The Economics of a Trade Policy for Peace

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Abstract

Countries may use trade agreements to promote peaceful relations among allies and advance geopolitical interests. I study the U.S.-sponsored Qualifying Industrial Zones (QIZ) agreement, which grants Egyptian firms tariff-free access to the U.S. market conditional on sourcing a share of their inputs from Israel. Stricter sourcing requirements increase the share of inputs from Israel by firms using the agreement but also raise the costs of utilizing the agreement, therefore potentially limiting aggregate imports from Israel. Using difference-in-differences strategies, I find that the agreement generated persistent increases in Egyptian exports to the U.S. and imports from Israel, alongside export spillovers to non-U.S. destinations. To quantify welfare effects and evaluate alternative input requirements, I develop a quantitative trade model in which Egyptian firms endogenously choose whether to use the QIZ agreement. Calibrating the model to Egypt, I find positive but modest aggregate welfare gains, since QIZ sourcing distortions partly offset the benefits from U.S. market access. Counterfactual results suggest that relaxing the Israeli input requirement can increase Egyptian exports and welfare while also increasing imports from Israel, since the expansion in exports more than offsets the reduction in Israeli input shares. Yet, the U.S. may not favor such a reform if its geopolitical benefits do not outweigh the economic costs of increased Egyptian exports.

Keywords: Trade Policy, Trade Agreements, Rules of Origin, Input Requirements, Geopolitical Objectives, Qualifying Industrial Zones
JEL: F13, F14, F50, F53

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1 Introduction

The rise of geopolitical competition has increased interest in how governments use economic policies to advance their strategic objectives. Such policies can be used to foster economic cooperation and peaceful relations among allies, thereby advancing the geopolitical interests of governments that sponsor them. Trade agreements can serve this purpose as they strengthen economic ties between countries and potentially reduce the risk of conflict between them. Yet the economic effects of such agreements, and how their design shapes their effectiveness, remain insufficiently understood. I address these questions by studying the Qualifying Industrial Zones (QIZ) agreement, a trade agreement fostered by the U.S. to strengthen relations between its allies in the Middle East.

Under the QIZ agreement, firms located within designated areas in Egypt and Jordan receive duty-free access to the U.S. market conditional on sourcing a minimum share of inputs from Israel. This design reflects the United States' geopolitical objectives in the Middle East which include maintaining peace between its Arab partners and Israel through deepening trade between them. However, the input requirement embedded in the QIZ agreement creates a trade-off. While it requires participating firms to purchase inputs from Israel, it also raises the cost of utilizing the agreement, potentially discouraging firms from participating and limiting the trade relationships the agreement seeks to promote. This makes the QIZ agreement a unique setting for analyzing how trade incentives and input-sourcing rules interact to advance geopolitical objectives.

In this paper, I evaluate the economic effects of the QIZ agreement in Egypt, focusing primarily on trade and firm outcomes. I then develop a multi-sector heterogeneous firm trade model and calibrate it to the Egyptian economy. The model is then used to quantify the welfare effects of the QIZ agreement on Egypt and investigate the role of input requirements in advancing the geopolitical objectives of the agreement.

The Qualifying Industrial Zone (QIZ) program was authorized by the United States in 1996, with the first agreement between Jordan and Israel signed in 1997 and implemented in 1998. The agreement designated specific areas within Jordan as QIZs, allowing firms located in these areas to export to the United States tariff free and quota free (Pelzman, 2011). This preferential access was conditional on sourcing a minimum share of inputs from Israel. In effect, the agreement extended the benefits of the United States–Israel Free Trade Agreement to eligible firms operating within designated zones in Jordan, conditional on incorporating Israeli inputs into their production process. In 2004, Egypt entered a similar agreement with Israel and the US, and specific areas within Egypt were designated as QIZs. Following the introduction of the QIZ agreement, aggregate Egyptian exports to the United States increased simultaneously with imports from Israel.

Combining Egyptian product-level trade data, firm-level customs data, and firm surveys, I evaluate the economic effects of the QIZ agreement using difference-in-differences strategies. The subsequent empirical analysis yields three main findings.

First, the QIZ agreement led to an expansion of Egyptian trade among exposed products. To identify these effects, I exploit variation in products' exposure to the benefits of the agreement, determined by pre-QIZ tariffs which Egyptian exporters faced in the U.S. market. Products facing higher initial tariffs benefited more from the conditional tariff elimination offered by the agreement. These pre-agreement Most Favored Nation (MFN) tariffs provide a predetermined measure of the potential benefits from QIZ participation. Using a triple difference in differences strategy exploiting variation in exposure, exporting destinations, and the timing of the agreement (Ortiz-Villavicencio and Sant'Anna, 2025), I find that Egyptian exports of more exposed products to the U.S. increased significantly after the agreement relative to less exposed Egyptian products and relative to the exports of other countries to the U.S. market. I also find that Egyptian imports from Israel increased substantially for products supplied to Egyptian industries that were more exposed to the agreement, consistent with the agreement's Israeli input-sourcing requirement.

Second, I find that the effects of the agreement extended beyond the U.S. market, generating positive spillovers to firms' exports to other destinations. To investigate these firm-level spillovers, I use Egyptian customs data from 2005 to 2016 and exploit the timing of firms' first imports from Israel as a proxy for entry into the QIZ program. Estimating event-study models, I find that firms beginning to import from Israel experience substantial and persistent increases in exports both to the United States and other destinations relative to control firms. These increases are accompanied by an expansion in the number of exported products and the number of destinations served. The results are robust to a range of robustness checks. The findings suggest that the benefits of preferential access to the U.S. market extended beyond the direct U.S. tariff savings provided by the agreement.

Third, I find suggestive evidence that international certification may have contributed to these export spillovers. Using the World Bank Enterprise Surveys, I compare changes in certification, foreign ownership, foreign-licensed technology, and fixed-asset investment across Egyptian exporting firms with different exposures to the agreement. I find that international certification increases among exporting firms that are more exposed to the QIZ agreement. However, I find no corresponding positive effect of exposure to the agreement on exporting firms' share of foreign ownership, foreign technology adoption, or investments in fixed assets. The increase in certification is consistent with firms meeting international buyers' requirements, thus reducing their costs of serving foreign markets and expanding to multiple destinations.

Taken together, the three main findings indicate that the QIZ agreement did not only expand trade in the sectors directly benefiting from preferential access, but also generated broader spillovers through changes in firms' access to international markets. These findings raise the question of how the observed expansion in trade and firm activity translates into aggregate welfare gains. Importantly, these gains depend on which firms find it profitable to participate in the agreement. While preferential access through the QIZ creates incentives to expand exports, the Israeli input-sourcing requirement may distort sourcing decisions and increase

production costs, and may therefore limit the number of firms utilizing the agreement. Thus, the same requirement designed to strengthen trade between Egypt and Israel may also constrain the economic benefits of the agreement and thus undermine the very trade linkages it intends to promote. These considerations motivate the quantitative model that follows. The aim is to quantify the aggregate welfare consequences of the agreement and examine how alternative designs of the Israeli input-sourcing requirement can shape trade between Egypt and Israel whose expansion advances the United States' geopolitical objectives.

I develop a multi-sector heterogeneous-firm model of the Egyptian economy which embeds the QIZ agreement. In the model, Egypt is a small open economy facing exogenous demand conditions from the United States and the rest of the world, while domestic consumers have constant elasticity of substitution preferences over product varieties. On the production side, firms differ in productivity across 15 manufacturing sectors that face different U.S. most-favored-nation (MFN) tariffs. To enter the market firms must pay a fixed entry cost and in order to export, a destination-specific fixed cost must be paid as well. Firms exporting to the United States choose between paying the applicable MFN tariff or obtaining duty-free access through the QIZ agreement. The latter saves the tariff but requires higher-cost Israeli input sourcing and additional QIZ fixed costs. Therefore, whether a firm chooses to use the QIZ program depends on whether the tariff savings outweigh those costs. The model therefore links participation in the QIZ agreement to both U.S. exports and Israeli imports.

In the calibrated model, the agreement generates positive but modest aggregate welfare gains because sourcing requirements distort firms' sourcing decisions and increase their production costs. The export gains are therefore uneven across firms and sectors, while their effect on economy-wide welfare is positive but small. This concentration of benefits raises the question of whether a lower Israeli input requirement could expand firm participation and increase the gains from the agreement.

The Israeli input requirement creates a policy trade-off. A higher required input share increases sourcing from Israel per unit of QIZ exports but raises the cost of complying with the program's requirement, thereby decreasing the quantity of QIZ exports and discouraging other firms from participating in the agreement. Consequently, a more stringent requirement does not necessarily increase aggregate imports from Israel, as this depends both on the amount of Israeli inputs sourced by participating firms and on how many firms choose to participate. To examine this trade-off, I use the calibrated model to investigate the effects of alternative levels of the Israeli input requirement. I find that lowering the requirement from 10.5% to 9% increases Egyptian exports to the U.S. by 5.7% and increases Israeli imports by 0.9%. In this counterfactual, increased exports by incumbent QIZ exporters and the additional sourcing by newly participating firms more than offset the reduction in Israeli inputs used per unit exported. This leads to an increase in aggregate imports from Israel. Therefore, relaxing the requirement by 1.5 percentage points can improve Egyptian welfare while strengthening the bilateral trade link the U.S. seeks to promote out of geopolitical considerations.

Finally, I use the model's counterfactual estimates to examine the geopolitical value of the agreement. In this exercise, I assume that Egypt values increased exports, Israel values increased input sales to Egypt, and the U.S. geopolitically values stronger trade linkages between Egypt and Israel but economically disfavors higher imports from Egypt. Under these assumptions, U.S. support for the QIZ agreement requires that the geopolitical value of each dollar of Egyptian imports from Israel be at least 5.11 times the economic cost of an additional dollar of imports from Egypt. Although reducing the Israeli input requirement from 10.5% to 9% benefits both Egypt and Israel, it requires a substantially high geopolitical valuation for the U.S. to support it. Specifically, this reform generates 56.91 dollars in additional Egyptian exports to the U.S. for every additional dollar of Egyptian imports from Israel. This is much higher than the threshold of 5.11 required to support the existing agreement with a 10.5% requirement. Thus, a geopolitical valuation sufficient to implement the existing agreement may not be sufficient for the U.S. to support relaxing the input requirement.

Taken together, the results highlight how the design of input-sourcing requirements shapes both the economic benefits from trade agreements and their effectiveness in advancing geopolitical objectives. While stricter requirements increase Israeli input use per unit of QIZ exports, the associated costs may reduce exports and discourage firms from utilizing the agreement. Relaxing these requirements can therefore increase exports without weakening the intended bilateral trade relationship. However, such reforms may not align with the interests of the sponsoring country, which is the U.S. in this case, even if it supported implementing the agreement in the first place.

This paper contributes to four strands of literature:

First, the paper contributes to the literature on rules of origin and the design of preferential trade agreements. Earlier work links the costs of complying with rules of origin to the use of trade preferences (Anson et al., 2005; Sytsma, 2021). Conconi et al. (2018) show that NAFTA rules of origin reduced intermediate-input imports from nonmember countries. Related preliminary firm-level evidence finds that rules of origin under the EU–UK Trade and Cooperation Agreement distorted input sourcing of French firms and raised their production costs (Conconi et al., 2026). Sytsma (2022) shows that relaxing restrictive sourcing rules can substantially increase firm exports. Head et al. (2024) show that regional sourcing responds non-monotonically to rules of origin requirements because firms will not utilize the preference when compliance with its sourcing rules becomes too costly. I contribute to this literature by studying a trade agreement that, driven by geopolitical objectives, requires sourcing inputs from a third country. My quantitative model examines how the stringency of these requirements affects firms' participation in the agreement, Egyptian exports to the U.S., and imports from Israel. In doing so, I assess how the agreement's design shapes its effectiveness in fostering the bilateral trade linkages it seeks to promote.

Second, the paper contributes to the literature on export spillovers across destinations (Bernard et al., 2003, 2010, 2011; Bustos, 2011; Das et al., 2007). Defever et al. (2015) show that firms' entry into an export market can facilitate subsequent

entry into neighboring markets. Defever and Ornelas (2026) find that removing textile quotas by the United States and Europe increased Chinese firms' exports into other markets unaffected by this policy change. I contribute by documenting how duty-free access to the U.S. market under the QIZ agreement affected Egyptian firms' exports to other destinations. I provide survey evidence consistent with international certification as a possible channel for these export gains.

Third, the paper contributes to the literature on geoeconomics (Caldara and Iacoviello, 2022; Mohr and Trebesch, 2025). Clayton et al. (2026) analyze theoretically how governments use economic relationships to pursue their geopolitical objectives. Limão (2007) studies preferential access exchanged for cooperation on nontrade issues such as environmental cooperation, while Mattoo et al. (2024) examine how geopolitical considerations alter trade cooperation and bargaining outcomes. I contribute by studying a trilateral arrangement where the United States uses access to its market to encourage trade between two of its regional allies. I use estimates of the economic effects of the sourcing requirement to quantify the geopolitical value of bilateral trade between allies.

Fourth, the paper relates to the literature on trade and industrial policies (Abagna et al., 2025; Barteska and Lee, 2024; Bianchi and Giorcelli, 2023; Kline and Moretti, 2014; Neumark and Simpson, 2015; Siegloch et al., 2025). Manelici and Pantea (2021) and Lane (2025) document how targeted interventions to specific sectors expand firms and industries in Romania and South Korea, respectively. New research on special economic zones in developing countries has also examined how these zones induce local structural change and industrial expansion, including Wang (2013) for China, Gallé et al. (2024) for India, and Tafese et al. (2025) for Vietnam. I contribute by examining how place-based access to a foreign market generates economic gains. Although the QIZ agreement does not target specific industries, differences between U.S. tariffs across industries and the cost of satisfying the QIZ sourcing requirements concentrate participation in the textile and apparel industries. Combining firm and industry data, I study how these incentives affected exposed firms and industries.

The paper also builds on earlier studies and reports examining the QIZ agreement in Egypt and Jordan (Yadav, 2007; Nugent and Abdel-Latif, 2010; Saif, 2006; Pelzman, 2011). I extend this work by combining firm- and product-level data with variation in exposure to the agreement across firms and industries to identify its effects on trade and firm-level outcomes. I then develop a quantitative model to assess the agreement's aggregate welfare effects and how its design through input requirements shapes its economic and geopolitical objectives.

The remainder of the paper is organized as follows. Section 2 provides background on the history of the QIZ agreements and presents some descriptive statistics. Section 3 describes the data. Section 4 outlines the empirical strategies. Section 5 presents the results. Section 6 looks into the mechanisms enabling export expansion to destinations beyond the U.S. Section 7 introduces a multi-sector heterogeneous-firm model embedding the QIZ agreement. Section 8 uses the model to quantify the welfare effect of the agreement, study alternative Israeli input requirements, and investigate the geopolitical value of the agreement. Section 9

concludes.

2 Institutional Context and History

The Arab–Israeli conflict in the 20th century involved multiple wars between Arab countries and Israel. During the conflict, particularly after the 1960s, Israel was aligned with the United States of America, while several Arab republics were allies of the Soviet Union (Khalidi, 2020). In 1978, Egypt and Israel signed the Camp David Accords, which paved the way for the 1979 Egypt–Israel Peace Treaty, formally ending the state of war between them following the October War of 1973. Later, in 1994, Jordan and Israel signed the Wadi Araba Peace Treaty, following the 1993 Oslo Accords between the Palestine Liberation Organization and Israel. Both peace treaties were brokered by the United States, which had a strategic and geopolitical interest in aligning these Middle Eastern countries more closely within its sphere of influence.

The conflict inflicted significant economic and political costs on the Arab states involved. To further consolidate this regional alignment and strengthen the cold peace between Israel and its Arab neighbors, the U.S. established the legal framework for the QIZ program in 1996. Jordan's first QIZ was designated in 1998, while Egypt joined the program in 2004. The agreement states that upon an agreement between Israel and its Arab partner (Egypt or Jordan), certain regions within each Arab state would be designated as QIZs and would benefit from special trade privileges with the U.S. Specifically, firms producing within these QIZ regions would be eligible to export to the U.S. tariff-free and quota-free upon sourcing a fixed amount of inputs from the country itself and from Israel. Moreover, a substantial transformation of the product must take place within the QIZs. For both Jordan and Egypt, qualifying input and processing costs should total at least 35% of the appraised value of the product upon entry into the U.S. For Jordan, of these 35%, at least 8% should come from Israel (7% for certain high-technology products), 11.7% from Jordan itself, and the remaining 15.3% from any combination of eligible sources, including Jordanian QIZs, Israel, the U.S., and the West Bank and Gaza Strip (Congressional Research Service, 2013). For Egypt, of these 35%, at least 10.5% should come from Israel, another 11.7% from Egypt itself, and the remaining 12.8% from eligible sources, including Egyptian QIZs, Israel, and the U.S. (International Trade Administration, n.d.).

Egypt's entry into the agreement came in 2004, much later than Jordan's participation, which began with the designation of its first QIZ in 1998. Initially, Egypt was skeptical of joining the QIZ arrangement, in part because its textile and apparel exports were operating under the World Trade Organization (WTO) Agreement on Textiles and Clothing (ATC) (WTO, n.d.). However, the expiration of the ATC at the end of 2004 pushed Egypt to explore alternative mechanisms to maintain preferential market access, including the QIZ agreement (Congressional Research Service, 2013). The observed success of the QIZs in Jordan, particularly in boosting exports and creating new jobs, made the idea more appealing, provided

it did not provoke public backlash. To preempt such concerns, the Egyptian government secured the support of the Islamic institution of Al-Azhar before formally entering the agreement (Raya, 2006).

QIZs were designated in certain areas of Jordan and Egypt successively in a staggered manner. A key difference between the two countries lies in the spatial design of the zones. In Jordan, QIZs were typically fenced industrial areas located in rural regions. In contrast, Egypt designated entire administrative districts as QIZs, meaning that any firm operating within those districts could potentially benefit from the agreement. Figure A1 in the appendix shows the geographic distribution of QIZ regions across Egypt.

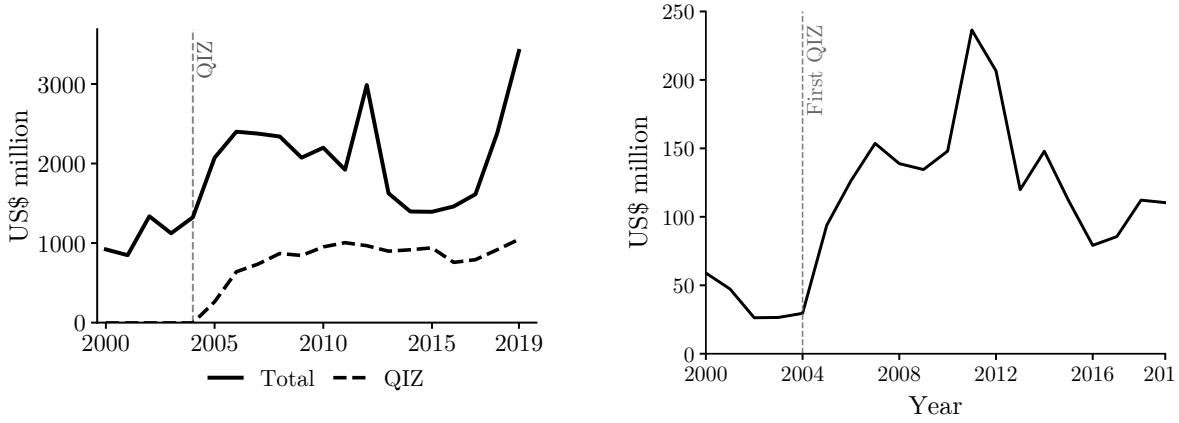
Another important aspect is that, initially, firms located within Egyptian QIZs needed individual approval from a joint QIZ committee in order to qualify for the agreement. This committee included representatives from Egypt, Israel, and the United States (QIZ Egypt, n.d.). In 2013, the United States agreed to grant QIZ status to all eligible firms and facilities located within the designated QIZ districts upon application.

The daily administration of the program is overseen by an official unit within both Egypt and Jordan, known as the QIZ Unit. These units are responsible for registering firms, issuing and renewing certifications, and facilitating all administrative procedures related to participation in the program and ensuring that its requirements are met. In addition, according to the QIZ protocols, a joint committee composed of Israeli and Egyptian or Jordanian representatives is required to meet on a quarterly basis to coordinate and oversee the implementation of the agreement (QIZ Egypt, n.d.). However, since Jordan signed its own Free Trade Agreement with the United States in 2000—which entered into force in 2001 and was fully implemented by 2010—the QIZ agreement in Jordan became less attractive to exporters. Unlike the QIZ framework, the U.S.–Jordan FTA does not impose input sourcing requirements from Israel, making it a more flexible option for Jordanian exporters (Saif, 2006; Congressional Research Service, 2013).

Figure 1, panel (a), shows in the black line total Egyptian exports to the U.S. and in the dashed line the QIZ exports out of these total exports before and after the implementation of the QIZ agreement. We observe a substantial increase in the value of QIZ exports from Egypt to the United States following the initial rollout of QIZs in December 2004–January 2005. By 2011, total QIZ exports rose to approximately $1 billion and constituted more than 50% of total Egyptian exports to the U.S. Panel (b) shows the total value of Egyptian imports from Israel, measured using Israel-reported exports to Egypt. Imports increased from approximately $29.5 million in 2004 to $93.8 million in 2005 and reached $153.6 million in 2007. They declined to $138.9 million in 2008 before peaking at $236.5 million in 2011. The increase begins in the first year following the agreement, consistent with its Israeli input-sourcing requirement, although these aggregate patterns alone cannot establish a causal effect.

To investigate whether the QIZ input requirement imposed a binding constraint on firms within Egypt and Jordan, taking a look at the Jordanian case is indicative. In contrast to Egypt, Jordan signed a free trade agreement with the United

Figure 1: Egyptian Exports to the United States and Imports from Israel

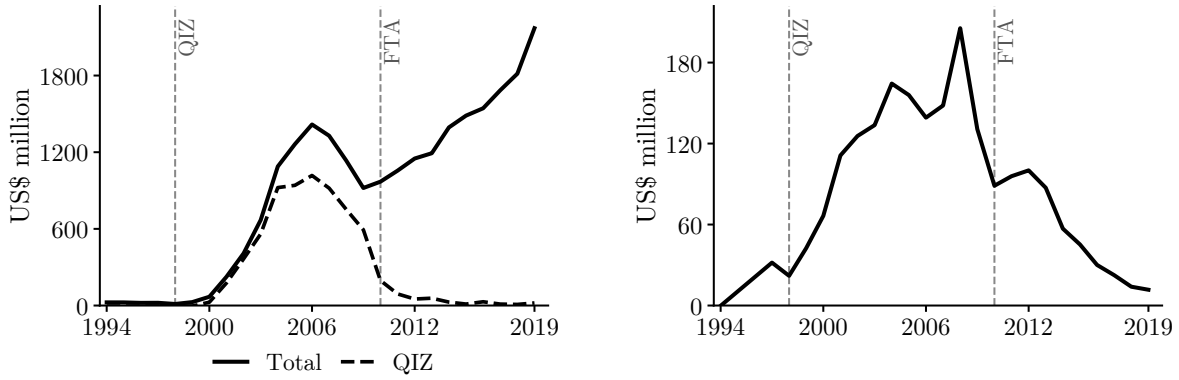


(a) Egyptian Total and QIZ Exports to U.S.

(b) Egypt's Total Imports from Israel

Notes: Panel (b) uses Israel-reported all-commodity exports to Egypt from UN Comtrade, including undisclosed product trade recorded in the country totals.

Figure 2: Jordanian Exports to the United States and Imports from Israel



(a) Jordan's Total and QIZ Exports to the U.S.

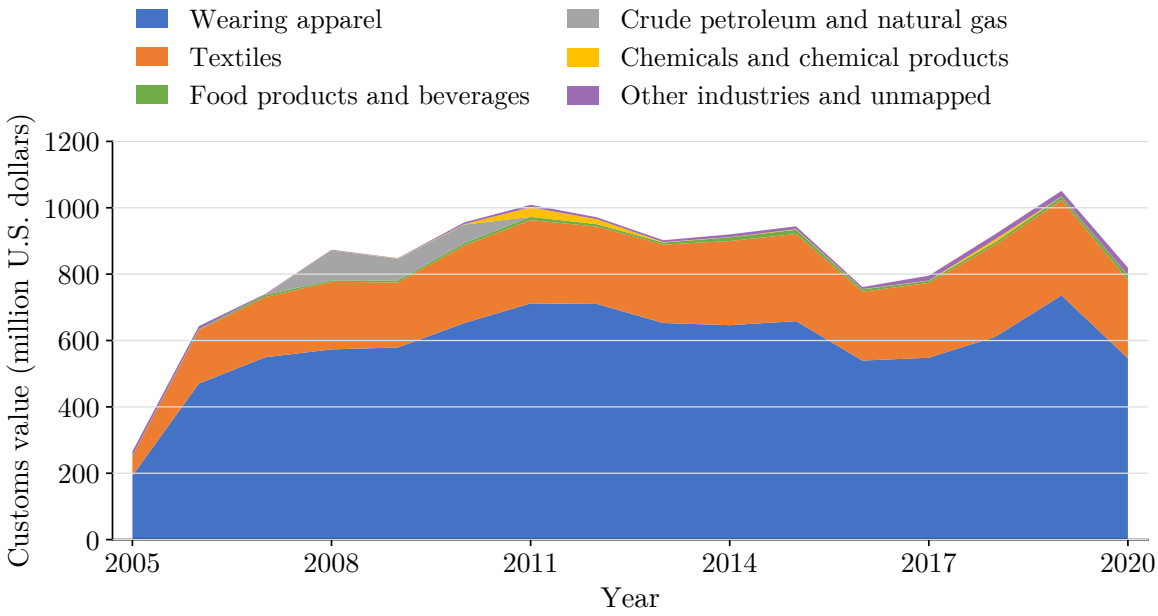
(b) Jordan's Imports from Israel

States in 2000, which entered into force in 2001 and eliminated duties by January 2010 (USTR, n.d.). This enabled Jordanian firms that wanted to export to the U.S. to choose between exporting under the QIZ program by satisfying the Israeli input requirement or exporting under the FTA with no Israeli input requirement. Figure 2, panels (a) and (b), present the same export and import dynamics as Figure 1, but for Jordan. The pattern is similar. QIZ exports to the U.S. increased by around $1 billion by 2004, six years after the first QIZ was designated in 1998, representing more than 95% of total exports to the U.S. Total exports to the U.S. were negligible before the QIZ agreement and rose substantially afterward. Although QIZ exports started declining after 2006 as the rollout of the FTA started affecting QIZ industries, total exports to the U.S. continued increasing well after 2010, reaching more than $3 billion. Figure 2(b) shows a corresponding rise in imports from Israel after 1998, peaking at approximately $200 million. However,

these imports declined sharply after 2006 as the U.S.–Jordan Free Trade Agreement's staged tariff reductions increasingly offered exporters an alternative route to preferential market access, culminating in the agreement's full implementation in 2010. Once fully implemented in 2010, firms shifted to the more profitable FTA regime, suggesting that QIZ-based regional integration was a second-best arrangement for complying firms where trade integration was only tied to market access.

The industries benefiting the most from the QIZ agreement in Egypt are textiles and apparel. As can be seen in Figure 3, textile and apparel products constituted more than 90% of QIZ exports to the U.S. throughout the period.

Figure 3: Egypt's QIZ Exports by Industry



3 Data

I draw on several complementary data sources to examine the effects of the QIZ agreement on Egyptian exports, manufacturing activity, and firm-level adjustment. The main analysis combines product-level trade data, industry-level manufacturing statistics, administrative customs records, and firm-level survey data. These sources allow me to examine changes in trade and manufacturing outcomes and investigate potential mechanisms of firm adjustment, including certification, input sourcing, and foreign investment linkages.

Product- and Industry-Level Data

To examine the effects of the QIZ agreement on trade, I use detailed trade data from UN Comtrade covering 1996–2020 and U.S. customs data recording imports

from Egypt and the World at the six-digit (HS6) product level for 1997–2020. I complement these records with actual 2003 and 2004 applied U.S. MFN tariffs from the WTO Integrated Database. Together, these data allow me to examine changes in Egyptian export performance across products while accounting for differences in U.S. tariff protection.

