Product	No	No	Yes	Yes	No	No	Yes	Yes
Observations	245,047	245,047	245,047	245,047	245,047	245,047	245,047	245,047

Note: Robust standard errors are reported in parentheses adjusted for clustering at the product-year level.
***Significant at 1%, **Significant at 5%, *Significant at 10%.

In all columns, with and without fixed effects, the coefficient on ***Applied MFN*** is negative and statistically significant in products for which the importing country has low market power. For example, Column 4 suggests that a one percent decrease in applied MFN tariffs leads to an increase in import price index of 0.29 percent. However, applied MFN tariffs in goods for which the importing country has market power above the median of the distribution the presence of market power mitigates the negative effect on importing countries as shown by the summation of the coefficient of applied MFN and its interaction with market power (***MFN_PWRMed***). Column 4 suggests that when the importing country shows high market power, a one percent decrease in applied MFN tariffs leads to a 0.22 percent increase in the import price index. Thus, our estimates suggest that the negative effect is mitigated in products where importers have higher market power. One explanation for these findings about importers with high market power is that the impact of the MFN comes from both members and nonmembers of the PTAs. Thus, distinguishing who may be affected is difficult for members with lower preference margin or nonmembers because the MFN here is the average of both.

Furthermore, Table 4 also shows the effect of preferential tariffs on import price index in the presence of market power. The results suggest that the effect of preferential tariffs on products for which the importing country has low market power, as indicated by the coefficient of ***Avg. Pref***, are inconsistent and statistically insignificant. Column 4, for example, shows that a decrease in preferential tariffs leads to a worse import price index when the importing country has more market power, as shown by the summation of the coefficient of ***Avg. Pref*** and its interaction with market power (***Avg. Pref_PWRMed***). Similar findings are obtained when using the quality-adjusted import price index as a dependent variable. Tables 1 and 2 in Appendix C show results when the market power dummy variable is measured based on the 67^{th} and 70^{th} percentile of the distribution of

market power by the importing country. The results seem to be in line with those in Table 4. The effect of applied MFN is consistent throughout when we control for fixed effects. A lower applied MFN tariff leads to higher import prices when the importing country shows low market power. However, this effect continues to be mitigated in the presence of high market power. The effect of preferential tariffs continues to be insignificant. Therefore, we find no evidence that market power affects this measure of terms of trade. Again, this could be because we do not distinguish between import prices from preferential partners and non-partners.

To test if our results are consistent across Arab League Countries, we run our model using specifications in equations (1) and (2) using two subsamples based on geographical locations of the member countries, North Africa and the GCC countries, as well as their accession to the WTO, new versus old WTO members, because the trade policies of these countries vary based on their negotiations in the WTO. The econometric results in Table 5 differ from FTAs, confirming our findings in the benchmark results, which indicate that both applied MFN and preferential tariffs are not significant in determining the terms of trade in the GCC region. In addition, we test for the effect of market power in the GCC region and find that the market power of importing countries plays no role in their import prices as shown in Table 3 of the Appendix C. Again, this confirms our findings in Table 3, where the CU results differ from FTA results, which is in line with the findings of *Silva* & *Benaddi (2018).*

Table 3-5. Baseline Results using Gulf Cooperation Council Subsample

Dependent Variables	Imports Price Index (IPI)				Quality-Adjusted Imports Price Index (QAIPI)			
	IPI	IPI(ln)	IPI	IPI(ln)	QAIPI	QAIPI(ln)	QAIPI	QAIPI (ln)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Applied MFN	-0.091		-0.127		0.034		0.015	
	(0.116)		(0.093)		(0.039)		(0.035)	
Avg. Pref	-0.099		0.091		-0.019		0.004	
	(0.170)		(0.120)		(0.059)		(0.033)	
Applied MFN(ln)		-0.074		-0.122		0.061		0.040
		(0.141)		(0.128)		(0.068)		(0.065)
Avg. Pref(ln)		-0.295		0.015		-0.091		-0.032
		(0.195)		(0.106)		(0.094)		(0.049)
Constant	1.211***	-0.142***			0.812***	-0.223***		
	(0.154)	(0.012)			(0.051)	(0.006)		
Fixed Effects:								
Importer-Year	No	No	Yes	Yes	No	No	Yes	Yes
Importer-Product	No	No	Yes	Yes	No	No	Yes	Yes
Observations	255,576	255,576	255,575	255,575	255,576	255,576	255,575	255,575

Note: Robust standard errors are reported in parentheses adjusted for clustering at the product-year level.
***Significant at 1%, **Significant at 5%, *Significant at 10%.

