

# Conditional Trade Policy for Peace? Economic Effects of Industrial Zones in the Middle East

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## Abstract

This paper examines how conditional trade policies with input-sourcing requirements affect firms' exports, production, and labor outcomes. I study Egypt's Qualifying Industrial Zones (QIZ) program, which grants duty-free access to the U.S. market conditional on sourcing inputs from Israel. I estimate event-study and triple-difference specifications using firm-level customs data, industrial census records, and labor force surveys. I find large and persistent export gains along both intensive and extensive margins alongside improvements in output, productivity, employment, and wages. The improvements are driven by U.S. market access rather than the quality of Israeli inputs. To map these firm-level responses into aggregate and welfare implications, I develop a quantitative heterogeneous-firm trade model with endogenous QIZ compliance, rules-of-origin costs, and productivity upgrading. The framework is used to quantify the program's economy-wide effects and conduct counterfactual analyses that vary the Israeli content requirement, highlighting the trade-off between lower tariffs and higher input costs.

**Keywords:** Trade policy, Place-based policies, Industrial Policy, Development

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# 1 Introduction

In recent decades, there has been increased interest in place-based policies and their role in stimulating local development and job creation. At the same time, trade has long been recognized as a powerful driver of economic growth and productivity, dating back to the Industrial Revolution and even earlier. Yet the interaction between these two areas remains less studied. What happens when a trade policy is tied to a specific location? And what are the consequences when preferential market access is granted only to firms operating in certain regions and sourcing inputs from particular partners? This paper explores this intersection by studying the economic effects of Qualifying Industrial Zones (QIZs), a policy instrument that links place-based targeting to conditional trade preferences.

Under the QIZ program, firms located in designated zones 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 economic and geopolitical objectives simultaneously, making QIZs a unique setting for analyzing how geographic targeting, trade incentives, and input-sourcing rules interact. The central research question I ask in this paper is therefore:

*How do conditional, place-based trade preferences affect firm productivity and local labor-market outcomes, and ultimately the aggregate economy?*

The literature on place-based policies has expanded considerably in both developed and developing countries (Neumark, 2018). Evidence shows that geographically targeted interventions can raise employment, output, and productivity through agglomeration effects, although impacts vary widely with local conditions and institutional design (Lu, Wang, & Zhu, 2019; Wang, 2013; Siegloch, Wehrhöfer, & Etzel, 2025; Kline & Moretti, 2014a). In parallel, the literature on trade policy documents substantial gains in productivity and firm upgrading when barriers to trade are reduced (Amiti & Konings, 2007; Bustos, 2011). However, much less is known about trade policies that are both conditional and geographically targeted and how they shape firms, workers, and regional economic activity.

In this paper I contribute to both literatures by evaluating the economic and labor-market effects of QIZs, primarily in Egypt with supporting evidence from Jordan. By examining a policy that conditions preferential market access on both location and input sourcing, the paper sheds new light on the interaction between spatial targeting, input requirements, and firm behavior.

The Qualifying Industrial Zone (QIZ) agreement was first established between Jordan, Israel, and the United States in 1996 and implemented in Jordan in 1998. It designated specific regions 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 the use of a specified minimum share of inputs sourced from Israel. In essence, the agreement extended the benefits of the United States–Israel Free Trade Agreement to eligible firms operating within designated zones in Jordan, provided they incorporated Israeli inputs into their production process. Although it used different tools, the logic behind the QIZ agreement resembled that of the Marshall Plan, in that it aimed to stimulate development and foster economic integration among countries previously in conflict, with the expectation of generating a virtuous cycle of peace and prosperity (Bianchi & Giorcelli, 2023; Yadav, 2007). In 2004, Egypt signed a similar agreement with Israel and the US, and specific areas within it were designated as QIZs. In both Egypt and Jordan, these zones were introduced gradually over time. The key difference is that in Jordan, QIZs were mainly fenced industrial zones, while in Egypt, entire administrative regions were designated as QIZs ([Author name redacted], 2013).

When observing the aggregate evolution of trade between each of Egypt and Jordan, with both Israel and the US, we notice that both imports from Israel and exports to the U.S have increased substantially after the QIZ agreement was enforced. Was this increase in trade a consequence of the QIZ agreement or a product of international trade dynamics that are not specific to this agreement? To answer this question, I apply the synthetic control method and compare Egyptian and Jordanian exports to the United States and imports from Israel to their respective synthetic control created from a pool of other countries. The synthetic control matches the trade dynamics prior to the implementation of the QIZ agreement in each of the two countries. I find that after the implementation of the QIZ agreement, manufacturing (and more specifically textile and apparel) exports from Egypt and Jordan to the United States increased substantially compared to their synthetic counterparts. Total imports from Israel increased substantially relative to the synthetic control as well. These results suggest that the QIZ agreement might have achieved two of its objectives, stimulating trade in Egypt and Jordan and promoting regional economic integration with Israel. A closer look at Jordan, which signed a free trade agreement with the United States in 2004 that was fully implemented by 2010, we observe a sharp decline in imports from Israel after 2010, even as exports to the United States continued to grow. This suggests that Jordan’s trade with Israel was

not driven by deeper cultural or political ties, but was instead a pragmatic economic choice shaped by the incentives of the QIZ agreement. Once a more favorable alternative—the United States–Jordan Free Trade Agreement—became fully available, imports from Israel declined and integration as measured by trade weakened.

I further investigate the case of Egypt and compare its exports to the United States with those of its synthetic control and ask whether the observed increase can be explained solely by rising demand from U.S. consumers. To do this, I use estimates of the price elasticity of substitution for U.S. textile and apparel imports and calculate whether the tariff reductions, if fully passed through to prices, are sufficient to account for the export increase (Feenstra, Luck, Obstfeld, & Weinstein, 2018; Lashkaripour, 2022). While a demand-driven explanation accounts for a large share of the observed growth, a substantial and statistically significant portion remains unexplained. This suggests that the QIZ agreement may have also led to productivity gains, particularly through increases in total factor productivity.

Holding on to this insight, which suggests that affected industries may have experienced productivity increases, I zoom in on Egypt and investigate the effects of the QIZ agreement at the micro level. To do so, I use two identification strategies. The first strategy builds on the requirements of the QIZ agreement. To access the U.S. market under this agreement, firms are required to use a fixed share of their inputs from Israel in their production process. Although the agreement allows all firms to benefit from preferential access, most firms that actually used the policy were in the textile and apparel sector, followed by firms in the food sector. This is because the benefits of the QIZ agreement could only be fully realized by firms producing goods with otherwise high MFN tariffs, which justify the use of higher-cost Israeli inputs. A firm would only benefit from the QIZ if the tariff reduction exceeded the additional cost of Israeli inputs, and this condition was met primarily for textile and apparel products.

Using Egyptian firm-level customs data on imports and exports at the HS6 product level from 2005 to 2016, I estimate event-study models where the “event” is the year a textile firm begins importing from Israel after previously never doing so (see Alfaro-Ureña, Manelici, and Vasquez, 2022, for a similar approach). Since both data and anecdotal evidence suggest that importing from Israel is more costly than importing from other countries (Author name redacted, 2013), only firms that benefit from a sufficiently large tariff reduction have a clear incentive to do so. This makes first-time importing from Israel a reasonable proxy for entry into QIZ treatment status. I find that the exports of treated firms to the United States

rise substantially and that these increases persist in the long run. Restricting the sample to textile and apparel firms, I find that firms that begin importing from Israel not only export more to the United States but also expand exports to non-U.S. destinations relative to control firms, with effects that remain over time. I also find sizable and persistent effects of entry into importing from Israel on the number of products exported and the number of destinations served. Exploring heterogeneity across firm types, I find that earlier-treated, new entrants, and larger firms drive much of the observed effects, consistent with Egger, Nigai, and Shingal (2024).

The identification of these effects relies on the parallel-trends assumption between treated and control firms. Although this assumption cannot be tested directly, I assess its plausibility by showing that treated and control firms follow similar pre-treatment trends in all outcome variables. To further strengthen the analysis, I conduct two placebo tests. The first defines a placebo sector, for example wood and furniture, and applies the same event-study approach. The second assigns a placebo country and defines the event as beginning to import from that country rather than from Israel. In both tests, I find null effects, which reinforces the validity of the main findings. The results are also robust to a wide range of alternative specifications and robustness checks.

The second identification strategy exploits the staggered rollout of QIZs across Egyptian regions together with the fact that the policy primarily targeted the textile and apparel sectors. This setting allows me to estimate a triple-difference model, where the coefficient of interest is the interaction between time, treated-region, and treated-sector indicators. Using the available firm-level information from two industrial censuses and focusing on the most recent QIZ expansion in 2013, I find that textile firms in treated regions import more inputs, are more productive, and employ more workers, particularly men. Balance tests indicate that the pre-treatment sample is well balanced across a broad set of firm characteristics.

Applying the same empirical strategy to annual labor force surveys, I find positive effects of QIZs on wages and formality, measured by social-insurance coverage. Two advantages of the labor-force surveys are that they allow direct tests of the parallel-trends assumption and make it possible to condition on workers' occupations. The positive effects appear to be concentrated among men, while the estimates for women are considerably noisier. This pattern contrasts with evidence from countries such as Bangladesh, where the expansion of the textile industry has been shown to disproportionately benefit women (Heath & Mobarak, 2015).

Motivated by this evidence, I develop a quantitative heterogeneous-firm trade model tailored to the QIZ setting. The aim is to quantify the aggregate effects of the policy and to use counterfactuals to investigate better policy designs. The model features endogenous export participation, compliance with rules-of-origin through costly Israeli input sourcing, and productivity upgrading induced by access to the U.S. market. This structure allows the model to aggregate firm-level responses into economy-wide effects, quantify welfare changes, and evaluate counterfactual policy designs. In particular, I use the framework to trace how the gains from market access depend on the stringency of the Israeli content requirement, varying it from its baseline level in the agreement to no content requirement. While the reduced-form estimates identify large export and labor-market impacts, the model is needed to distinguish the roles of selection, compliance costs, and upgrading, and to assess how alternative input requirements would reshape both aggregate welfare and the distribution of gains across firms and regions.

Beyond the literature referenced so far, this paper is closely related to three strands of research. The first is the literature on trade liberalization and trade policy, which examines how agreements that reduce trade barriers affect firms and workers (Autor et al., 2013; Opalova, 2010; Costa et al., 2016; Choi et al., 2024). A growing body of work emphasizes the role of agreement design, including rules of origin and conditional market access. Sytsma (2022) shows that relaxing rules of origin can expand firm participation in preferential trade schemes, underscoring the importance of input-sourcing constraints for understanding heterogeneous firm responses. Another related line of work uses export shocks as quasi-experiments. Barteska et al. (2025) exploit large, plausibly exogenous foreign-demand shocks to study how firms upgrade, raise productivity, and expand into new markets.

The second strand is the literature on industrial policy. Much recent work has shifted toward micro-founded evidence on targeted interventions. Lane (2024) analyzes Korea's manufacturing push and documents large and persistent firm-level upgrading effects. Manelici and Pantea (2021) study Romania's IT-sector tax exemption and show that a narrowly targeted policy can generate productivity spillovers and labor-market impacts in treated regions. These papers highlight that industrial-policy outcomes depend heavily on sectoral focus, implementation details, and existing industrial structure.

The third strand is the literature on place-based policies. Most early work focuses on developed countries (Neumark, 2015), but a growing number of studies analyze developing contexts. Wang (2013) shows that special economic zones in

China attract foreign direct investment and raise wages, while Gallé et al. (2024) find that zones in India accelerate structural transformation, especially for women. Similar studies examine zones in Vietnam and Africa (Abagna, Hornok, and Mulyukova, 2025; Treibich et al., 2025; Tafese, Lay, and Tran, 2025).

This paper contributes to all three strands of literature by studying a policy that is simultaneously a place-based intervention, a form of (unintended) industrial targeting focused on textiles and apparel, and a conditional trade policy tied to sourcing requirements and preferential access to the U.S. market.

A comprehensive overview of the history of QIZs in Egypt and Jordan is provided by a U.S. Congress report (Author name redacted, 2013). Several papers have studied the effects of QIZs on trade and employment in Egypt (Yadav, 2007; Nugent and Abdulatif, 2010) and in Jordan (Warad, 2010; Pelzman, 2011; Saif, 2006). However, these studies rely on aggregate data and do not attempt to causally identify the effects of QIZs. This paper contributes to the literature by using microdata from Egypt and applying econometric methods to estimate the causal impact of QIZs on firms and workers. To the best of my knowledge, this is the first study to apply microeconomic methods, such as event-studies and triple-difference designs to examine the effect of a place based conditional trade policy, like the QIZ, on firm-level and labor outcomes.

The remainder of the paper is organized as follows. Section 2 provides background on the institutional context and history of the QIZ agreements. Section 3 describes the data. Section 4 outlines the empirical strategies. Section 5 presents descriptive statistics and the SCM results from the aggregate trade data. Section 6 presents the event-study firm level results from customs data. Section 7 and 8, presents results from the industrial censuses and labor force surveys by employing a triple differences design. Section 9 introduces the quantitative heterogeneous-firm model and uses it to quantify welfare effects and conduct counterfactual analyses that vary the Israeli content requirement. Section 10 discusses the results, and section 10 concludes.

## 2 Institutional Context and History

The Arab–Israeli conflict in the 20th century involved multiple Arab countries engaging in wars with Israel in an effort to secure the rights of Palestinians to return to their homes and establish an independent state. During the conflict, particularly after the 1960s, the United States aligned itself with Israel, while the Soviet

Union supported the Arab states involved (Khalidi, 2020). In 1979, Egypt and Israel signed the Camp David Peace Accords, which formally ended 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 parties more closely within its sphere of influence.