For Egypt's imports from Israel, I use Israel-reported exports to Egypt and the World from UN Comtrade for 1996–2020. I combine these flows with Egypt's 2000/01 input-output table to measure how input-supplying industries are linked to downstream industries benefiting from U.S. tariff preferences. The baseline uses the pre-agreement 2000/01 production linkages; the Appendix reports results using the later 2008/09 table. The import sample retains all mapped HS6 merchandise, including nonmanufacturing goods.

Firm-Level Data

Two firm-level datasets are used to examine firm responses to the QIZ agreement: administrative customs records from Egypt and the World Bank Enterprise Surveys. The customs records allow me to track changes in firms' trade activities, while Enterprise Surveys provide information on some firm characteristics and practices that can shed light on potential mechanisms driving the trade responses to the QIZ agreement.

Administrative customs records. I use firm-level import and export data for 2005–2016 compiled by the General Organization for Export and Import Control (GOEIC) and accessed through the Economic Research Forum (ERF). These administrative records cover the universe of Egyptian firms engaged in international trade and report import and export values by firm, trading partner, HS6 product, and port used.

Using unique firm identifiers, I link import and export records and construct a firm-level panel of trading activity. This allows me to examine changes in firms' export behavior following their first observed import from Israel, a particularly relevant observation given that the QIZ agreement mandates an Israeli-input requirement. I also distinguish between incumbent exporters and new entrants.

World Bank Enterprise Surveys. Mechanisms through which the QIZ agreement affects firm behavior can be investigated using firm-level data from the World Bank Enterprise Surveys for Egypt. I exploit multiple survey rounds (2004, 2007, 2008, 2013, 2016, 2020) and their panel component. The surveys provide detailed information on firm characteristics that are not captured in the administrative customs records. I focus particularly on certification, fixed asset investments, the adoption of foreign technology, and foreign ownership of the firm as potential mechanisms facilitating trade adjustment.

Additional Data In addition to the datasets described above, I use industry-level data from the United Nations Industrial Development Organization (UNIDO)

for an empirical exercise reported in the appendix. Additionally, I use Egypt's input-output and supply-use tables for 2000/01, 2008/09, and 2016/17, provided by the Central Agency for Public Mobilization and Statistics (CAPMAS). I also use the 2017 Economic Census data, provided by the Economic Research Forum (ERF), to calibrate the model.

4 Empirical Strategies

To identify the economic impact of QIZs, I use two different empirical strategies.

4.1 Triple-Difference Analysis of Trade Flows

I exploit variation in products' and industries' exposure to the QIZ agreement to estimate its effects on Egyptian trade and manufacturing activity. The main source of variation is the U.S. most-favored-nation (MFN) tariff that Egyptian exporters faced before the agreement. Since the QIZ program eliminated these tariffs for eligible exports, products facing higher initial tariffs stood to benefit more from the agreement. I use this variation to examine two trade responses: the increase in Egyptian exports to the United States and the increase in imports from Israel induced by the agreement's input-sourcing requirement.

Measuring exposure to the agreement. For exports to the United States, I measure each product's exposure using its pre-agreement MFN tariff:

$$\text{Exposure}_p^{\text{exp}} = \text{MFN}_{p,2004}, \tag{1}$$

where p denotes an HS6 product and tariffs are measured in percentage points. The intuition is straightforward: a higher initial tariff implies a larger potential benefit from obtaining duty-free access through the QIZ program, and therefore a stronger incentive to satisfy its sourcing requirements. I use the 2004 applied MFN tariffs in the baseline specification and 2003 tariffs as a robustness check. I harmonize tariff and trade classifications using product concordances and take the arithmetic mean when multiple tariff lines map to the same HS6 product. The analysis covers manufacturing products in ISIC Revision 3 divisions 15–37.

For imports from Israel, the relevant exposure depends on how strongly an imported product is linked to Egyptian industries benefiting from preferential access to the U.S. market. Under the QIZ agreement, firms seeking duty-free access must source part of their inputs from Israel. I therefore expect Israeli imports to increase more for products supplied to Egyptian industries facing larger initial U.S. tariffs.

To capture these linkages, I use Egypt's 2000/01 input-output table. Let $Z_{ij,2000/01}$ denote intermediate sales from supplying industry i to purchasing industry j. I construct import exposure for each HS6 product h as

$$\text{Exposure}_h^{\text{imp}} = \sum_{q \in \mathcal{P}} \frac{s_{i(h),j(q),2000/01}}{N_{j(q)}} \text{MFN}_{q,2004}, \qquad s_{ij,2000/01} = \frac{Z_{ij,2000/01}}{\sum_\ell Z_{i\ell,2000/01}}, \quad (2)$$

where $i(h)$ is the industry supplying imported product h, $j(q)$ is the industry producing downstream product q, and N_j is the number of products with available tariffs in industry j. The weight $s_{ij,2000/01}$ measures the share of industry i's intermediate sales going to industry j, which is distributed equally across the latter's products.

This measure assigns greater exposure to Israeli products supplied by industries whose Egyptian customers benefit more from the QIZ tariff preferences. For example, an input-supplying industry selling a large share of its output to apparel producers would receive greater exposure if apparel products faced high initial U.S. tariffs. Each imported HS6 product inherits the exposure of its supplying industry, while trade flows remain measured at the HS6 level. One unit of exposure corresponds to one percentage point of the input-output-weighted tariff index.

Both measures use information determined before the agreement. Export exposure relies on pre-agreement U.S. tariffs, while import exposure combines these tariffs with input-output relationships from 2000/01. This avoids constructing exposure using trade flows or sourcing patterns that may have responded to the agreement. Moreover, U.S. MFN tariffs applied broadly across trading partners and were not set specifically in response to Egypt's participation in the QIZ program. As a robustness check, I also construct import exposure using the 2008/09 input-output table. Since these later relationships may themselves reflect adjustment to the agreement, I report these results in the Appendix.

Empirical specification. To estimate the effect of the agreement on trade, I use a triple-difference strategy that compares products with different levels of exposure, before and after the agreement, across Egypt and other trading partners. The third difference is important because changes in trade following the agreement may reflect broader product-specific shocks rather than the QIZ program itself. By comparing Egypt with other trading partners, I can control for shocks that affect trade in the same products more generally.

I estimate the following event-study specification separately for exports and imports using Poisson pseudo-maximum likelihood (PPML):

$$\begin{aligned}\mathbb{E}[Y_{pct} \mid \mathbf{X}_{pct}] = \exp\Big[&\sum_{\substack{k \in \mathcal{K} \\ k \neq -1}} \beta_k \left(\text{Exposure}_p^{\text{exp/imp}} \times D_c \times \mathbf{1}\{t - 2005 = k\} \right) \\ &+ \alpha_{pt} + \gamma_{ct} + \delta_{pc} \Big].\end{aligned} \quad (3)$$

Here, Y_{pct} denotes trade in product p, trading-partner category c, and year t. The indicator D_c equals one for Egypt and zero for the rest of the world. For the

export analysis, I use U.S.-reported imports from Egypt and compare them with U.S. imports from all other countries. For the import analysis, I use Israel-reported exports to Egypt and compare them with Israeli exports to all other destinations. The sample covers years 1997–2020. I balance the panels across products, trading partners, and years, retaining zero trade flows, which are accommodated by the PPML estimator.

The agreement entered into force in Egypt in 2005, and I use 2004 as the omitted reference year. Product-by-year fixed effects, α_{pt}, absorb shocks affecting trade in a given product that are common across trading partners. In the export analysis, these include changes in U.S. demand for particular products, while in the import analysis they capture changes in Israeli product supply. Trading-partner-by-year fixed effects, γ_{ct}, control for annual shocks common across products for a given partner, and product-by-partner fixed effects, δ_{pc}, absorb time-invariant differences in trade relationships. The coefficients β_k therefore measure how trade with Egypt changes across products with different exposure levels, relative to other trading partners and to the pre-agreement year.

In my preferred export specification, I further control for trading-partner-by-HS2-by-year fixed effects, $\eta_{c,s(p),t}$, replacing γ_{ct}. This allows Egypt and other suppliers to experience different shocks across broad product categories, so identification comes from tariff variation across HS6 products within the same HS2 chapter. For Israeli imports, I report both the baseline specification and one including trading-partner-by-broad-sector-by-year fixed effects. The broad sectors are agriculture, extraction, textiles and apparel, other manufacturing, and utilities and services. I do this because import exposure is common to products within the same input-output industry; including partner-by-input-output-industry-by-year fixed effects would absorb the variation used to identify the effect.

I also estimate the average post-agreement effect by replacing the annual event-time interactions with a single interaction between exposure, Egypt, and a post-2004 indicator.

For the export analysis, I cluster standard errors at the HS6 product level. For imports, I cluster at the input-output industry level, where exposure varies, allowing for correlation across products within the same industry over time. The 2000/01 input-output classification contains 16 traded industries. Tables report clustered standard errors, while event-study figures show pointwise 95% confidence intervals using a $t(G-1)$ reference distribution, where G denotes the number of clusters.

To assess the validity of the identifying assumption, I examine whether more exposed products experienced differential trade changes before the agreement. I jointly test whether the pre-agreement event-study coefficients are equal to zero. Given the limited number of clusters in the import analysis, I complement conventional Wald tests with null-imposed wild cluster score-bootstrap tests following Kline and Santos (2012) and Roodman et al. (2019). The bootstrap re-estimates the fixed effects and post-treatment coefficients under the joint null, using 99,999 Webb-weight draws at the relevant clustering level. I also report results using Rademacher weights.

The identifying assumption is that, absent the QIZ agreement, changes in Egypt's trade relative to other trading partners would not have been systematically related to the pre-agreement exposure measures, conditional on the fixed effects. Although this assumption cannot be tested directly, the event studies allow me to examine whether differential trends were already present before the agreement.

Manufacturing activity. I report complementary industry-level estimates in Appendix C. This exercise compares changes in three-digit manufacturing outcomes across industries with different pre-agreement tariff exposure, using industry and year fixed effects. The appendix describes the data, construction of the exposure measure, and regression estimates.

4.2 Firm-Level Event Study

To examine how QIZ participation affects firms' exporting behavior, I use administrative customs data covering the universe of Egyptian exporters and importers between 2005 and 2016, disaggregated by firm, HS6 product, and partner country. Since the customs records do not directly identify which firms utilize the QIZ program, I use the timing of firms' first imports from Israel as a proxy for participation. This is motivated by the fact that Israeli sourcing is a requirement for obtaining preferential access to the U.S. market under the agreement. Moreover, since Israeli inputs are more costly than those from alternative suppliers as shown by customs records, firms have an incentive to begin sourcing from Israel only because of the QIZ program. Nevertheless, some firms importing from Israel may not actually participate in the program. To the extent that these firms do not benefit from preferential access, their inclusion in the treated group would tend to attenuate the estimated effects, making the observed export responses a potentially conservative measure of the gains among actual QIZ participants.

I define a firm as treated in year t if it begins importing from Israel in that year, with no recorded imports from Israel in earlier years. Firms that never import from Israel during the sample period constitute the comparison group. Firms already importing from Israel in 2005 are excluded from the treated group, as the beginning of their Israeli sourcing cannot be observed. I construct an annual panel of firms that exported at least once during the sample period, assigning zero exports in years without recorded export activity.

The main analysis focuses on textile and apparel firms, which account for the vast majority of QIZ exports to the United States. I identify these firms by their dominant export product, restricting the sample to products within chapters 50–63. The baseline analysis includes 110 firms whose first Israeli import occurred between 2008 and 2012 and a pool of 1,630 potential comparison firms that never imported from Israel. I also extend the analysis to all eligible firms importing from Israel between 2006 and 2015 as a robustness exercise.

To estimate the dynamic export responses, I compare firms beginning to import from Israel with firms that never do so, separately for each first-import cohort g

as suggested by Sun and Abraham (2021). I estimate the following event-study specification:

$$Y_{igt} = \alpha_{ig} + \lambda_{g,s(i),t} + \sum_{\substack{k \in \mathcal{K}_g \\ k \neq -1}} \theta_{gk} D^k_{igt} + \varepsilon_{igt}, \tag{4}$$

where Y_{igt} denotes the outcome of firm i in year t in the comparison associated with cohort g. The indicator D^k_{igt} equals one when a treated firm is k years from its first recorded Israeli import and zero otherwise. The firm-by-cohort fixed effects, α_{ig}, absorb time-invariant differences across firms within each cohort comparison, while the cohort-by-HS2-by-year fixed effects, $\lambda_{g,s(i),t}$, control for shocks common to firms in the same export chapter and calendar year within each cohort comparison. The year immediately preceding the first Israeli import, $k = -1$, is omitted and serves as the reference period.

The coefficients θ_{gk} trace the evolution of firm outcomes before and after the beginning of Israeli sourcing. To account for potential heterogeneity in treatment effects across cohorts and avoid problematic comparisons between firms treated at different times, I allow the coefficients to vary by cohort and aggregate them using the interaction-weighted estimator of Sun and Abraham (2021). The aggregation weights reflect the number of treated firms contributing to each event time. I also report conventional two-way fixed-effects event-study estimates that impose common coefficients across cohorts. Both specifications include all observed event-time indicators, while the figures display event years -3 through $+4$. Standard errors are clustered at the firm level, which is the treatment level.

For outcome variables, I examine total exports, exports to the United States and other destinations, the number of exported HS6 products, and the number of destination markets served. For export values, I use a thresholded log transformation, $\log(\max\{x, 10{,}000\})$, assigning a common lower bound to zero and small export flows as suggested by Chen and Roth (2024) and implemented recently by Barteska et al. (2026). This threshold lies just below the weighted 10th percentile of positive pre-event U.S. exports in the matched sample. The resulting estimates capture both the entry of firms into export markets and changes in sales among existing exporters, rather than changes along the intensive margin alone. I also report results using export levels and alternative outcome specifications in the online Appendix.

Coarsened Exact Matching

A potential concern is that firms beginning to import from Israel may differ systematically from firms that never do so. For example, treated firms may be larger, more internationally integrated, or already expanding their exports before entering the QIZ program. Comparing these firms directly could therefore confound the export response associated with Israeli sourcing with pre-existing differences in firm characteristics.

To address this concern, I construct a matched comparison group using Coars-

ened Exact Matching (CEM). Within each treatment cohort, I match firms operating in the same dominant export HS2 chapter and with similar total exports in the year preceding the first Israeli import. Export values are divided into bins using thresholds of \$10,000, \$100,000, and \$1 million. I additionally match on earlier export growth, measured between years $g-3$ and $g-2$. Treated firms receive unit weights, while comparison firms are reweighted within each matched cell to reproduce the number of treated firms. The procedure retains all 110 treated firms and 1,630 distinct comparison firms in the baseline matched sample.

Matching improves the comparability of treated and control firms based on observed pre-event characteristics, while the event-study coefficients allow me to examine whether their export trajectories differed before the first recorded Israeli import. However, the timing of Israeli sourcing is an endogenous firm decision and may not coincide exactly with the beginning of QIZ participation. I therefore interpret the estimates as changes in exporting behavior associated with the onset of Israeli sourcing, taking into account the observed pre-event dynamics.

5 Results

In this section, I investigate the economic effects of the QIZ agreement by presenting the results of the empirical analysis described in the previous section. I begin by examining how the QIZ agreement affected product-level trade between Egypt and the United States, as well as between Egypt and Israel. I briefly discuss complementary industry-level estimates reported in the appendix before examining the impact of the QIZ agreement on firms.

5.1 QIZ and U.S. Exports

Table 1 reports export estimates from the pooled version of Equation (3). In the preferred specification in column (1), which measures exposure using 2004 MFN tariffs, the DDD coefficient is 0.0789 (standard error 0.0329; $p = 0.017$). This implies that a one-percentage-point higher baseline tariff is associated with an 8.2% larger post-agreement increase in Egyptian exports to the U.S. relative to non-Egyptian suppliers. A ten-percentage-point difference in baseline tariffs corresponds to approximately 120% greater relative export growth. These results indicate that the agreement generated larger export gains for products facing higher initial U.S. tariffs. Columns (2)–(4) show that the findings are robust to measuring exposure using 2003 MFN tariffs and clustering standard errors at the two-digit product level (HS2) rather than the six-digit level (HS6).

Figure 4 presents the corresponding event-study estimates. The results show a persistent increase in relative Egyptian exports among products facing higher initial MFN tariffs. The joint test of pre-trends does not reject the null of zero pre-treatment effects (Webb score-bootstrap p-value of 0.640 and conventional Wald p-value of 0.666). By 2020, the estimated relative export response reaches 14.2% per tariff percentage point, with a 95% confidence interval of 7.8–20.9%. These

Table 1: Manufacturing Exports to the United States: Pooled Estimates

	HS6 clustering		HS2 clustering	
	2004 MFN	2003 MFN	2003 MFN	2004 MFN
	(1)	(2)	(3)	(4)
DDD coefficient	**0.0789****	**0.0776****	**0.0776****	**0.0789****
	(0.0329)	(0.0327)	(0.0304)	(0.0307)
Response to 1 pp MFN	8.2%	8.1%	8.1%	8.2%
Fixed effects				
Trade partner × HS6	Yes	Yes	Yes	Yes
HS6 × year	Yes	Yes	Yes	Yes
Trade partner × HS2 × year	Yes	Yes	Yes	Yes
Observations	148,420	148,420	148,420	148,420
Years	1997–2020	1997–2020	1997–2020	1997–2020
Clusters	4,390	4,390	89	89
Bootstrap pretrend p-value	0.640	0.609	0.966	0.976

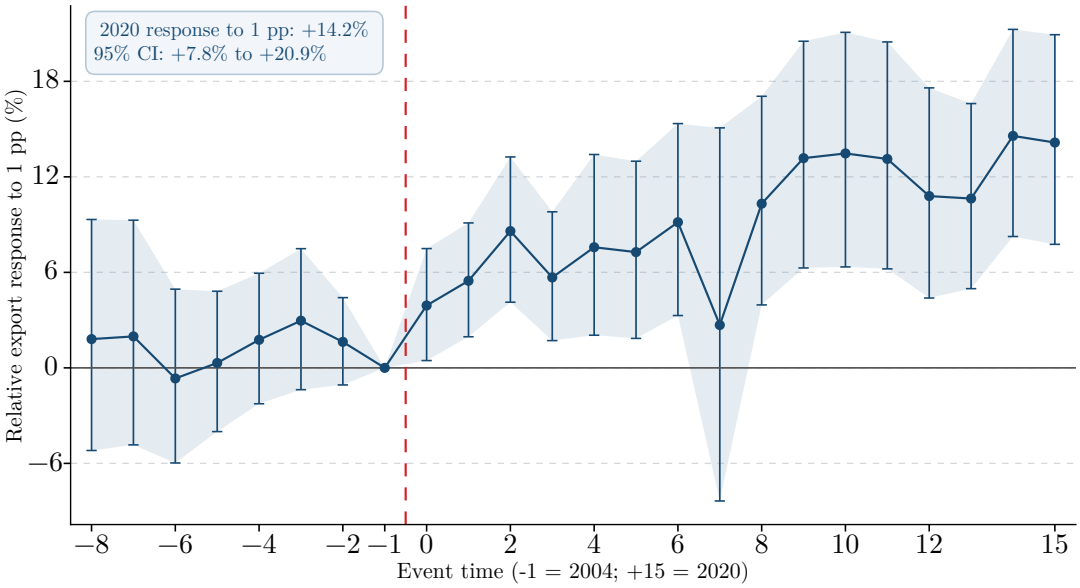
Notes: Standard errors clustered at the level indicated in the column headings are in parentheses; $^{**}p < 0.05$. Bootstrap p-values test joint pretrends (Webb weights).

results are consistent with larger gains from preferential market access among products facing higher initial tariffs. Importantly, the inclusion of exports to the U.S. from other countries allows me to control for product-specific U.S. demand shocks through product-by-year fixed effects. These absorb changes in U.S. demand for a given product that are common across exporting countries, helping isolate the Egypt-specific response to the agreement. The observed export expansion, however, may reflect both growth in existing trade flows (intensive margin) and the emergence of new trade flows (extensive margin).

5.2 QIZ and Imports from Israel

Table 2 reports estimates from the pooled version of Equation (3), examining the effects of the QIZ agreement on imports from Israel using the import exposure measure defined in the previous section. The results show that imports from Israel increased more for products supplied by Israeli industries whose downstream Egyptian customers benefited from larger U.S. tariff preferences. In column (1), the pooled DDD coefficient is 0.7386 (standard error 0.0854), corresponding to a 109.3% larger relative post-agreement increase in imports per percentage point of input-weighted MFN exposure. Including trade-partner-by-broad-sector-by-year fixed effects in column (2) yields a coefficient of 1.0125 (standard error 0.1433), corresponding to a 175.2% relative increase. These findings suggest that the QIZ agreement increased Egyptian demand for Israeli inputs, particularly those used more intensively by industries benefiting from preferential access to the U.S. market.

Figure 4: Triple Difference Effects on Exports to the United States



Notes: Fixed effects: trade partner × HS6, HS6 × year, and trade partner × HS2 × year. Pointwise 95% confidence intervals are clustered by HS6; the bootstrap joint-pretrend p-value is 0.640.

Table 2: Imports from Israel: Pooled Estimates

	Baseline	Sector FE	Sector FE + trends
	(1)	(2)	(3)
DDD coefficient	**0.7386*****	**1.0125*****	**0.3611*****
	(0.0854)	(0.1433)	(0.0829)
Response to 1 pp exposure	+109.3%	+175.2%	+43.5%
Fixed effects and trends			
Trade partner × HS6	Yes	Yes	Yes
HS6 × year	Yes	Yes	Yes
Trade partner time effects	Partner× Year	Partner×Sector ×year	Partner×Sector ×year
Egypt × industry linear trends	No	No	Yes
Observations	103,005	102,729	102,729
Years	1996–2020	1996–2020	1996–2020
IO-industry clusters	16	16	16
Bootstrap pretrend p-value	0.545	0.139	–

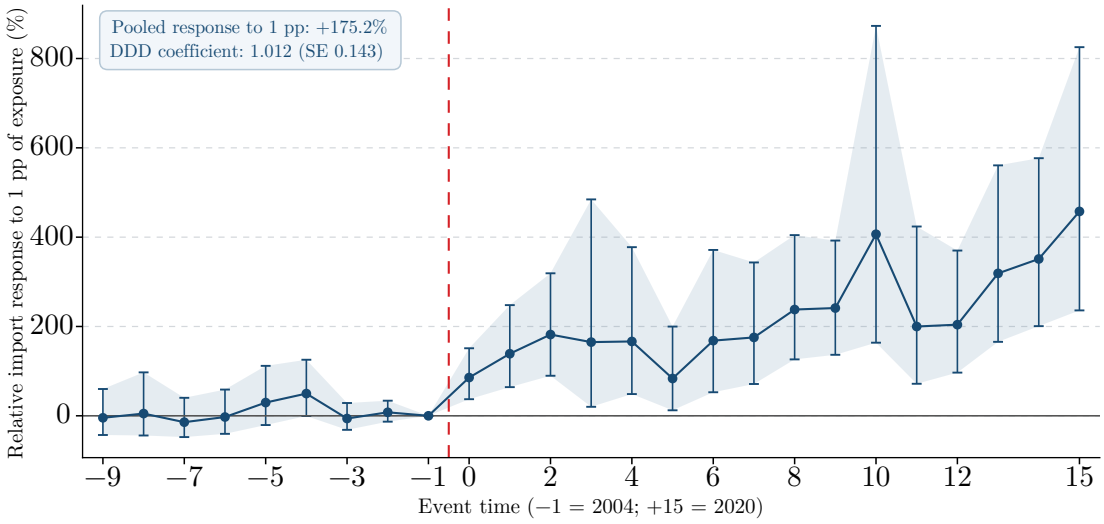
Notes: Sector FE denotes trade partner × broad sector × year effects; column (3) adds Egypt × industry linear trends. Standard errors clustered by IO industry in parentheses; ***$p < 0.01$. Bootstrap p-values test joint pretrends (Webb weights); – denotes not applicable.

Figure 5 presents the corresponding event-study estimates with trade-partner-by-sector-by-year fixed effects. The results show a substantial increase in relative imports from Israel, reaching 457.6% per exposure percentage point by 2020. The joint pre-trend test yields mixed evidence. While the Webb score-bootstrap does

not reject the null of zero pre-treatment effects ($p = 0.139$), the conventional Wald test rejects it ($p < 0.001$). This discrepancy highlights the sensitivity of pre-trend inference to the inference procedure, particularly given that inference relies on only 16 input-output industry clusters. The dynamic estimates should therefore be interpreted with this limitation in mind. Appendix A.2 presents the corresponding event study with trade-partner-by-year fixed effects.

These findings are consistent with the mechanism underlying the QIZ agreement: larger tariff preferences for downstream producers increase their incentives to source inputs from Israel. The estimates capture changes in imports associated with exposure to the agreement rather than direct measures of compliance by firms with the Israeli input requirement. Appendix A.3 reports robustness results using the 2008/09 input-output tables, with pooled estimates remaining positive under the alternative IO weights.

Figure 5: Dynamic Triple Difference Effects on Imports from Israel



Notes: Exposure uses 2000/01 input-output weights. Fixed effects: trade partner × HS6, HS6 × year, and trade partner × broad sector × year. Pointwise 95% confidence intervals are clustered by input-output industry (16 clusters); the bootstrap joint-pretrend p-value is 0.139.

5.3 QIZ and Industry

Complementary industry-level evidence is reported in Appendix C. Comparing three-digit manufacturing industries, the estimates are consistent with an expansion in output, employment, value added, and total wages among industries more exposed to the agreement. However, the estimates are generally imprecise, and their statistical significance varies across samples. Incomplete coverage and the harmonization of industry classifications limit the conclusions that can be drawn from this evidence.

5.4 QIZ and Firms

The preceding trade analysis shows that exposure to the agreement was associated with changes in U.S. exports and Israeli imports. I now examine how individual firms' exports evolved around their first recorded import from Israel. Israeli sourcing is a useful indicator of potential QIZ utilization, although the customs records do not identify firms' QIZ registrations or preference claims.

I study textile and apparel firms whose first recorded Israeli import occurred between 2008 and 2012. The matched sample contains 110 such firms and 1,630 distinct comparison firms that never imported from Israel during the customs panel. I use coarsened exact matching within a firm's dominant export HS2 chapter, based on total exports in the year before the event and, where supported, earlier total-export growth. The event studies include firm-by-cohort and cohort-by-HS2-by-year fixed effects, with standard errors clustered by firm. Event year zero is the first recorded Israeli import, and year -1 is the omitted reference period. To address concerns about potentially misleading comparisons across treatment cohorts in staggered difference-in-differences designs, I report cohort-weighted Sun–Abraham estimates alongside conventional two-way fixed-effects (TWFE) estimates.

Total Exports

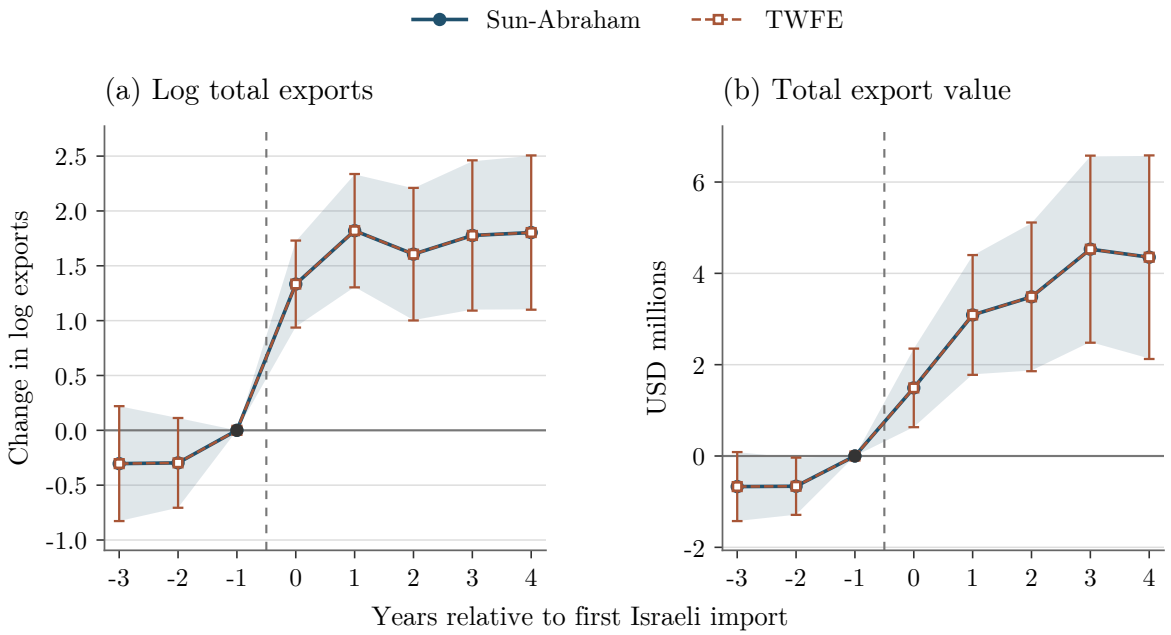
Figure 6 shows a substantial increase in total exports around the first Israeli import. In the Sun–Abraham specification, thresholded log total exports rise by 1.33 log points in event year zero and by 1.82 log points in the following year. In levels, the corresponding estimates are approximately \$1.49 million and \$3.09 million per firm. The two displayed pre-event log coefficients are jointly indistinguishable from zero ($p = 0.364$). The TWFE and Sun–Abraham post-event estimates are nearly identical in this sample, indicating that the post-event pattern is insensitive to the choice between these two estimators.