We then estimate the same equations (1) and (2) for North African countries as shown in Table 6. The results from our entire sample seem to be driven mostly by those related to North African countries with and without fixed effects. Estimates in Column 2, for example, where we do not control for fixed effects suggest that a one percent decrease in applied MFN tariffs results in a 0.19 percent increase in the import price index, while a decrease in preferential tariffs by one percentage point leads to a 0.18 percentage point increase in the import price index. The results seem to hold even when we control for fixed effects. Results in Column 4 of Table 6 are consistent with those in Column 4 of Table 2. Estimates in Column 4 suggest that a one percent decrease in applied MFN tariffs leads to a 0.16 percent increase in the import price index. A one percent decrease in preferential tariffs leads to a 0.09 percent increase in the import price index. The results when we consider North African countries seem consistent with those of the full sample.

To compare the effect of applied MFN tariffs and preferential tariffs, we turn to Column 3 of Table 6. Estimates in Column 3 suggest that a one standard deviation increase in applied MFN tariffs leads to a 0.022[83] percentage point decrease in import price index while a one standard deviation increase in average preferential tariffs leads to a 0.014[84] percentage point increase in import price index. However, using a Wald test, we find that the effect of the two tariffs on import price index does not differ statistically, implying that the two are equally important for this set of countries.

[83] The effect on import price index is measured by the product between the standard deviation of applied MFN tariff (based on the subsample of North Africa) and its coefficient (see Column 3 of Table 6): 0.174*0.128=0.022.
[84] The effect on import price index is measured by the product between the standard deviation of Average preferential tariffs (based on the subsample of North Africa) and its coefficient (see Column 3 of Table 6): 0.15305*0.0919=0.014.

Furthermore, we test the robustness of our findings in relation to market power using the North African subsample. The effect of market power obtained using full sample seem to resonate better with the findings shown in Table 4 in the Appendix C. These findings suggest that market power matters for North African countries, particularly for the applied MFN but not as much for preferential tariffs. We also tried measuring the effect of market power using this subsample when the power dummy variable is equal to one if the inverse of the export supply elasticity face by the importer in a particular industry is higher than the median, 67^{th} percentile of the distribution of the inverse elasticity (market power) by the importing country, but we did not observe any difference.

Table 3-6. Baseline Results using North African Countries Subsample

Dependent Variables	**Imports Price Index (IPI)**				**Quality-Adjusted Imports Price Index(QAIPI)**			
	IPI	**IPI(ln)**	**IPI**	**IPI(ln)**	**QAIPI**	**QAIPI(ln)**	**QAIPI**	**QAIPI(ln)**
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**
Applied MFN	-0.138***		-0.128***		-0.009		-0.046***	
	(0.038)		(0.035)		(0.015)		(0.014)	
Avg.Pref	-0.146***		-0.092**		-0.035*		-0.029*	
	(0.047)		(0.042)		(0.019)		(0.016)	
Applied MFN(ln)		-0.199***		-0.161***		-0.038*		-0.087***
		(0.050)		(0.040)		(0.023)		(0.020)
Avg. Pref(ln)		-0.186***		-0.096**		-0.050*		-0.037
		(0.065)		(0.044)		(0.029)		(0.023)
Constant	1.255***	-0.155***			0.881***	-0.202***		
	(0.042)	(0.010)			(0.014)	(0.004)		
Fixed Effects:								
Importer-Year	No	No	Yes	Yes	No	No	Yes	Yes
Importer-Product	No	No	Yes	Yes	No	No	Yes	Yes
Observations	261,486	261,486	261,486	261,486	261,486	261,486	261,486	261,486

Note: Robust standard errors are reported in parentheses adjusted for clustering at the product-year level.
***Significant at 1%, **Significant at 5%, *Significant at 10%.

V. Conclusion:

Our objective in this paper is to explore an essential component of the terms of trade, import price index, and quality-adjusted import price index. We have explained how using the quality-adjusted import price index is a proper measure of terms of trade because unit values of internationally traded goods are heavily influenced by quality. In our analysis, we find that preferential trade agreements and trade liberalization tend to increase the price faced by importers but also promote quality thereby limiting the loss in the terms of trade at least from the importing side.

Empirical results indicate that a one percentage point decrease in applied MFN tariffs leads to a reduction in international import prices of approximately 0.16 percentage points while domestic prices of imported goods, as well as those produced domestically if they are homogeneous, would fall by 0.84 percentage points. Moreover, we find that a one percentage point decrease in preferential tariffs leads to a 0.084 percentage point increase in international prices while domestic prices of imported goods decreased by 0.92 percentage points. We did not find perfect pass-thru of tariffs to consumers, but there are now studies that find that in the short run there is a complete pass-thru for U.S. tariffs to the U.S. consumer prices implying that they do not affect international prices. In addition, we find no significant effects of MFN tariffs and preferential tariffs on the terms of trade under a CU. Furthermore, our results provide no evidence that market power affects this measure of terms of trade under a CU.

In this paper, we do not provide a full analysis of the terms of trade, focusing instead only on the import side. If import prices rise for the importer that means their terms of trade would deteriorate relative to the exporting country. A future extension could include the export side to provide a full analysis of the terms of trade of the countries involved.