The conflict left the economies of the Arab states weaker and inflicted significant economic and political costs on them. To further consolidate this regional alignment and strengthen the cold peace between its allies, the U.S. offered Jordan and Egypt the QIZ agreement in 1996. The agreement states that upon the agreement of Israel with its Arab partner (Egypt or Jordan), certain regions would be designated as QIZs and would benefit from special trade privileges in the U.S. 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, country input shares should total 35% of the appraised value of the product upon entry to the U.S. For Jordan, of these 35 %, 8% should come from Israel, 11.7 % from Jordan itself, and the remaining 15.3 % from any combination of Jordanian QIZ, Israel, the U.S, and the West bank and Gaza strip (Author name redacted, 2013). For Egypt, of these 35 %, 10.5% should come from Israel, another 10.5 % from Egypt itself, and the remaining 15.3 % from any combination of Jordanian QIZ, Israel, the U.S, and the West bank and Gaza strip (Author name redacted, 2013).

Egypt's entry into the agreement came in 2004, much later than Jordan's participation in 1996. Initially, Egypt was skeptical of the QIZ arrangement, in part because it was already benefiting from the World Trade Organization (WTO) Agreement on Textiles and Clothing (ATC) (WTO, n.d.). However, the expiration of the ATC in January 2005 pushed Egypt to explore alternative mechanisms to maintain preferential market access, including the QIZ agreement (Author name redacted, 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 insured the support of the Islamic institution of Al-Azhar before formally entering the agreement (Raya, 2006).

QIZs were added in both Jordan and Egypt successively in a staggered manner.

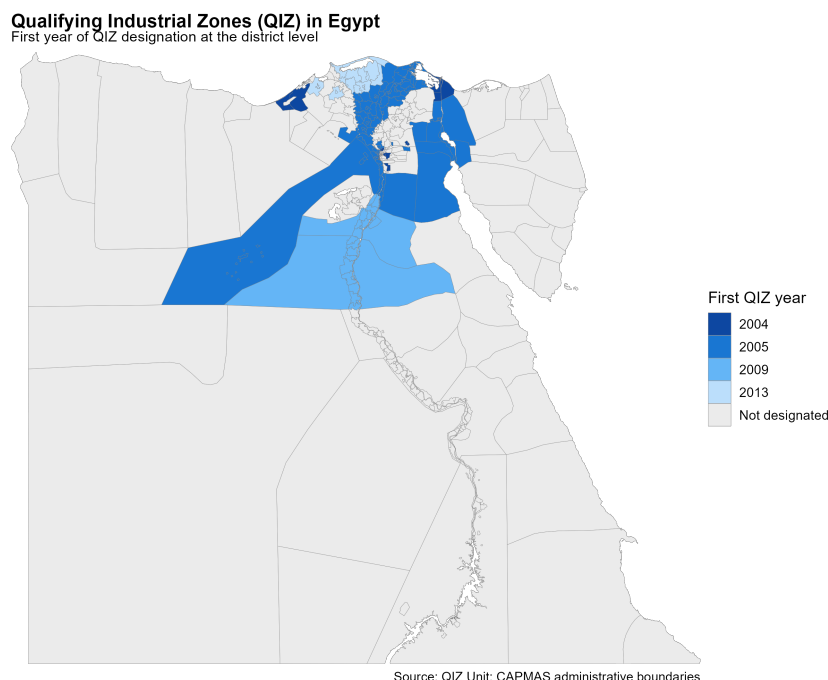


Figure 1: Map of Egyptian QIZs

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 1 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 practice, these approvals were granted almost exclusively to textile and apparel firms. Even after the 2013 liberalization, when the United States confirmed that all firms and facilities, both existing and future, located within designated QIZ districts would automatically qualify, participation remained concentrated in the textile and apparel sector. Over time, firms in the food processing sector also began to join the program in increasing numbers, as shown in Figure 2. The reason why firms from other sectors have not participated is that U.S. tariffs on their products tend to be already relatively low, and as a result, the cost savings from tariff exemptions under the QIZ agreement are not enough to offset the higher input costs associated with sourcing from Israel (Author name redacted, 2013). Industry accounts suggest that for firms to benefit meaningfully from the agreement, tariff rates must be at least 10 percent in order to create a sufficient margin to compete with lower-cost producers such as those in China



Figure 2: QIZ Companies by Sector

and Bangladesh (ibid). Figure A2 in the appendix provides direct evidence for this mechanism. The left panel shows the average MFN tariff rate in 2004 by 2-digit HS chapter, which captures the tariff preference created by the QIZ agreement because eligible products enter at a zero tariff. The right panel shows each sector's share of total Egyptian exports in 2005. Textile and apparel chapters (HS 50–63, shown in navy) stand out on both margins: they faced some of the highest pre-QIZ tariffs, with several chapters above the 10 percent threshold often cited by industry as necessary to create a meaningful competitive advantage, and they accounted for a large share of Egyptian exports. Most other manufacturing sectors, by contrast, faced tariffs well below this level, which helps explain why QIZ participation remained concentrated in textiles and, to a lesser extent, food processing. This pattern supports the industry accounts cited above and motivates the paper's empirical focus on textile and apparel firms.

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. 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 2004—which

was fully implemented by 2010 to cover all products, including those produced in QIZs—the QIZ agreement gradually became obsolete. Unlike the QIZ framework, the FTA does not impose input sourcing requirements, making it a more flexible and attractive option for Jordanian exporters (Saif, 2006, Areiel & Yahn, 2019).

The expansion of QIZs in both Jordan and Egypt is a trilateral decision. This means that Egypt or Jordan must first reach an agreement with Israel on designating a new QIZ, after which the United States must also approve the addition. U.S. approval is typically granted through the Office of the United States Trade Representative, which oversees trade agreements on behalf of the U.S. government.

## 3 Data

### Data on QIZs

I compiled data on QIZs in Egypt from multiple sources. The primary source is the U.S. Federal Register, which documents each new addition to the QIZ program and records the governorate in which the zone is located as well as the date of its official designation. In the main analysis, I treat the governorate as the unit of treatment, since the remainder of the data is either representative at this level or only available at the governorate level. A governorate is therefore coded as treated if at least one area within its boundaries contains a QIZ. In addition, I gathered more granular information from the website of the Egyptian QIZ Unit, which provides the exact district locations of QIZs. I use this district-level data in some of the robustness checks.

### Trade Data

To explore what happens at the aggregate trade level and to compare the performance of the textile and apparel industry in these countries to a synthetic control before and after the introduction of QIZs, I use export and import data from UN Comtrade covering the period from 1990 to 2022. Specifically, I use the value of textile and apparel exports to the US and the values of import from Israel for all countries in the dataset. I exclude the US, European countries, Australia, New Zealand, Japan, and Canada from the donor group and hence effectively restrict the sample to the set of developing countries which are closer economically to Jordan and Egypt. Since the synthetic control method does not work if missing values

exist, I exclude any country with missing values for years prior to the QIZ introduction year. I also interpolate any missing values post QIZ years for the same reason.

## **Firm Level Data**

To explore what happens to firms that begin importing from Israel after previously not doing so, I use firm-level export and import data from 2005 to 2016 compiled by the General Organization for Export and Import Control (GOEIC). I get access to this data through the Economic Research Forum (ERF). The data includes the values of import and export by source countries and destination markets at the HS6 product level for the universe of Egyptian firms. By merging the export and import datasets through firm identifiers, I am able to track changes in firm behavior following the first import from Israel. Additionally, I can distinguish between incumbent firms and new entrants. I define new entrants as firms that do not appear in the export data in 2005, the first year of observation.

To explore how production and labor adjust at the firm level, I use two waves of the Egyptian industrial census from 2012 and 2017, accessed through the ERF. These data provide detailed information on firm production, employment, and trade, which allows me to evaluate how firms in regions included in the 2013 expansion of QIZs in Egypt change relative to firms in regions that were never included. A key limitation of this dataset is that firm location is reported only at the governorate level (equivalent to the state level in the United States). While some QIZs are designated at the governorate level, others are defined at the district (county) level. Because of this data constraint, I classify a governorate as treated if any area within it receives QIZ designation.

## **Labor Data**

To explore how QIZs affect workers differentially, I use the annual Labor Force Surveys from the Egyptian Statistical Office (CAPMAS) covering the years 2006 to 2017. Since the first survey year available to me is 2006, I exclude all governorates that were treated in 2004–2005 and focus on the 2009 and 2013 expansions instead. The surveys are representative at the governorate level. I focus on wages and social-insurance coverage as outcome variables and examine how these outcomes evolve by gender for individuals working in the textile industry after a region receives QIZ status.

## 4 Empirical Strategies

To identify the causal impact of QIZs, I use three different empirical strategies.

### 4.1 SCM: Aggregate Effects on Trade

To examine the aggregate trade effects of QIZs, I use the Synthetic Control Method (SCM) to compare the evolution of textile and apparel exports to the United States and imports from Israel for Egypt and Jordan relative to a counterfactual which matches Egyptian and Jordanian outcomes in years prior to the QIZ agreement. This approach allows me to construct a counterfactual trajectory of what trade would have looked like in the absence of the agreement. The method is particularly suited to our setting given the focus on a single treated unit and the clear start of intervention years: 1998 for Jordan and 2005 for Egypt.

I compile bilateral trade data from UN Comtrade for the years 1988 to 2022, focusing on exports of textiles and clothing to the U.S. and imports from Israel. The analysis is performed separately for each country and trade flow. For consistency, I restrict the sample to countries that have complete data on trade in these sectors during the pre-treatment period (1994–2004 for Egypt and 1990–1998 for Jordan). Countries with missing pre-treatment data are dropped, while missing values in the post-treatment period are linearly interpolated. To minimize confounding from other preferential trade agreements, I exclude developed economies and other countries with advanced bilateral trade privileges with the United States (e.g., Mexico, Canada, Korea).

Let  $J$  denote the number of control countries. The goal is to select weights  $W = (w_2, \dots, w_{J+1})'$ , such that the weighted average of the control units best approximates the pre-treatment characteristics of the treated country. Let  $X_1$  be a  $K \times 1$  vector of pre-treatment trade outcomes for the treated country and  $X_0$  the corresponding  $K \times J$  matrix for the donor pool. The vector  $W^*$  is chosen to minimize the distance  $(X_1 - X_0W)'V(X_1 - X_0W)$ , where  $V$  is a positive semi-definite diagonal matrix that reflects the relative importance of predictors.

The estimated treatment effect in year  $t$  is the difference between the actual outcome for the treated unit and the synthetic control:

$$\hat{\alpha}_{1t} = Y_{1t} - \sum_{j=2}^{J+1} w_j^* Y_{jt},$$

where  $Y_{1t}$  is the trade outcome for the treated country and  $Y_{jt}$  is the outcome for control country  $j$  in year  $t$ .

I construct the synthetic control using a combination of export and import values in the years leading up to treatment (for example, 1994–2005 for Egypt) as predictors. Inference is based on placebo tests, in which the same model is estimated for each untreated country under the assumption that it was treated in the same year. The distribution of placebo effects is then used to assess the likelihood that the observed treatment effect could have occurred by chance.

This analysis is intended to provide indicative evidence at the aggregate level and motivate further analyses using micro data.

## 4.2 Firm-Level Event Study

To estimate the impact of entering the QIZ agreement at the firm level, I exploit detailed administrative data on the universe of Egyptian exporters and importers between 2005 and 2016, disaggregated by HS6 product and partner country. I define a firm as treated if it begins importing from Israel in year  $t$  after having no recorded imports from Israel in all years prior to  $t$ . Firms that never import from Israel over the entire sample period form the control group.

### Restricted Sample

Restricting the sample to firms in the textile and apparel sector—the main beneficiaries of the QIZ agreement—I estimate the following event-study model:

$$Y_{it} = \alpha_i + \omega_t + \lambda_{st} + \sum_{\substack{k=-5 \\ k \neq -1}}^6 \theta_k D_{it}^k + \varepsilon_{it} \quad (1)$$

where  $Y_{it}$  is the outcome of interest (e.g., exports to the U.S.),  $\alpha_i$  are firm fixed effects,  $\omega_t$  are year fixed effects,  $\lambda_{st}$  are subsector by year fixed effects, and  $D_{it}^k$  are event-time dummies indicating  $k$  years before or after firm  $i$  begins importing from Israel. The omitted category is the year immediately prior to the treatment event. Standard errors are clustered at the firm level.

This specification allows us to observe the dynamic effects of entering QIZ treatment over time. I show that exports to the U.S. increase significantly following entry, and that this effect persists in the long run. The event of importing from Israel acts as a strong and credible proxy for participation in the QIZ program,

given the Israeli input requirement embedded in the agreement and the higher cost of sourcing inputs from Israel relative to other suppliers.

## Sectoral Comparison and Heterogeneity Analysis

I then broaden the analysis to include firms from other manufacturing sectors to assess whether the observed effects are specific to textiles or indicative of wider patterns. Specifically, I compare textile firms that begin importing from Israel with firms in other sectors, while controlling for those that experience similar importing from Israel events. I exclude firms in the food sector, as these industries also contained companies registered under the QIZ program.

In this specification, I include sector-by-year fixed effects and interact the event-time dummies with a binary indicator for textile firms. I thus estimate:

$$Y_{ist} = \alpha_i + \omega_t + \lambda_{st} + \mathbf{1}_{\text{Textile}} \cdot \sum_{\substack{k=-5 \\ k \neq -1}}^6 \theta_k D_{it}^k + \varepsilon_{ist}, \quad (2)$$

where  $\lambda_{st}$  are sector-by-year fixed effects and  $\mathbf{1}_{\text{Textile}}$  equals one for firms in the textile and apparel sector. This setup captures how treated textile firms differ in their export dynamics to firms that begin importing from Israel in unrelated sectors.

Standard errors are clustered at the firm level to account for correlated shocks within firms. While this approach could introduce some attenuation due to unrelated sectoral shocks during the event window, it provides a conservative test of whether the export gains following Israeli input sourcing are concentrated among QIZ-eligible firms.

In another specification, I interact the event dummies with all sectors (textile and apparel, food, and chemicals) of firms which have exported under the QIZ program according to the QIZ unit in Egypt.