The customs measure may include firms that purchased Israeli inputs without claiming QIZ preferences. Such firms would dilute the estimated response among actual QIZ users if their exports otherwise followed those of the matched controls. Comparison firms have no recorded direct Israeli sourcing. This makes them a relevant benchmark, although purchases through intermediaries remain possible.

Export Growth across Destinations

Figure 7 examines whether the export expansion extended beyond the U.S. market directly targeted by the agreement. The results show substantial increases in exports to both the United States and other destinations following firms' first recorded imports from Israel. U.S. exports increase by 1.20 log points in the first-import year and 1.34 log points one year later. Exports to non-U.S. destinations also rise substantially, by 0.90 and 1.29 log points, respectively. In levels, the corresponding average increases over years zero and $+1$ amount to approximately \$0.85 million in U.S. exports and \$1.44 million in non-U.S. exports. These findings

Figure 6: Total exports around the first recorded Israeli import



Notes: Textile and apparel firms, 2008–2012 first-import cohorts (110 treated; 1,630 never-importer controls). Matched within dominant export HS2 on pre-event size and, where observed, growth. Firm-by-cohort and cohort-by-HS2-by-year fixed effects; firm-clustered standard errors. Shading and bars show 95% confidence intervals for Sun–Abraham and TWFE estimates, respectively.

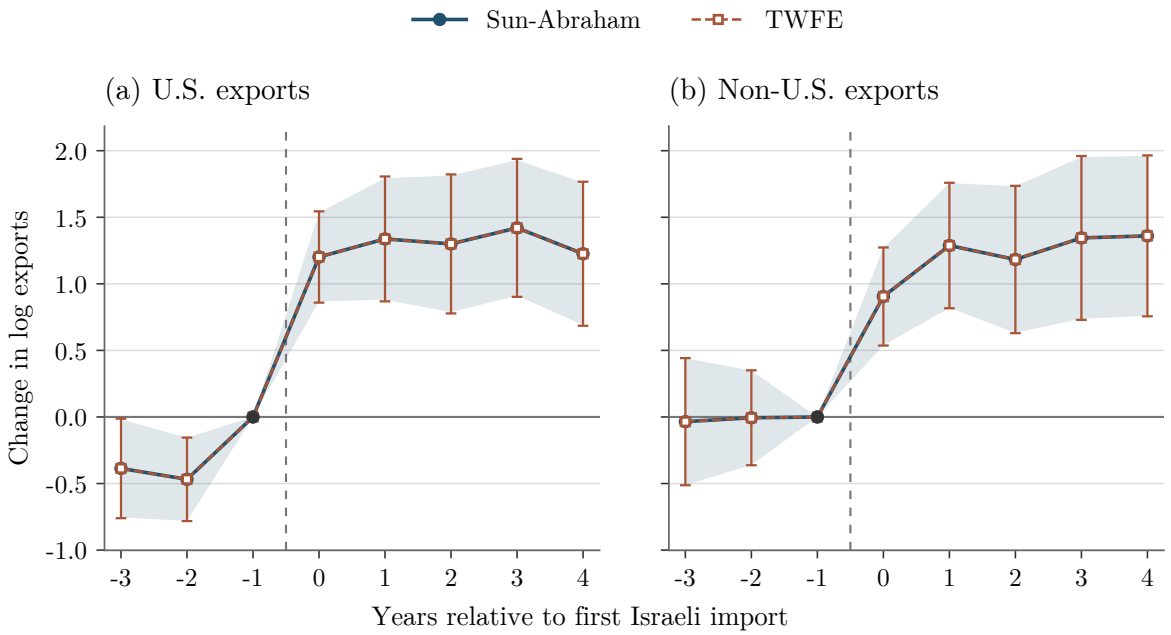
point to a broad expansion in firms' international sales, consistent with positive export spillovers beyond the market directly targeted by the agreement.

Importantly, the expansion in non-U.S. exports is not preceded by significant differential pre-trends, with the joint test of pre-event coefficients failing to reject zero ($p = 0.981$). For U.S. exports, the pre-event coefficients at -3 and -2 are negative relative to the omitted year -1, and jointly significant ($p = 0.011$), suggesting that firms had already begun expanding their U.S. sales before their first recorded Israeli import. This pattern indicates that entry into Israeli sourcing may be part of a broader adjustment process associated with expansion into the U.S. market, rather than marking its precise beginning. While this limits a causal interpretation of the U.S. post-event response, the substantial and persistent growth in non-U.S. exports, together with the absence of significant pre-trends in those markets, provides suggestive evidence of export spillovers associated with QIZ participation.

Number of Products and Destinations

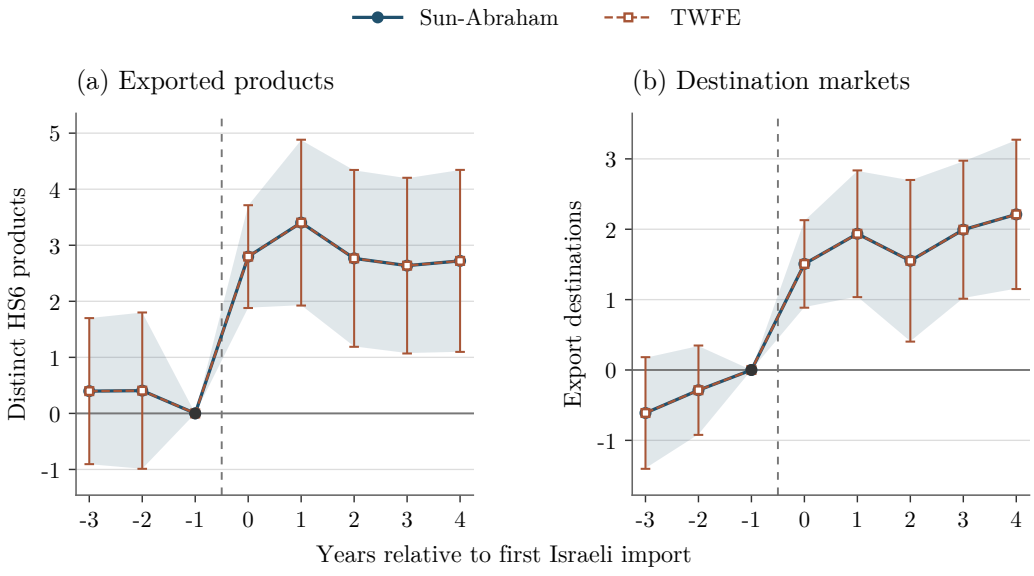
The increase in non-U.S. exports was accompanied by an expansion in the number of products exported and destinations served, suggesting that export growth also occurred along the extensive margin. Figure 8 shows that firms exported an additional 2.80 HS6 products and served 1.51 additional destinations in the first-import year, increasing to 3.40 products and 1.94 destinations one year later. These find-

Figure 7: Exports by destination around the first recorded Israeli import



ings suggest that the increase in non-U.S. exports reflects not only higher sales in existing markets but also firms' expansion into new products and destinations, consistent with broader access to international markets following QIZ participation.

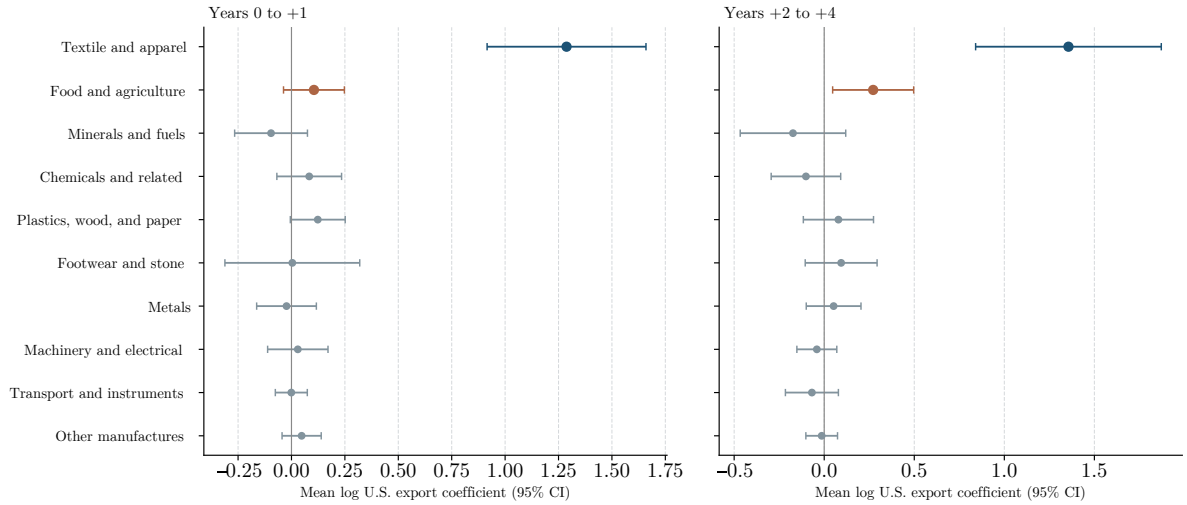
Figure 8: Number of products and destinations around first Israeli import.



5.5 Robustness Checks

I assess the robustness of the results through several additional exercises. Figure 9 presents a sectoral placebo test, in which I re-estimate the first-import event study separately for firms in different economic sectors. The figure shows that the average response of U.S. exports following the first import event is substantially larger for textile and apparel firms, while the estimated effects for firms in other sectors are statistically indistinguishable from zero. Food and agriculture firms show a positive response in years +2 to +4, consistent with the fact that some products in these sectors also benefited from the QIZ agreement. This exercise shows that the estimated export response is concentrated in the sectors most exposed to the QIZ agreement, rather than reflecting a broader increase in exports across sectors.

Figure 9: Post-event U.S. export responses across different sectors.



Notes: Each sector is estimated separately with Sun–Abraham estimator after matching.

Additional robustness checks are reported in Appendix D. Comparing first imports from Israel with those from six other countries, Figure D6 shows a substantially larger U.S. export response for Israel (1.27 log points) than for other origins (0.17–0.34). This result supports the interpretation that the response to Israeli sourcing reflects the QIZ preferential treatment rather than general effects of importing inputs from abroad. Additional checks using alternative cohorts, matching strategies, and different outcome definitions yield similar positive post-event responses. The findings are consistent across specifications.

6 Mechanisms

6.1 Empirical Approach

I examine several potential mechanisms behind the expansion of exports to non-U.S. destinations using successive waves of the World Bank Enterprise Surveys in

Egypt. I focus on international certification, foreign ownership, foreign-licensed technology, and investment in fixed assets. Certification may help firms meet buyers' requirements, while foreign owners and technology can facilitate access to new destinations. Investment may also allow firms to expand their capacity to serve foreign markets. I estimate:

$$Y_{it} = \alpha_i + \lambda_{t,G_i} + \beta_N \left(E_{i,2004} \times Post_t\right) + \theta \left(E_{i,2004} \times Post_t \times G_i\right) + \varepsilon_{it}. \quad (5)$$

where Y_{it} denotes one of the four outcomes and $E_{i,2004}$ is the average 2004 MFN tariff in the firm's 2004 industry, measured in percentage points. $Post_t$ equals one from 2005 onward. The time-invariant indicator G_i equals one if the firm reports positive direct or indirect exports in any observed survey wave from 2004 to 2020. It therefore uses post-agreement information and describes exporter heterogeneity rather than a predetermined treatment group. Firm fixed effects are denoted by α_i, and λ_{t,G_i} denotes exporter-status-by-survey-wave fixed effects. The coefficient θ measures how the post-agreement response to tariff exposure differs between exporting firms and other firms; the exporter response itself is $\beta_N + \theta$.

6.2 Results

Table 3: MFN Exposure and Firm Adjustment

	International certification (1)	Foreign ownership share (2)	Foreign-licensed technology (3)	Fixed-asset investment (4)
MFN × Post × Exporter	**1.612*****	**0.127**	**0.167**	**0.302**
	(0.690)	(0.290)	(0.882)	(1.494)
Bootstrap p-value	0.011	0.580	0.803	0.797
Observations	2,120	2,118	2,091	1,744
Firms	655	655	647	541
Firm fixed effects	Yes	Yes	Yes	Yes
Exporter-status × wave FE	Yes	Yes	Yes	Yes

Notes: Each column reports θ from Equation (5). Outcomes are expressed on a 0–100 scale; foreign ownership is the foreign-owned share, and the other outcomes are indicators. Firm-clustered standard errors are in parentheses; bootstrap p-values use 999 restricted Rademacher draws.

Table 3 shows a positive certification response among exporting firms more exposed to the QIZ relative to other firms. The coefficient in column (1) is 1.612 percentage points, with a firm-clustered standard error of 0.690 and a bootstrap p-value of 0.011. A one-percentage-point higher baseline MFN tariff is therefore associated with a 1.61-percentage-point larger post-agreement increase in certification among exporting firms. This pattern is consistent with firms adopting international standards that may facilitate sales to destinations beyond the United States.

The remaining columns show no statistically significant difference in foreign ownership, foreign-licensed technology, or investment in fixed assets. The estimates provide the clearest support for international certification as a potential channel for export spillovers. These findings are consistent with certification facilitating access to foreign buyers and contributing to export expansion across destinations.

The certification estimate remains positive with additional industry-by-survey-wave controls and alternative exporter definitions. Appendix Table E1 reports these alternative specifications.

7 Model

In this section, I develop a quantitative model to evaluate the effects of the QIZ agreement on Egyptian welfare and trade between Egypt and Israel. The QIZ agreement creates a trade-off: firms can obtain duty-free access to the U.S. market conditional on satisfying sourcing requirements, including a minimum share of Israeli inputs, and paying an additional fixed compliance cost. To quantify the aggregate effects of the agreement, I build on the heterogeneous-firm framework of Melitz (2003), incorporating multiple sectors with sector-specific tariffs, intermediate-input sourcing from different origins, and endogenous export participation under the QIZ program.

7.1 Environment

Consider a small open economy, Egypt, with S manufacturing sectors and a fixed supply of labor L. Labor is freely mobile across domestic activities and is paid a common wage w. Within each sector, a continuum of firms produces differentiated varieties under monopolistic competition. Firms differ in their productivity and produce using labor and an intermediate composite input sourced from each of Egypt, Israel, the United States, and the rest of the world. Foreign demand and the price of inputs from foreign markets are taken as given.

Firms sell domestically and choose whether to export to two destinations: the United States and a composite non-U.S. market. Exporting to either destination requires paying a destination-specific fixed cost. Firms exporting to the United States face an additional choice between two trade regimes. Under most-favored-nation (MFN) treatment, firms pay the sector-specific U.S. import tariff but can source inputs freely. Under QIZ, firms obtain duty-free access but must satisfy QIZ sourcing requirements and pay an additional fixed compliance cost. These differences in variable and fixed costs across firms and sectors generate productivity-based selection into each of the two export markets and, among U.S. exporters, selection into exporting under the MFN or QIZ program.

7.2 Preferences

A representative Egyptian household consumes differentiated varieties produced domestically and imported from abroad. Preferences are Cobb–Douglas across

sectors and CES across varieties within each sector:

$$U = \prod_{s=1}^{S} \left(\frac{C_s}{\alpha_s} \right)^{\alpha_s}, \qquad C_s = \left[\int_{\mathcal{V}_s} c_s(v)^{(\sigma_s - 1)/\sigma_s} \, dv \right]^{\sigma_s/(\sigma_s - 1)}, \qquad \sum_{s=1}^{S} \alpha_s = 1. \quad (6)$$

Here, C_s denotes the sectoral consumption composite, $c_s(v)$ denotes consumption of variety v, and $\mathcal{V}_s$ is the set of domestic and imported varieties available in sector s. The parameter $\alpha_s > 0$ is the expenditure share allocated to sector s, and $\sigma_s > 1$ is the elasticity of substitution across varieties within the sector.

Given nominal income Y, utility maximization implies that households allocate a fraction α_s of their expenditure to each sector. Therefore, demand for variety v in sector s is

$$c_s(v) = \alpha_s Y P_s^{\sigma_s - 1} p_s(v)^{-\sigma_s}, \qquad P_s = \left[\int_{\mathcal{V}_s} p_s(v)^{1-\sigma_s} \, dv \right]^{1/(1-\sigma_s)}, \quad (7)$$

where $p_s(v)$ is the consumer price of variety v and P_s is the sectoral CES price index. The aggregate consumption price index is $P = \prod_s P_s^{\alpha_s}$.

Prices of imported varieties are taken as given, whereas prices of domestically produced varieties are an equilibrium object. Therefore, changes in domestic prices and the mass of varieties available affect the aggregate price index and consequently household welfare.

7.3 Firms and Production Technology

Building on Blaum et al. (2018), firms produce differentiated varieties by combining labor with intermediate inputs sourced from different origins. A firm with productivity φ in sector s produces according to

$$y_s = \varphi \ell^{1-\gamma_s} X_s^{\gamma_s}, \qquad X_s = \left[\sum_{o \in \mathcal{O}} \beta_{o,s}^{1/\eta_s} x_o^{(\eta_s - 1)/\eta_s} \right]^{\eta_s/(\eta_s - 1)}. \quad (8)$$

Here, ℓ denotes labor and X_s is a CES composite of intermediate inputs from $\mathcal{O} = \{E, I, U, R\}$: Egypt, Israel, the United States, and the rest of the world. The parameter $\gamma_s \in (0, 1)$ determines intermediate-input intensity, while $\eta_s > 1$ governs substitution across input origins. The origin weights satisfy $\beta_{o,s} > 0$ and $\sum_{o \in \mathcal{O}} \beta_{o,s} = 1$.

Egyptian intermediate inputs are produced competitively using one unit of labor for each unit of output, so their price equals the domestic wage, $p_E = w$. I thus abstract from input-output linkages across domestic sectors. Foreign input prices, p_I, p_U, and p_R, are taken as given and assumed to be common across sectors.

When sourcing is unrestricted, firms choose labor and intermediate inputs to minimize variable production costs. The resulting marginal cost of a firm with

productivity φ is

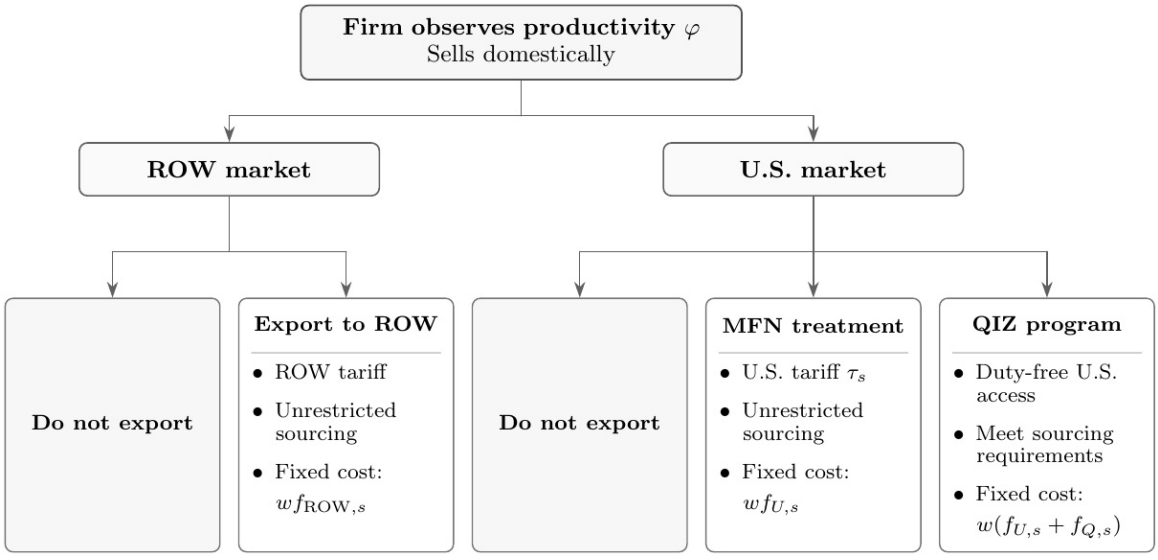
$$\frac{a_{\text{unres},s}(w)}{\varphi} = \frac{1}{\varphi}\left(\frac{w}{1-\gamma_s}\right)^{1-\gamma_s}\left(\frac{P_{X,s}}{\gamma_s}\right)^{\gamma_s},$$
$$P_{X,s} = \left[\sum_{o\in\mathcal{O}} \beta_{o,s} p_o^{1-\eta_s}\right]^{1/(1-\eta_s)}. \tag{9}$$

Here, $P_{X,s}$ is the sector-specific price index of intermediate inputs, and $a_{\text{unres},s}(w)$ denotes unit cost at productivity one under unrestricted sourcing. This cost applies to firms selling domestically, exporting to the non-U.S. market, and exporting to the United States under MFN treatment. Firms exporting under the QIZ program face additional sourcing restrictions, which I introduce in the next subsection.

Potential entrants pay a fixed entry cost $wf_{e,s}$ before drawing their productivity from a sector-specific Pareto distribution G_s, with shape parameter $\theta_s > 0$ and support $[\underline{\varphi}_s, \overline{\varphi}_s]$. Each firm produces one differentiated variety, and productivity remains fixed after entry. All of the entrants produce, since selling domestically does not require an additional fixed operating cost. The mass of entrants therefore equals the mass of active firms, denoted M_s. Details about the productivity distribution and aggregation are provided in Appendix F.

7.4 Trade and the QIZ Agreement

Figure 10: Firm Export Decisions



Upon observing their productivity, firms choose whether to export to the non-U.S. market (ROW) and the United States. These decisions are independent, and exporting to either destination requires paying a fixed market-access cost. Firms can export to the U.S. market under either of two trade regimes. Under most-favored-nation (MFN) treatment, firms pay the U.S. import tariff but source

inputs freely. Under the QIZ program, firms obtain duty-free access but must comply with sourcing requirements that may increase production costs and pay an additional fixed QIZ participation cost. The QIZ participation fixed cost captures administrative and compliance expenses, as well as costs associated with meeting the program's geographic eligibility requirements, since I abstract from modeling firms' location choices. Figure 10 summarizes these choices.

Exporting to destination $j \in \{\text{ROW}, U\}$ requires a destination-specific fixed cost ($wf_{j,s}$). For U.S. exports, the MFN tariff is (τ_s), while QIZ exporters face no U.S. tariff but pay an additional fixed cost ($wf_{Q,s}$), on top of the ordinary U.S. export cost. This additional cost captures administrative and compliance expenses, as well as costs associated with the program's geographic eligibility requirements, since I abstract from modeling firms' location choices. The sourcing restrictions apply only to production exported under QIZ.

QIZ sourcing requirements. The QIZ agreement imposes three minimum content requirements, expressed as shares of the value of output. The first requires a minimum share of Egyptian content, including domestic labor and Egyptian intermediate inputs. The second requires a minimum share of inputs sourced from Israel. The third imposes a combined content requirement, toward which Egyptian labor and intermediate inputs from Egypt, Israel, and the United States all qualify. These three requirements overlap, meaning that the Egyptian and Israeli content also count toward satisfying the combined requirement.

Let $\underline{e}$, r, and $\underline{q}$ denote the minimum Egyptian, Israeli, and combined content shares required under the QIZ, respectively.

To incorporate these restrictions into firms' sourcing decisions, let $C = w\ell + \sum_{o\in\mathcal{O}} p_o x_o$ denote total variable production expenditure, and let $\mu_s = \sigma_s/(\sigma_s - 1)$ denote the constant markup a firm in sector s puts on its products. Under constant-markup pricing, the value of output is $\mu_s C$. Thus, the content requirements impose minimum qualifying expenditure shares relative to the value of output.

Firms minimize production costs by choosing labor and intermediate inputs, subject to the requirements of their sourcing regime. For a firm with productivity one, unit cost under regime $m \in \{\text{unres}, \text{QIZ}\}$ is

$$
\begin{aligned}
a_{m,s}(w,r) = \min_{\ell\geq 0,\,\{x_o\geq 0\}_{o\in\mathcal{O}}} \quad & C \\
\text{subject to} \quad & \ell^{1-\gamma_s} X_s(\mathbf{x})^{\gamma_s} \geq 1, \\
& \left.\begin{aligned} w\ell + p_E x_E &\geq \underline{e}\,\mu_s C, \\ p_I x_I &\geq r\,\mu_s C, \\ w\ell + \sum_{o\in\{E,I,U\}} p_o x_o &\geq \underline{q}\,\mu_s C \end{aligned}\right\} \quad \text{if } m = \text{QIZ}.
\end{aligned}
\tag{10}
$$

Under unrestricted sourcing, firms face only the production constraint, yielding

the unit cost $a_{\text{unres},s}(w)$ derived in Equation (9). Under QIZ, firms must additionally satisfy the three content requirements, yielding $a_{\text{QIZ},s}(w,r)$. Since the production technology is the same across regimes but QIZ restricts the set of feasible input combinations, it follows that $a_{\text{QIZ},s}(w,r) \geq a_{\text{unres},s}(w)$. Constant returns to scale imply that a firm with productivity φ has marginal cost $a_{m,s}(w,r)/\varphi$ under regime m.

The sourcing requirements may therefore create a production-cost disadvantage for exporters under the QIZ program. In particular, a higher Israeli content requirement weakly increases QIZ unit costs by restricting firms' ability to substitute toward cheaper input combinations. Conversely, relaxing the input requirements expands the set of sourcing choices and thus may reduce production costs. The size of this effect depends on relative input prices across origins, the input substitution elasticity, and whether these content requirements are binding.

Tariff savings and the QIZ revenue advantage. Firms exporting under QIZ face a trade-off. Eliminating the U.S. tariff lowers the price paid by American buyers and increases demand for their products. However, the sourcing requirements may raise marginal production costs, partially offsetting the benefits of tariff elimination.

Let $A_{U,s}$ denote the U.S. demand shifter in sector s, and let $\Delta_{U,s} \geq 1$ denote the iceberg trade cost of exporting to the United States. Under CES demand and constant-markup pricing, producer revenues from exporting to the U.S. under MFN and QIZ are

$$R_{U,s}^{\text{MFN}}(\varphi) = A_{U,s} \underbrace{(1+\tau_s)^{-\sigma_s}}_{\text{MFN tariff effect}} \left(\underbrace{\frac{\mu_s \Delta_{U,s} a_{\text{unres},s}(w)}{\varphi}}_{\substack{\text{Delivered price} \\ \text{before tariffs}}} \right)^{1-\sigma_s},$$
$$R_{U,s}^{\text{QIZ}}(\varphi) = A_{U,s} \left(\underbrace{\frac{\mu_s \Delta_{U,s} a_{\text{QIZ},s}(w,r)}{\varphi}}_{\substack{\text{Delivered price} \\ \text{under QIZ}}} \right)^{1-\sigma_s}. \tag{11}$$

These producer revenues exclude tariff payments to the U.S. government. The iceberg trade cost applies under both regimes, while the MFN tariff is eliminated under QIZ. The relative revenue advantage of QIZ over MFN is therefore

$$\rho_s(w,r) \equiv \frac{R_{U,s}^{\text{QIZ}}(\varphi)}{R_{U,s}^{\text{MFN}}(\varphi)} = \underbrace{(1+\tau_s)^{\sigma_s}}_{\text{Tariff benefit}} \underbrace{\left(\frac{a_{\text{QIZ},s}(w,r)}{a_{\text{unres},s}(w)} \right)^{1-\sigma_s}}_{\text{QIZ Sourcing cost penalty}}. \tag{12}$$

The first term captures the revenue gain from eliminating the MFN tariff,

while the second captures the offsetting effect of higher sourcing costs. Thus, higher sector-specific MFN tariffs increase the attractiveness of QIZ, whereas more restrictive sourcing requirements reduce it.