References

Anderson, J. E., & Yotov, Y. V. (2016). Terms of trade and global efficiency effects of free trade agreements, 1990–2002. *Journal of International Economics, 99*, 279-298.

Anson, J., Cadot, O., Estevadeordal, A., Melo, J. d., Suwa-Eisenmann, A., & Tumurchudur, B. (2005). Rules of origin in North–South preferential trading arrangements with an application to NAFTA. *Review of International Economics, 13*(3), 501-517.

Antoni Estevadeordal, Caroline Freund, & Emanuel Ornelas. (2008). Does regionalism affect trade liberalization toward nonmembers? *The Quarterly Journal of Economics, 123*(4), 1531-1575.

Bagwell, K., & Staiger, R. W. (2011). What do trade negotiators negotiate about? *The American Economic Review, 101*(4), 1238-1273.

Baldwin, R., & Freund, C. (2011). Preferential trade agreements and multilateral liberalization. *Preferential Trade Agreement Policies for Development–A Handbook', World Bank, Washington DC,*

Berlingieri, G., Breinlich, H., & Dhingra, S. (2018). The impact of trade agreements on consumer Welfare—Evidence from the EU common external trade policy. *Journal of the European Economic Association, 16*(6), 1881-1928.

Bessen, J. (2002). Technology adoption costs and productivity growth: The transition to information technology. *Review of Economic Dynamics, 5*(2), 443-469.

Calvo-Pardo, H., Freund, C., & Ornelas, E. (2009). *The ASEAN free trade agreement: Impact on trade flows and external trade barriers* Centre for Economic Performance, London School of Economics and Political Science.

Carballo, J., Handley, K., & Limão, N. (2018). Trade cold wars and the value of agreements during crises. *VoxEU.at: Https://Voxeu.Org/Article/Trade-Cold-Wars-and-Value-Agreements-during-Crises*,

Chad P. Bown, & Meredith A. Crowley. (2013). Self-enforcing trade agreements: Evidence from time-varying trade policy. *The American Economic Review, 103*(2), 1071-1090.

Christian Broda, & David E. Weinstein. (2006). Globalization and the gains from variety. *The Quarterly Journal of Economics, 121*(2), 541-585.

Christian Broda, Nuno Limão, & David E. Weinstein. (2008). Optimal tariffs and market power: The evidence. *The American Economic Review, 98*(5), 2032-2065.

Crowley, M., Exton, O., & Han, L. (2019, Jan 21,). The impact of brexit uncertainty on UK exports. Retrieved from https://voxeu.org/article/impact-brexit-uncertainty-uk-exports

Damian Paletta, & Ana Swanson. (2017). Trump suggests ignoring world trade organization in major policy shift. Retrieved from https://search.proquest.com/docview/1873262243

Econbrowser: Guest contribution: "Trump's trade policy uncertainty deters investment". (2018). Retrieved from https://search.proquest.com/docview/2087459593

Evenett, S. J., & Venables, A. (2002). Export growth by developing economies: Market entry and bilateral trade.

Facchini, G., Silva, P., & Willmann, G. (2013). The customs union issue. *Journal of International Economics, 90*(1), 136-147.

Handley, K. (2014). Exporting under trade policy uncertainty: Theory and evidence. *Journal of International Economics, 94*(1), 50-66.

Hiau Looi Kee, Alessandro Nicita, & Marcelo Olarreaga. (2009). Estimating trade restrictiveness indices. *The Economic Journal, 119*(534), 172-199.

Hummels, D., & Klenow, P. J. (2005). The variety and quality of a nation's exports. *The American Economic Review, 95*(3), 704-723.

Justin R. Pierce, & Peter K. Schott. (2016). The surprisingly swift decline of US manufacturing employment. *The American Economic Review, 106*(7), 1632-1662.

Karacaovali, B., & Limão, N. (2008). The clash of liberalizations: Preferential vs. multilateral trade liberalization in the european union. *Journal of International Economics, 74*(2), 299-327.

Ketterer, T. D., Bernhofen, D., & Milner, C. (2014). Preferences rent destruction and multilateral liberalization: The building block effect of CUSFTA. *Journal of International Economics, 92*(1), 63-77.

Kyle Handley, & Nuno Limão. (2015). Trade and investment under policy uncertainty: Theory and firm evidence. *American Economic Journal: Economic Policy, 7*(4), 189-222.

Limao, N. (2006). Preferential trade agreements as stumbling blocks for multilateral trade liberalization: Evidence for the united states. *The American Economic Review, 96*(3), 896-914.

Mark J. Roberts, & James R. Tybout. (1997). The decision to export in colombia: An empirical model of entry with sunk costs. *The American Economic Review, 87*(4), 545-564.

Missios, P., Saggi, K., & Yildiz, H. M. (2012). *Free trade agreements versus customs unions: Implications for global free trade.* Unpublished manuscript.