## Coarsened Exact Matching

To address potential selection bias in firms' decisions to source from Israel, I construct a matched comparison group using Coarsened Exact Matching (CEM). Firms that begin importing from Israel under the QIZ agreement may differ systematically from non-importing firms in ways that independently predict export performance—for instance, they may be larger, more diversified, or more integrated into global supply chains. A naive comparison of treated and control firms would

therefore conflate the effect of Israeli sourcing with pre-existing differences in firm characteristics.

CEM mitigates this concern by coarsening continuous pre-treatment characteristics into discrete bins and exactly matching treated and control firms within the same coarsened strata. Matching is implemented using firm characteristics measured in the year prior to treatment (i.e., the year before a firm first imports from Israel). The matching variables include: (i) total exports to the world, (ii) total imports from the world, (iii) two-digit ISIC sector, and (iv) an indicator for whether the firm exported to the United States prior to treatment.

### 4.3 Triple-Difference Design

To assess how QIZs affected local firm outcomes through regional labor demand channels, I leverage the staggered geographic expansion of QIZs across Egypt and the sectoral exposure across Egypt to estimate a triple-difference (DDD) specification.

#### Firm Censuses

Using firm-level economic census data from 2012 and 2017, the 2013 expansion targeted several new governorates, creating variation across sector, region, and time that I use for identification. I estimate the following triple DDD specification:

$$Y_{igst} = \beta_1 \text{Textile}_s \times \text{TreatedGov}_g \times \text{Post}_t + \gamma X_{igst} + FE + \epsilon_{igst} \quad (3)$$

where  $Y_{igst}$  is the outcome of interest (e.g., employment, wages) for firm  $i$ , in governorate  $g$ , sector  $s$ , and year  $t$ . The coefficient  $\beta_1$  captures the differential change in the outcome for textile firms located in treated governorates after the QIZ expansion, relative to other firms.

$X_{igst}$  includes firm-level controls such as age. Fixed effects (FE) include governorate by year, governorate by sector, and sector by year fixed effects. Standard errors are clustered at the governorate level.

Since only two census waves are available, the variation comes entirely from the 2013 expansion of the QIZ agreement. I exclude all governorates that were already treated before 2013 from the analysis and compare treated governorates in 2013 to never treated governorates. Given that only two waves of censuses are available, I cannot test for the existence of pre-trends. However, I implement a comprehensive balance check on pre-treatment observables (in 2012) to assess the similarity of

treated and untreated firms across firm characteristics, input use, and balance sheet financial variables.

## Labor Force Surveys

To examine how QIZ exposure differentially affects workers, I use the annual Labor Force Surveys from 2006 to 2017, which are representative at the governorate level. I exploit the 2009 and 2013 expansions of QIZ areas and estimate the same triple-difference specification as in the firm-level analysis, now applied to individual labor market outcomes focusing on wages and social insurance status (a measure of formality). The identification relies the parallel trends assumption holding. I test for the existence of pretrends by estimating the following equation:

$$Y_{igst} = \sum_{\tau \neq -1} \beta_{\tau} (\text{Textile}_s \times \text{TreatedGov}_g \times \mathbf{1}\{t - T_g = \tau\}) + \text{FE} + \varepsilon_{igst} \quad (4)$$

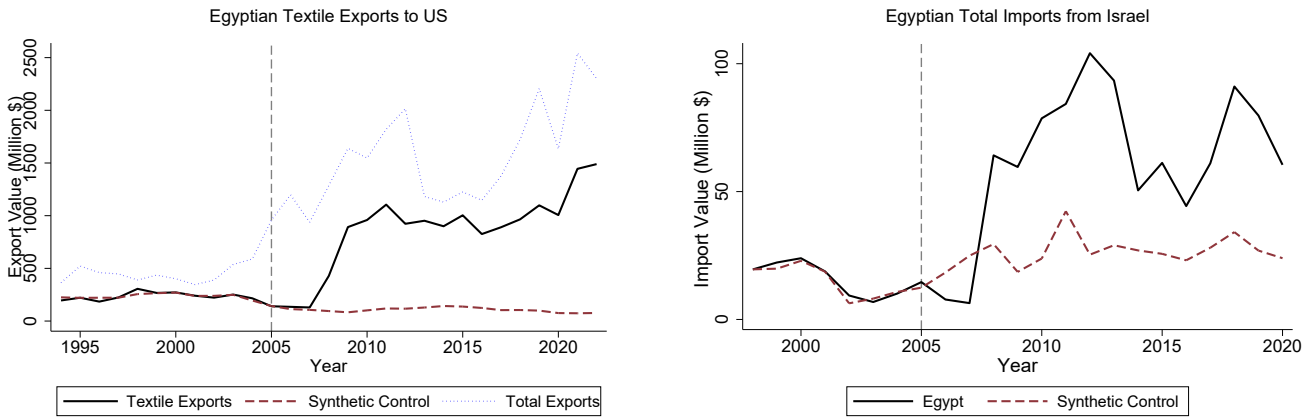
where FE (Fixed effects) include governorate-year, industry-governorate, industry-year, occupation-year and standard errors are clustered at the governorate levels.

## 5 Synthetic Control Method Results

In this section, I present the baseline estimation results corresponding to the SCM empirical strategies outlined in Section 4. I begin by analyzing how the implementation of QIZ agreements affected aggregate trade patterns in Egypt and Jordan using a synthetic control approach (Section 5.1). I then assess whether the change in exports could be explained by demand side effects alone. Examining textile and apparel exports in Jordan and Egypt to the US and their imports from Israel, I find a large increase in the amount after both implemented the QIZ agreements in 1998 and 2005 respectively.

### 5.1 SCM: Egypt

Figure 3 panel a compares Egyptian textile and apparel exports to the US, to a synthetic control. We can observe a substantial increase in the value of textile and apparel exports from Egypt to the United States following the initial rollout of QIZs in Dec 2004 - January 2005 relative to the synthetic control whose exports were moving in parallel with Egyptian exports prior to 2005. By 2011, exports had risen



(a) Egyptian Textile & Apparel Exports to U.S

(b) Egypt's Total Imports from Israel

Figure 3: SCM: Egypt

by approximately \$ 1 billion. Interestingly, the increase does not occur immediately relative to the synthetic control but exhibits a two-year lag, after which exports grow sharply. This delayed response can be explained by the expiration of the extension of the Multi-Fiber Agreement (MFA) in 2005, which previously imposed export quotas on each country (WTO, n.d.). Firms that were already exporting textiles and apparel to the United States gradually shifted to using the QIZ agreement as an alternative mechanism after the removal of MFA quotas. In addition, the lag reflects the time required for find Israeli suppliers, complete bureaucratic requirements, and find buyer from the United States to export.

Panel b shows the total value of Egyptian imports from Israel compared to its synthetic control. A sharp increase in Israeli imports after 2004 can be observed, following the introduction of QIZs, relative to the synthetic counterpart. Similar to the export pattern, the rise in imports exhibits a two-year lag before accelerating, coinciding with the surge in Egyptian textile and apparel exports to the U.S. This reinforces the interpretation that the export growth was driven by the QIZ agreement. At their peak in 2012, imports from Israel reached approximately \$ 100 million —an increase of about \$ 85 million from 2004. Notably, once imports surpass the synthetic control, they remain consistently higher. Given that Egyptian firms were required to source at least 10.5 % of inputs from Israel, the ratio of the increase in U.S. textile exports to the increase in imports from Israel is close to this mandated share, providing further evidence that these trade patterns were indeed a direct result of the QIZ agreement.

## Demand-Side vs. Supply-Side Forces Behind Egypt's Export Boom

To assess whether the observed surge in Egyptian apparel exports to the U.S. can be explained purely by tariff-induced demand shifts, I conduct a back-of-the-envelope calculation. Tariffs on Egyptian exports to the U.S. were subject to Most Favoured Nation tariffs. The average tariff rate on textile and apparel products according to WITS (AHS weighted average, 2003) was 9.77%, hence the QIZ agreement eliminated tariffs of roughly 9.77%, reducing the relative price of Egyptian goods from 1.0977 to 1.00. This corresponds to:

$$\Delta \ln P = \ln \left( \frac{1.00}{1.0977} \right) \approx -0.0932.$$

I use an estimate of the within variety price elasticity of substitution for textile and apparel goods in the U.S., of  $\sigma = 6.7$ , from Broda and Weinstein (2006). Given this estimate the predicted import response of U.S. consumers is:

$$\Delta \ln M = -\sigma \cdot \Delta \ln P = -6.7 \times (-0.0932) \approx 0.625,$$

which implies a multiplicative increase of:

$$e^{0.625} \approx 1.87.$$

Thus, if tariff reductions were fully passed through to prices and no other forces were at play, U.S. consumers would demand more Egyptian textile goods, and Egyptian apparel exports would be expected to increase by a factor of 1.87. Starting from a low point of \$129 million in 2007, this predicts a post-treatment level of:

$$\hat{M} \approx 1.87 \times 129 \approx \$242 \text{ million.}$$

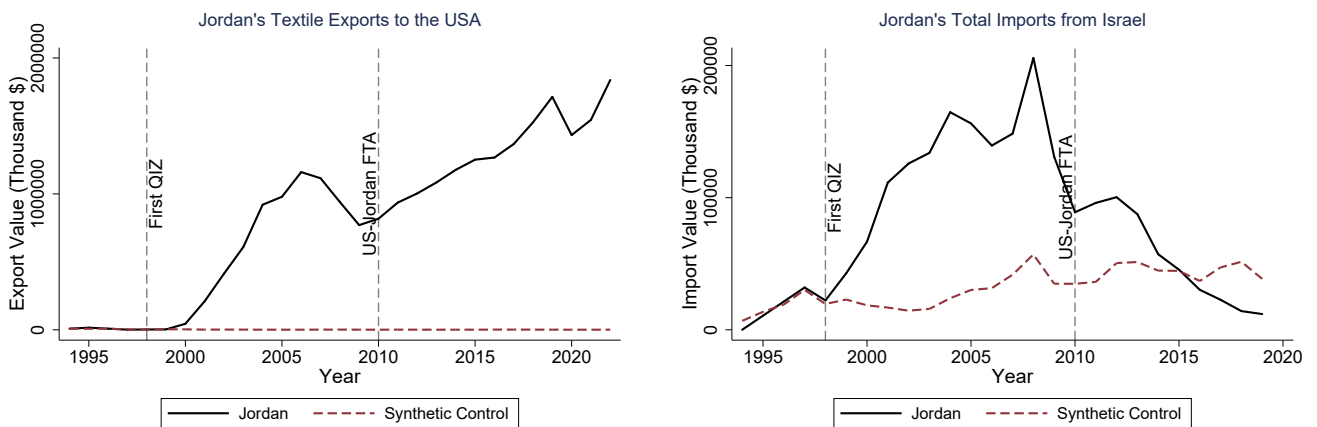
In reality, exports reached about \$1,105 million at their peak, an 8.6-fold increase relative to the 2007 low. This suggests that tariff-induced demand explains less than half of the actual growth. If I repeat the same exercise using the 2004 export level of \$216 million as the baseline, the predicted level would be about \$403 million, which still falls short of the observed value.

The remaining gap likely reflects supply-side forces such as capacity expansion, learning effects, fixed cost effects, and agglomeration effects within QIZ regions. Diversion of exports from other countries to the U.S. is also a possible explanation. However, as we will see in the next section, exports to other countries increase rather

than decrease for QIZ treated firms, which points to a supply-side productivity effect rather than trade diversion.

## 5.2 SCM Jordan

Figures 4 panel (a) and panel (b) present the same export and import dynamics as Figures 3, but for Jordan. The pattern is similar. Exports to the U.S. increased by about \$ 1.1 billion by 2006, eight years after the first QIZ was designated in 1998 (Figure 4 (a)). The textile and apparel sector was very small before the QIZ agreement, which explains why the synthetic control remains flat and close to zero during the pre-treatment period and after. Figure 4(b) shows a corresponding rise in imports from Israel after 1998, peaking at approximately \$ 200 million. However, these imports decline sharply once the U.S.–Jordan Free Trade Agreement (FTA) is fully implemented in 2010, eventually falling below the synthetic control by 2016. This pattern suggests that the FTA offered a more favorable economic arrangement for firms, as it eliminated the costly Israeli input requirement imposed by the QIZ framework. Once the FTA applied fully to the textile and apparel sector in 2010, firms switched to the more profitable option. This implies that the regional integration fostered by the QIZ agreement was not structural but rather a second-best solution that unraveled when a more profitable alternative became available.



(a) Jordan's Textile Exports to the U.S.

(b) Jordan's Imports from Israel

Figure 4: SCM: Jordan

## 6 Event Study Results

Using Egyptian firm-level customs data, I estimate event study models as described in Section 4.2 to examine the dynamic effects of QIZ treatment on textile firm exports. To assess the robustness of my findings, I conduct two placebo tests. I further investigate whether the observed effects are driven by an overall expansion of trade or by a reallocation of exports across destinations. Finally, I explore heterogeneity in the treatment effects by distinguishing between incumbent and new entrants, as well as between early- and later-treated firms.

### 6.1 Textile Only Sample

I begin by estimating Equation (1), where the dependent variable is the value of firm-level exports to the U.S. As described in Section 4.2, an event is defined as the year in which a firm starts importing from Israel after not importing in the previous year. To visualize the events, Figure A1 in the appendix shows the number of textile firms that experienced an event in each year of our dataset. I observe a spike in the number of events in years following each QIZ expansion. There is a noticeable increase in 2006, which reflects the impact of the late 2004 and 2005 expansions. A similar pattern appears in 2010 following the 2009 expansion, and again in 2015 after the 2013 expansion. Over time, the number of firms experiencing an event decreases, as earlier treated regions had more established textile and apparel firms, while later treated regions were generally less developed in terms of textile industry presence (Capmas, 2004).