Although ρ_s is independent of firm productivity, the absolute revenue gain from QIZ increases with productivity, since revenues are proportional to φ^{σ_s-1}. This means that more productive firms have a greater incentive to incur the additional fixed QIZ participation cost. The next subsection characterizes how these differences in variable profits and fixed costs determine firms' export participation and which trade regime a firm chooses.

7.5 Export Participation and Regime Choice

The choice of export regime depends on the revenue advantage of QIZ and the fixed costs of exporting. Under CES demand and constant-markup pricing, operating profits before fixed costs equal producer revenues divided by σ_s. Net profits from exporting to ROW, to the United States under MFN, and to the United States under QIZ respectively are:

$$\begin{aligned}
\pi_{\text{ROW},s}(\varphi) &= \frac{R_{\text{ROW},s}(\varphi)}{\sigma_s} - w f_{\text{ROW},s}, \\
\pi_{\text{MFN},s}(\varphi) &= \frac{R^{\text{MFN}}_{U,s}(\varphi)}{\sigma_s} - w f_{U,s}, \\
\pi_{\text{QIZ},s}(\varphi) &= \frac{\rho_s R^{\text{MFN}}_{U,s}(\varphi)}{\sigma_s} - w(f_{U,s} + f_{Q,s}).
\end{aligned} \tag{13}$$

Here, $R_{\text{ROW},s}(\varphi)$ denotes producer revenue from the non-U.S. market, which, like U.S. export revenue, is proportional to φ^{σ_s-1}. A firm exports to ROW if the associated profits are not negative. For the U.S. market, it chooses the most profitable option among MFN, QIZ, and not exporting. Since these decisions are made separately across destinations, the firm's total operating profits after drawing productivity are

$$\begin{aligned}
\Pi_s(\varphi) = \underbrace{\frac{R_{D,s}(\varphi)}{\sigma_s}}_{\text{Domestic profits}} &+ \underbrace{\max\{0, \pi_{\text{ROW},s}(\varphi)\}}_{\text{ROW export profits}} \\
&+ \underbrace{\max\{0, \pi_{\text{MFN},s}(\varphi), \pi_{\text{QIZ},s}(\varphi)\}}_{\text{U.S. export profits}}.
\end{aligned} \tag{14}$$

where $R_{D,s}(\varphi)$ denotes domestic sales revenue.

Export productivity cutoffs. Export revenues increase with productivity at the rate φ^{σ_s-1}. More productive firms therefore earn higher operating profits and are better able to cover the fixed costs of exporting. The productivity levels at which firms break even from exporting to ROW and under MFN are given by

$$\varphi_{\mathrm{ROW},s} = \left(\frac{\sigma_s w f_{\mathrm{ROW},s}}{R_{\mathrm{ROW},s}(1)} \right)^{1/(\sigma_s - 1)},$$
$$\varphi_{\mathrm{MFN},s} = \left(\frac{\sigma_s w f_{U,s}}{R_{U,s}^{\mathrm{MFN}}(1)} \right)^{1/(\sigma_s - 1)}. \tag{15}$$

The first cutoff determines whether a firm exports to ROW, while the second gives the minimum productivity required to profitably export to the United States under MFN. These cutoffs differ across sectors because of differences in export costs, foreign demand, and production costs. In particular, higher sector-specific U.S. MFN tariffs reduce export revenues and raise the MFN productivity cutoff. When QIZ is available, however, a firm may choose QIZ instead of MFN, so the MFN break-even cutoff need not correspond to an actual entry threshold.

QIZ participation. QIZ offers a potential revenue advantage over MFN but requires an additional fixed participation cost. If $\rho_s \leq 1$, QIZ is never chosen, since it generates no higher operating profits than MFN while imposing a larger fixed cost. When $\rho_s > 1$, the difference in net profits between the two regimes is

$$\pi_{\mathrm{QIZ},s}(\varphi) - \pi_{\mathrm{MFN},s}(\varphi) = \frac{(\rho_s - 1) R_{U,s}^{\mathrm{MFN}}(\varphi)}{\sigma_s} - w f_{Q,s}.$$

The ordinary U.S. export fixed cost cancels out. Thus, a firm prefers QIZ when the additional operating profits from duty-free access, net of the sourcing-cost disadvantage, exceed the fixed QIZ participation cost. Since this gain increases with productivity, sufficiently productive firms prefer QIZ whenever $\rho_s > 1$.

Two thresholds characterize this decision. The first is the QIZ break-even cutoff, at which $\pi_{\mathrm{QIZ},s} = 0$. The second is the MFN-to-QIZ switching cutoff, at which $\pi_{\mathrm{QIZ},s} = \pi_{\mathrm{MFN},s}$:

$$\varphi_{\mathrm{QIZ},s}^{\mathrm{BE}} = \left(\frac{\sigma_s w (f_{U,s} + f_{Q,s})}{\rho_s R_{U,s}^{\mathrm{MFN}}(1)} \right)^{1/(\sigma_s - 1)},$$
$$\varphi_{\mathrm{QIZ},s}^{\mathrm{SW}} = \left(\frac{\sigma_s w f_{Q,s}}{(\rho_s - 1) R_{U,s}^{\mathrm{MFN}}(1)} \right)^{1/(\sigma_s - 1)}. \tag{16}$$

A firm must satisfy both conditions to participate in QIZ: its QIZ profits must be positive, and QIZ must be more profitable than MFN. The QIZ participation cutoff is therefore

$$\varphi_{\mathrm{QIZ},s} = \max \left\{ \varphi_{\mathrm{QIZ},s}^{\mathrm{BE}}, \varphi_{\mathrm{QIZ},s}^{\mathrm{SW}} \right\}, \qquad \rho_s > 1. \tag{17}$$

Ordering of productivity cutoffs. The ordering of these cutoffs determines which firms export under MFN and which participate in QIZ. Three cases are

possible.

When $\rho_s \leq 1$, QIZ is never preferred to MFN. Firms below $\varphi_{\text{MFN},s}$ do not export to the United States, while those above it export only under MFN.

When the QIZ revenue advantage is positive but relatively small,

$$1 < \rho_s < 1 + \frac{f_{Q,s}}{f_{U,s}},$$

the cutoffs satisfy

$$\varphi_{\text{MFN},s} < \varphi^{\text{BE}}_{\text{QIZ},s} < \varphi^{\text{SW}}_{\text{QIZ},s}. \tag{18}$$

In this case, MFN cutoff productivity is lower than the QIZ cutoff productivity because it requires a lower fixed cost. Although QIZ eventually becomes profitable, firms initially continue exporting under MFN because its profits remain higher. Only when a firm's productivity is higher than the switching cutoff does the additional operating-profit advantage of QIZ outweigh its fixed costs. Firms are therefore sorted by productivity: the least productive do not export to the United States, intermediate-productivity firms export under MFN, and the most productive export under the QIZ program.

When the QIZ revenue advantage is sufficiently large, however,

$$\rho_s > 1 + \frac{f_{Q,s}}{f_{U,s}},$$

the ordering reverses:

$$\varphi^{\text{SW}}_{\text{QIZ},s} < \varphi^{\text{BE}}_{\text{QIZ},s} < \varphi_{\text{MFN},s}. \tag{19}$$

Here, QIZ becomes profitable at a lower productivity than MFN because additional variable profits under QIZ exporting are high enough to compensate for any additional fixed costs associated with the QIZ. Therefore, firms that enter the U.S. market choose to export under the QIZ, and MFN is never the preferred exporting regime. At $\rho_s = 1 + f_{Q,s}/f_{U,s}$, all three cutoffs coincide.

The ROW cutoff is determined separately. A firm may therefore export only to ROW, only to the United States, or to both destinations.

7.6 Equilibrium

Given the model parameters and trade policies, an equilibrium consists of a common wage w, a mass of firms M_s in each sector, and the associated prices and allocations such that households and firms optimize, free entry holds, and goods and labor markets clear.

Household demand satisfies Equation (7). Firms choose their inputs to minimize production costs under unrestricted sourcing and QIZ according to Equations (9) and (10), respectively. Given these costs, firms set prices as constant markups over marginal costs and choose their export activities to maximize profits,

as characterized by Equation (13). Export participation and the choice between MFN and QIZ are determined by the productivity cutoffs in Equations (15) and (17).

The equilibrium wage and sectoral firm masses are jointly determined by the S free-entry conditions and aggregate labor-market clearing, with goods markets clearing at the resulting prices and quantities. These conditions are described below.

Household income and free entry. Household income consists of labor earnings and an external balance $\mathcal{B}$ from outside the modeled manufacturing block. I hold its income share, $b = \mathcal{B}/Y$, fixed across equilibria, so $\mathcal{B} = bY$. Since labor is fully employed and expected net profits are zero under free entry, household income is

$$Y = wL + \mathcal{B} = \frac{wL}{1-b}. \tag{20}$$

Free entry requires expected operating profits, given by Equation (14), to equal the entry cost in each sector:

$$\int \Pi_s(\varphi)\, dG_s(\varphi) = w f_{e,s}, \qquad s = 1, \ldots, S. \tag{21}$$

Goods-market clearing. Domestic varieties are priced at $\mu_s a_{\text{unres},s}(w)/\varphi$, while imported varieties are supplied at exogenous prices. Aggregating household demand from Equation (7) across domestic firms gives

$$R_{D,s} = \alpha_s Y M_s \int \left(\frac{\mu_s a_{\text{unres},s}(w)}{\varphi P_s} \right)^{1-\sigma_s} dG_s(\varphi). \tag{22}$$

The remaining expenditure, $\alpha_s Y - R_{D,s}$, is allocated to imported varieties. For foreign markets, firms supply demand at the prices and participation decisions characterized in the preceding subsections, accounting for iceberg trade costs.

Labor-market clearing. Labor is used in production, firm entry, and the fixed costs of exporting. Let $d_{\text{unres},s}$ and $d_{\text{QIZ},s}$ denote the shares of variable production expenditure on direct labor and Egyptian intermediate inputs under each sourcing regime, obtained from the corresponding cost-minimization problems.

Let $N_{j,s}$ and $X_{j,s}$ denote the mass of exporters and their aggregate producer revenues, respectively, for $j \in \{\text{ROW}, \text{MFN}, \text{QIZ}\}$. These are obtained by integrating over the productivity ranges implied by the export cutoffs.

Labor-market clearing requires

$$L = \sum_{s=1}^{S} \Bigg[\underbrace{M_s f_{e,s}}_{\text{Entry}} + \underbrace{f_{\text{ROW},s} N_{\text{ROW},s} + f_{U,s} \left(N_{\text{MFN},s} + N_{\text{QIZ},s} \right) + f_{Q,s} N_{\text{QIZ},s}}_{\text{Fixed export costs}} + \underbrace{\frac{d_{\text{unres},s}}{w \mu_s} \left(R_{D,s} + X_{\text{ROW},s} + X_{\text{MFN},s} \right) + \frac{d_{\text{QIZ},s}}{w \mu_s} X_{\text{QIZ},s}}_{\text{Variable production}} \Bigg]. \tag{23}$$

The S free-entry conditions and aggregate labor-market clearing jointly determine the equilibrium wage w and sectoral firm masses $\{M_s\}_{s=1}^{S}$. All other endogenous outcomes follow from household demand, firms' optimal sourcing decisions, and the export participation cutoffs.

Egyptian welfare is measured by real household income:

$$W = \frac{Y}{P}, \qquad P = \prod_{s=1}^{S} P_s^{\alpha_s}. \tag{24}$$

Equilibrium in changes. I solve counterfactual equilibria in exact changes relative to the observed QIZ equilibrium, following Dekle et al. (2008). Holding $b = \mathcal{B}/Y$ and labor supply fixed implies $Y'/Y = w'/w$, so the change in Egyptian welfare is

$$\frac{W'}{W} = \frac{w'}{w} \prod_{s=1}^{S} \left(\frac{P_s}{P_s'} \right)^{\alpha_s}, \tag{25}$$

where primes denote counterfactual equilibrium values. The complete equilibrium system and solution procedure are provided in Appendix F.

7.7 The Israeli Input Requirement and Bilateral Trade

The Israeli input requirement creates a trade-off between the amount of Israeli content used by QIZ exporters and the scale of their economic activity. Holding the wage fixed, relaxing a binding requirement reduces QIZ production costs and increases its revenue advantage relative to MFN. This allows existing participants to expand their exports and may induce additional firms to enter the program. At the same time, firms are required to use less Israeli content per unit of output.

Israeli inputs are used in both unrestricted and QIZ production. Let $t_{I,s}^{m}$ denote the share of variable production expenditure spent on Israeli inputs under sourcing regime $m \in \{\text{unres}, \text{QIZ}\}$. Aggregate Israeli input purchases are:

$$M_I = \sum_{s=1}^{S} \left[\frac{t_{I,s}^{\text{unres}}}{\mu_s} \left(R_{D,s} + X_{\text{ROW},s} + X_{\text{MFN},s} \right) + \frac{t_{I,s}^{\text{QIZ}}}{\mu_s} X_{\text{QIZ},s} \right]. \tag{26}$$

When the Israeli content requirement binds in sector s, the Israeli expenditure share under QIZ equals $\mu_s r$, since the requirement is defined relative to output value. Israeli input purchases by QIZ exporters in that sector are therefore

$$M_{I,s}^{\text{QIZ}} = r X_{\text{QIZ},s}.$$

Consequently, a reduction in r increases Israeli input purchases by QIZ exporters if

$$-\frac{d \log X_{\text{QIZ},s}}{d \log r} > 1, \tag{27}$$

where the derivative captures the total response of QIZ exports in general equilibrium. Thus, a lower requirement can increase Israeli input purchases if the expansion in QIZ exports more than offsets the reduction in required Israeli content per dollar of exports.

This condition applies to QIZ production in sectors where the Israeli requirement binds. The overall effect on bilateral trade also depends on changes in Israeli input purchases under unrestricted sourcing and the reallocation of activity across firms and sectors. The net effect is therefore determined by the model's general-equilibrium response rather than by the direct sourcing effect alone.

8 Quantitative Analysis

I calibrate the model to the Egyptian economy and use it to evaluate the welfare effects of the agreement and alternative Israeli input requirements. The quantitative application contains fifteen manufacturing sectors. The observed QIZ equilibrium is the baseline; counterfactuals hold foreign demand, foreign prices, technology, and fixed costs constant while allowing sourcing, export participation, entry, and wages to adjust.

8.1 Calibration

The calibration combines data from the 2017 Egyptian economic census, firm-level customs records, U.S. tariffs and trade data, and Egypt's 2016/17 input-output and supply-use tables. All data sources are harmonized to the model's fifteen manufacturing sectors. Table 4 summarizes the calibration strategy, distinguishing parameters estimated directly from the data, parameters calibrated to match baseline moments, and parameters assumed based on the literature. The detailed construction of the calibration targets is reported in Appendix F.

Panel B reports parameters calibrated to match baseline equilibrium moments. Conditional on η_s and relative input prices, the origin weights $\beta_{o,s}$ are recovered

Table 4: Calibration: Data, Matched Moments, and Assumptions

Parameter	Interpretation	Source, moment, or restriction
A. Directly measured or estimated from data		
γ_s	Intermediate-input cost share	2017 economic census
θ_s	Productivity distribution shape	2017 census revenue distribution
$\underline{\varphi}_s/\overline{\varphi}_s$	Relative productivity support	2017 census revenue distribution
$(1+\tau_s)^{\sigma_s}$	Sectoral tariff-benefit factor	2016 U.S. HTS8 tariffs and export data
α_s	Sectoral consumption expenditure share	2016/17 IO and supply-use tables
$\lambda_{D,s}$	Baseline domestic expenditure share	2016/17 IO and supply-use tables
Y	Baseline household expenditure	2016/17 IO and supply-use tables
$p_I/p_U,\ p_R/p_U$	Relative foreign input prices	Customs data estimates: 1.18, 0.959
B. Internally calibrated to baseline moments		
$\beta_{o,s}$	Input-origin weights	Sourcing-share proxies under unrestricted production
$A_{R,s}, A_{U,s}$	Foreign-demand	Export revenues by destination
$f_{R,s}, f_{U,s}$	Fixed export costs	Destination exporter counts and revenues
$f_{Q,s}$	QIZ Fixed cost	QIZ shares of U.S. export revenue
C. Parameters		
σ_s	Substitution across varieties	Maintained: 5
η_s	Substitution across input origins	Maintained: 3
$\underline{e}$, r, and $\underline{q}$	QIZ Content Requirements	0.117, 0.105, 0.35
$b = \mathcal{B}/Y$	Transfer share of household income	Fixed at baseline: 0.3154
$f_{Q,s}$	QIZ cost for non-QIZ sectors	Common fixed cost

from census and customs sourcing-share proxies under unrestricted production. QIZ sourcing is then determined by the content requirements, so the calibration does not separately target the combined expenditure shares across unrestricted and QIZ production. Foreign-demand coefficients and fixed export costs are jointly calibrated to match export revenues and the number of exporters in Egypt by destination. Exporter counts discipline the productivity cutoffs, while export revenues discipline foreign demand, with fixed costs recovered from the corresponding zero-profit conditions. For food, textiles, and apparel, the QIZ fixed costs are calibrated to match the share of U.S. export revenue receiving QIZ treatment in each sector.

Panel C summarizes the maintained assumptions and parameter restrictions. I set $\sigma_s = 5$, which is within the range of estimates in the literature, and $\eta_s = 3$ in every sector, which is within the range of estimates reported by Blaum et al. (2018). The common foreign price ratios are set to $p_I/p_U = 1.18$ and $p_I/p_R = 1.23$, based on estimates from the 2005–2016 customs data. Normalizing $p_U = 1$ gives $p_R = 1.18/1.23$. I hold transfers fixed as a share of household income across

all policy equilibria: $b = \mathcal{B}/Y = 0.3154$. The baseline share is recovered from $\mathcal{B} = Y - wL$, and transfers subsequently vary proportionately with income. In sectors with negligible baseline QIZ utilization, the data identify a lower bound on compliance costs rather than a unique value. I therefore assign a common finite cost above this lower bound in order to be consistent with nonparticipation.

8.2 Model Fit

I assess the model's fit by comparing its predictions with untargeted industry-level responses to the agreement. I aggregate product-level export flows to the model's fifteen manufacturing sectors. Israeli input purchases are assigned to fourteen purchasing industries using the 2008/09 input-output table. This allocation assigns Israeli inputs to the industries using them rather than those producing the imported products.

I estimate PPML regressions with industry and year fixed effects over 1998–2020, interacting an indicator for the post-agreement period with industry exposure, measured by the average 2004 U.S. MFN tariff. I construct the corresponding model estimates by comparing industry outcomes under the no-QIZ and observed-QIZ equilibria, including industry and policy-state fixed effects. Table 5 reports the implied percentage responses in the data and the model to a one percentage point increase in baseline tariff exposure. Appendix F.5 provides further details.

Table 5: Untargeted Industry-Level Responses

Outcome	Data (%)	90% CI	Model (%)
U.S. exports	7.03	[0.91, 13.52]	9.71
Israeli input purchases	8.30	[4.70, 12.03]	11.63

Notes: Data estimates use PPML with industry and year fixed effects over 1998–2020. Confidence intervals are 90% and clustered by industry.

The model's responses are somewhat above the data estimates: 9.71% versus 7.03% for U.S. exports and 11.63% versus 8.30% for Israeli input purchases. Both model responses lie within the corresponding 90% industry-clustered confidence intervals. Neither response is targeted in calibration.

8.3 The Aggregate Effects of QIZ

Table 6 compares three scenarios against a common baseline in which firms can only export to the U.S. under most-favored-nation (MFN) tariffs without any sourcing restrictions. The first scenario corresponds to introducing the QIZ agreement as described in the previous section. The second removes the Israeli input requirement while retaining other QIZ sourcing requirements. The third represents full, unconditional access to the U.S. market, eliminating all U.S. tariffs on Egyptian exports in addition to all QIZ sourcing requirements and other costs associated with the QIZ agreement.

Table 6: Economic Effects of Alternative Trade Policies

	QIZ	No Israeli input requirement	Unrestricted U.S. access
Welfare and prices			
Welfare	0.0916	0.2134	0.3012
Wages	0.1942	0.5047	0.6783
Consumer Price Index	0.1024	0.2907	0.3760
Trade			
U.S. Exports	58.79	124.05	166.32
Non-U.S. Exports	-1.14	-2.37	-3.29
Total Exports	1.89	4.02	5.30
Israeli Input Imports	174.00	14.75	20.67

Notes: Percentage changes relative to no QIZ in every column. The external-income share $\mathcal{B}/Y$ is fixed.

The first column of Table 6 reports the aggregate effects of the QIZ agreement relative to the no-QIZ equilibrium. The agreement generates a substantial increase in the trade flows it directly targets. Exports to the U.S. rise by 58.8%, while imports of Israeli inputs increase by 174.0%. However, the increase in total exports is only 1.9% and this is due to the relatively small share of the U.S. market in Egyptian exports and the concentration of gains within the apparel sector. Moreover, the increase in exports raises labor demand and wages, which push up production costs across sectors. Consequently, exports to non-U.S. destinations decline by 1.1%, partially offsetting the expansion of U.S. exports. Despite this substantial increase in bilateral trade flows, the agreement generates a modest but positive welfare gain of 0.0916%.

The modest welfare effect reflects both the limited number of industries directly benefiting from the QIZ agreement and the costs associated with imposing sourcing requirements. Additionally, while higher wages increase household income, they also raise domestic prices, partially offsetting the gains in purchasing power. This can be seen from the welfare decomposition:

$$\Delta \log W = \Delta \log Y - \sum_s \alpha_s \Delta \log P_s. \tag{28}$$

Household income increases by approximately 0.1940 log-percentage points, while the increase in consumer prices offsets approximately 0.1024 log-percentage points, leaving a net welfare gain of around 0.0916%. Since the external-income share $\mathcal{B}/Y$ is held fixed, external income adjusts proportionately with labor income, and its contribution is incorporated into the welfare measure.

Columns 2 and 3 help assess the extent to which the sourcing requirements linked to preferential access to the U.S. would limit its economic benefits. Column 2 considers a counterfactual that eliminates the Israeli input requirement while retaining all other QIZ restrictions. Relative to the no-QIZ equilibrium, U.S. exports increase by 124.1% and welfare rises by 0.2134%, compared with 58.8%

and 0.0916% under the QIZ agreement. Therefore, removing the Israeli input requirement greatly expands exports to the U.S. market and more than doubles the welfare gain. This suggests that the Israeli input requirements impose a meaningful constraint on firms' ability to take advantage of the QIZ agreement.

Column 3 considers giving Egyptian firms unrestricted access to the U.S. while removing all sourcing requirements and costs associated with the QIZ agreement. Under this policy, U.S. exports increase by 166.3%, while welfare rises by 0.3012% relative to the no-QIZ equilibrium. These additional gains indicate that restrictions other than the Israeli input requirement also limit the tariff reduction benefits of the QIZ agreement.

An additional result relates to the imports of Israeli inputs. These imports remain above their no-QIZ level even without imposing an Israeli input requirement, increasing by 14.8% when only the Israeli requirement is removed and by 20.7% under unrestricted U.S. access. These increases, however, are considerably smaller than the 174.0% observed under the existing QIZ agreement, which suggests that the mandatory sourcing requirement directs a substantial amount of input demand towards Israel, as intended.

The results highlight an important trade-off in the design of the QIZ agreement. While the agreement stimulates U.S. exports and promotes bilateral input trade with Israel, the sourcing requirements substantially reduce the welfare gains that could otherwise be achieved under no requirements. In particular, the Israeli sourcing requirement plays a central role in expanding bilateral input trade, but does so at the cost of limiting firms' sourcing options.

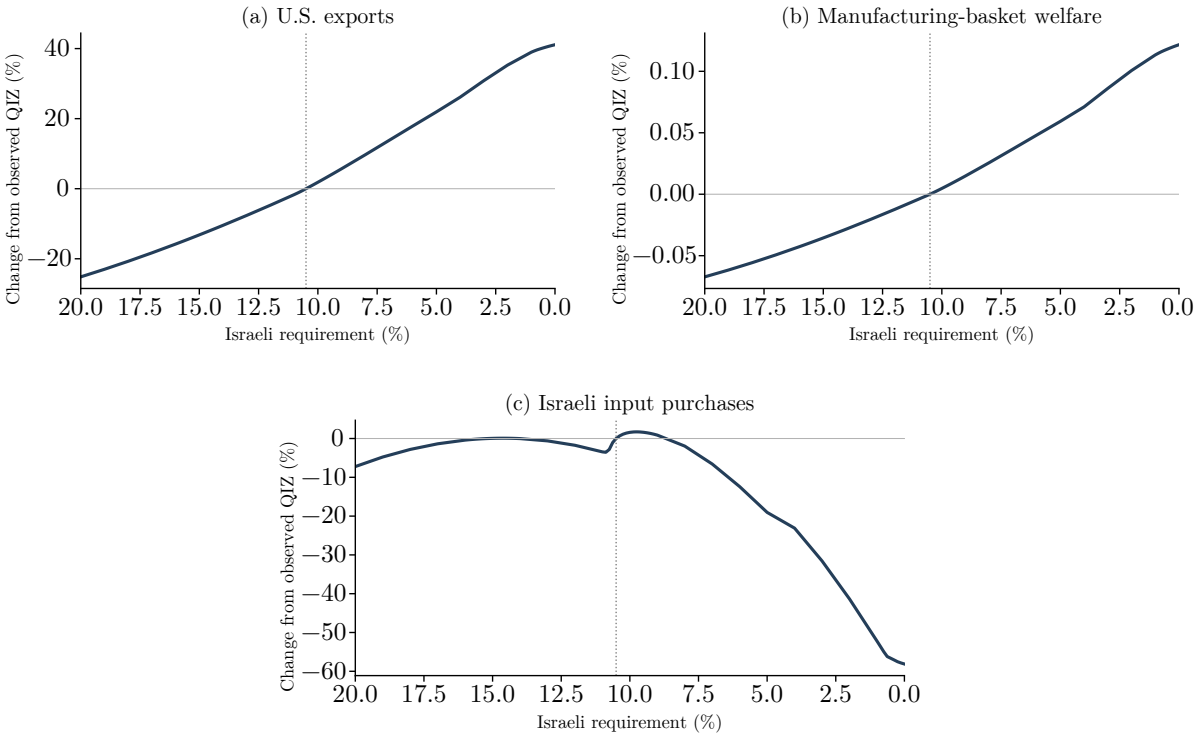
8.4 Alternative input requirements

In these counterfactual exercises, I vary the Israeli input requirement from 20% to zero, holding the other constraints regarding the Egyptian and combined requirements at 11.7% and 35%. The novelty of the QIZ agreement is that it links market access to geopolitical objectives through these input requirements. Therefore, determining how the input requirement influences different margins is essential to understanding the design of the policy. Figure 11 shows changes in U.S. exports, welfare, and Israeli imports relative to the 10.5% baseline as the input requirement varies from 20% to 0% in the model.

Relaxing the Israeli input requirement always increases U.S. exports and welfare, as shown in panels (a) and (b), but its effect on Israeli input imports is non-monotone. Initially, the expansion in U.S. exports more than offsets the reduction in the required Israeli input share, leading to an increase in Israeli input purchases. As the requirement is relaxed further, the reduction in the input share dominates, and Israeli purchases begin to decline. Below approximately 11%, additional sectors start using QIZ, leading to a renewed increase in Israeli input purchases, as shown in panel (c).

The increase in Israeli input purchases even as the input requirement decreases reflects both the entry of new industries into QIZ and changes in purchases by existing participants. When the requirement falls from 11% to 9.755%, the increase

Figure 11: Economic Effects of the Israeli Input Requirement



Notes: Percentage changes relative to observed QIZ at 10.5%, marked by the dotted vertical line.

is driven by newly participating industries, which more than offset the decline in Israeli purchases. Appendix F.3 provides a detailed decomposition of Israeli imports by industry.