Nicholas Bloom. (2014). Fluctuations in uncertainty. *The Journal of Economic Perspectives, 28*(2), 153-175.

Nicita, A., Olarreaga, M., & Silva, P. (2018). Cooperation in WTO's tariff waters? *Journal of Political Economy, 126*(3), 1302-1338.

Nuno Limão, & Giovanni Maggi. (2015). Uncertainty and trade agreements. *American Economic Journal: Microeconomics, 7*(4), 1-42.

Ornelas, E. (2007). Exchanging market access at the outsiders' expense. *The Canadian Journal of Economics, 40*(1), 207-224.

Robert C. Feenstra. (1994). New product varieties and the measurement of international prices. *The American Economic Review, 84*(1), 157-177.

Rodney D. Ludema, & Anna Maria Mayda. (2013). Do terms-of-trade effects matter for trade agreements? theory and evidence from wto countries. *The Quarterly Journal of Economics, 128*(4), 1837-1894.

Silva, P., & Benaddi, A. *The multilateral trade policy of Arab League countries: An empirical investigation;* Unpublished manuscript.

Subramanian, A., & Wei, S. (2007). The WTO promotes trade, strongly but unevenly. *Journal of International Economics, 72*(1), 151-175.

Timothy J. Kehoe, & Kim J. Ruhl. (2013). How important is the new goods margin in international trade? *Journal of Political Economy, 121*(2), 358-392.

Appendix A - Chapter 1

Table A 1. Descriptive Statistics (continued)

***a. Sample with Preference Margin* ≥ 2.5**

Variable	N	Mean	S.D.	Min	0.25	Median	0.75	Max
MFN	9419	12.80	15.70	2.50	5.00	5.00	15.85	200.00
minpref	9415	3.27	8.23	0.00	0.00	0.33	2.27	160.83
L_minpref	9419	4.91	10.54	0.00	0.00	0.83	4.65	180.00
bound	8774	38.24	41.82	5.00	15.00	28.75	40.00	2145.71
BIND	9419	0.11	0.31	0.00	0.00	0.00	0.00	1.00
L_BIND	9419	0.12	0.32	0.00	0.00	0.00	0.00	1.00
optimal	7950	0.14	0.49	0.00	0.03	0.07	0.11	10.05

b. *CU Sample with Preference Margin* ≥ 2.5 *avg*

Variable	N	Mean	S.D.	Min	0.25	Median	0.75	Max
MFN	4993	7.04	12.83	2.50	4.85	5.00	5.00	125.00
avgprefCUdum	4991	0.75	4.26	0.00	0.00	0.03	0.45	87.50
L_avgprefCUdum	4993	1.54	5.34	0.00	0.00	0.17	1.30	100.00
bound	4881	36.26	37.89	5.00	13.91	15.00	35.00	200.00
BIND	4993	0.07	0.25	0.00	0.00	0.00	0.00	1.00
L_BIND	4993	0.07	0.25	0.00	0.00	0.00	0.00	1.00
optimal	3751	0.16	0.39	0.00	0.04	0.07	0.14	5.85

c. *CU Sample with Preference Margin* ≥ 2.5 *min*

Variable	N	Mean	S.D.	Min	0.25	Median	0.75	Max
MFN	5188	7.00	12.61	2.50	4.86	5.00	5.00	125.00
minprefCUdum	5186	0.56	3.29	0.00	0.00	0.00	0.40	76.13
L_minprefCUdum	5188	1.25	4.60	0.00	0.00	0.09	1.00	100.00
bound	5075	36.35	37.84	5.00	14.00	15.00	35.00	200.00
BIND	5188	0.07	0.25	0.00	0.00	0.00	0.00	1.00
L_BIND	5188	0.07	0.26	0.00	0.00	0.00	0.00	1.00
optimal	3882	0.16	0.41	0.00	0.04	0.08	0.14	5.85

Table A 2. First Stage Regressions for Table 3

	Independent Variables							
	avgpref (3)	**minpref (4)**	**L_avgpref (7)**	**L_minpref (8)**	**L_avgpref (9)**	**L_minpref (10)**	**L_avgpref (11)**	**L_minpref (12)**
avgprefp1	0.214*** (0.035)							
avgprefp2	0.347*** (0.082)							
prefp1min		0.314*** (0.052)						
prefp2min		0.352*** (0.092)						
L_avgprefp1			0.213*** (0.037)		0.213*** (0.037)		0.161*** (0 .0417)	
L_avgprefp2			0 .338*** (0.0798)		0.338*** (0.079)		0.367*** (0.367)	
L_prefp1min				0.292*** (0.034)		0 .292*** (0.034)		0.249*** (0.034)
L_prefp2min				0.382*** (0.088)		0.382*** (0.088)		0.406*** (0.106)
F-Test of excluded instruments	29.19 [0.00]	35.52 [0.00]	27.03 [0.00]	55.2 [0.00]	27.03 [0.00]	55.2 [0.00]	20.55 [0.00]	41.04 [0.00]
Shea Partial R2	0.12	0.04	0.12	0.16	0.12	0.16	0.11	0.14

Notes: Country-industry and country-year fixed effects are included in all regressions. Robust standard errors are reported in parenthesesand adjusted for clustering at the country-industry level. P-values are reported in brackets.
***Significant at 1%, **Significant at 5%, *Significant at 10%.