Figure 5 reports the results when restricting the sample to textile and apparel firms. Panel (a) uses total US exports as the outcome, while panel (b) uses the log specification adjusted to accommodate zeros by isolating the intensive margin of exporting (See B). I find no differential pre-trends between the treatment and control group, as pre-event coefficients are not statistically different from zero. On average, exports to the U.S increase by approximately \$1 million per firm immediately after the event, although this short-term effect is not statistically significant at the 95% confidence level. In the long run, however, the effect becomes both substantial and persistent: four years after the event, treated firms export close to \$2 million more to the U.S. than before, and this increase persists even after seven years. Although the results are positive even 8 years after the event, we can notice a decrease in the coefficient of later years relative to the first 5 years after the event. This relative decrease in the coefficients is driven by firms exits and firms reallocating exports to

other destinations.

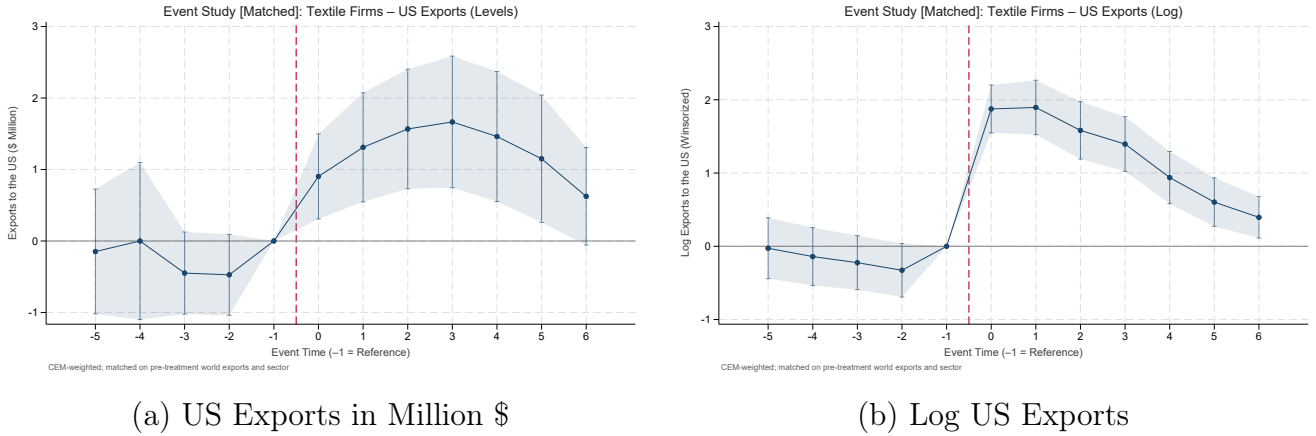


Figure 5: Event Study: US Exports

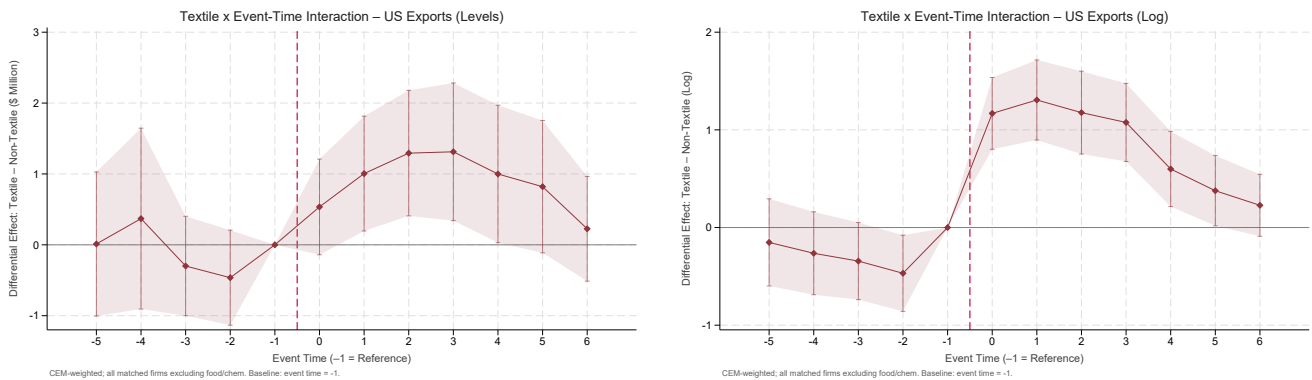
Since trade data often contains a large number of zeros in firm-level exports, using OLS on export values as the dependent variable can lead to biased estimates due to heteroskedasticity and the censoring problem (Santos Silva and Tenreyro, 2006). One way to address this issue as noted recently by Chen and Roth (2024) is to estimate a Poisson pseudo-maximum likelihood (PPML) model, which accommodates zero trade flows and provides consistent estimates under heteroskedasticity. Figure A4 in the Appendix presents the results from estimating Equation (1) using the PPML estimator. A similar pattern emerges as in the OLS results: there are no pre-trends when observing 4 years prior to the event. Two years after the event, exports to the U.S. begin to rise, and the increase becomes economically and statistically significant. As before, we notice that in the long run the estimated coefficients decrease, and the reasons for that are as discussed before.

## 6.2 All Firms Sample

To assess whether QIZ-treated textile firms experience different export responses than other firms, I estimate Equation 2, which interacts the event variable with an indicator for textile and apparel firms. Figure 7 plots the corresponding interaction effects. The results indicate that importing from Israel generates substantially different impacts for textile firms in both the short and long run.

Textile firms which are eligible for and actively use the QIZ agreement—exhibit markedly larger increases in exports to the United States compared to all other exporting firms. In other words, access to the U.S. market through the QIZ framework

appears to have enabled textile firms to significantly outperform non-textile firms along the export margin.



(a) US Exports in Million \$

(b) Log US Exports

Figure 6: Event-study: Differential Effect (Textile and Apparel vs Others) on US Exports

### 6.3 Second Stage Effects: Other Outcome Variables

In this section, I examine how the QIZ agreement affected additional outcomes for treated firms. The increase in exports to the United States can be viewed as a first-stage outcome, since expanding access to the U.S. market was the primary objective of the QIZ agreement. To explore potential second-stage effects, I focus on three additional variables that can be constructed from the trade dataset. First, I assess whether treated firms increased their exports to non-U.S. destinations following treatment. Second, I examine whether treatment led firms to expand the range of products they exported. Finally, I analyze whether treated firms increased the number of foreign destinations to which they exported.

#### Non-U.S. Exports: Expansion or Reallocation?

I examine whether the increase in exports for QIZ-treated firms is driven by a reallocation of exports from other countries to the U.S. To do this, I re-estimate equation (1) using total non-U.S. exports as the outcome. Figure ?? plots the dynamic effects of a firm starting to import from Israel on total non-U.S. exports, relative to firms that do not import from Israel. As apparent in the figure, there is a strong and persistent positive effect of QIZ treatment on the value of non-U.S. exports exhibited by treated Egyptian firms, similar in magnitude to the effects estimated for U.S. exports. This pattern suggests that firms did not simply reallocate exports

from non-U.S. destinations to the U.S. after treatment, since exports to both destinations increase. By exporting under the QIZ agreement, firms expand their exports to both the U.S. and non-U.S. markets, pointing to some underlying productivity gain such as a decrease in fixed costs, a learning by doing effect in export activities, better matching between suppliers and buyers, and/or economies of scale.

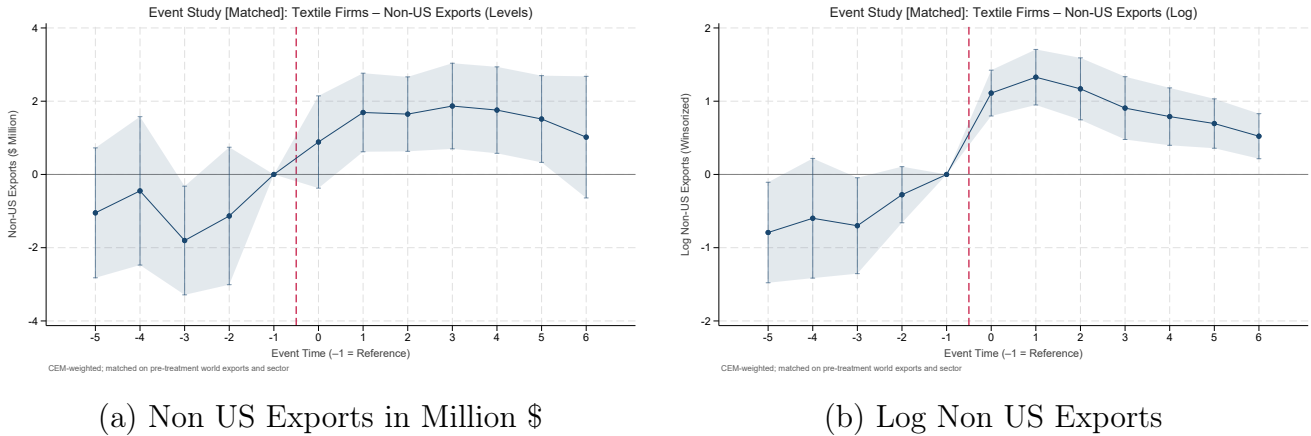


Figure 7: Event-study: Differential Effect (Textile and Apparel vs Others) on Non US Exports

Egypt signed a trade agreement with the European Union, the EU–Egypt Association Agreement, which entered into force in 2004, roughly coinciding with the introduction of the QIZ agreement. The agreement established a Euro-Mediterranean free-trade framework between Egypt and the EU and aimed to deepen economic integration through the gradual removal of tariffs on industrial products and improved market access for agricultural goods (European Commission, n.d.). To assess whether the observed increase in non-U.S. exports is driven primarily by this agreement, I examine Egypt’s non-U.S. exports by destination in Figure X, distinguishing between Europe, Africa, and Asia (including the Middle East). I find that exports rise not only to Europe, where the Association Agreement would be expected to matter most, but also to Asia. This suggests that the increase in non-U.S. exports cannot be attributed solely to the EU–Egypt Association Agreement and is also consistent with productivity upgrading.

### Number of Destinations

I next examine whether the QIZ agreement encouraged firms to increase the number of countries to which they export. Expanding the number of export destinations is often interpreted in the trade literature as a form of diversification and market upgrading. According to models of multi-destination exporting (Eaton, Kortum,

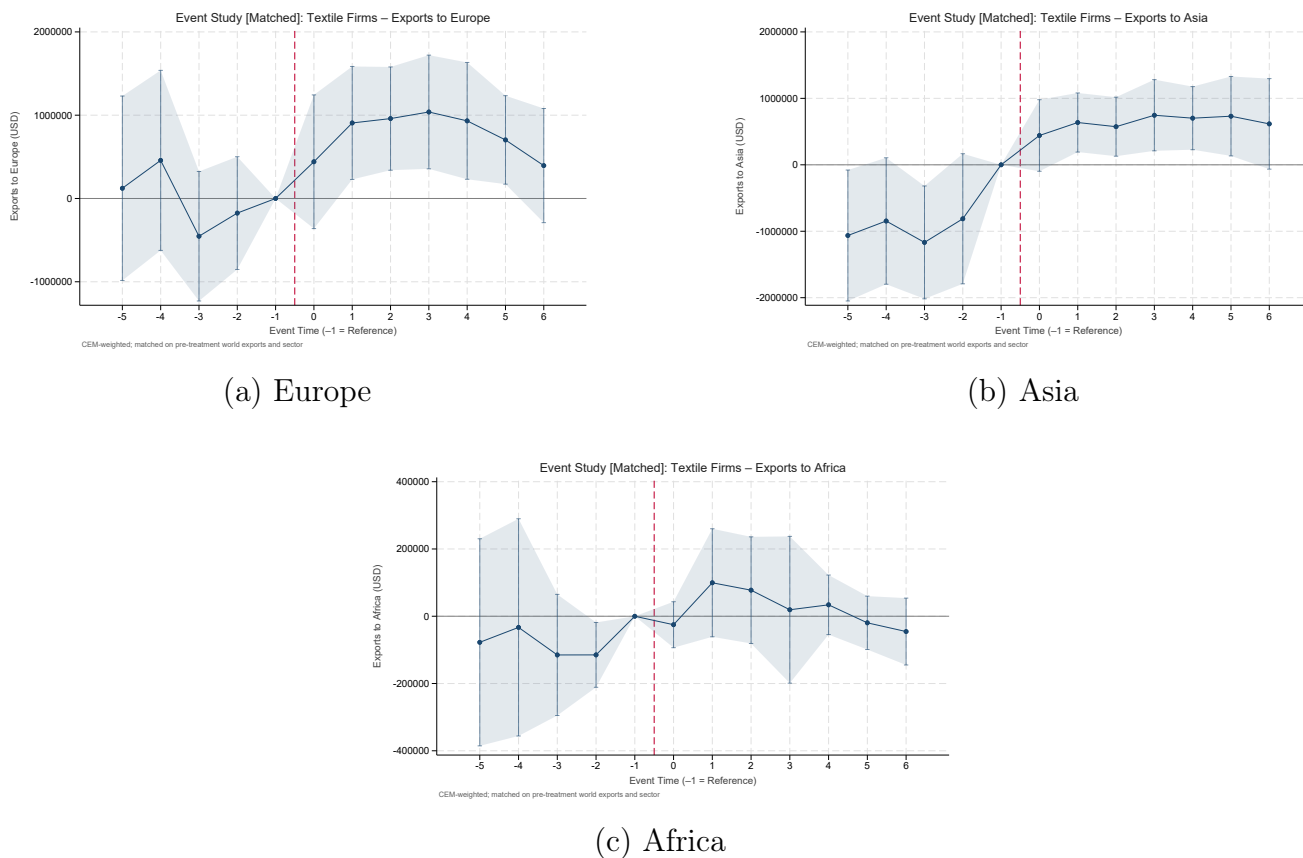


Figure 8: Event-study estimates of textile exports by destination region

and Kramarz, 2011; Bernard et al., 2011), firms that face lower trade costs or improved access to buyer networks tend to enter new markets sequentially once initial fixed export costs are covered. Therefore, if the QIZ agreement reduced the costs of exporting or improved firms' credibility and relationships with foreign buyers, I would expect treated firms to expand not only their sales to the U.S. but also the set of other countries they serve. Figure 9 panel (a) shows that the QIZ agreement drives treated firms to increase their number of export destinations by 3 and this persists 5 years after the treatment. Panels (a) in Figure ?? of Appendix A reports the results taking the  $\log(x+1)$  of the number of destinations as the dependent variable while panel b reports the coefficients from a ppml regression. Both panels show similar results.