Israeli input purchases peak at a requirement of approximately 9.76%. Further decreasing the requirement continues to increase U.S. exports and welfare but eventually reduces Israeli input purchases. Removing the Israeli input requirement entirely increases U.S. exports by 41.1% and welfare by 0.1216%, while Israeli input purchases fall by 58.1% relative to the observed QIZ equilibrium. These results suggest that a modest reduction in the Israeli input requirement can increase both U.S. exports and Israeli input purchases, while larger reductions lead to greater export and welfare gains but lower Israeli input purchases.

In the next section, I examine the geopolitical value of the QIZ agreement from the perspective of the U.S.

8.5 The Geopolitical Value of the QIZ

In this section, I use the counterfactual trade flows to examine what relative geopolitical valuation of Egypt–Israel trade would rationalize U.S. support for the QIZ agreement, and how this valuation changes under alternative Israeli input requirements.

Suppose the United States values bilateral input trade between Egypt and Israel for geopolitical reasons, but faces a net economic cost from granting preferential access to Egyptian exports. This cost may primarily reflect forgone tariff revenue

and a more negative trade balance, net of changes in consumer and producer surplus. Since I do not explicitly model U.S. consumers and producers, I approximate these considerations using the following reduced-form function:

$$U_{US}(r) = \lambda M_I(r) - \theta X_U(r), \tag{29}$$

where $M_I(r)$ denotes Israeli input sales to Egypt and $X_U(r)$ denotes Egyptian exports to the United States. The parameter $\lambda \geq 0$ captures the geopolitical value assigned to bilateral input trade between Egypt and Israel, while $\theta > 0$ captures the net cost assigned to additional Egyptian exports. Their ratio, λ/θ, measures the relative weight the United States places on bilateral integration compared with additional Egyptian market access. For simplicity, I assume that Egypt values its exports to the United States and Israel values its input sales to Egypt. These trade flows are proxies for each country's welfare.

For each counterfactual, I calculate the changes in Egyptian exports to the United States and Israeli input sales to Egypt relative to the relevant outside option. Under the assumed U.S. objective, a policy change is acceptable if

$$\lambda \Delta M_I \geq \theta \Delta X_U \qquad \Longrightarrow \qquad \frac{\lambda}{\theta} \geq \frac{\Delta X_U}{\Delta M_I}, \tag{30}$$

provided that $\Delta M_I > 0$ and $\Delta X_U > 0$, so that both Egypt and Israel also prefer the change under their assumed objectives. The counterfactuals therefore identify the minimum relative valuation of bilateral integration consistent with U.S. support of the agreement, conditional on the assumed objective function of the U.S.

Table 7: Counterfactual Trade Gains and Political Valuations

Policy comparison	ΔX_U	ΔM_I	Minimum λ/θ
10.5% versus no QIZ	3,366.3	658.6	5.11
10.5% to 9%	517.9	9.1	56.91
11.7% to 10.5%	345.8	22.8	15.16

Notes: Trade changes are EGP million.

Table 7 reports the minimum relative geopolitical valuation required to rationalize U.S. support for the QIZ agreement at the current Israeli input requirement of 10.5%, relative to a no-QIZ scenario. The comparison implies $\lambda/\theta \geq 5.11$, meaning that, under the assumed objective, the geopolitical value assigned to each additional dollar of Egypt–Israel input trade must be at least as large as the cost associated with 5.11 additional dollars of Egyptian exports to the United States. This measure quantifies the relative geopolitical valuation of bilateral economic integration needed to rationalize U.S. support for the agreement under our assumptions.

Recent ongoing negotiations have sought to reduce the Israeli input requirement further, with proposals to lower it from 10.5% to between 5% and 8% (EnterpriseAM, 2026). To illustrate the trade-offs associated with such reforms, I consider a reduction from 10.5% to 9%. Such a reduction would be beneficial

for both Egypt and Israel since it would increase Egyptian exports to the U.S. and imports from Israel. However, this reduction implies a substantially higher minimum relative valuation of $\lambda/\theta = 56.91$. This reflects the relatively small increase in Israeli input purchases compared with the additional Egyptian exports generated by relaxing the requirement. Under the assumed U.S. objective, further relaxation would require a higher geopolitical valuation of bilateral trade to secure U.S. support. Historically, however, the input requirement was reduced from 11.7% to 10.5% in 2007 through bilateral negotiations between Egypt and Israel, without requiring formal U.S. approval (U.S. Embassy Cairo, 2007). Under the model's assumptions, U.S. support for such a reduction would require a relative geopolitical valuation of $\lambda/\theta = 15.16$, still much lower than the threshold required for a further reduction to 9%.

9 Conclusion

In this paper, I study how geopolitically motivated trade agreements affect trade and firm outcomes, and how their design shapes their effectiveness. Using the QIZ agreement in Egypt, I show that preferential access to the U.S. market increased Egyptian exports and imports from Israel, while generating export spillovers to other destinations. Survey evidence is consistent with international certification as a potential mechanism for these wider gains.

A calibrated heterogeneous-firm model shows that the agreement generated positive but modest welfare gains, with utilization of the agreement concentrated in a few firms and sectors. The model reveals a central trade-off since stricter Israeli input requirements increase sourcing from Israel among participating firms but discourage other firms from utilizing the agreement. Consequently, relaxing the requirement in certain cases can increase Egyptian exports and welfare without reducing imports from Israel. The model estimates suggest that U.S. support for the QIZ agreement is consistent with a substantial geopolitical valuation of bilateral trade between Egypt and Israel, while further reductions in the Israeli input requirement would require an even higher valuation under the assumed political objective. Thus, input requirements can undermine the trade ties they seek to strengthen, while mutually beneficial reforms may remain politically infeasible.

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A Program Geography and Exposure

Figures A1, A2, and A3 present the program's geography, pre-agreement tariff exposure, and the timing of the firm cohorts used below.

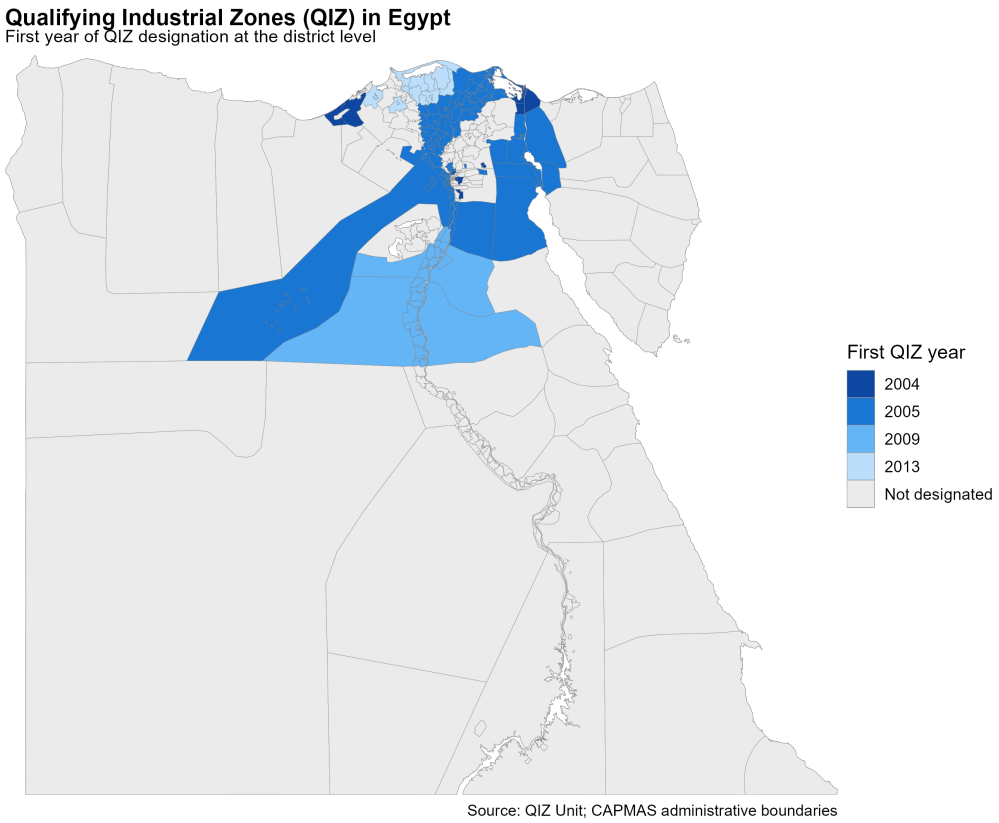


Figure A1: Map of Egyptian QIZs

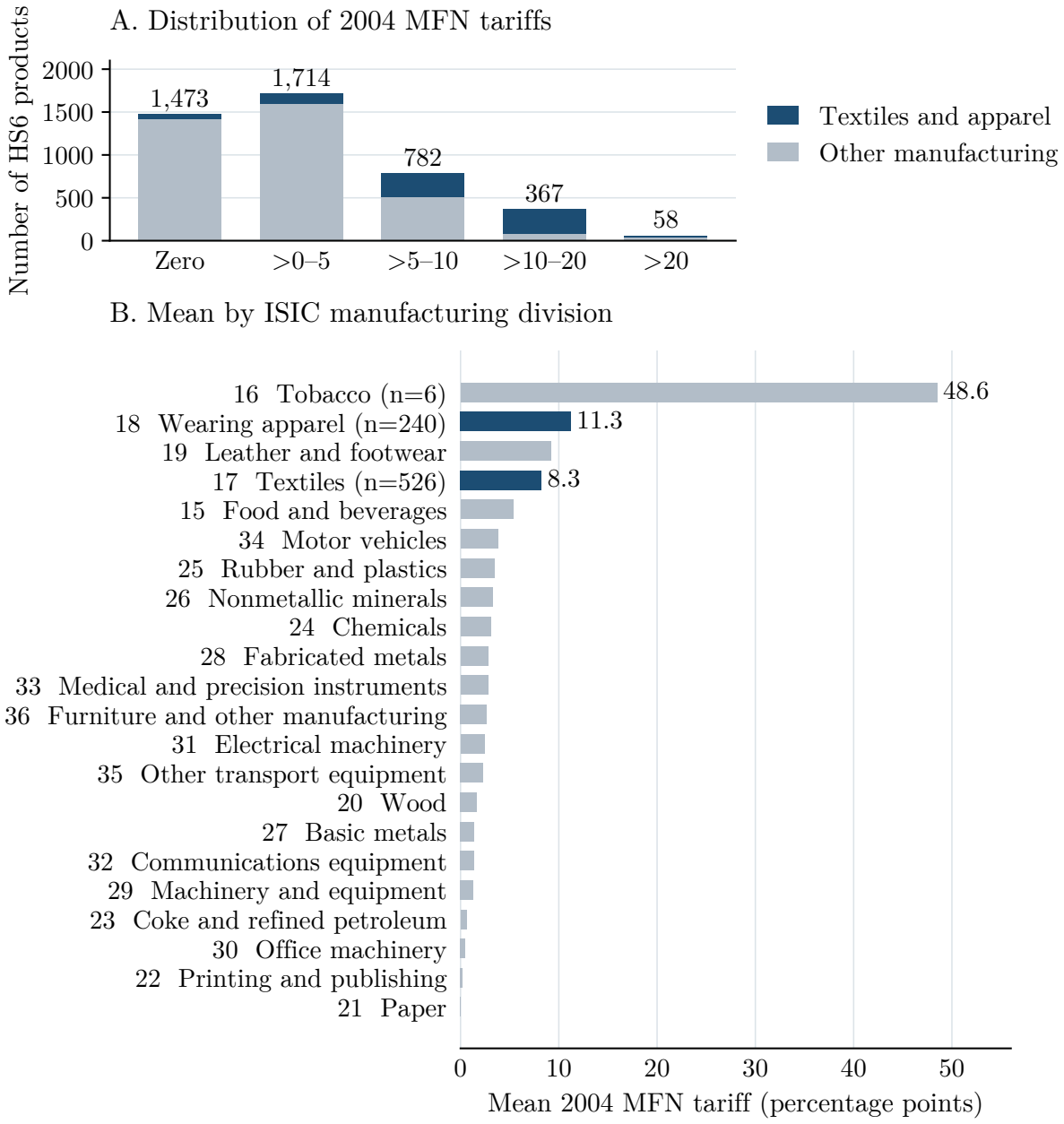


Figure A2: Distribution of 2004 U.S. MFN tariffs in the manufacturing export-exposure sample. The 4,394 HS6 products are each counted once. Panel A shows tariff bands; Panel B shows unweighted means by ISIC manufacturing division. Textiles and apparel (ISIC 17–18) are highlighted. The tobacco mean is based on six products.

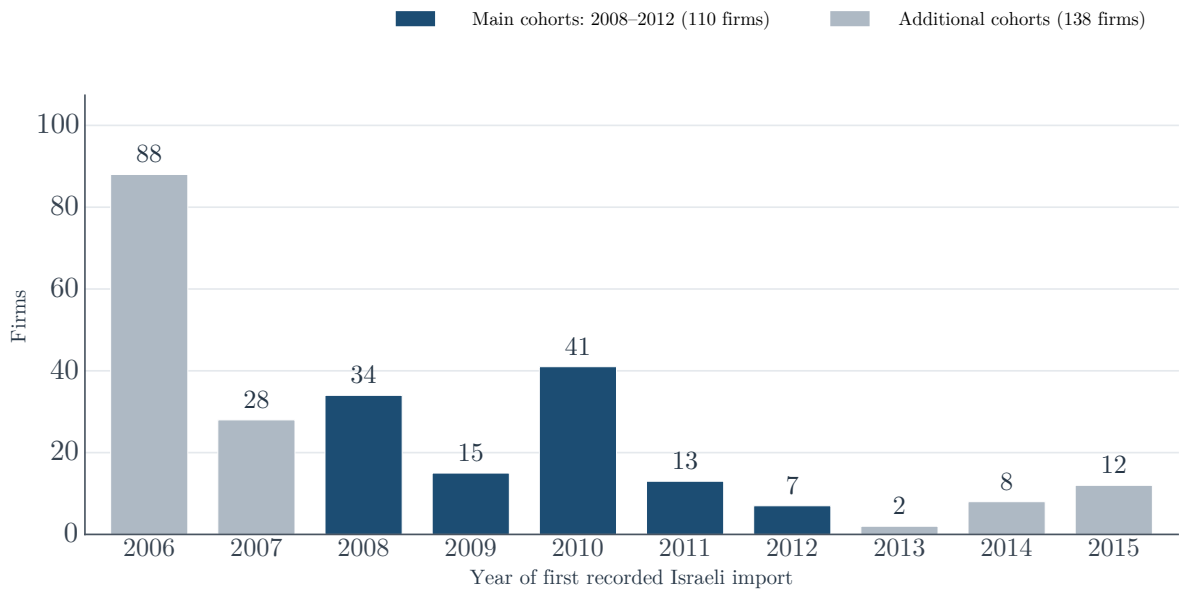


Figure A3: First recorded Israeli imports among textile and apparel exporters. The 2006–2015 cohorts used in the wider event study include 248 firms; the main 2008–2012 cohorts (110 firms) are highlighted. Firms already importing from Israel in 2005 are excluded because their first-import year is not observed.

A.1 Robustness of the U.S. Export DDD Estimates

Figures A4–A6 present the three export robustness event studies. They vary the MFN tariff year and clustering level while retaining the preferred fixed effects and manufacturing sample. The associated pooled coefficients and bootstrap pretrend tests appear in columns (2)–(4) of Table 1.

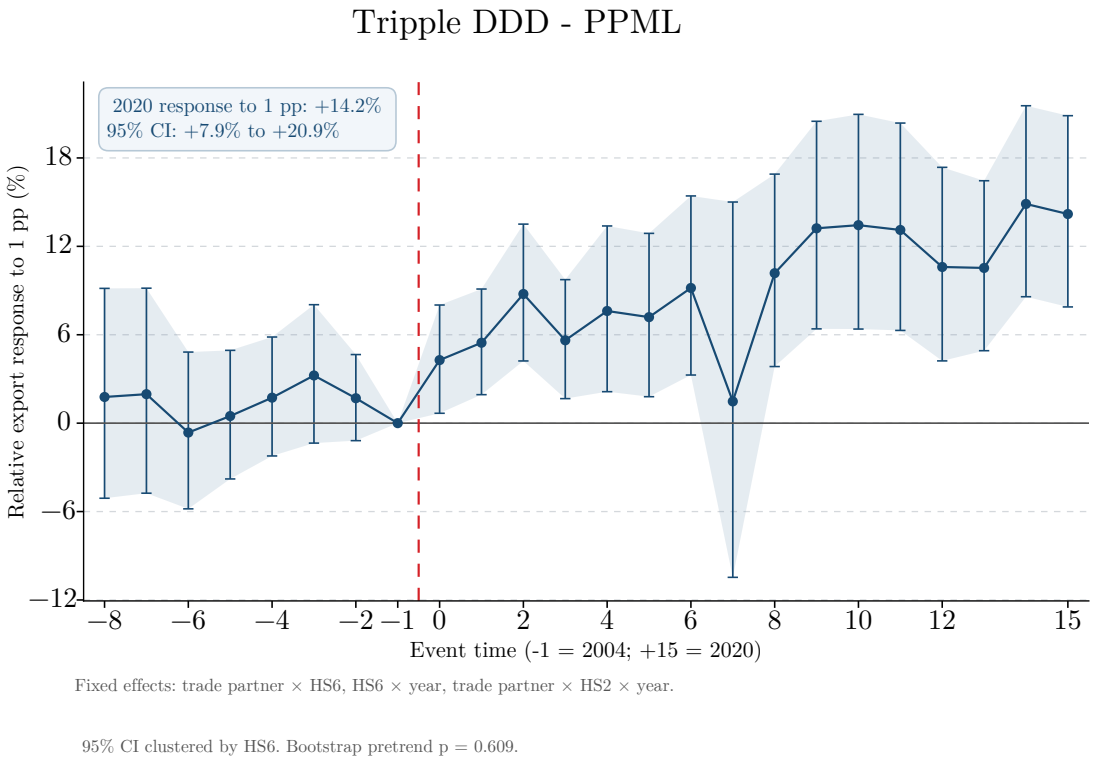


Figure A4: Manufacturing Export: 2003 MFN Exposure, HS6 Clustering

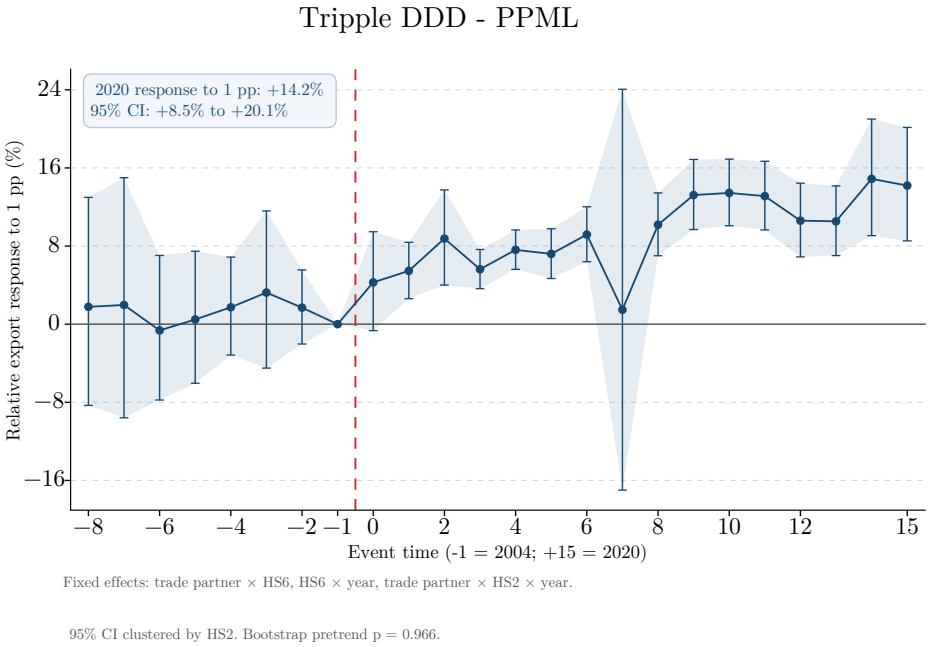


Figure A5: Manufacturing Export: 2003 MFN Exposure, HS2 Clustering

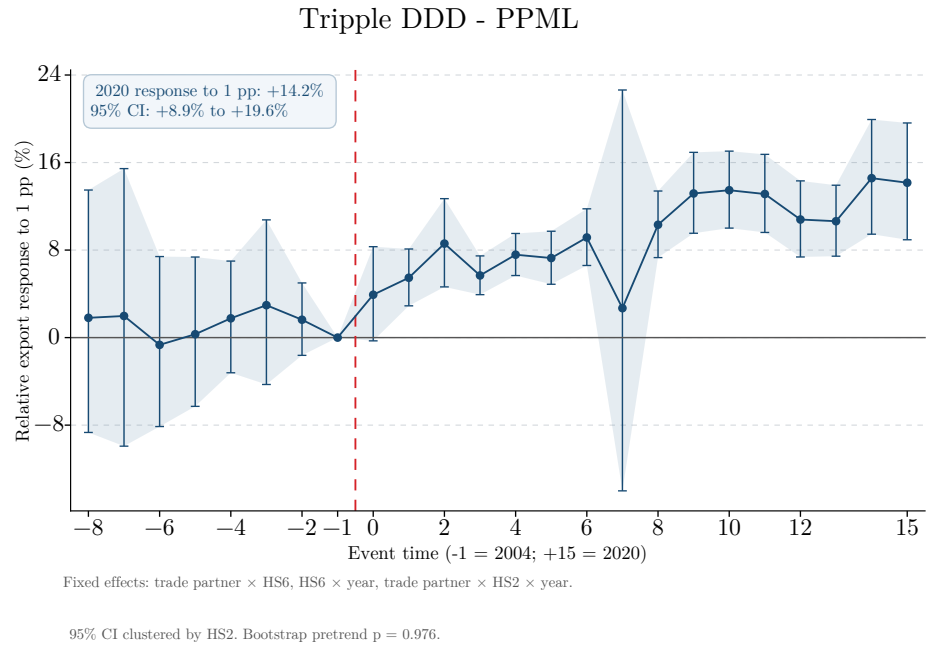


Figure A6: Manufacturing Export: 2004 MFN Exposure, HS2 Clustering

These robustness charts vary the MFN base year and clustering level while retaining the manufacturing sample and preferred fixed effects. Table 1 gives the pooled estimates.

A.2 Imports from Israel: Trade-Partner-by-Year Controls

Figure A7 presents the 2000/01 input-output event study with trade-partner-by-year controls, complementing the specification with sector controls in Figure 5. By 2020, the estimated relative import response reaches 316.7% per exposure percentage point. The Webb bootstrap joint pretrend p-value is 0.545, while the conventional Wald test rejects ($p < 0.001$).

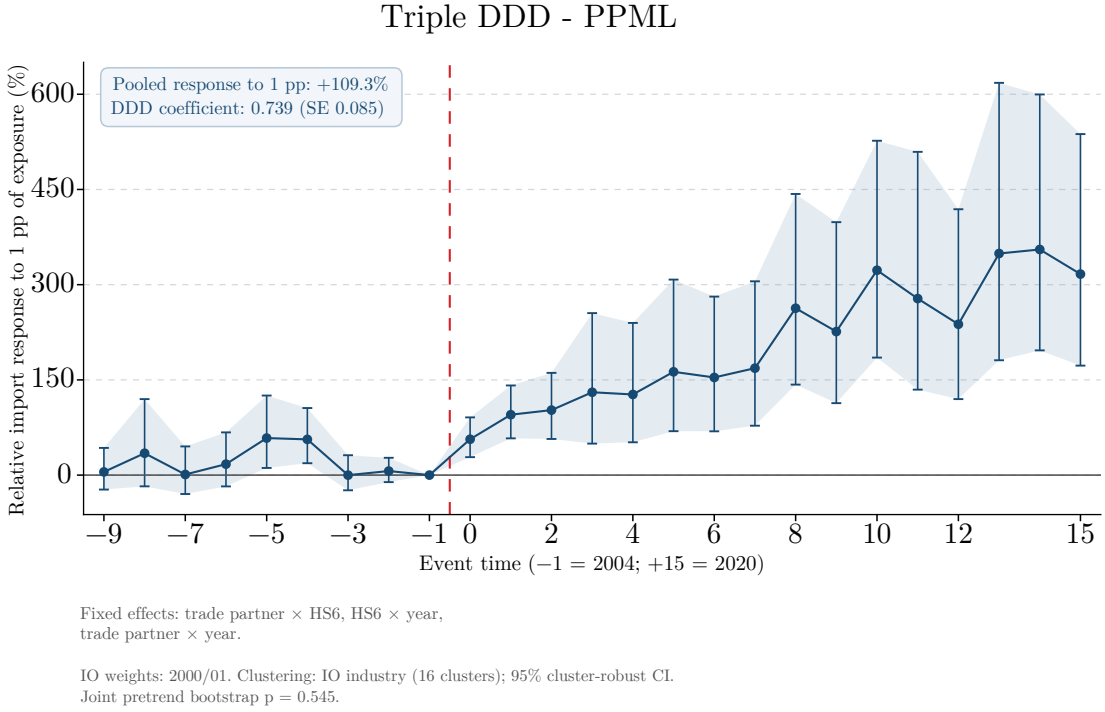


Figure A7: Imports from Israel: 2000/01 IO Exposure, Trade-Partner-by-Year Controls

A.3 Imports from Israel: 2008/09 Input-Output Weights

Table A1 and Figures A8–A9 report the import robustness results using the 2008/09 input-output table. The pooled coefficients without industry trends are 0.4127 with trade-partner-by-year controls and 0.7498 with trade-partner-by-broad-sector-by-year controls, implying relative responses of 51.1% and 111.7% per exposure percentage point. The Webb pretrend p-values are 0.816 and 0.532, while both conventional Wald tests reject at 5%. With differential industry trends, the pooled coefficients become -0.0247 ($p = 0.467$) and 0.0501 ($p = 0.678$). These results reinforce the sensitivity to trend assumptions. Because the 2008/09 weights are measured after implementation, they provide a robustness comparison rather than a predetermined baseline.

Table A1: Imports from Israel: Robustness Using 2008/09 IO Exposure

	Baseline (1)	Sector FE (2)	Sector FE + trends (3)
DDD coefficient	**0.4127*****	**0.7498*****	**0.0501**
	(0.0895)	(0.1651)	(0.1193)
Response to 1 pp exposure	+51.1%	+111.7%	+5.1%
Fixed effects and trends			
Trade partner × HS6	Yes	Yes	Yes
HS6 × year	Yes	Yes	Yes
Trade partner time effects	Year	Sector × year	Sector × year
Egypt × industry linear trends	No	No	Yes
Observations	103,005	102,756	102,753
Years	1996–2020	1996–2020	1996–2020
IO-industry clusters	29	29	29
Bootstrap pretrend p-value	0.816	0.532	–

Notes: Sector FE denotes trade partner × broad sector × year effects; column (3) adds Egypt × industry linear trends. Standard errors clustered by IO industry in parentheses; $^{***}p < 0.01$. Bootstrap p-values test joint pretrends (Webb weights); – denotes not applicable.

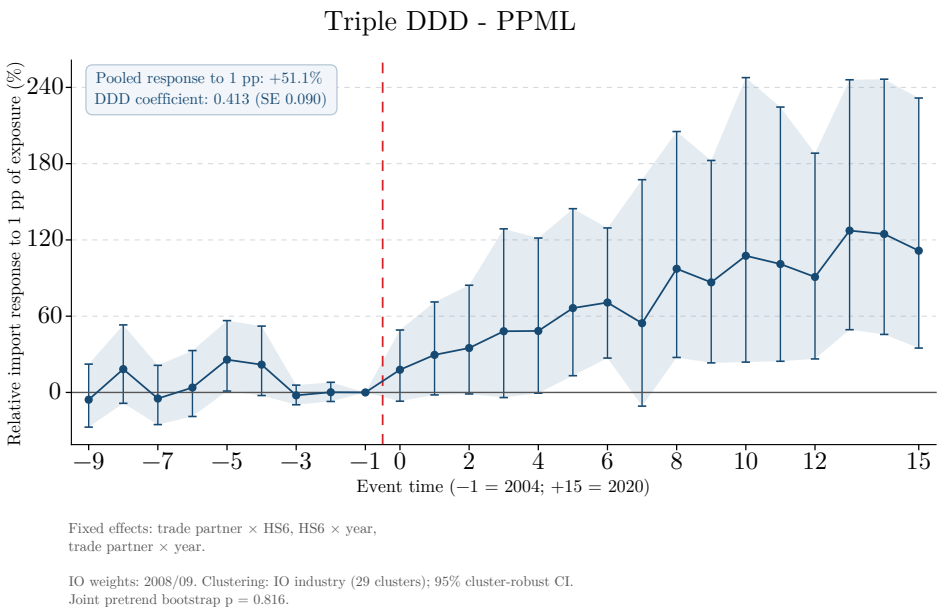


Figure A8: Imports from Israel: 2008/09 IO Exposure, Trade-Partner-by-Year Controls

The 2008/09 input-output weights postdate QIZ implementation. These results therefore serve as a robustness comparison rather than the predetermined baseline.