Table A 3. First Stage Regressions for Table 4

	Dependent Variables					
	L_avgpref	**L_avgprefCUdum**	**L_minpref**	**L_minprefCUdum**	**L_avgpref**	**L_avgprefCUdum**
	(3)		**(4)**		**(5)**	
L_avgprefp1	0.275***	-0.001			0 .194*	-0.021
	(0.036)	(0 .016)			(0 .119)	(0.016)
L_avgprefp2	0.280***	-0.026			0.203***	-0.002
	(0.08)	(0.012)			(0.055)	(0.005)
L_avgprefp1CUdum	-0.255***	0.066			0.318*	0 .564***
	(0.059)	(0.045)			(0.195)	(0 .153)
L_avgprefp2CUdum	0.193	0.679***			-0.259***	0.0153
	(0.136)	(0.106)			(0.0621)	(0.033)
L_prefp1min			0.368***	0 .003		
			(0 .037)	(0.009)		
L_prefp2min			0.334***	-0.023***		
			(0.096)	(0.00)		
L_prefp1minCUdum			-0.284***	0.071		
			(0.072)	(0.055)		
L_prefp2minCUdum			0.132	0.649***		
			(0.148)	(0.125)		
F-Test of excluded instruments	23.5	22.33	35.47	11.07	8.09	4.31
	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]
Shea Partial R2	0.14	0.31	0.18	0.29	0.09	0.17

Notes: Country-industry and country-year fixed effects are included in all regressions. Robust standard errors are reported in parentheses and adjusted for clustering at the country-industry level. P-values are reported in brackets.
***Significant at 1%, **Significant at 5%, *Significant at 10%.

Table A 4. First Stage Regressions for Table 4 (Continued)

	Dependent Variables					
	L_minpref	**L_minprefCUdum**	**L_avgpref**	**L_avgprefCUdum**	**L_minpref**	**L_minprefCUdum**
		(6)		**(7)**		**(8)**
L_avgprefp1			0.217	-0.027		
			(0.142)	(0.019)		
L_avgprefp2			0.205***	0.005		
			(0.071)	(0.006)		
L_avgprefp1CUdum			0.205	0.455**		
			(0.24)	(0.196)		
L_avgprefp2CUdum			-0.305***	0.002		
			(0.075)	(0.04)		
L_prefp1min	0.275**	-0.012			0.275**	0.242
	(0.119)	(0.009)			(0.119)	(0.158)
L_prefp2min	0.297***	-0.003			0.297***	0.298***
	(0.064)	(0.004)			(0.064)	(0.099)
L_prefp1minCUdum	0.108	0.426**			0.108	0.003
	(0.163)	(0.169)			(0.163)	(0.185)
L_prefp2minCUdum	-0.354***	-0.0015			-0.354***	-0.396***
	(0.075)	(0.042)			(0.075)	(0.115)
F-Test of excluded instruments	7.68	2.4	6.7	1.36	7.68	3.97
	[0.00]	[0.048]	[0.00]	[0.25]	[0.00]	[0.00]
Shea Partial R2	0.09	0.12	0.07	0.11	0.09	0.06

Notes: Country-industry and country-year fixed effects are included in all regressions. Robust standard errors are reported in parentheses and adjusted for clustering at the country-industry level. P-values are reported in brackets.
***Significant at 1%, **Significant at 5%, *Significant at 10%.

Appendix B - Chapter 2

Table B 1: Probability a Product is Traded – Sample of Countries in North Africa and the Middle East

Product Traded	**Tunisia**			**Jordan**			**Oman**		
	(1)	(2)	**(3)**	(4)	(5)	**(6)**	(7)	(8)	**(9)**
Water (ln)	-0.142***	-0.140***	**-0.848*** **	-0.209***	-0.237***	**-0.320*** **	-0.208***	-0.210***	**-0.131** **
	(0.003)	(0.003)	**(0.075)**	(0.009)	(0.009)	**(0.022)**	(0.008)	(0.008)	**(0.057)**
Applied MFN (ln)	-0.079***	-0.064***	**-0.816*** **	0.031***	0.058***	**-0.221*** **	0.046***	0.068***	**-0.066**
	(0.003)	(0.003)	**(0.073)**	(0.005)	(0.005)	**(0.016)**	(0.012)	(0.011)	**(0.048)**
Constant	0.148***	0.145***	**0.423*** **	0.101***	0.100***	**0.131*** **	0.115***	0.114***	**0.115*** **
	(0.001)	(0.001)	**(0.028)**	(0.001)	(0.001)	**(0.003)**	(0.001)	(0.001)	**(0.006)**
F-test	1558.56	1532.35	**70.26**	564.78	808.84	**108.81**	337.75	362.56	**9.12**
	[0.00]	[0.00]	**[0.00]**	[0.00]	[0.00]	**[0.00]**	[0.00]	[0.00]	**[0.00]**
Fixed Effects:									
Exporter-Year	NO	YES	**YES**	NO	YES	**YES**	NO	YES	**YES**
Exporter-Product	NO	NO	**YES**	NO	NO	**YES**	NO	NO	**YES**
Observations	2,701,617	2,701,617	**2,701,617**	3,434,597	3,434,597	**3,434,597**	2,947,366	2,947,366	**2,947,366**