## Number of Products

I next examine whether the QIZ agreement affected the range of products exported by treated firms. An increase in the number of exported products reflects product diversification and expansion along the extensive margin. The trade literature links such diversification to reductions in both variable and fixed export costs (Bernard, Redding, and Schott, 2010; Mayer, Melitz, and Ottaviano, 2014). By eliminating

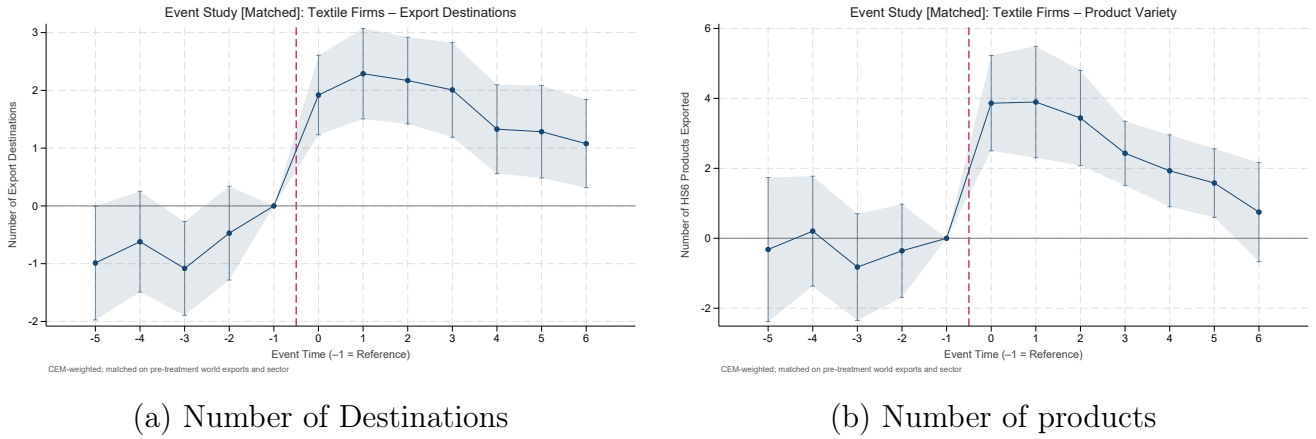


Figure 9: Event-study: Intensive and Extensive Margins

U.S. tariffs on qualifying exports, the QIZ agreement directly lowered variable trade costs, making it more profitable for firms to export additional products. At the same time, participation in the QIZ network may have reduced fixed export costs by improving access to imported inputs, easing compliance with export standards, and facilitating relationships with international buyers. Together, these effects could have encouraged treated firms to broaden their product range following treatment. Panel (b) of figure 9 shows that treated firms increased the number of products they exported by roughly 4 products relative to the control group, but this effect gradually declined and disappeared six years after treatment. This pattern implies that the QIZ agreement led to a temporary diversification in firms' export portfolios, likely as firms took advantage of lower trade costs and new opportunities to experiment with additional product lines. Over time, however, firms appear to have refocused on their most profitable products, consistent with models in which initial reductions in trade costs encourage product expansion, followed by specialization as competition intensifies and firms concentrate on their most profitable varieties.

## Robustness

To assess the robustness of the findings, I conduct two placebo tests. The first redefines the treatment event by considering firms that begin importing from a neighboring country, such as Sudan or Saudi Arabia, after previously not importing from that country, rather than from Israel. The logic is that, although these countries are geographically close to Egypt, importing from them is unrelated to the QIZ agreement. The second placebo test focuses on firms in sectors that were not meaningfully affected by the QIZ agreement, such as wood and furniture, and examines their export behavior after they begin importing from Israel. The idea is that these

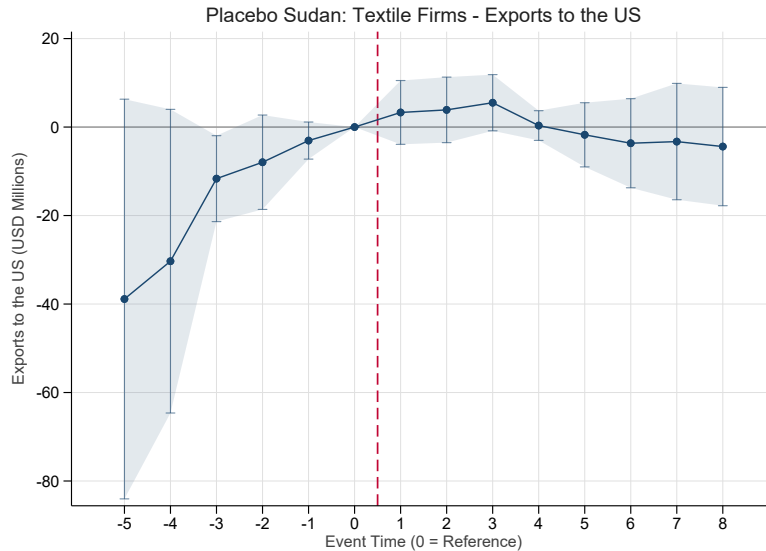


Figure 10: Event study estimates using Sudan as a placebo country.

sectors, even if formally eligible for the agreement, were unlikely to benefit from it because the tariff reductions did not offset the higher input costs associated with compliance. If these placebo exercises do not generate effects comparable to those found in the baseline analysis, this would provide reassurance that the estimated impacts are driven by the QIZ agreement rather than by unrelated factors.

Figure 10 presents the results for the first placebo test, where I modify the country of import. In this exercise, I redefine the event as the year in which a firm begins importing from Sudan rather than from Israel and reestimate the model using OLS. The results show no evidence of differential pre-trends and, importantly, no significant effect of the placebo event on textile exports to the U.S. after treatment. This strengthens the interpretation that the event definition captures the causal impact of the QIZ agreement on the textile and apparel sector, rather than picking up unrelated changes in trade patterns.

Figure ?? in Appendix A reports the results of a placebo exercise using Saudi Arabia as the alternative source country. The overall pattern is similar to that observed for Sudan. However, in this case, I detect some pre-trends and a short-run increase in exports following the placebo event. This likely reflects a correlation between growing U.S. exports and higher imports of energy-related products from Saudi Arabia during that period. Taken together, these results support the credibility of our baseline event-study design, indicating that the main estimates capture the causal effect of QIZ participation on the textile and apparel sector rather than spurious correlations.

Moving to the next placebo test, I re-estimate the event-study model by restrict-

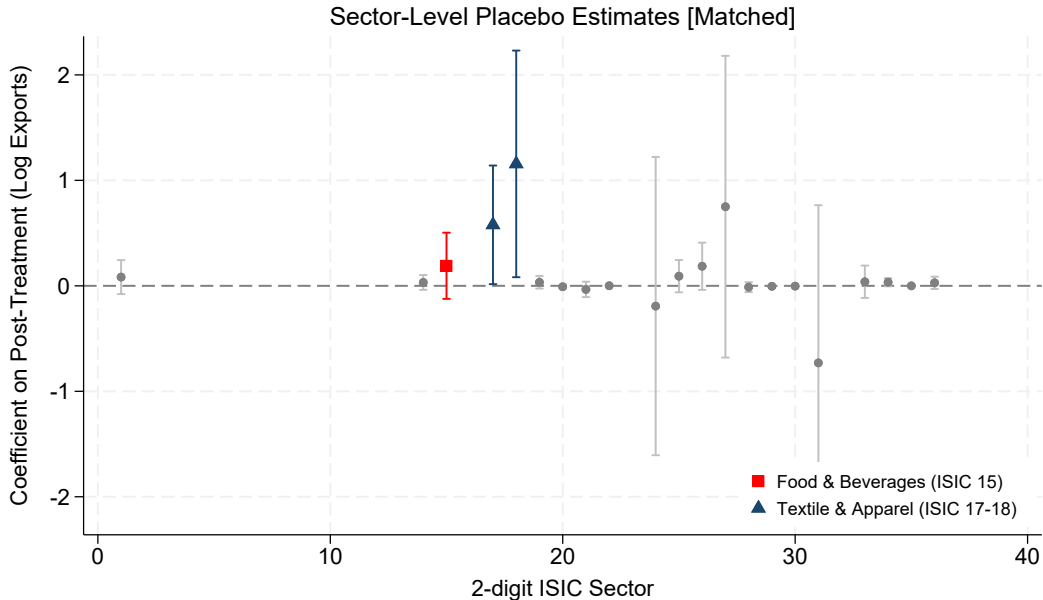


Figure 11: Placebo Sector Estimates.

ing the sample to firms in each placebo sector—specifically. I estimate the model subsequently restricting the sample to firms within each 2 digit sector and plot the resulting average treatment effects in Figure 11. Across all placebo sectors, I find no significant positive effects of first importing from Israel on subsequent exports to the United States. The only exceptions are textile and apparel firms, which together account for more than 90% of all QIZ exports as reported by the QIZ unit. In Figure A5 in the appendix, I report the full placebo event study for the wood and furniture sector. Consistent with expectations, there are no significant pre-trends and no discernible post-event effects.

For a further robustness check, I report in the appendix results from estimating the event study imputation estimator as suggested by Borusyak et al. (2021). This estimator is robust in heterogeneous treatment effects. Figure A6 in the appendix shows the results for US exports.

## 6.4 Quality of Imports or Market Access?

An important question is whether the export gains documented above reflect improvements in production driven by the quality of Israeli imports, or whether they are primarily explained by the preferential access to the U.S. market conferred by the QIZ agreement. I examine this question in three steps.

First, I document the composition of Israeli imports at the product level. Figure A7 in the appendix shows that textile firms import predominantly raw materi-

als and intermediate inputs—including yarns, fabrics, and chemical inputs—rather than machinery or other capital equipment. This suggests limited scope for quality upgrading through embodied technology in imported capital goods.

Second, I construct a firm-year measure of import quality following Khandelwal (2010) and the broader trade literature. The identifying assumption is that, within a narrowly defined product category, firms paying a higher price per unit are importing higher-quality varieties rather than purchasing the same variety at a worse price. To operationalize this idea, I compute log unit values, defined as import value divided by quantity, for each firm-product-year observation and demean them within HS6-product-unit-year cells. This demeaning step is necessary because raw unit values are not directly comparable across products: a kilogram of yarn differs in price from a kilogram of woven fabric for reasons unrelated to quality. By removing the average price of each product in each year, I isolate the deviation of a firm’s import price from the typical price paid for that product in that year, which I interpret as the firm-specific quality component. I then aggregate these deviations to the firm-year level by taking a value-weighted average across products, so that products accounting for a larger share of the firm’s Israeli imports receive greater weight:

$$Q_{ft} = \sum_k \omega_{fkt} (\ln UV_{fkt} - \overline{\ln UV}_{kt}), \quad (5)$$

where  $\omega_{fkt}$  is the share of product  $k$  in firm  $f$ ’s total Israeli import value in year  $t$ . I standardize  $Q_{ft}$  to have mean zero and standard deviation one within the estimation sample.

Third, I estimate the following triple-difference specification:

$$Y_{ft} = \beta_1 (\text{Textile}_f \times \text{Post}_{ft}) + \beta_2 (\text{Textile}_f \times \text{Post}_{ft} \times Q_{ft}) + \alpha_f + \lambda_t + \gamma_{st} + \varepsilon_{ft}, \quad (6)$$

where  $\alpha_f$ ,  $\lambda_t$ , and  $\gamma_{st}$  denote firm, year, and sector-by-year fixed effects, respectively. The coefficient  $\beta_1$  captures the average export gain for textile firms after QIZ exposure, while  $\beta_2$  identifies whether that gain is amplified for firms importing higher-quality Israeli inputs. If quality upgrading is the operative channel,  $\beta_2$  should be positive and statistically significant.

Table 1 reports the estimates. The coefficient on  $\text{Textile}_f \times \text{Post}_{ft}$  is positive and statistically significant across all specifications, confirming the baseline export gains for textile firms. By contrast, the coefficient on the triple interaction is small and statistically indistinguishable from zero in all columns, for both U.S. exports and to-

tal exports, and for both level and log specifications. This indicates that, conditional on importing from Israel, the quality of those imports does not significantly shape export performance. Taken together with the product-composition evidence, these results suggest that the export gains are driven primarily by preferential market access rather than by quality upgrading through imported inputs.

Table 1: Impact of Israeli Import Quality

	US Exports		Total Exports	
	(USD Mill.)	(Log)	(USD Mill.)	(Log)
Textile $\times$ Post	0.979*** (0.310)	0.510*** (0.155)	3.084*** (0.714)	0.965*** (0.183)
Textile $\times$ Post $\times$ Quality	0.019 (0.403)	0.036 (0.134)	-0.051 (0.420)	-0.090 (0.139)
Observations	281,460	281,460	281,460	281,460
Firm FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Sector $\times$ Year FE	Yes	Yes	Yes	Yes

*Notes:* Standard errors clustered by firm in parentheses. Quality ( $Q_{ft}$ ) is the value-weighted average of demeaned log unit values of Israeli imports, standardized to mean 0, SD 1 among importers in the analysis sample. Post = 1 for event time  $> 0$ . Baseline: event time =  $-1$ .

\*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

## 6.5 Heterogeneous Effects

In this section, I investigate the heterogeneous effects of QIZ treatment on firms. First, I examine whether the increase in trade is driven primarily by incumbent firms or new entrants. Second, I analyze how these effects differ across successive QIZ expansion waves. Finally, I investigate how these effects differ across firm size as measured by their exports prior to their treatment.