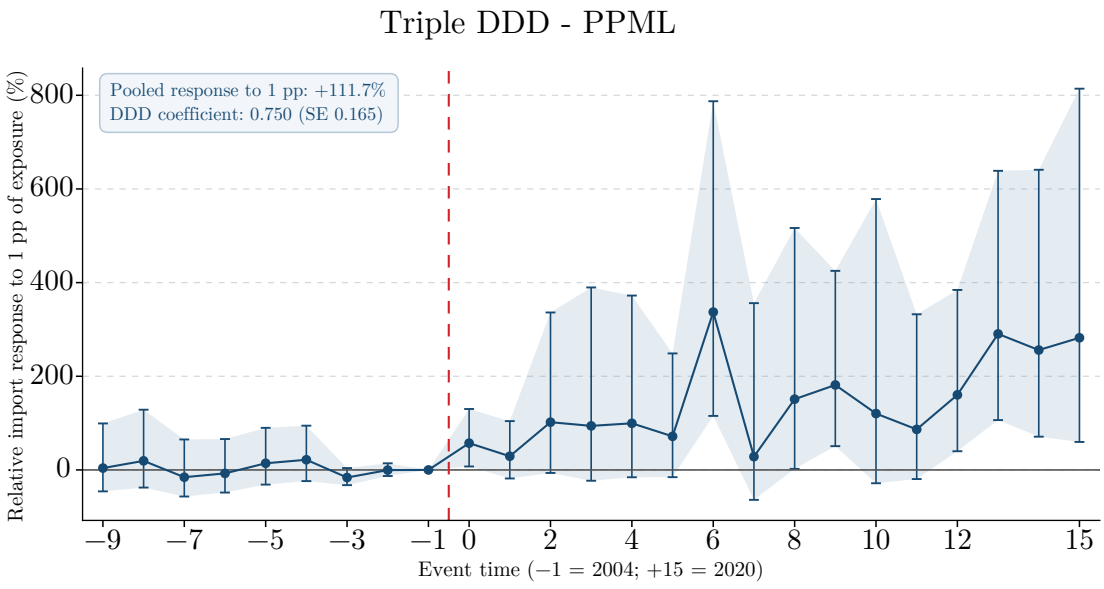


Figure A9: Imports from Israel: 2008/09 IO Exposure, Trade-Partner-by-Sector-by-Year Controls

B Log Outcomes with Zeros

For the firm-level log-outcome specifications, I use a transformation of exports designed for settings with many zero or very small trade flows. Following Chen and Roth (2024), I assign export values below 10,000 a common floor and take logs of values at or above that threshold. Changes entirely below the floor do not affect the transformed outcome, while a firm moving from zero to exports above the floor does contribute. The estimates therefore include sufficiently large entries into exporting as well as changes among continuing exporters; export levels and annual export participation provide complementary views of adjustment.

$$y_{it} = \begin{cases} \log(10{,}000), & \text{if Exports}_{it} < 10{,}000, \\ \log(\text{Exports}_{it}), & \text{if Exports}_{it} \geq 10{,}000. \end{cases} \tag{31}$$

C Additional Industry Results

I examine changes in manufacturing activity using UNIDO data for 1998–2021. Exposure is measured by the average 2004 U.S. MFN tariff across products within each industry, weighted by their shares of Egyptian exports to the United States over 2000–2004. Product tariffs are mapped to three-digit industries using the existing industry concordances. The measure does not incorporate industries' U.S. export orientation and is expressed in tariff percentage points.

I estimate the following pooled specification by ordinary least squares:

$$\ln Y_{it} = \alpha_i + \delta_t + \beta \left(E_i \times \mathbb{1}\{t \geq 2005\} \right) + \varepsilon_{it}, \tag{32}$$

where Y_{it} denotes output, employment, value added, or total wages in industry i and year t, and E_i is pre-agreement tariff exposure. Industry and year fixed effects are included. Standard errors are clustered by three-digit industry, and I report wild-cluster-bootstrap p-values. The monetary outcomes are measured in U.S. dollars. Wages refer to the total wage bill rather than wages per worker. Dairy and footwear are retained; tobacco is absent from the source panel, while the motor-vehicle industry has undefined U.S.-export-weighted exposure.

Table C1 reports positive coefficients for output, employment, value added, and total wages. In the expanded panel, a one-percentage-point higher exposure is associated with approximately 2.8% higher output, 3.4% higher employment, 2.3% higher value added, and 4.1% higher total wages after the agreement relative to less exposed industries. Employment and total wages are significant at the 10% level using the bootstrap, while output and value added are not statistically significant.

Removing extrapolated observations leaves the estimates positive. Total wages are significant at the 5% level, while output and value added are significant at the 10% level using the bootstrap. However, this exercise also changes the industries and years represented. The reported-only panel retains all available industries with observations before and after 2005. Restricting these regressions to the corresponding balanced-sample industries yields similar magnitudes, although precision generally weakens. Value added has a smaller balanced sample because the log specification requires positive values in every retained year.

These findings are consistent with an expansion of exposed industries, but provide only suggestive evidence. Pre-agreement observations require mapping from ISIC Rev. 3 to Rev. 4 using fixed industry-allocation weights, and missing observations limit coverage. The bootstrap conditions on this construction and does not account for uncertainty in the mapping or extrapolated values. Employment's joint Wald bootstrap pretrend test rejects in the expanded panel ($p = 0.036$), but not after extrapolated observations are removed ($p = 0.345$). The latter test contains only two pre-policy contrasts, for 1998 and 2002 relative to 2004, and therefore has limited power. Differences in calendar-year coverage and sample composition also affect comparisons across specifications. These limitations warrant caution in interpreting the estimates causally.

Table C1: Industry-Level Responses to Weighted MFN Exposure

	Coefficient (clustered SE)	Response (%)	Clustered p-value	Bootstrap p-value	Industries
Panel A: With extrapolation					
Output	0.0277 (0.0213)	2.80	0.199	0.159	59
Employment	0.0331 (0.0205)	3.37	0.112	0.084	59
Value added	0.0224 (0.0223)	2.27	0.320	0.270	55
Total wage bill	0.0397 (0.0207)	4.05	0.060	0.060	59
Panel B: Without extrapolation					
Output	0.0416 (0.0259)	4.25	0.113	0.057	65
Employment	0.0318 (0.0231)	3.23	0.174	0.143	65
Value added	0.0373 (0.0261)	3.80	0.159	0.092	65
Total wage bill	0.0526 (0.0241)	5.40	0.032	0.037	65

Notes: Fixed effects: industry and year. Clustering: three-digit industry. Wild-cluster-bootstrap tests use 9,999 null-imposed Rademacher draws. Coefficients and standard errors are per one percentage point of weighted MFN exposure; responses equal $100[\exp(\beta) - 1]$. All outcomes are logged. Panel A is balanced over 1998–2021; Panel B retains reported observations in an unbalanced panel. Panel A has 1,416 observations per outcome except value added (1,320); Panel B has 1,041 for output, 1,056 for employment, 1,039 for value added, and 1,052 for wages. Missing or nonpositive outcomes are excluded from the log regressions. Dairy and footwear are included.

D Additional Firm-Level Results

These figures use the rebuilt 2005–2016 customs panel and first recorded Israeli import. The main sample has 2008–2012 first-import cohorts (110 treated textile and apparel firms); the wider 2006–2015 sample includes 248 treated firms. Unless stated otherwise, estimates use the cohort-specific CEM weights, firm-by-cohort and cohort-by-HS2-by-year fixed effects, firm-clustered standard errors, and event year -1 as the reference. The figures describe associations around recorded Israeli sourcing.

D.1 Annual Export Participation

An additional margin of adjustment is whether firms export in a given year. I examine an annual indicator for positive exports to any destination. I estimate its event-study path for the same matched textile and apparel firms used in the main firm analysis, with the first recorded Israeli import defining event year zero. The sample includes firms that exported at least once during 2005–2016, including firms with no exports before the event.

Figure D1 shows that the probability of exporting to any destination rises by 24.1 percentage points in the first-import year and 29.2 percentage points one year later in the Sun–Abraham specification. The two displayed pre-event coefficients are jointly indistinguishable from zero ($p = 0.433$).

This outcome measures annual export activity among firms observed exporting at some point in the customs panel. It does not measure entry into exporting from the universe of Egyptian firms or the creation of new firms. The increase in export participation is consistent with a broader expansion of trade following Israeli sourcing, while endogenous selection into Israeli sourcing and the absence of firm-level QIZ registration data limit a causal interpretation.

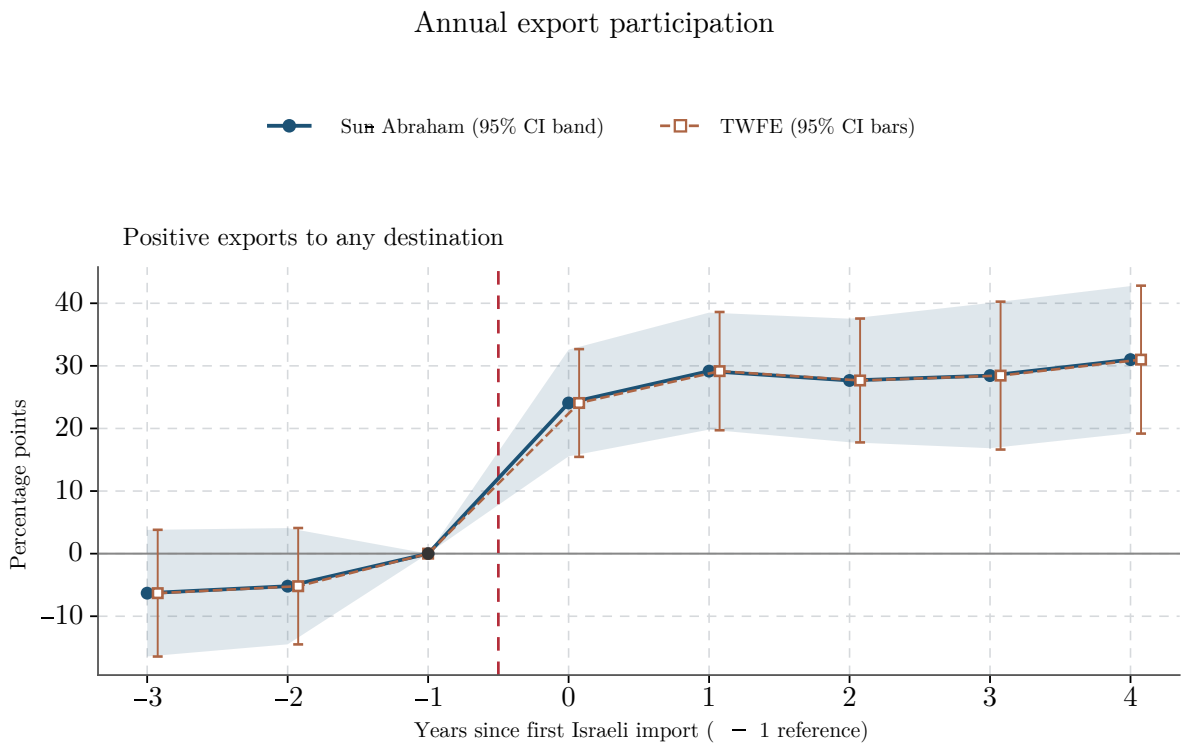


Figure D1: Annual Export Participation to Any Destination around the First Recorded Israeli Import

Notes: The outcome is positive exports to any destination. Sample: 110 treated textile and apparel firms (2008–2012 cohorts) and 1,630 never-Israel-importer controls; all exported during 2005–2016. Main matching weights and fixed effects; firm-clustered 95% confidence intervals. Coefficients are percentage points relative to event year −1.

D.2 Cohort Range and Matching

Figures D2–D5 repeat the main outcomes for the wider 2006–2015 set of first-import cohorts. This raises the treated sample to 248 firms. The dynamic estimates for both cohort ranges appear in Tables D1 and D2.

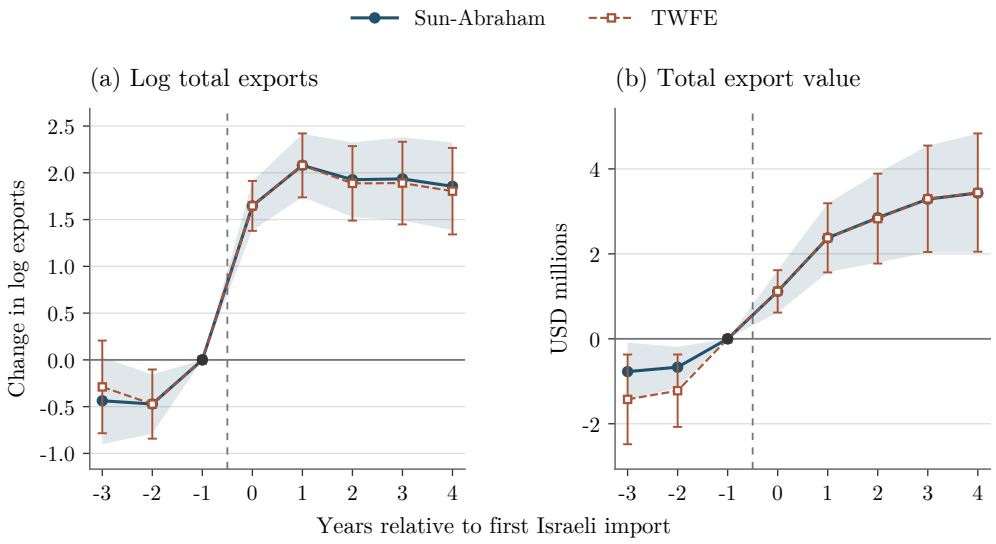


Figure D2: Log and level total exports, 2006–2015 first-import cohorts.

The wider cohort contains 248 treated firms. The matching design and event-year reference follow the main firm analysis.

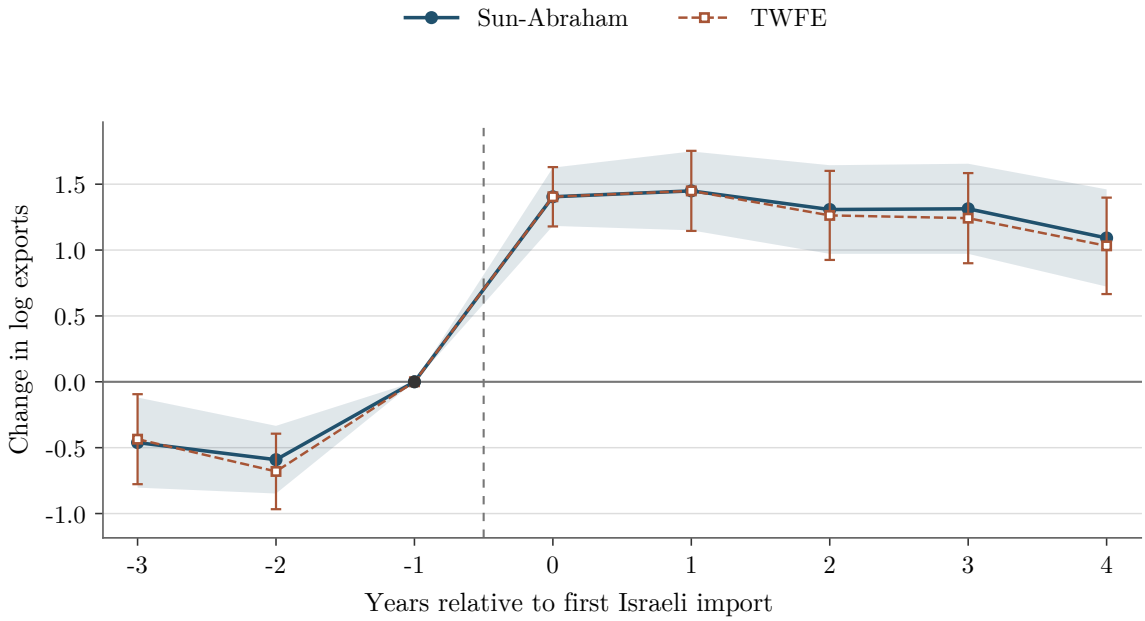


Figure D3: Thresholded log U.S. exports, 2006–2015 first-import cohorts.

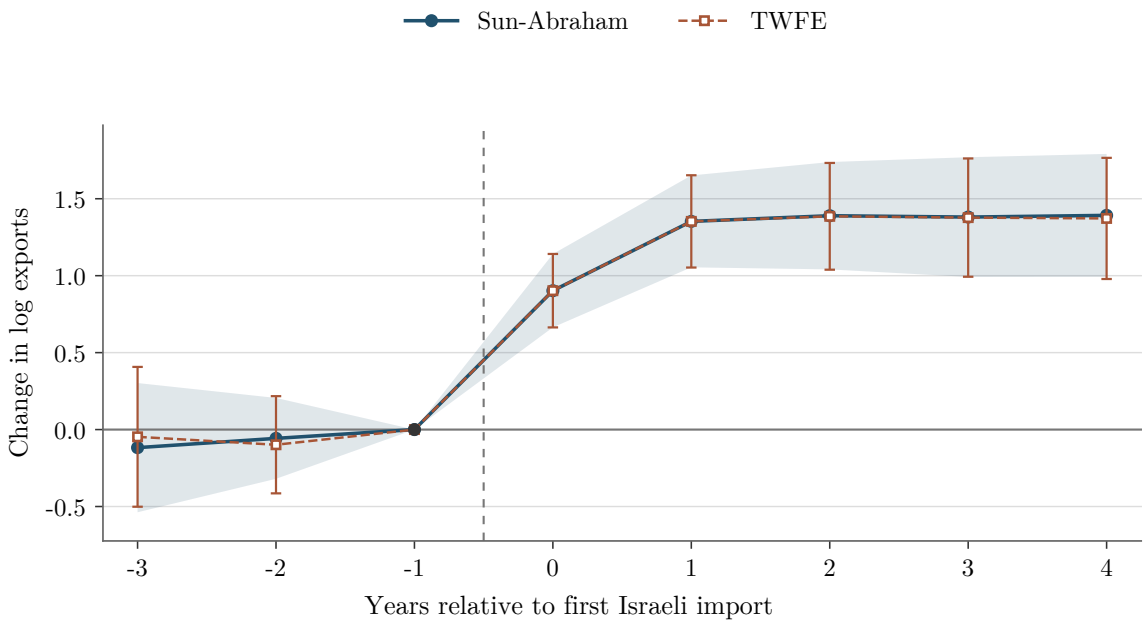


Figure D4: Thresholded log non-U.S. exports, 2006–2015 cohorts.

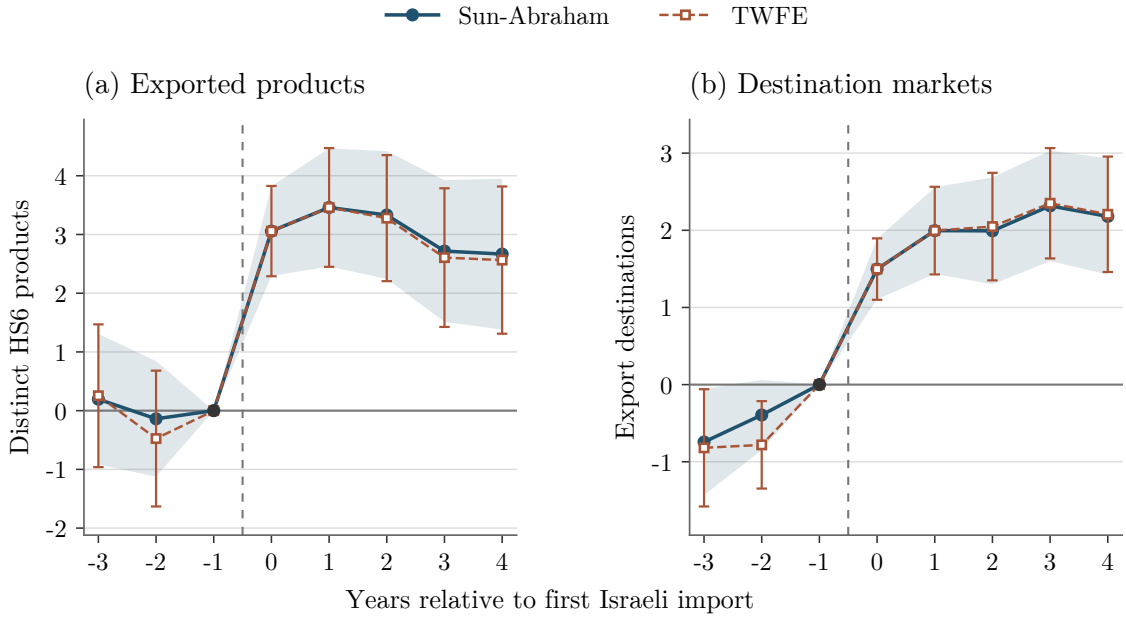
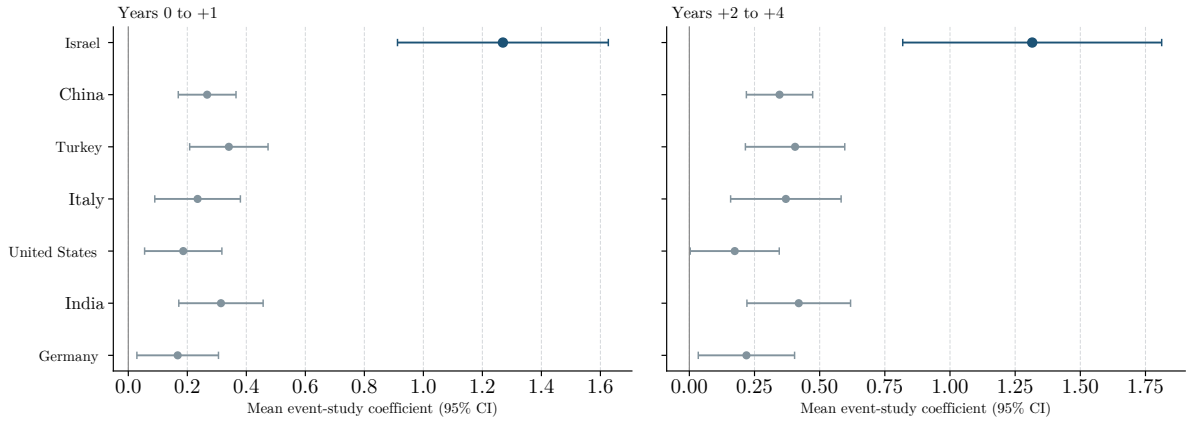


Figure D5: Product and destination counts, 2006–2015 cohorts.

Figure D6: Post-event U.S. export responses around first imports from Israel and six other countries.



Notes: Sun–Abraham estimates for thresholded log U.S. exports. Regressions for other origins control for the full first-Israeli-import event path. Each origin uses its own matched cohort sample, so magnitudes are descriptive comparisons.

Table D1: Sun–Abraham dynamic outcomes: 2008–2012 cohorts

Event time	Log U.S.	U.S. USDm	Log non-U.S.	Non-U.S. USDm	Products	Destinations
−3	-0.386	-0.182	-0.035	-0.488	0.397	-0.611
	(0.188)	(0.156)	(0.243)	(0.334)	(0.665)	(0.400)
−2	-0.468	-0.228	-0.006	-0.434	0.406	-0.287
	(0.159)	(0.129)	(0.181)	(0.278)	(0.711)	(0.320)
+0	1.202	0.414	0.905	1.077	2.797	1.507
	(0.171)	(0.186)	(0.187)	(0.403)	(0.465)	(0.313)
+1	1.337	1.287	1.288	1.801	3.404	1.936
	(0.233)	(0.336)	(0.239)	(0.565)	(0.751)	(0.455)
+2	1.300	1.678	1.183	1.807	2.766	1.552
	(0.262)	(0.438)	(0.281)	(0.644)	(0.801)	(0.583)
+3	1.420	2.107	1.345	2.423	2.636	1.993
	(0.260)	(0.559)	(0.310)	(0.784)	(0.796)	(0.495)
+4	1.226	1.948	1.360	2.406	2.721	2.211
	(0.274)	(0.533)	(0.306)	(0.902)	(0.827)	(0.538)
Mean 0 to +1	1.270	0.851	1.096	1.439	3.100	1.721
	(0.182)	(0.232)	(0.204)	(0.470)	(0.565)	(0.360)
Mean +2 to +4	1.315	1.911	1.296	2.212	2.708	1.919
	(0.253)	(0.488)	(0.285)	(0.730)	(0.780)	(0.498)
Joint leads p $(-3,-2)$	0.011	0.111	0.981	0.280	0.820	0.270

Notes: Estimates and firm-clustered standard errors in parentheses. First customs-recorded Israeli import is event 0; event −1 is omitted. Cohort-by-event interactions are aggregated by treated-cohort size. Windows average the indicated interactions over a common set of eligible cohorts. Firm-by-cohort and cohort-by-HS2-by-year fixed effects. CEM within HS2 and year −1 total-export size, with earlier total-export growth when available. Log outcomes use $\log(\max\{x, 10{,}000\})$; export levels are USD millions. Requires the booktabs package.