Note: Robust standard errors are reported in parentheses adjusted for clustering at the product-year level. P-values are reported in brackets.
***Significant at 1%, **Significant at 5%, *Significant at 10%.

Table B 2: Probability a Product is Traded – Sample of Countries in North Africa and the Middle East

Product Traded	**Bahrain**			**United Arab Emirates**			**Saudi Arabia**		
	(1)	(2)	**(3)**	(4)	(5)	**(6)**	(7)	(8)	**(9)**
Water (ln)	-0.169***	-0.197***	**-0.287*** **	0.009	0.011	**0.298** **	-0.320***	-0.341***	**-0.147*** **
	(0.017)	(0.017)	**(0.110)**	(0.008)	(0.008)	**(0.136)**	(0.012)	(0.013)	**(0.026)**
Applied MFN (ln)	0.008	0.036**	**-0.143**	0.099***	0.092***	**0.538*** **	0.149***	0.209***	**-0.015**
	(0.015)	(0.015)	**(0.096)**	(0.022)	(0.022)	**(0.137)**	(0.012)	(0.017)	**(0.019)**
Constant	0.183***	0.188***	**0.219*** **	0.133***	0.133***	**0.0897*** **	0.126***	0.124***	**0.129*** **
	(0.005)	(0.004)	**(0.031)**	(0.001)	(0.001)	**(0.017)**	(0.001)	(0.001)	**(0.002)**
F-test	51.66	77.37	**14.14**	11.61	11.16	**38.02**	554.02	442.01	**38.85**
	[0.00	[0.00]	**[0.00]**	[0.00]	[0.00]	**[0.00]**	[0.00]	[0.00]	**[0.00]**
Fixed Effects:									
Exporter-Year	NO	YES	**YES**	NO	YES	**YES**	NO	YES	**YES**
Exporter-Product	NO	NO	**YES**	NO	NO	**YES**	NO	NO	**YES**
Observations	1,466,770	1,466,770	**1,466,770**	5,334,579	5,334,579	**5,334,579**	6,345,613	6,345,613	**6,345,613**

Note: Robust standard errors are reported in parentheses adjusted for clustering at the product-year level. P-values are reported in brackets.
***Significant at 1%, **Significant at 5%, *Significant at 10%.

1. **Summary Statistics: Morocco**

Variable	N	mean	sd
Product Traded	4544785	0.096	0.295
Product Traded_10	4544785	0.085	0.279
Water (ln)	4544785	0.185	0.131
Bound Tariffs (ln)	4544785	0.338	0.087
Applied MFN (ln)	4544785	0.163	0.150

2. **Summary Statistics: Egypt**

Variable	N	mean	sd
Product Traded	7262845	0.100	0.300
Product Traded_10	7262845	0.092	0.289
Water (ln)	7262845	0.121	0.106
Bound Tariffs (ln)	7262845	0.224	0.181
Applied MFN (ln)	7262845	0.109	0.156

3. **Summary Statistics: Tunisia**

Variable	N	mean	sd
Product Traded	2701617	0.105	0.307
Product Traded_10	2701617	0.094	0.291
Water (ln)	2701617	0.201	0.165
Bound Tariffs (ln)	2701617	0.380	0.200
Applied MFN (ln)	2701617	0.181	0.154

4. **Summary Statistics: Emirates**

Variable	N	mean	sd
Product Traded	5334579	0.138	0.345
Product Traded_10	5334579	0.124	0.330
Water (ln)	5334579	0.082	0.067
Bound Tariffs (ln)	5334579	0.127	0.076
Applied MFN (ln)	5334579	0.045	0.027

5. **Summary Statistics: Saudi**

Variable	N	mean	sd
Product Traded	6345613	0.122	0.327
Product Traded_10	6345613	0.112	0.315
Water (ln)	6345613	0.043	0.042
Bound Tariffs (ln)	6345613	0.096	0.052
Applied MFN (ln)	6345613	0.061	0.039