### Incumbents or New Entrants?

Determining whether QIZs expand trade with the U.S. by boosting the exports of incumbent firms (intensive margin) or by inducing new firms to start exporting (extensive margin) is important because these channels have different implications. The first suggests that the observed increase in exports under the QIZ agreement results from a reduction in variable trade costs (Bernard et al., 2003; Melitz, 2003), whereas the second points to a reduction in fixed export costs, which the trade

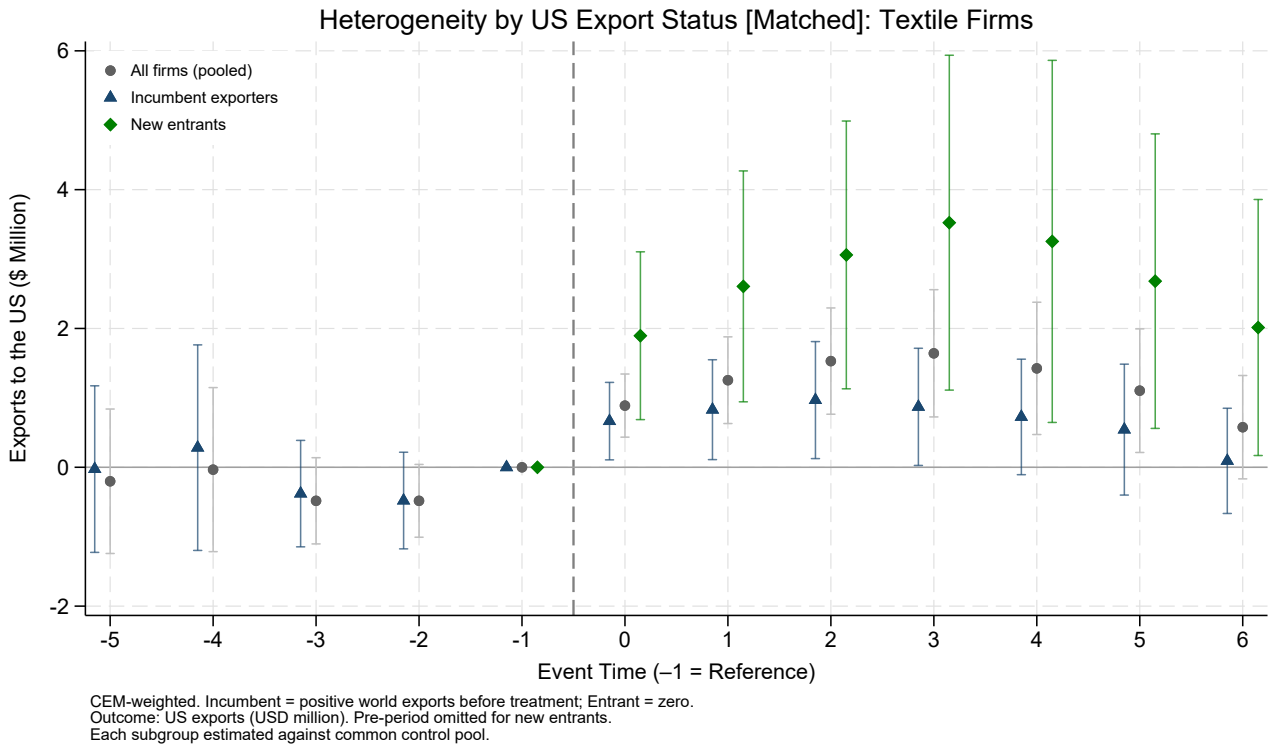


Figure 12: Event-study estimates of the dynamic effects of QIZs on exports to the United States for all, incumbent, and new-entrant textile and apparel firms. Coefficients are OLS estimates using export values in \$ as the dependent variable.

literature identifies as a key driver of export entry and productivity growth (Das et al., 2007; Eaton et al., 2008). Moreover it is more likely that new entering firms are foreign firms locating in Egypt in order to benefit from the QIZ agreement.

I define new entrants as firms that do not export anything in 2005, the first year observed in our data. Conversely, incumbent firms are those that are observed in the dataset in 2005.

Figure 12 reports the results comparing coefficients for the full sample of textile firms, incumbents only, and new entrants only. As shown, the positive effects of QIZs on textile firms are larger for incumbent firms, whose exports increase sharply after treatment. When restricting the sample of firms to incumbents or new entrants, pre-trends are absent, indicating the our inference still holds. Positive effects can also be observed for incumbent firms, although the estimates are smaller. Although I cannot directly observe whether a firm is foreign or not, it is possible that some of these new entering firms are foreign firms locating in Egypt to benefit from the agreement.

## Effects Across Early vs Late QIZ Expansions

In this subsection, I examine whether the increase in exports by treated firms varies by the wave of expansion. As shown in Figure 3, QIZ expansions occurred along two dimensions: geographically and over time. Since our customs data do not include firm location, I leverage the fact that expansions unfolded in a staggered manner across time. I classify firms in two groups: early-treated firms, which were treated in 2009 or earlier, and late-treated firms, which were treated after 2009. Firms treated earlier are likely to have been located in the regions designated as QIZs in 2004 and 2005, which were the areas where the textile and apparel industry was concentrated prior to the QIZ agreement. In contrast, later-treated firms could also be located in regions designated as QIZs in 2009 and 2013, which are generally less developed (CAPMAS, 2017) and have lower levels of manufacturing activity and a smaller textile industry.

Figure 13 panel (a) reports the results comparing coefficients for three samples: the full set of textile firms, the sample excluding late-treated firms, and the sample excluding early-treated firms. As shown, the positive effects of QIZs on textile firms are driven strongly by early-treated firms, with a strong but noisy impact for later treated firms. This pattern likely reflects the fact that early-treated firms were concentrated in regions with pre-existing textile and apparel clusters, better infrastructure, and established supply chains, allowing them to take advantage of the QIZ agreement more effectively. Combined with our earlier finding that incumbent firms drove the overall results, this suggests that the benefits of QIZ treatment accrued primarily to firms that were already established and located in historically strong manufacturing regions, rather than to new entrants or firms in less developed areas.

## Effects Across Firms by Size

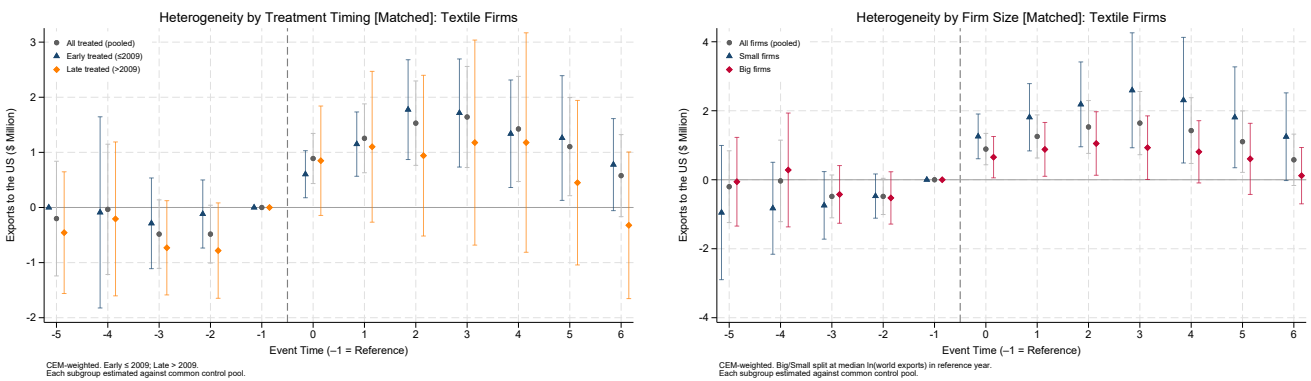
Finally, in this subsection, I examine whether the increase in exports by treated firms varies by firm size, as measured by their average value of exports before their treatment. I classify firms in two groups based on the average value of exports that treated firms had before their treatment and that untreated firms had over the entire sample. Hence big firms are defined as firms whose value of exports pre-treatment was greater than this average, while small firms are those whose average pre-treatment exports were less than this average.

Figure 13 panel (b) reports the results comparing coefficients for three samples:

the full set of textile firms, the sample excluding big-treated firms, and the sample excluding small-treated firms. As shown, the positive effects of QIZs on textile firms are driven by both big and smaller firms. However the relative increase in exports to the U.S after the event is much greater for smaller firms and persists for a longer time. This pattern likely reflects the fact that smaller treated firms exported very little prior to the QIZ agreement, whereas bigger firms were already exporting to the world and possibly to the U.S as well through the Multi-fiber quota agreement.

Taken together, these results suggest a different interpretation of the QIZ effects. Rather than operating primarily through incumbent exporters, the gains appear to be stronger among new entrants. This implies that the agreement did not merely expand the exports of already-established firms, but also lowered barriers to entering export markets. At the same time, the effects remain concentrated among early-treated firms, likely reflecting the importance of pre-existing textile clusters, infrastructure, and buyer linkages. When splitting by firm size, both small and large firms benefit, although the magnitudes differ in intuitive ways: relative gains are larger for smaller firms, while absolute gains remain larger for bigger firms given their greater scale.

Combined with the earlier event-study evidence, this pattern suggests that QIZs operated not only through reductions in variable trade costs for established exporters, but also through a reduction in entry barriers and coordination frictions that enabled new firms to enter export markets. In this sense, the agreement appears to have had both an intensive-margin effect on existing firms and an extensive-margin effect through new entry.



(a) Early Treated vs Late Treated Frims

(b) Big vs Small Firms

Figure 13: Event-study: Heterogeneity in Size and treatment time

## 7 Firm-Level Analysis from Censuses

In this section, I use two waves of the Egyptian Firm-Level Industrial Census (2012 and 2017) to estimate equation (3) and examine the impact of a region's designation as a QIZ on textile firm outcomes, including employment and wages. The identification strategy leverages the 2013 QIZ expansion as the treatment, excluding from the analysis all regions that had previously been designated as QIZs. This design allows me to compare textile firms located in newly designated QIZ regions with those in regions that were never designated. As discussed in the heterogeneity analysis, later-treated firms exhibited smaller export increases than earlier-treated firms; however, I still examine whether QIZ designation influenced textile firms at the regional level.

### 7.1 Pre-Treatment Balance Test

Since there is only one pre-treatment and one post-treatment observation, it is essential to verify that treatment and control observations were not statistically different in the pre-period. Otherwise, the DDD estimates could be biased and fail to capture the true effect of the treatment (Ortiz-Villavicencio and Sant'Anna, 2025). To assess this, I compare average outcomes in the pre-treatment year (2012) for textile firms in treated regions with two groups: textile firms in non-treated regions and all other firms in both treated and non-treated regions.

Figure A8 reports balance checks for differences in the following dimensions: firm characteristics (age, size, ownership), inputs (labor, materials, capital), finance (revenue, costs, assets), and tax and subsidy exposure. I find no statistically significant differences between treated and control firms in any of these dimensions, except for firm size, which is controlled for in the regressions. This supports the validity of the identification strategy by reducing concerns about systematic pre-treatment differences that could bias the estimated effects.

### 7.2 Results

I first examine the effect of QIZs on firm-level production outcomes. I find evidence that QIZ designation improved the performance of treated firms in regions added to the program in 2013. Specifically, the total revenue, production, and gross value added of these firms increased relative to controls. Figure 14 shows these results, with estimated log coefficients close to 1, implying an increase of more than 150 % in

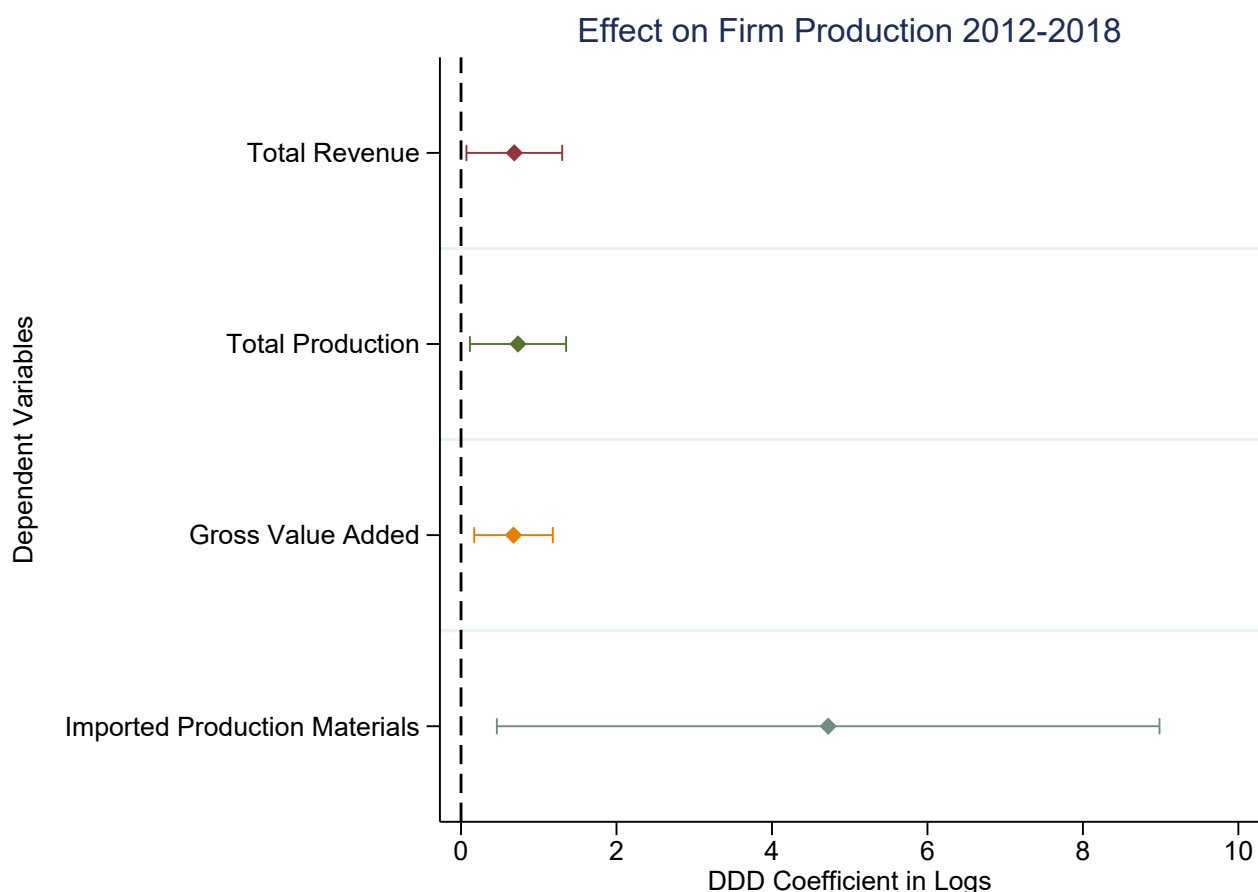


Figure 14: Firm Production Outcomes: DDD Estimates. Confidence intervals are shown at the 90% level.

these outcomes. Importantly, I also observe a substantial increase in the coefficient on imported production materials, which reinforces the validity of the empirical strategy: to qualify for QIZ benefits, firms must source a minimum share of inputs from Israel, making this an expected first stage channel of adjustment.