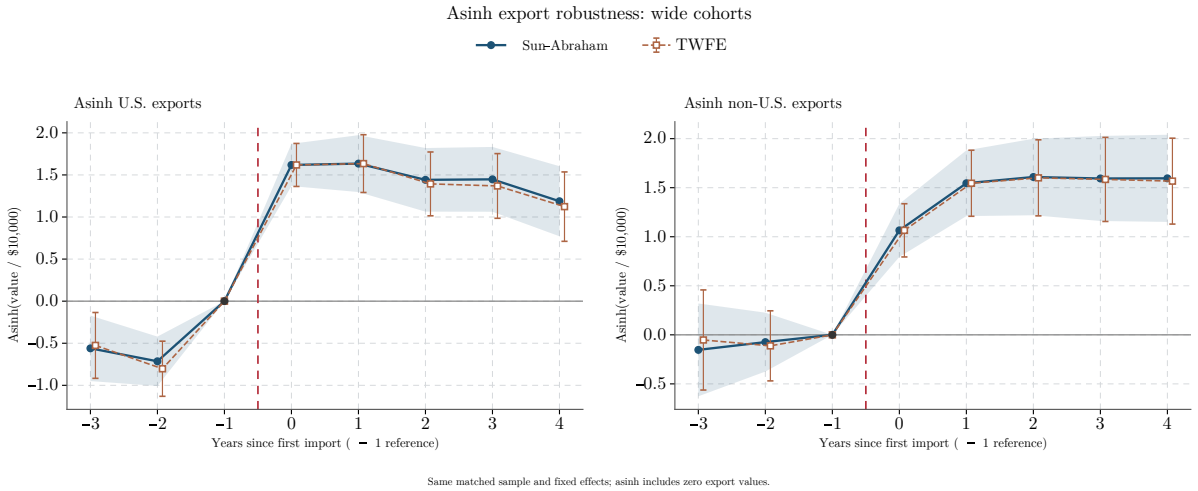
Table D2: Sun–Abraham dynamic outcomes: 2006–2015 cohorts

Event time	Log U.S.	U.S. USDm	Log non-U.S.	Non-U.S. USDm	Products	Destinations
-3	-0.461	-0.402	-0.117	-0.370	0.195	-0.744
	(0.175)	(0.177)	(0.214)	(0.281)	(0.567)	(0.351)
-2	-0.591	-0.366	-0.057	-0.302	-0.139	-0.394
	(0.131)	(0.133)	(0.134)	(0.192)	(0.502)	(0.232)
$+0$	1.404	0.461	0.903	0.656	3.057	1.497
	(0.113)	(0.130)	(0.122)	(0.203)	(0.390)	(0.200)
$+1$	1.449	1.056	1.353	1.321	3.460	1.996
	(0.153)	(0.193)	(0.152)	(0.322)	(0.514)	(0.286)
$+2$	1.308	1.302	1.390	1.548	3.331	1.993
	(0.172)	(0.250)	(0.178)	(0.405)	(0.555)	(0.354)
$+3$	1.313	1.550	1.381	1.738	2.718	2.316
	(0.175)	(0.329)	(0.198)	(0.479)	(0.615)	(0.365)
$+4$	1.092	1.528	1.392	1.905	2.666	2.180
	(0.188)	(0.316)	(0.204)	(0.557)	(0.656)	(0.384)
Mean 0 to $+1$	1.427	0.758	1.128	0.988	3.259	1.746
	(0.122)	(0.135)	(0.131)	(0.248)	(0.413)	(0.228)
Mean $+2$ to $+4$	1.246	1.480	1.395	1.736	2.898	2.155
	(0.169)	(0.288)	(0.187)	(0.463)	(0.595)	(0.348)
Joint leads p $(-3,-2)$	< 0.001	0.018	0.860	0.291	0.717	0.106

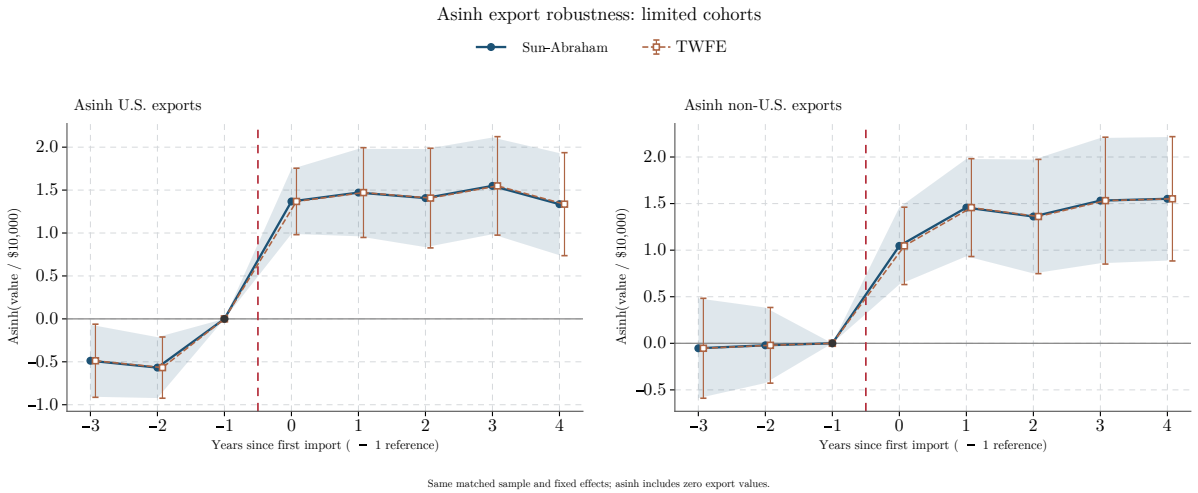
Notes: Estimates and firm-clustered standard errors in parentheses. First customs-recorded Israeli import is event 0; event -1 is omitted. Cohort-by-event interactions are aggregated by treated-cohort size. Windows average the indicated interactions over a common set of eligible cohorts. Firm-by-cohort and cohort-by-HS2-by-year fixed effects. CEM within HS2 and year -1 total-export size, with earlier total-export growth when available. For the wide sample, outer event times use only cohorts observed at those times; two 2006 firms use adjacent within-HS2 size bins to preserve treated support. Log outcomes use $\log(\max\{x, 10{,}000\})$; export levels are USD millions. Requires the booktabs package.

D.3 Inverse-Hyperbolic-Sine Export Outcomes

The inverse-hyperbolic-sine transformation retains zero export values. Figure D7 reports U.S. and non-U.S. export responses for both cohort ranges.



(a) 2006–2015 cohorts



(b) 2008–2012 cohorts

Figure D7: Inverse-hyperbolic-sine U.S. and non-U.S. export responses.

D.4 Non-U.S. Exports by Destination Region

This exercise estimates the response in non-U.S. exports to the first import from Israel by textile and apparel firms. The region crosswalk covers 94.5% of textile and apparel non-U.S. export value in Europe, Africa, and Asia. Unmapped destinations are excluded.

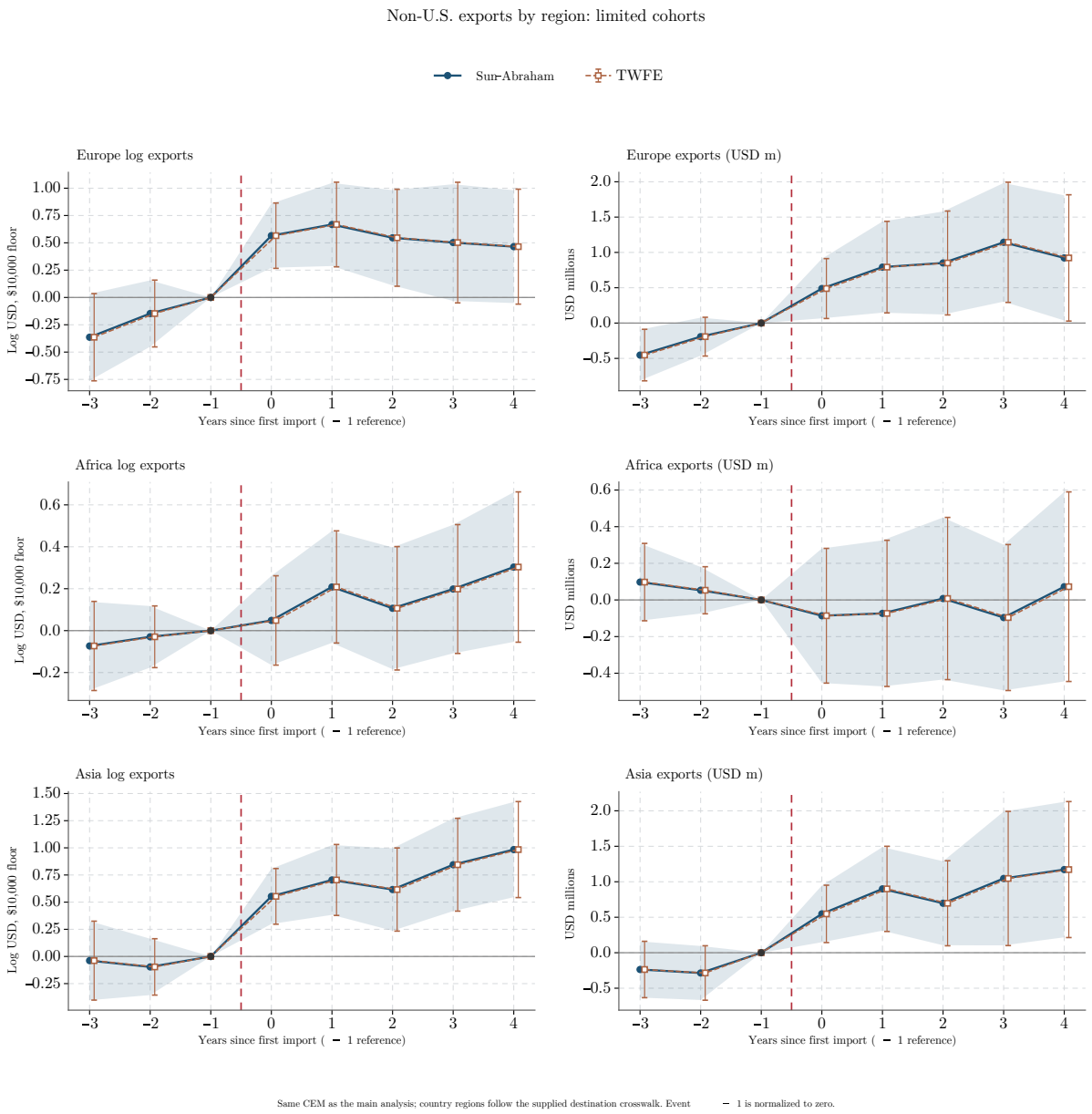
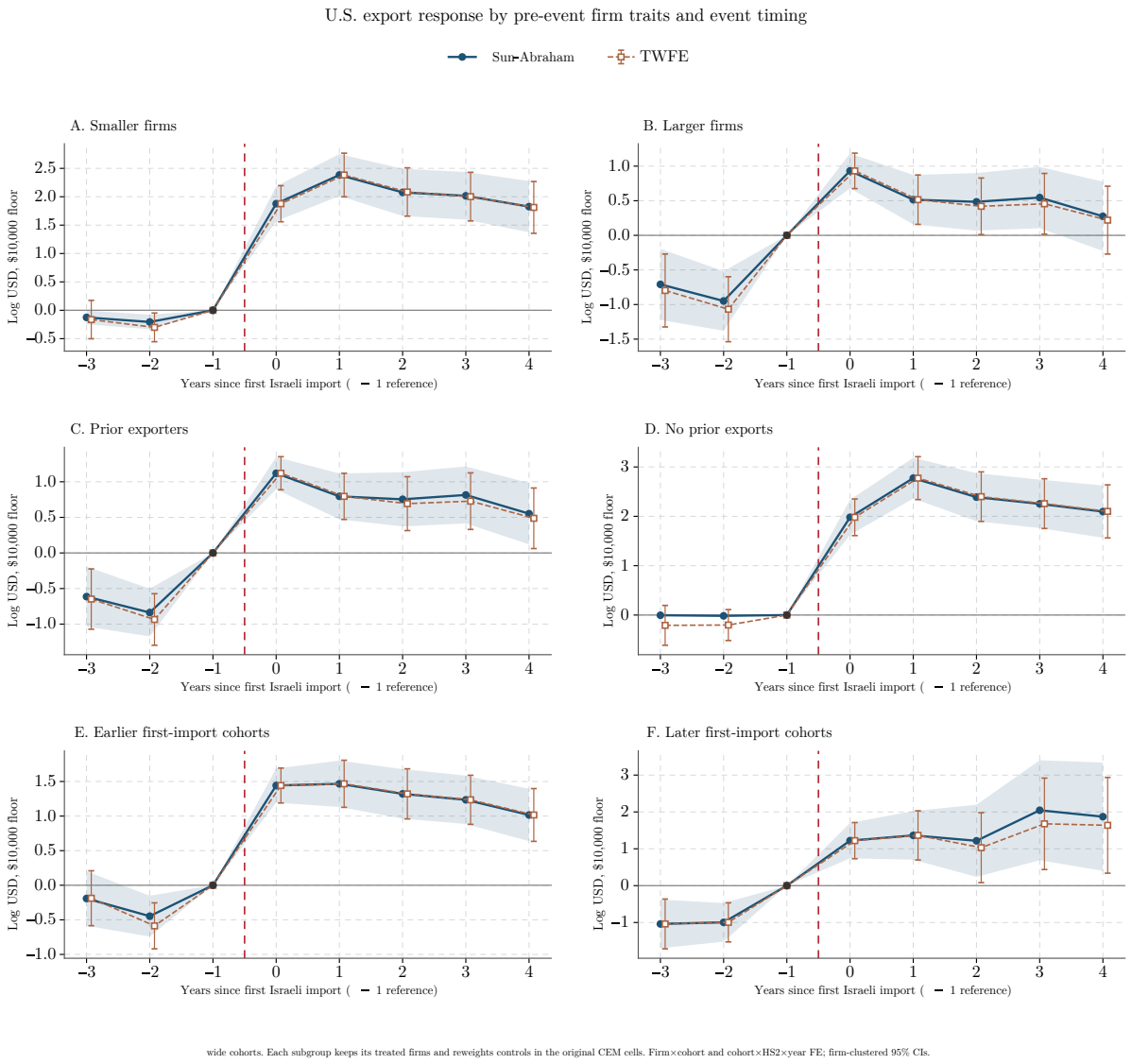


Figure D8: Non-U.S. exports to Europe, Africa, and Asia, 2008–2012 cohorts.

D.5 Firm Heterogeneity

I examine heterogeneity in the U.S. export response by firm size, prior export experience, and the timing of first Israeli imports. Firms are classified as small or large based on median total exports in the year preceding their first Israeli import. Prior export experience distinguishes firms with and without positive exports before the event, while early and late importers are defined relative to the first-import year in each sample.



wide cohorts. Each subgroup keeps its treated firms and reweights controls in the original CEM cells. Firm×cohort and cohort×HS2×year FE; firm-clustered 95% CIs.

Figure D9: U.S. export responses by firm size, prior exporting, and first-import timing, 2006–2015 cohorts.

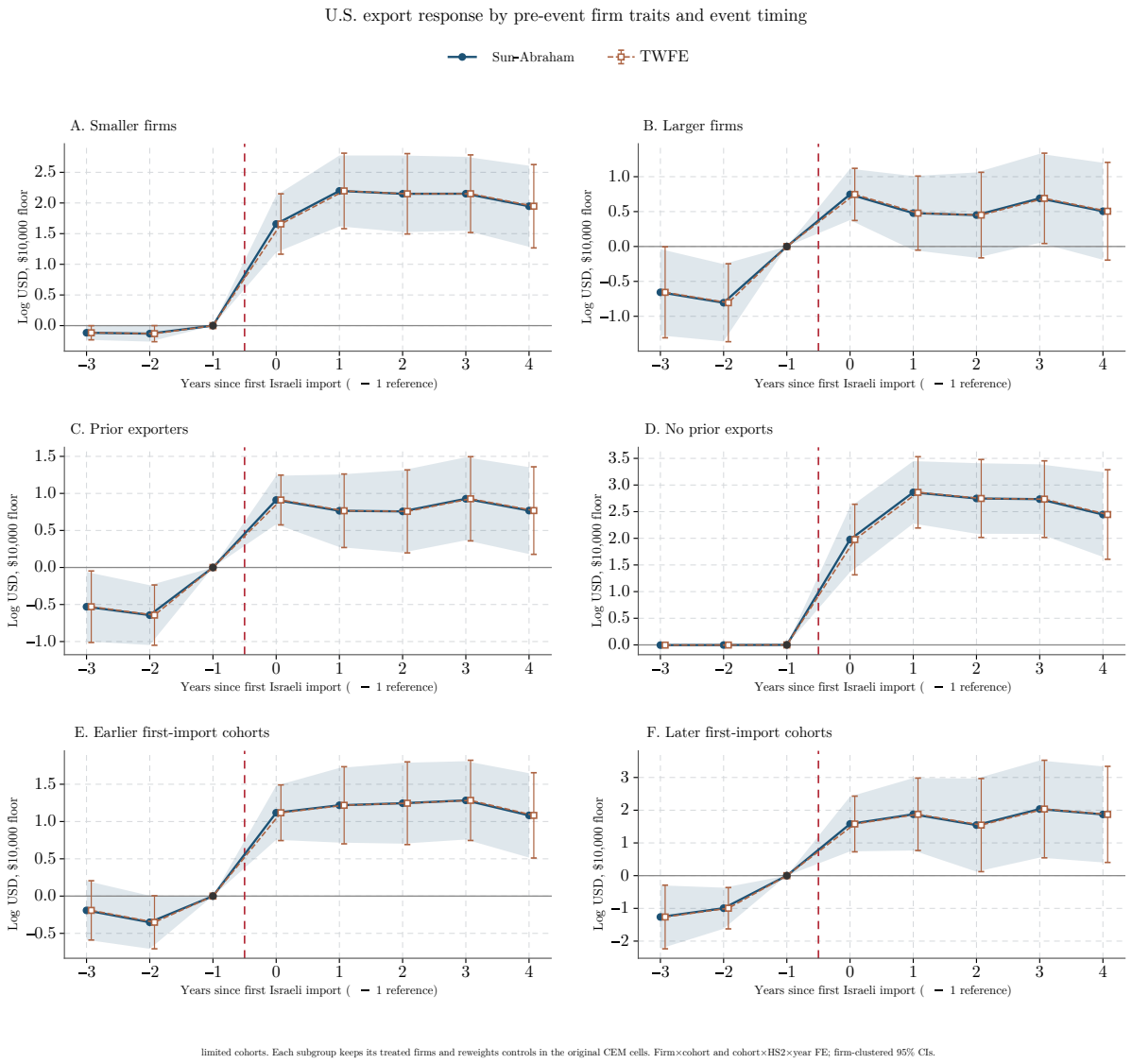


Figure D10: U.S. export responses by firm size, prior exporting, and first-import timing, 2008–2012 cohorts.

D.6 Sector and Import-Origin Comparisons

I conduct two additional exercises to examine whether the export response following first Israeli imports is consistent with the QIZ preferential treatment. First, I repeat the event study separately across broad HS2 sector groups. Within each group, I construct matched samples using coarsened exact matching (CEM), retaining up to five control firms per treated firm within each matching cell. Figures D11–D16 report the average post-event responses, dynamic effects, and differential response for textile and apparel firms. The export response is substantially larger in textiles and apparel, where QIZ participation is concentrated. Food and agriculture provide an imperfect placebo because some products in these sectors also qualify for QIZ preferences. The differential textile and apparel estimates also exhibit some pre-event movement.

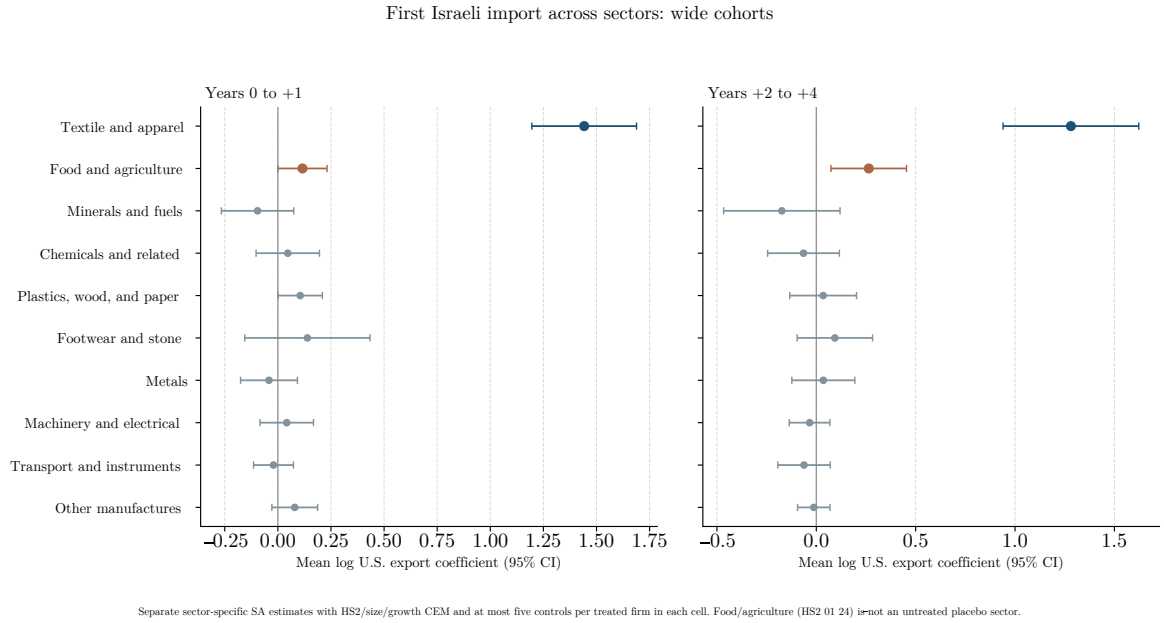


Figure D11: Post-event log U.S. export responses by sector, 2006–2015 cohorts.

Second, I compare export responses around first imports from Israel with those around first imports from six other countries. For each origin, I construct a separate matched sample and estimate the event-study response of U.S. exports. The regressions for other origins additionally control for the full event-study path around first Israeli imports. Figures D17 and D18 report the post-event responses. The substantially larger response around Israeli imports is consistent with QIZ preferences contributing to export expansion beyond the general benefits of foreign input sourcing. Since each origin uses a different matched sample, the comparisons remain descriptive.

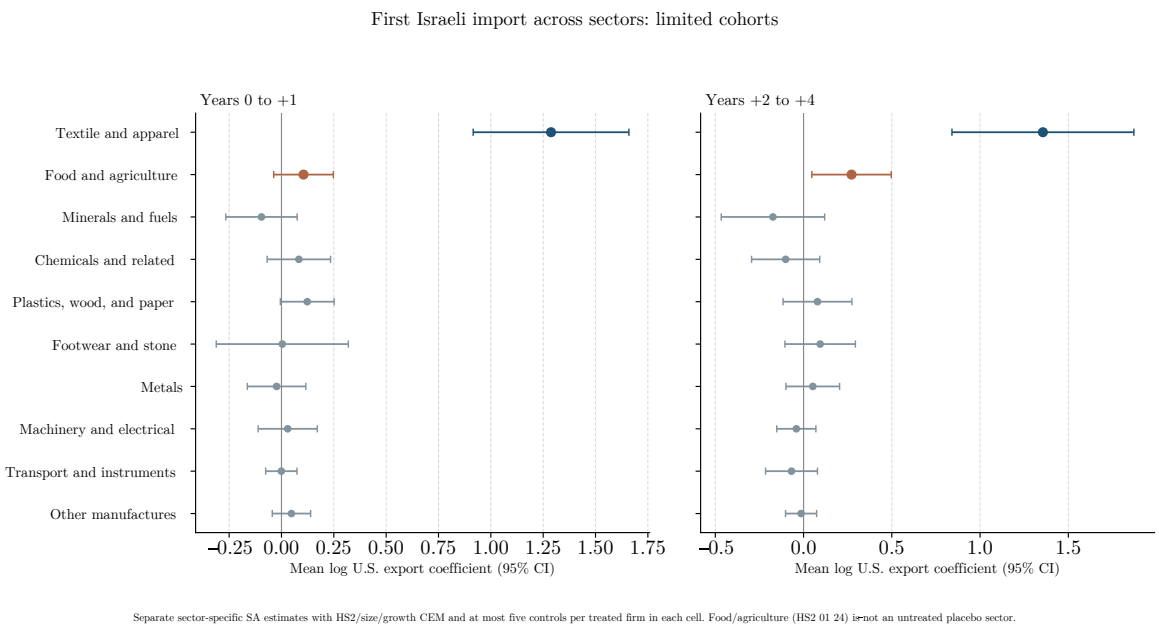


Figure D12: Post-event log U.S. export responses by sector, 2008–2012 cohorts.

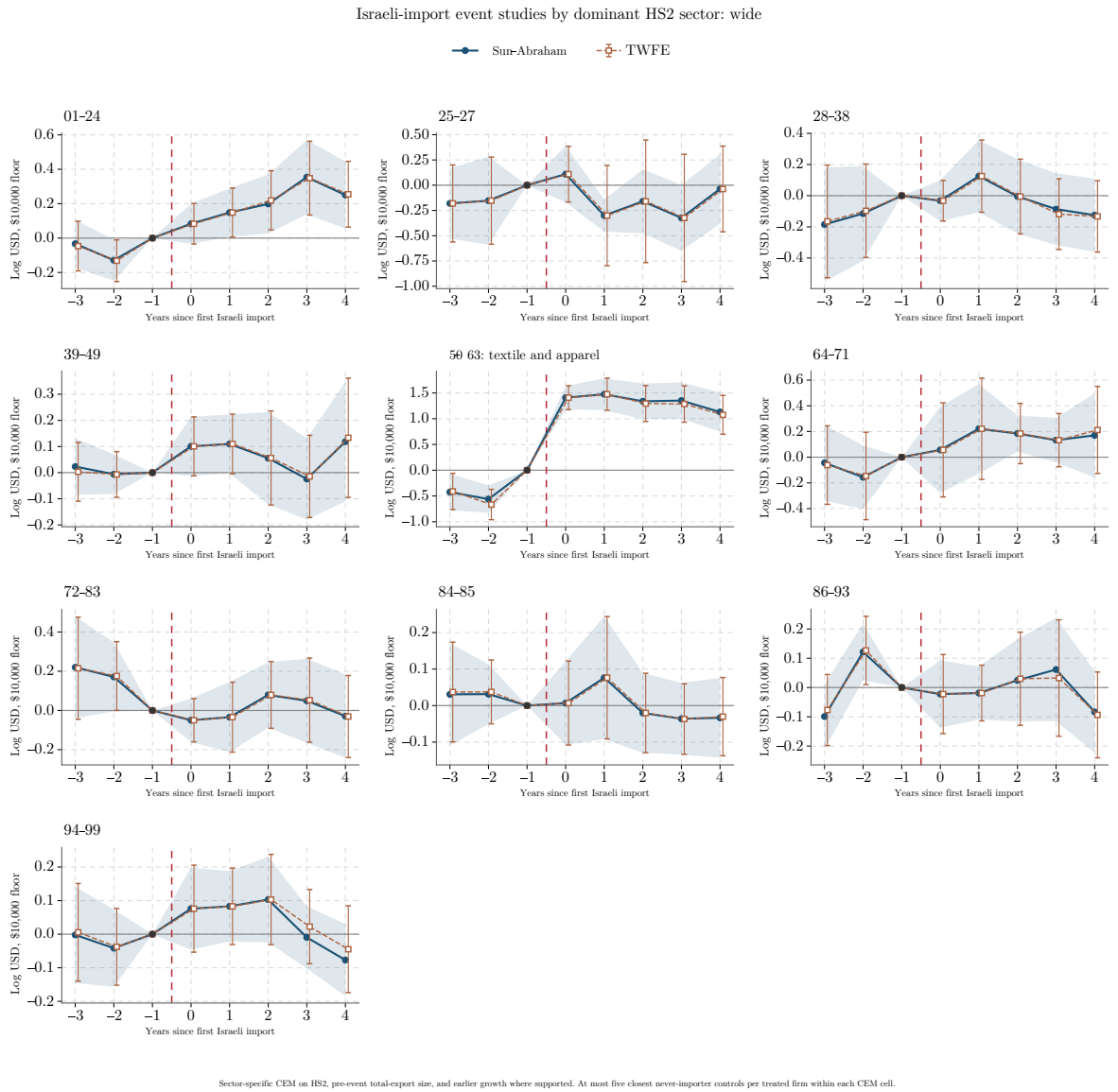


Figure D13: Dynamic export responses around first Israeli imports by sector, 2006–2015 cohorts.

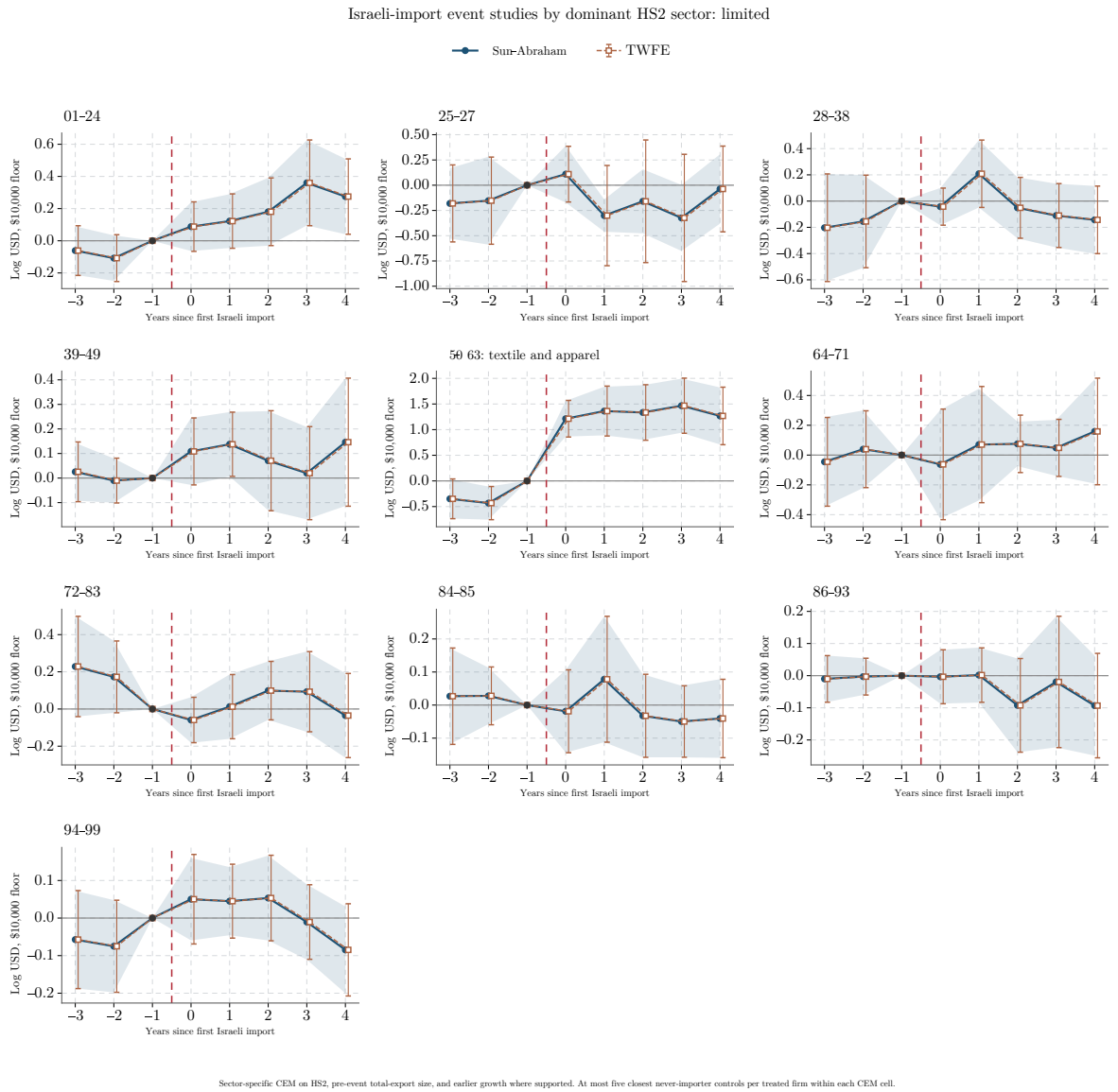


Figure D14: Dynamic export responses around first Israeli imports by sector, 2008–2012 cohorts.