6. **Summary Statistics: Qatar**

Variable	N	mean	sd
Product Traded	2548880	0.165	0.371
Product Traded_10	2548880	0.146	0.353
Water (ln)	2548880	0.094	0.069
Bound Tariffs (ln)	2548880	0.139	0.085
Applied MFN (ln)	2548880	0.046	0.042

7. **Summary Statistics: Bahrain**

Variable	N	mean	sd
Product Traded	1466770	0.143	0.351
Product Traded_10	1466770	0.127	0.332
Water (ln)	1466770	0.237	0.066
Bound Tariffs (ln)	1466770	0.289	0.089
Applied MFN (ln)	1466770	0.054	0.068

8. **Summary Statistics: Oman**

Variable	N	mean	sd
Product Traded	2947366	0.103	0.304
Product Traded_10	2947366	0.094	0.291
Water (ln)	2947366	0.069	0.071
Bound Tariffs (ln)	2947366	0.116	0.088
Applied MFN (ln)	2947366	0.049	0.043

9. Summary Statistics: Kuwait

Variable	N	mean	sd
Product Traded	2292388	0.169	0.375
Product Traded_10	2292388	0.147	0.354
Water (ln)	2292388	0.627	0.105
Bound Tariffs (ln)	2292388	0.670	0.108
Applied MFN (ln)	2292388	0.043	0.027

10. Summary Statistics: Jordan

Variable	N	mean	sd
Product Traded	3434597	0.093	0.291
Product Traded_10	3434597	0.086	0.279
Water (ln)	3434597	0.053	0.062
Bound Tariffs (ln)	3434597	0.133	0.092
Applied MFN (ln)	3434597	0.092	0.109

Appendix C - Chapter 3

Table C 1. The Effects of Market Power Interacting with Trade Agreements on International Prices Full Sample

Dependent Variables	Imports Price Index (IPI)				Quality Adjusted Imports Price Index (QAIPI)			
	IPI	IPI(ln)	IPI	IPI(ln)	QAIPI	QAIPI(ln)	QAIPI	QAIPI(ln)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
MFN	-0.172***		-0.223***		-0.038**		-0.097***	
	(0.042)		(0.037)		(0.016)		(0.014)	
MFN_PWR67	0.014		0.033		0.008		0.015	
	(0.037)		(0.029)		(0.014)		(0.013)	
Avg. Pref	-0.072		-0.001		0.001		0.011	
	(0.057)		(0.051)		(0.022)		(0.015)	
Avg. Pref _PWR67	-0.018		-0.031		-0.002		-0.009	
	(0.039)		(0.031)		(0.014)		(0.012)	
MFN(ln)		-0.202***		-0.275***		-0.078***		-0.164***
		(0.059)		(0.045)		(0.025)		(0.022)
MFN_PWR67(ln)		0.004		0.041		0.005		0.015
		(0.035)		(0.028)		(0.035)		(0.022)
Avg. Pref		-0.116		0.007				0.044***
		(0.081)		(0.047)				(0.014)
Avg. Pref _PWR67(ln)		-0.033		-0.022				-0.008
		(0.043)		(0.035)				(0.017)
Constant	1.198***	-0.161***			0.865***	-0.208***		
	(0.036)	(0.009)			(0.014)	(0.003)		
Fixed Effects:								
Importer-Year	No	No	Yes	Yes	No	No	Yes	Yes
Importer-Product	No	No	Yes	Yes	No	No	Yes	Yes
Observations	245,047	245,047	245,047	245,047	245,047	245,047	245,047	245,047

Note: Robust standard errors are reported in parentheses adjusted for clustering at the product-year level.
***Significant at 1%, **Significant at 5%, *Significant at 10%.

Table C 2. The Effects of Market Power Interacting with Trade Agreements on International Prices using a Full sample

Dependent Variables	Imports Price Index (IPI)				Quality Adjusted Imports Price Index (QAIPI)			
	IPI	IPI (ln)	IPI	IPI (ln)	QAIPI	QAIPI (ln)	QAIPI	QAIPI (ln)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
MFN	-0.170***		-0.222***		-0.039**		-0.098***	
	(0.041)		(0.037)		(0.016)		(0.014)	
MFN_PWR70	0.008		0.032		0.015		0.020*	
	(0.038)		(0.031)		(0.014)		(0.012)	
Avg. Pref	-0.073		-0.002		0.004		0.012	
	(0.056)		(0.051)		(0.022)		(0.014)	
Avg.Pref_PWR70	-0.016		-0.030		-0.009		-0.016	
	(0.039)		(0.032)		(0.015)		(0.0127)	
MFN(ln)		-0.196***		-0.270***		-0.075***		-0.165***
		(0.059)		(0.045)		(0.025)		(0.022)
MFN_PWR70(ln)		-0.018		0.028		0.056***		0.049***
		(0.035)		(0.028)		(0.017)		(0.014)
Avg. Pref(ln)		-0.116		0.007		0.006		0.016
		(0.081)		(0.046)		(0.035)		(0.022)
Avg.Pref_PWR70(ln)		-0.034		-0.027		-0.031		-0.018
		(0.043)		(0.035)		(0.021)		(0.017)
Constant	1.198***	-0.161***			0.865***	-0.208***		
	(0.036)	(0.009)			(0.013)	(0.004)		
Fixed Effects:								
Importer-Year	No	No	Yes	Yes	No	No	Yes	Yes
Importer-Product	No	No	Yes	Yes	No	No	Yes	Yes
Observations	245,047	245,047	245,047	245,047	245,047	245,047	245,047	245,047