I then examine the effect of QIZs on firm-level employment. I find that QIZ designation increased the number of textile workers by roughly 100%, with most of this growth driven by male rather than female workers. When distinguishing between permanent and temporary employment, both categories show substantial increases. The gendered pattern of this effect is surprising, as globally the textile industry often absorbs female workers and serves as a key driver of structural change for women (Heath and Mobarak, 2015). However, this does not appear to be the case in Egypt, where male workers continue to dominate the textile industry, largely due to cultural and social norms (Burszty, González, and Yanagizawa-Drott, 2020; World Bank, 2023). Interestingly, both male and female unpaid workers decline following QIZ designation. This may reflect compliance with labor requirements tied

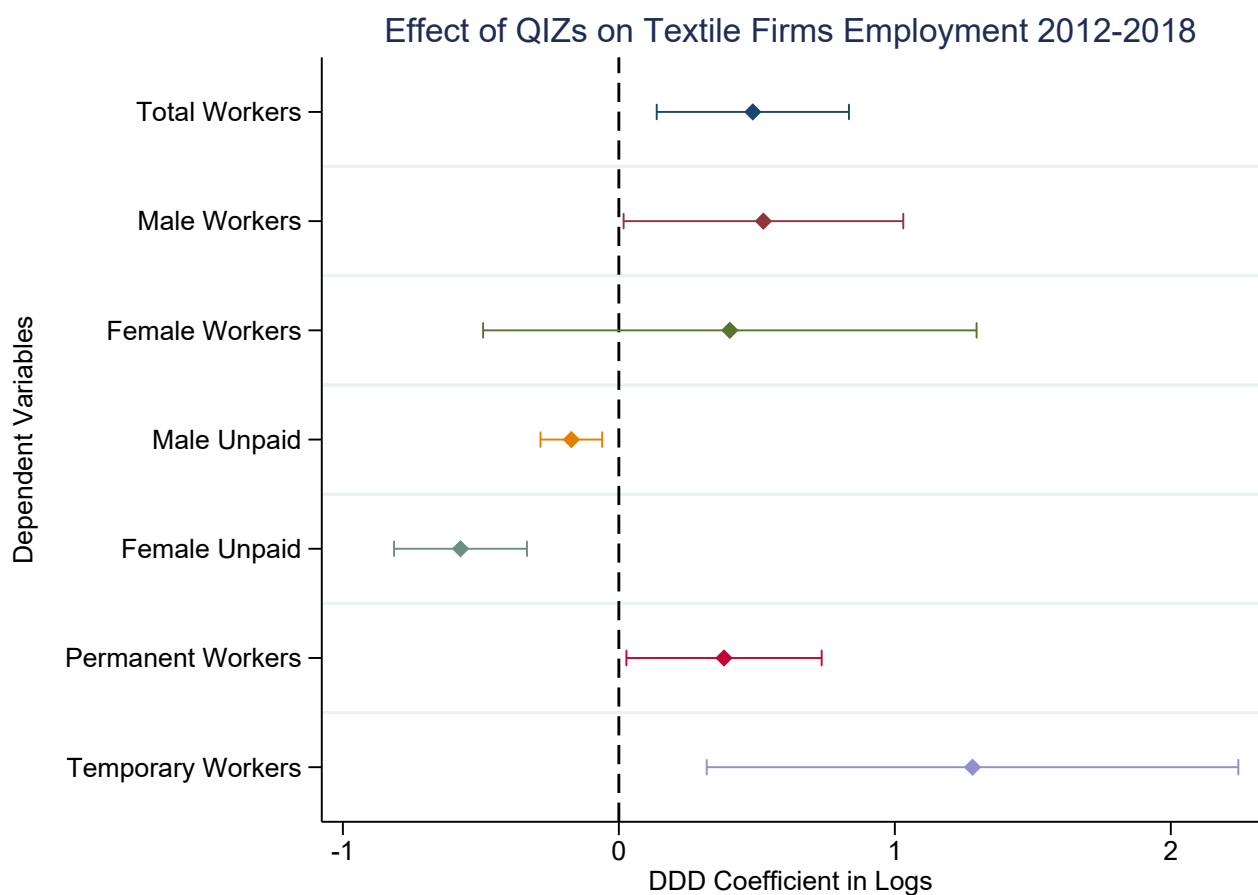


Figure 15: Firm Employment Outcomes: DDD Estimates. Confidence intervals are shown at the 90% level.

to QIZ participation, which likely incentivized firms to convert unpaid positions into temporary contracts. Overall, these findings suggest that while trade agreements such as the QIZ can boost employment, they may not produce the same gender-equalizing effects observed in other contexts.

Finally, we examine the effect of QIZ treatment on wages. As shown in Figure A9, we find no statistically significant impact on wages—whether measured in cash or in-kind compensation. This absence of wage growth, despite substantial increases in employment, may reflect labor market conditions in which an abundant supply of low-skilled workers prevents upward wage pressure, or the nature of job creation under QIZs, which often relies on short-term or lower-quality contracts rather than higher-paid employment. It may also reflect the fact that this analysis uses only the most recent QIZ expansion, which earlier results suggest had relatively limited effects on exports to the United States. In the next section, when examining both the 2009 and 2013 expansions jointly, we observe stronger wage responses.

Furthermore, these aggregate firm-level results may mask important gender-

specific patterns that this dataset cannot capture, motivating the use of labor force survey data in the following section.

In Appendix A, we restrict the sample to manufacturing firms and repeat the analysis. The results are qualitatively similar, though estimated with less precision.

## 8 Labor Force Surveys

In this section, I use the Egyptian Labor Force Surveys from 2006 to 2017 to examine the effect of regions designated as QIZs on wages and social insurance coverage for workers in textile firms. I estimate equation (4) for this analysis. To validate the parallel trends assumption, I first present event study plots, and then I explore the aggregate results separately by gender.

### Results

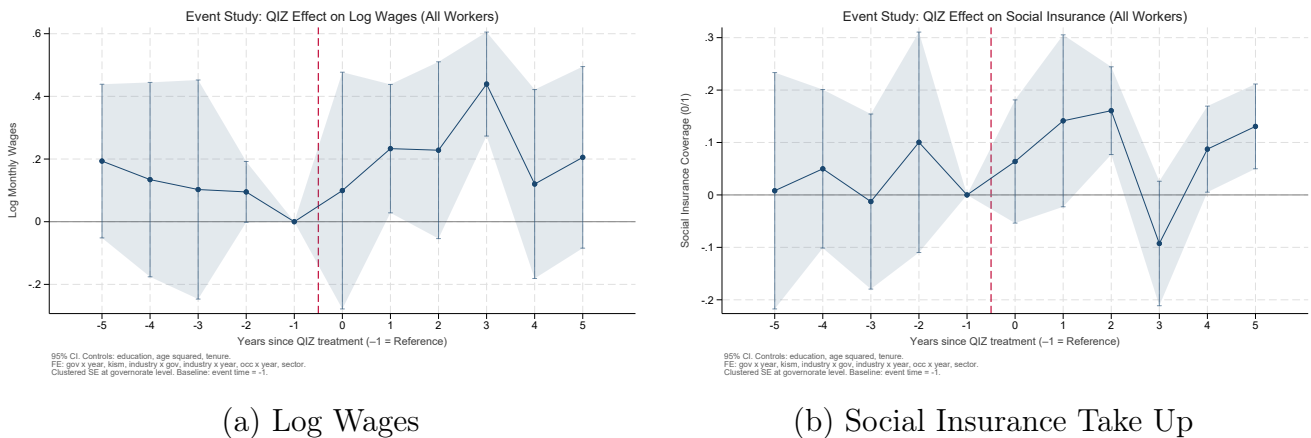


Figure 16: Event-study: Wages and Social Insurance (Formality)

I begin by examining the effect of QIZ designation on the log wages of textile workers. The analysis exploits the 2009 and 2013 QIZ expansions and excludes workers in previously treated regions, for which pre-treatment data are unavailable. Figure 16 panel (a) presents the corresponding event-study estimates. The pre-treatment coefficients are non significantly different than 0, supporting the parallel trends assumption. Although the post-treatment estimates are somewhat noisy, they indicate a positive and statistically significant increase in log wages following QIZ designation.

I then examine the effect of QIZ designation on workers' social insurance status. Following the same approach as for wages, I first assess pre-trends and then estimate gender-specific effects. Figure 16 panel (b) presents the event-study results.

The pre-treatment coefficients show no detectable deviations from parallel trends, supporting the validity of the DDD design. The dynamic estimates reveal a statistically significant and persistent effect on social insurance status following QIZ designation.

Next, I examine heterogeneity by gender. As shown in Table A1 columns (1) and (2), QIZ designation leads to a positive and statistically significant increase in male wages. The estimated effect for female workers is large but imprecisely estimated and statistically insignificant, likely due to the small number of female textile workers in the data. This pattern is consistent with the firm-level evidence presented earlier, suggesting that male workers benefited more from QIZ participation than female workers.

I then examine the effect of QIZ designation on workers' social insurance status by gender. As shown in Table A1 columns (3) and (4), QIZ designation increases social insurance take-up among male workers in a statistically significant manner, whereas the corresponding effect for female workers is statistically insignificant. This result is consistent with earlier findings from both firm-level and worker-level analyses, and reinforces the interpretation that male workers benefited more from QIZ participation in the Egyptian context—particularly with respect to the formality of their employment.

## 9 Quantitative Model

This section develops a quantitative heterogeneous-firm trade model tailored to the Qualifying Industrial Zones (QIZ) setting. The model serves two main purposes. First, it provides a structured mapping from the estimated firm-level responses—export expansion, destination and product diversification, and evidence consistent with productivity gains—to underlying economic mechanisms, including endogenous export participation, compliance with QIZ input requirements through costly Israeli imports, and productivity upgrading induced by U.S. market access. Second, it aggregates these micro-level responses into economy-wide outcomes, such as equilibrium wages, employment reallocation across locations, domestic price indices, and welfare. The model is calibrated to match moments from the customs microdata and is used to quantify the welfare effects of QIZ and to evaluate counterfactual policy scenarios, in particular changes in input requirement stringency through variation in the Israeli content requirement. Additional derivations and technical details are provided in Appendix C.

## 9.1 Environment

Egypt consists of two regions  $r \in \{Q, N\}$ , where  $Q$  denotes QIZ-eligible locations and  $N$  denotes non-QIZ locations. Firms are region-fixed, while workers can move across regions. The economy produces differentiated varieties in multiple sectors indexed by  $s \in S$  (e.g., textiles/apparel, food). Firms sell domestically ( $j = \text{EG}$ ) and export to foreign destinations  $j \in \{\text{US}, \text{RW}\}$ , where RW denotes the rest of the world.

Egypt is modeled as a small open economy relative to the United States and the rest of the world. In foreign destinations, sectoral expenditures  $E_{js}$  and sectoral price indices  $P_{js}$  are taken as exogenous. Israel enters through the ROO constraint: compliant QIZ exporters must source a minimum share of intermediates from Israel, which raises their variable input costs. Israeli intermediate input prices are treated as exogenous.

## 9.2 Demand

Consumers have nested CES preferences over sectors and varieties within sectors. Let  $\sigma_s > 1$  denote the elasticity of substitution across varieties within sector  $s$ . Standard CES demand implies that revenue from selling a variety to destination  $j$  is

$$R_{js}(\omega) = E_{js} \left( \frac{p_{js}(\omega)}{P_{js}} \right)^{1-\sigma_s}, \quad (7)$$

where  $E_{js}$  is expenditure in destination  $j$ , sector  $s$ , and  $P_{js}$  is the corresponding sectoral price index.

For Egypt ( $j = \text{EG}$ ), expenditures and price indices are endogenous. Aggregate income in Egypt is

$$Y_{\text{EG}} = w_Q L_Q + w_N L_N + T, \quad (8)$$

where  $w_r$  and  $L_r$  are the wage and employment in region  $r$ , and  $T$  is a transfer that closes the small-open economy.

## 9.3 Firms, sourcing, and trade costs

In each region  $r$  and sector  $s$ , a mass of potential entrants pays a sunk entry cost  $w_r f_{rs}^E$  to draw productivity  $\phi$  from a Pareto distribution:

$$G_s(\phi) = 1 - \left( \frac{\phi_{\min,s}}{\phi} \right)^{\theta_s}, \quad \phi \geq \phi_{\min,s}, \quad (9)$$

with shape parameter  $\theta_s > \sigma_s - 1$ .

A firm with productivity  $\phi$  produces according to

$$y = \phi l^{\alpha_s} m^{1-\alpha_s}, \quad (10)$$

where  $\alpha_s \in (0, 1)$  is the labor share,  $l$  denotes labor, and  $m$  is a composite intermediate input. Cost minimization yields marginal cost

$$mc_{rs}(\phi; c_{m,s}) = \frac{1}{\phi} \cdot \frac{w_r^{\alpha_s} c_{m,s}^{1-\alpha_s}}{\alpha_s^{\alpha_s} (1-\alpha_s)^{1-\alpha_s}}, \quad (11)$$

where  $c_{m,s}$  is the unit cost of intermediates.