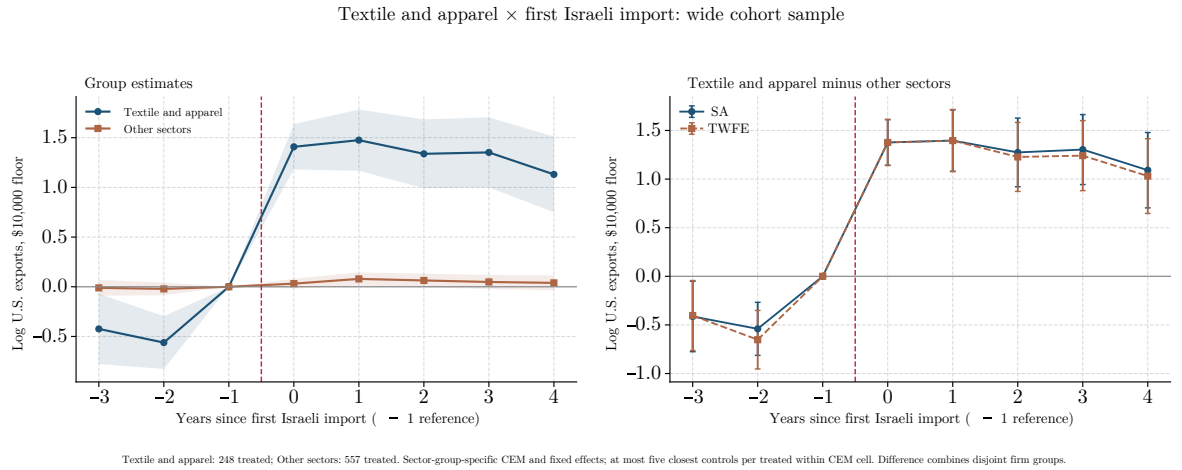


Figure D15: Differential U.S. export response of textile and apparel firms relative to other sectors, 2006–2015 cohorts.

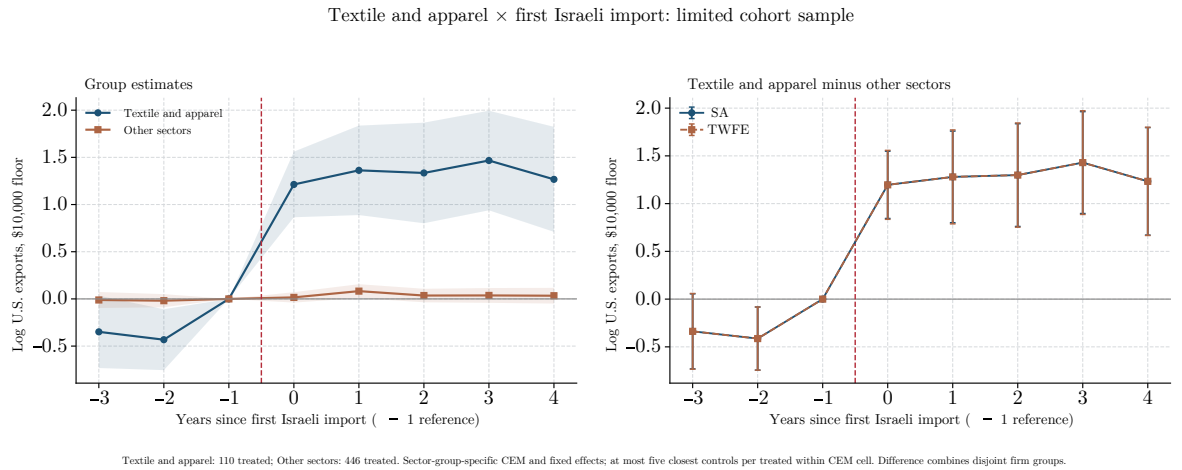


Figure D16: Differential U.S. export response of textile and apparel firms relative to other sectors, 2008–2012 cohorts.

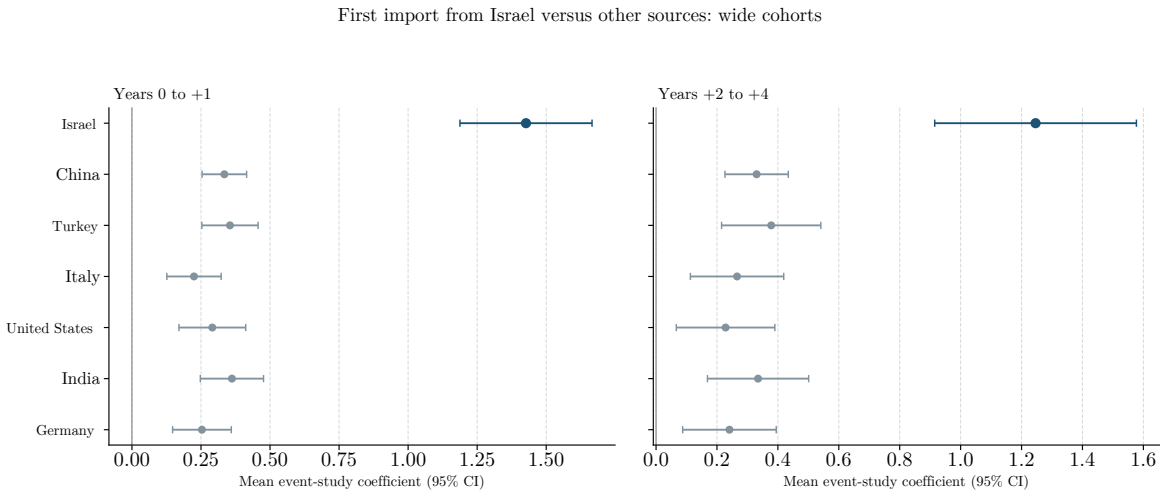


Figure D17: U.S. export responses around first imports from Israel and six other countries, 2006–2015 cohorts.

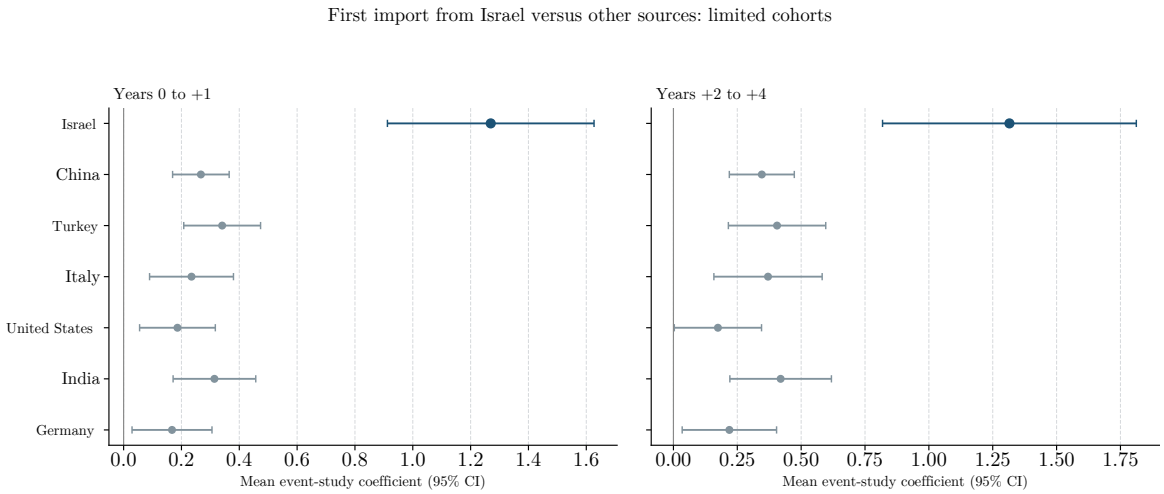


Figure D18: U.S. export responses around first imports from Israel and six other countries, 2008–2012 cohorts.

E Robustness: Mechanisms

Table E1 reports additional specifications for the analysis looking at the mechanisms inducing export spillovers across destinations. In these exercises, I use alternative exporter definitions, panel and repeated cross-sectional data, and industry-by-wave fixed effects. The positive response in international certification persists across specifications, although precision weakens under industry-level clustering. Foreign ownership shows negative differentials among firms already exporting in 2004, while foreign technology adoption and fixed-asset investment exhibit no consistent response. The evidence points to certification as the most prominent upgrading margin associated with QIZ exposure.

Table E1: Survey Mechanisms: Additional Specifications

		International certification	Foreign ownership	Foreign technology	Fixed-asset investment
Panel A. Ever direct or indirect exporters					
Panel	Baseline	1.612	0.127	0.167	0.302
		(0.690)	(0.290)	(0.882)	(1.494)
Cross-section	Baseline	0.993	0.110	-0.341	1.155
		(0.560)	(0.280)	(0.713)	(1.008)
Panel	Industry × wave FE	1.428	0.066	-0.101	-0.317
		(0.735)	(0.297)	(0.963)	(1.597)
Cross-section	Industry × wave FE	1.138	0.263	-0.596	1.200
		(0.559)	(0.294)	(0.733)	(1.045)
Panel B. Direct or indirect exporters in 2004					
Panel	Baseline	2.443	-0.576	-0.476	-0.228
		(1.151)	(0.351)	(1.408)	(2.073)
Cross-section	Baseline	2.430	-0.560	-0.679	0.084
		(0.910)	(0.302)	(1.182)	(1.693)
Panel	Industry × wave FE	2.443	-0.645	-0.426	-1.242
		(1.208)	(0.329)	(1.509)	(2.225)
Cross-section	Industry × wave FE	2.606	-0.612	-0.480	-0.762
		(0.940)	(0.283)	(1.241)	(1.818)

Notes: Coefficients are exporter–other-firm differences in percentage points per percentage point of MFN exposure; firm-clustered standard errors are in parentheses. Panel models include firm fixed effects; cross-sectional models include industry-by-exporter-status fixed effects. All include exporter-status-by-wave effects; the last two rows of each panel add industry-by-wave effects. Panel B uses 2004 exporter status.

F Counterfactual Equilibrium and Additional Quantitative Results

This appendix describes the calculations used for the model counterfactuals and the additional results reported in the quantitative analysis. The household problem, firms' sourcing and export decisions, and equilibrium conditions are specified in Section 7. I use the observed QIZ equilibrium as the benchmark and vary the Israeli content requirement r or remove the QIZ option, holding foreign demand, foreign prices, tariffs, technology, and fixed costs constant.

F.1 Equilibrium in changes

For any positive variable z, let $\widehat{z} = z'/z$, with primes denoting counterfactual values. I normalize the benchmark wage to one. The labor endowment and the external-balance share $b = \mathcal{B}/Y$ are fixed, so $\widehat{Y} = \widehat{\mathcal{B}} = \widehat{w}$. Welfare changes follow Equation (25).

The unrestricted intermediate-input expenditure share of origin o in the benchmark is

$$\delta_{o,s} = \frac{\beta_{o,s} p_o^{1-\eta_s}}{\sum_{h \in \mathcal{O}} \beta_{h,s} p_h^{1-\eta_s}}. \tag{33}$$

The unrestricted unit cost therefore changes according to

$$\widehat{a}_{\text{unres},s} = \widehat{w}^{\,1-\gamma_s} \left[\sum_{o \in \mathcal{O}} \delta_{o,s} \widehat{p}_o^{\,1-\eta_s} \right]^{\gamma_s/(1-\eta_s)}, \tag{34}$$

where $\widehat{p}_E = \widehat{w}$ and $\widehat{p}_I = \widehat{p}_U = \widehat{p}_R = 1$.

For QIZ production, I solve the constrained sourcing problem at each counterfactual wage and requirement. Let t_L and $\{t_o\}_{o \in \mathcal{O}}$ be shares of variable production expenditure on labor and inputs, and write $\nu_s = (\eta_s - 1)/\eta_s$. By constant returns to scale, constrained unit cost is the reciprocal of the maximum output per unit of expenditure:

$$\begin{aligned} \left[a_{\text{QIZ},s}(w', r')\right]^{-1} = \max_{t_L, \{t_o\} \geq 0} \quad & \left(\frac{t_L}{w'}\right)^{1-\gamma_s} \left[\sum_{o \in \mathcal{O}} \beta_{o,s}^{1/\eta_s} \left(\frac{t_o}{p'_o}\right)^{\nu_s} \right]^{\gamma_s/\nu_s} \\ \text{subject to} \quad & t_L + \sum_{o \in \mathcal{O}} t_o = 1, \\ & t_L + t_E \geq \mu_s \underline{e}, \\ & t_I \geq \mu_s r', \\ & t_L + \sum_{o \in \{E,I,U\}} t_o \geq \mu_s \underline{q}. \end{aligned} \tag{35}$$

The factors μ_s convert content requirements defined relative to output value into expenditure shares. The binding constraints are determined by the optimization.

Holding foreign demand and tariffs fixed, the ROW and MFN revenue coefficients change by $\widehat{a}_{\text{unres},s}^{1-\sigma_s}$. I update the QIZ revenue advantage as

$$\rho_s' = (1+\tau_s)^{\sigma_s}\left(\frac{a_{\text{QIZ},s}'}{a_{\text{unres},s}'}\right)^{1-\sigma_s}. \tag{36}$$

When QIZ is removed, firms choose between MFN and not exporting to the United States.

Let $\lambda_{D,s}$ be the benchmark share of sectoral final expenditure on Egyptian varieties. Domestic prices and sales update as

$$\begin{aligned}\widehat{P}_s &= \left[1-\lambda_{D,s}+\lambda_{D,s}\widehat{M}_s\widehat{a}_{\text{unres},s}^{1-\sigma_s}\right]^{1/(1-\sigma_s)},\\ \widehat{R}_{D,s} &= \widehat{Y}\,\frac{\widehat{M}_s\widehat{a}_{\text{unres},s}^{1-\sigma_s}}{1-\lambda_{D,s}+\lambda_{D,s}\widehat{M}_s\widehat{a}_{\text{unres},s}^{1-\sigma_s}}.\end{aligned} \tag{37}$$

These expressions account for changes in domestic prices and the mass of Egyptian varieties, with foreign-variety prices fixed.

F.2 Export aggregation and numerical solution

The productivity cutoffs are recalculated from Equations (15) and (17) at each counterfactual equilibrium. Set $\varphi_{\text{QIZ},s}=\infty$ when QIZ is unavailable or $\rho_s \le 1$. The minimum productivity for exporting to the United States under either regime is $\min\{\varphi_{\text{MFN},s}, \varphi_{\text{QIZ},s}^{\text{BE}}\}$ when QIZ is available with $\rho_s>1$, and $\varphi_{\text{MFN},s}$ otherwise.

To aggregate across firms, define the survival probability $\mathcal{S}_s(c)=\int_{\varphi\ge c} dG_s(\varphi)$ and the revenue-relevant tail moment $\mathcal{T}_s(c)=\int_{\varphi\ge c}\varphi^{\sigma_s-1}dG_s(\varphi)$. Write $k_s=\sigma_s-1$, $u_{0,s}=\underline{\varphi}_s/\overline{\varphi}_s$, and $u_s(c)=\min\{1,\max\{u_{0,s},c/\overline{\varphi}_s\}\}$. For the truncated Pareto distribution,

$$\begin{aligned}\mathcal{S}_s(c) &= \frac{u_s(c)^{-\theta_s}-1}{u_{0,s}^{-\theta_s}-1},\\ \mathcal{T}_s(c) &= \frac{\theta_s\overline{\varphi}_s^{k_s}}{u_{0,s}^{-\theta_s}-1}\begin{cases}\dfrac{u_s(c)^{k_s-\theta_s}-1}{\theta_s-k_s}, & \theta_s\neq k_s,\\ -\log u_s(c), & \theta_s=k_s.\end{cases}\end{aligned} \tag{38}$$

Both expressions are zero above the upper productivity support.

Let $B_{\text{ROW},s}=R_{\text{ROW},s}(1)$ and $B_{U,s}^{\text{MFN}}=R_{U,s}^{\text{MFN}}(1)$. Exporter masses and producer revenues are

$$\begin{aligned}N_{\text{ROW},s} &= M_s\mathcal{S}_s(\varphi_{\text{ROW},s}),\\ X_{\text{ROW},s} &= M_s B_{\text{ROW},s}\mathcal{T}_s(\varphi_{\text{ROW},s}),\\ N_{\text{MFN},s} &= M_s[\mathcal{S}_s(\varphi_{\text{MFN},s})-\mathcal{S}_s(\varphi_{\text{QIZ},s})]_+,\\ X_{\text{MFN},s} &= M_s B_{U,s}^{\text{MFN}}[\mathcal{T}_s(\varphi_{\text{MFN},s})-\mathcal{T}_s(\varphi_{\text{QIZ},s})]_+,\\ N_{\text{QIZ},s} &= M_s\mathcal{S}_s(\varphi_{\text{QIZ},s}),\\ X_{\text{QIZ},s} &= M_s\rho_s B_{U,s}^{\text{MFN}}\mathcal{T}_s(\varphi_{\text{QIZ},s}),\end{aligned} \tag{39}$$

where $[x]_+ = \max\{x, 0\}$. These formulas allow firms to switch regimes and sectors with no initial QIZ participation to enter the program.

Integrating the profit function gives the free-entry condition in aggregate form:

$$\begin{aligned} M_s w f_{e,s} = &\frac{R_{D,s} + X_{\mathrm{ROW},s} + X_{\mathrm{MFN},s} + X_{\mathrm{QIZ},s}}{\sigma_s} \\ &- w\left[f_{\mathrm{ROW},s} N_{\mathrm{ROW},s} + f_{U,s}(N_{\mathrm{MFN},s} + N_{\mathrm{QIZ},s}) + f_{Q,s} N_{\mathrm{QIZ},s}\right]. \end{aligned} \tag{40}$$

I solve the S free-entry equations and the labor-market condition in Equation (23) for $\widehat{w}$ and $\{\widehat{M_s}\}_{s=1}^{S}$. For each trial solution, I update sourcing costs, domestic demand, export cutoffs, and aggregate sales. A trust-region nonlinear least-squares solver iterates on the log wage and log firm masses, using nearby policy solutions and alternative starting values for numerical checks. The saved policy grid satisfies a maximum absolute normalized equilibrium residual below 3×10^{-12}.

I also check the external-account identity

$$M^{\mathrm{final}} + M^{\mathrm{int}} - X_E = \mathcal{B}, \tag{41}$$

where $M^{\mathrm{final}} = Y - \sum_s R_{D,s}$ is final-goods import expenditure, M^{int} is spending on intermediate inputs from Israel, the United States, and ROW, and $X_E = \sum_s (X_{\mathrm{ROW},s} + X_{\mathrm{MFN},s} + X_{\mathrm{QIZ},s})$ is Egyptian export revenue. The identity follows from free entry and labor-market clearing. The share $\mathcal{B}/Y$ remains fixed across equilibria.

F.3 Sectoral decomposition of Israeli input purchases

I decompose the change in Israeli purchases into changes within continuing QIZ sectors, QIZ sector entry or exit, and changes in purchases under unrestricted sourcing. Let $\mathcal{A}_j = \{s : X_{\mathrm{QIZ},s}(r_j) > 0\}$ for policy $j \in \{0, 1\}$, and let $M_{I,s}^{\mathrm{QIZ}}$ and $M_{I,s}^{\mathrm{unres}}$ denote Israeli purchases under the two sourcing regimes. The decomposition is

$$\begin{aligned} \Delta M_I = &\sum_{s \in \mathcal{A}_0 \cap \mathcal{A}_1} \Delta M_{I,s}^{\mathrm{QIZ}} \\ &+ \sum_{s \in \mathcal{A}_1 \setminus \mathcal{A}_0} M_{I,s}^{\mathrm{QIZ}}(r_1) - \sum_{s \in \mathcal{A}_0 \setminus \mathcal{A}_1} M_{I,s}^{\mathrm{QIZ}}(r_0) \\ &+ \sum_s \Delta M_{I,s}^{\mathrm{unres}}. \end{aligned} \tag{42}$$

The within-sector term includes changes in firm entry, QIZ participation, output, and sourcing among sectors that use QIZ in both equilibria.

At requirements of 20% and 11%, apparel is the only QIZ-using sector. Food, textiles, and leather enter as the requirement falls to 9.755%. From the observed 10.5% requirement, the additional sector-entry contribution comes from leather; changes within continuing sectors account for most of the increase in Israeli purchases.

Table F1: Sources of Changes in Israeli Input Purchases

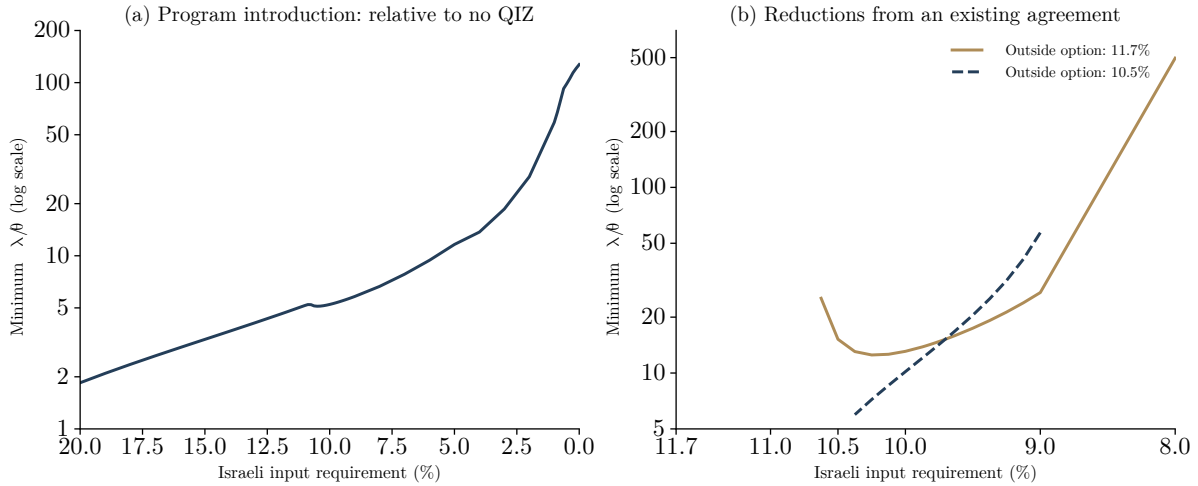
Initial Israeli requirement	20%	11%	10.5%
Final requirement	9.755%	9.755%	9.755%
Continuing QIZ sectors	6.14	-31.07	17.83
QIZ sector entry and exit	85.42	85.42	0.22
Unrestricted sourcing	1.18	-0.88	-0.29
Total Israeli purchases	92.74	53.47	17.76

Notes: Changes in EGP million. Components sum using unrounded values; no sector exits QIZ in these comparisons.

F.4 Political valuation thresholds

Figure F1 extends the relative-valuation calculation in Equation (30) to alternative Israeli requirements and outside options: no QIZ, 11.7%, and 10.5%. Each curve plots $\Delta X_U/\Delta M_I$ where both changes are positive. The curves omit the unchanged outside option and comparisons with no increase in Israeli purchases.

Figure F1: Political Support Thresholds under Alternative Input Requirements



Notes: Each curve uses the stated outside option. Vertical axes are logarithmic. Thresholds describe relative preferences under the assumed political objective.

F.5 Industry-level validation

Table 5 compares untargeted responses in the data and the model using the same industry definitions and pre-agreement tariff exposure. U.S. exports are aggregated to the fifteen model sectors. For industry s, exposure is

$$\text{Exposure}_s = 100\frac{\sum_{p\in s}\tau_{p,2004}}{\sum_{p\in s}1}, \tag{43}$$

where $\tau_{p,2004}$ is the 2004 U.S. MFN tariff on product p, expressed as a fraction. Exposure is therefore measured in percentage points. Products receive equal weight,

including zero-tariff products and products without recorded Egyptian exports in 2004. For combined industries, I recompute exposure from their constituent products.

Israeli input purchases use the expanded Israel-reported trade series. Undisclosed product flows are allocated using fixed 2000–2004 product shares before aggregation. I retain intermediate goods and assign purchases to Egyptian using industries with the 2008/09 input-output table:

$$\widetilde{M}_{I,s,t} = \sum_i \frac{Z_{is}^{08/09}}{\sum_j Z_{ij}^{08/09}} M_{I,i,t}^{\mathrm{INT}}, \tag{44}$$

where $M_{I,i,t}^{\mathrm{INT}}$ is Israeli intermediate exports to Egypt from supplier industry i in year t, and $Z_{is}^{08/09}$ is intermediate sales from supplier i to user s. The denominator includes all users, including nonmanufacturing industries. The allocation yields fourteen groups, combining furniture with other manufacturing, repair, and installation. These fixed, post-agreement input-output weights proxy the industries purchasing imported inputs rather than directly observing them.

For each outcome, I estimate PPML over 1998–2020:

$$\mathbb{E}[Y_{s,t} \mid s, t, \mathrm{Exposure}_s] = \exp\left[\delta_s + \delta_t + \beta^{\mathrm{data}} \mathrm{Exposure}_s \mathbf{1}\{t \geq 2005\}\right]. \tag{45}$$

Here $Y_{s,t}$ denotes U.S. exports or Israeli input purchases; δ_s and δ_t are industry and year fixed effects. The coefficient β^{data} measures the differential post-2004 response per percentage point of tariff exposure.

On the model side, I aggregate equilibrium levels to the corresponding fifteen or fourteen industry groups and fit the same PPML projection, replacing years with policy states:

$$\mathbb{E}[\widetilde{Y}_{s,q} \mid s, q, \mathrm{Exposure}_s] = \exp\left[c_s + c_q + \beta^{\mathrm{model}} \mathrm{Exposure}_s q\right]. \tag{46}$$

The outcome $\widetilde{Y}_{s,q}$ is the model's industry-level export revenue or Israeli purchases; $q = 0$ denotes no QIZ and $q = 1$ observed QIZ. The terms c_s and c_q are industry and policy-state fixed effects. I repeat no-QIZ outcomes seven times and observed-QIZ outcomes sixteen times to match the numbers of pre- and post-agreement years. This is a projection of static equilibria, not a simulated historical transition. Neither response coefficient is targeted in calibration.

I report percentage responses as $100[\exp(\widehat{\beta}) - 1]$. The 90% confidence intervals transform $\widehat{\beta} \pm t_{G-1,0.95}\,\mathrm{se}(\widehat{\beta})$ in the same way, using industry-clustered standard errors and $G = 15$ clusters for U.S. exports and $G = 14$ for Israeli purchases. Here $t_{G-1,0.95}$ is the 95th percentile of the Student t distribution with $G - 1$ degrees of freedom. These intervals describe empirical uncertainty; the model responses are deterministic. The sector-clustered Webb bootstrap p-values are 0.251 for U.S. exports and 0.017 for Israeli purchases.