Note: Robust standard errors are reported in parentheses adjusted for clustering at the product-year level.
***Significant at 1%, **Significant at 5%, *Significant at 10%.

Table C 3. The Effects of Market Power Interacting with Trade Agreements on International Prices in GCC Countries

Dependent Variables	Imports Price Index (IPI)				Quality Adjusted Imports Price Index (QAIPI)			
	IPI	IPI(ln)	IPI	IPI(ln)	QAIPI	QAIPI(ln)	QAIPI	QAIPI(ln)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
MFN	0.025		-0.082		0.037		-0.026	
	(0.106)		(0.096)		(0.041)		(0.036)	
MFN_PWRMed	-0.060		-0.075		0.025		-0.001	
	(0.091)		(0.079)		(0.034)		(0.027)	
Avg. Pref	-0.086		0.042		-0.019		0.001	
	(0.155)		(0.098)		(0.062)		(0.036)	
Avg.Pref_PWRMed	0.057		0.076		-0.017		0.006	
	(0.093)		(0.082)		(0.035)		(0.028)	
MFN(ln)		0.014		-0.193		0.029		-0.074
		(0.147)		(0.134)		(0.067)		(0.062)
MFN_PWRMed(ln)		0.021		0.004		0.173***		0.093***
		(0.094)		(0.070)		(0.046)		(0.036)
Avg. Pref(ln)		-0.358*		-0.042		-0.126		-0.047
		(0.206)		(0.125)		(0.098)		(0.055)
Avg.Pref_PWRMed(ln)		0.172		0.191**		0.023		0.045
		(0.116)		(0.094)		(0.058)		(0.047)
Constant	1.013***	-0.176***			0.802***	-0.225***		
	(0.119)	(0.013)			(0.047)	(0.005)		
Fixed Effects:								
Importer-Year	No	No	Yes	Yes	No	No	Yes	Yes
Importer-Product	No	No	Yes	Yes	No	No	Yes	Yes
Observations	89,651	89,651	89,651	89,651	89,651	89,651	89,651	89,651

Note: Robust standard errors are reported in parentheses adjusted for clustering at the product-year level.
***Significant at 1%, **Significant at 5%, *Significant at 10%.

Table C 4. The Effects of Market Power Interacting with Trade Agreements on International Prices North Africa Countries

Dependent Variables	Imports Price Index (IPI)				Quality Adjusted Imports Price Index (QAIPI)			
	IPI (1)	IPI(ln) (2)	IPI (3)	IPI(ln) (4)	QAIPI (5)	QAIPI(ln) (6)	QAIPI (7)	QAIPI(ln) (8)
MFN	-0.189***		-0.266***		-0.055***		-0.110***	
	(0.043)		(0.039)		(0.016)		(0.016)	
MFN_PWRMed	0.026		0.097**		-0.001		0.022*	
	(0.035)		(0.038)		(0.014)		(0.012)	
Avg. Pref	-0.046		0.031		0.004		0.019	
	(0.054)		(0.051)		(0.020)		(0.016)	
Avg.Pref_PWRMed	-0.035		-0.103***		0.005		-0.017	
	(0.037)		(0.039)		(0.014)		(0.013)	
Ln_mfn		-0.254***		-0.304***		-0.114***		-0.188***
		(0.057)		(0.047)		(0.025)		(0.023)
MFN_PWRMed(ln)		0.016		0.079***		0.023		0.052***
		(0.034)		(0.029)		(0.018)		(0.015)
Avg. Pref(ln)		-0.074		0.039		0.011		0.032
		(0.071)		(0.049)		(0.031)		(0.024)
Avg.Pref_PWRMed(ln)		-0.069*		-0.089**		-0.014		-0.027
		(0.042)		(0.035)		(0.022)		(0.018)
Constant	1.186***	-0.152***			0.887***	-0.196***		
	(0.040)	(0.009)			(0.014)	(0.004)		
Fixed Effects:								
Importer-Year	No	No	Yes	Yes	No	No	Yes	Yes
Importer-Product	No	No	Yes	Yes	No	No	Yes	Yes
Observations	155,396	155,396	155,396	155,396	155,396	155,396	155,396	155,396

Note: Robust standard errors are reported in parentheses adjusted for clustering at the product-year level.
***Significant at 1%, **Significant at 5%, *Significant at 10%.