The model distinguishes two sourcing regimes. Under noncompliance, firms source intermediates freely from the rest of the world at unit cost

$$c_{m,s}^N = p_{RW,s}. \quad (12)$$

Under compliance, firms must satisfy a minimum Israeli-content requirement  $\gamma_s \in (0, 1)$ . The corresponding unit cost index is

$$c_{m,s}^C(\gamma_s) = \frac{p_{IL,s}^{\gamma_s} p_{RW,s}^{1-\gamma_s}}{\gamma_s^{\gamma_s} (1-\gamma_s)^{1-\gamma_s}}, \quad (13)$$

and complying also requires paying a fixed compliance cost  $w_Q f_s^C$ .

Shipping from region  $r$  to destination  $j$  in sector  $s$  incurs iceberg trade costs  $d_{rjs} \geq 1$ . In addition, exporting to the U.S. is subject to an MFN tariff  $t_s^{\text{MFN}}$  unless the firm complies with QIZ. Let the total delivered wedge be

$$\tau_{rjs} = d_{rjs} \times \begin{cases} 1 + t_s^{\text{MFN}}, & j = \text{US and noncomplier,} \\ 1, & j = \text{US and complier,} \\ 1, & j \in \{\text{EG, RW}\}. \end{cases} \quad (14)$$

Under monopolistic competition and CES demand, firms set constant-markup prices:

$$p_{rjs}(\phi) = \mu_s \tau_{rjs} mc_{rs}(\phi; c_{m,s}), \quad \mu_s = \frac{\sigma_s}{\sigma_s - 1}. \quad (15)$$

## 9.4 Exporting, compliance, and upgrading

Serving destination  $j$  requires paying a fixed cost  $w_r f_{rjs}$ . Exporting is profitable if variable profits cover this fixed cost, which defines a productivity cutoff  $\phi_{rjs}^*$ . Firms with  $\phi \geq \phi_{rjs}^*$  serve destination  $j$ , generating both intensive-margin responses (higher exports among incumbents) and extensive-margin responses (changes in export participation).

Only firms in region  $Q$  are eligible to comply and receive tariff-free U.S. access. A QIZ firm chooses compliance if the gain from avoiding the U.S. MFN tariff exceeds the higher variable cost of sourcing from Israel and the fixed compliance cost. Let  $\Pi_{Q_s}^N(\phi)$  denote profits under noncompliance and  $\Pi_{Q_s}^C(\phi; \gamma_s)$  denote profits under compliance. The firm complies iff

$$\Pi_{Q_s}^C(\phi; \gamma_s) - w_Q f_s^C \geq \Pi_{Q_s}^N(\phi). \quad (16)$$

The model also allows firms to upgrade productivity after obtaining export access. Upgrading scales productivity by  $\delta_s > 1$  at fixed cost  $w_r f_s^U$ , so that  $\phi' = \delta_s \phi$ . A firm upgrades iff

$$\Pi_{r_s}(\delta_s \phi) - \Pi_{r_s}(\phi) \geq w_r f_s^U. \quad (17)$$

Because upgrading lowers marginal costs for all destinations, it increases exports not only to the U.S. but also to non-U.S. markets. Under CES demand and constant markups, export revenues scale with productivity as

$$\frac{R'_{rjs}}{R_{rjs}} = \delta_s^{\sigma_s - 1}. \quad (18)$$

This provides a direct link between productivity upgrading and export spillovers to non-U.S. destinations.

## 9.5 Labor mobility and equilibrium

Total labor supply is  $L$ . Workers choose region based on real wages. A parsimonious logit mobility structure implies regional labor shares

$$\lambda_r = \frac{(w_r / P_{EG})^\kappa}{\sum_{r' \in \{Q, N\}} (w_{r'} / P_{EG})^\kappa}, \quad L_r = \lambda_r L, \quad (19)$$

where  $\kappa > 0$  governs the responsiveness of migration to real wage differences.

An equilibrium is a set of wages  $\{w_r\}$ , labor allocations  $\{L_r\}$ , masses of entrants,

export cutoffs, compliance and upgrading decisions, and domestic price indices such that households optimize, firms optimize, free entry holds, labor mobility holds, and labor markets clear in both regions.

## 9.6 Counterfactuals and calibration

The model is used for three exercises. First, I compute the welfare effect of QIZ by comparing the observed equilibrium to a counterfactual without preferential U.S. access. Welfare is measured as real income,

$$W \equiv \frac{Y_{EG}}{P_{EG}}. \quad (20)$$

Second, I vary the Israeli content requirement  $\gamma_s$  to evaluate how the gains from preferential market access depend on the stringency of the ROO constraint. Lower values of  $\gamma_s$  relax the sourcing requirement while preserving tariff preferences; higher values increase the cost of compliance.

Third, I use the model to decompose mechanisms by shutting down upgrading, compliance costs, or labor mobility one at a time.

The model is calibrated to match moments from the customs data. Sector elasticities and tariffs are taken from external sources, while the Pareto shape, fixed costs, compliance costs, and upgrading parameters are disciplined by moments on exporter participation, export premia, destination scope, Israeli intermediate sourcing, and export spillovers to non-U.S. destinations.

## 9.7 Model Results

In Progress!

# 10 Discussion

The experience of Egypt’s QIZ program offers several lessons for the design of trade agreements in complex institutional environments. First, agreements that incorporate sourcing requirements—such as mandated imports from a specific partner country—may achieve short-term policy objectives but need not lead to sustained regional economic integration. Evidence from Jordan illustrates this point: following the implementation of the United States–Jordan Free Trade Agreement, firms largely discontinued imports from Israel. This pattern suggests that compliance

with such requirements is primarily driven by their economic incentives, rather than reflecting deeper or persistent integration across partner countries.

More broadly, these findings indicate that trade-based incentives alone may be insufficient to generate durable integration in settings characterized by longstanding political frictions. Policymakers considering similar arrangements should therefore recognize that trade provisions, in isolation, may not overcome deeper structural constraints to integration. Instead, the effectiveness of such agreements is likely to depend on how they interact with structural resolutions to conflicts.

Second, the sequencing and geographic targeting of trade programs play an important role in shaping the distribution of gains. The results show that the positive effects of QIZ designation on exports were concentrated among firms located in early-designated regions and among new entering firms, while later expansions generated weaker impacts. Both large and small firms increased exports, but new entrants experienced larger relative gains, consistent with the program attracting foreign investment. In addition to increased exports to the United States, treated firms expanded sales to non-U.S. destinations and exhibited productivity improvements. Firms also temporarily increased the number of products and destinations they served before refocusing on core lines, suggesting an initial phase of diversification followed by specialization as competitive pressures intensified.

At the firm level, QIZ designation led to increases in revenues, production, and value added, but its effects on workers were uneven. Employment rose substantially—particularly among male workers—and was accompanied by wage gains at the margin. However, average firm-level wages showed little change, reflecting that much of the employment growth occurred in lower-paid or newly created positions.

These patterns highlight a broader trade-off in the design of geographically targeted trade policies. Focusing on established industrial clusters can maximize short-run export growth, but may also reinforce existing regional and distributional disparities if gains are concentrated in more advanced areas. Earlier inclusion of less developed regions could encourage firms to expand into new locations, generating wider spillovers and more balanced development. Complementary place-based policies—such as infrastructure investment, industrial zone development, and targeted workforce training—are therefore important to ensure that trade liberalization supports more inclusive growth (Kline and Moretti, 2014).

Finally, the results point to the importance of considering gender dimensions in trade policy design. While QIZ participation increased male employment and social insurance coverage, female workers did not experience comparable gains. In contexts

where labor market participation is shaped by social and institutional constraints, trade liberalization alone may be insufficient to generate inclusive employment outcomes.

## 11 Conclusion

This paper examined the effects of Egypt's QIZ agreement on production, exports, and employment. The results demonstrate that the program generated substantial productivity-related gains, particularly among incumbent and early-treated textile and apparel firms located in established industrial clusters. These firms expanded their export volumes, diversified across products and destinations, and increased output, value added, and overall firm size. The pattern of effects is consistent with learning-by-exporting, incumbency advantages, and scale-related productivity improvements. Later-treated firms also benefited, although to a lesser degree. On the labor side, the program led to sizable employment growth, especially among men, reflecting pre-existing gender patterns in Egypt's manufacturing sector.

Despite these positive impacts, the broader distribution of gains was uneven across firms, regions, and workers. The evidence shows that QIZ-driven integration was concentrated within strong industrial clusters and did not generate deeper or more persistent forms of regional integration. This is consistent with international experience, where sourcing requirements tend to affect firms' short-run input choices without altering long-term economic linkages. Taken together, the findings suggest that trade agreements with conditional input-sourcing rules can successfully stimulate export growth and productivity improvements in targeted sectors, but their broader developmental impact depends critically on timing, geographic targeting, and complementary policies that support more inclusive and sustained industrial expansion.

An important next step is to translate these firm- and worker-level effects into aggregate and welfare implications. I therefore develop a quantitative heterogeneous-firm trade model with endogenous QIZ compliance, rules-of-origin costs, and productivity upgrading, disciplined by the micro evidence in this paper. The model will be used to quantify the economy-wide welfare effects of the program and to evaluate counterfactual designs that vary the Israeli input requirement, thereby characterizing the trade-off between conditionality and gains from market access.

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# Appendix

## A Figures

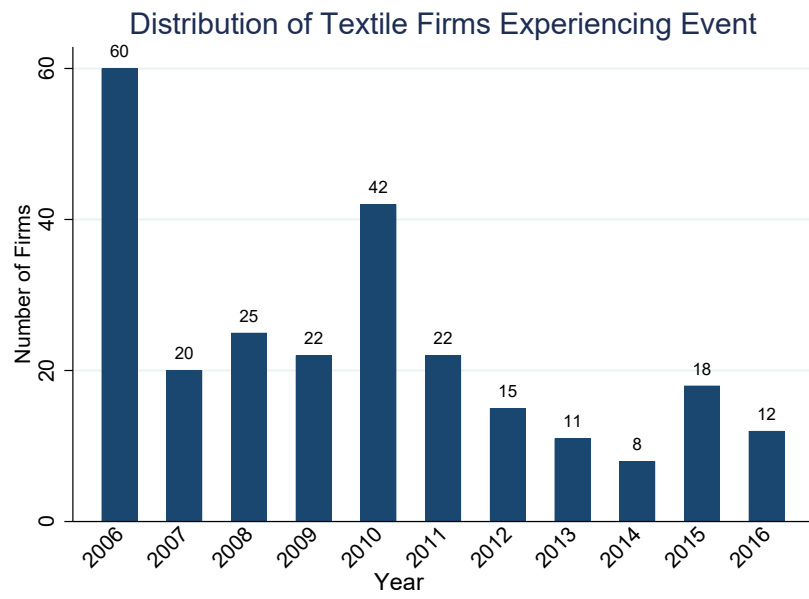
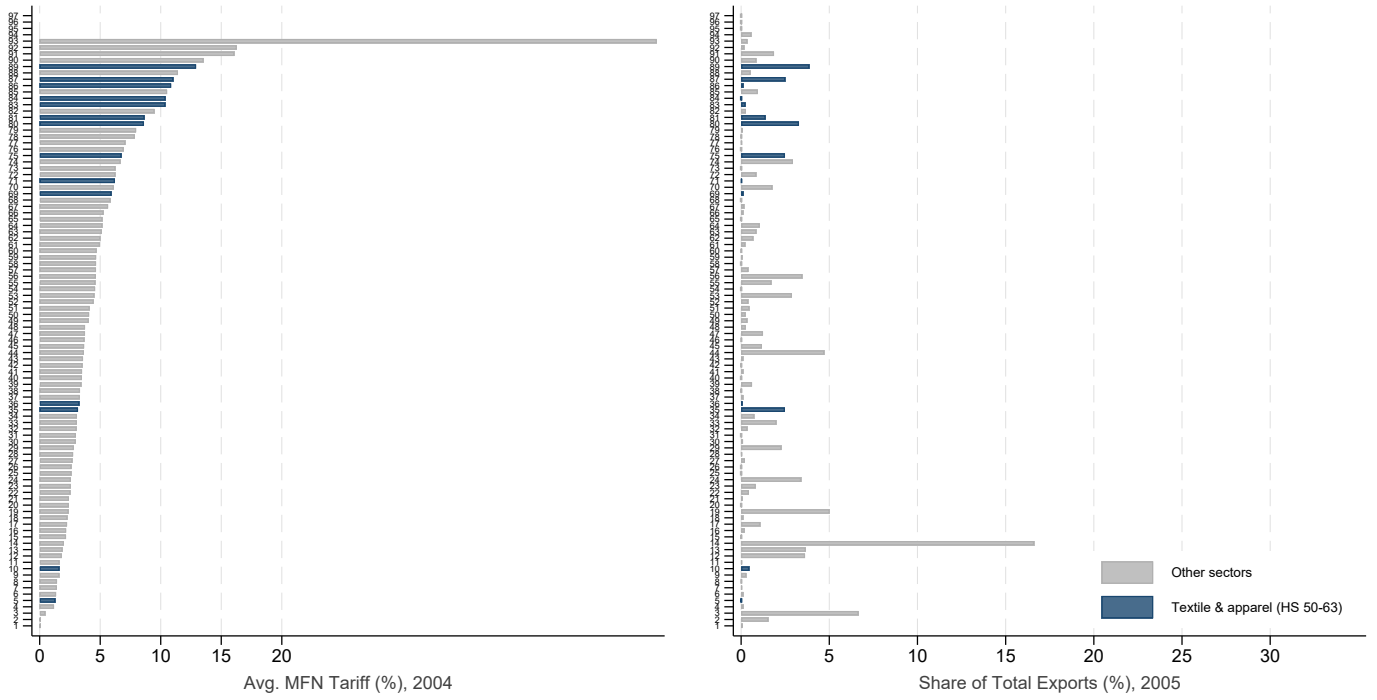


Figure A1: Distribution of Events for Textile Firms per Year

## Tariff Exposure and Export Importance by HS2 Chapter



Left: average MFN tariff in 2004 (= tariff reduction to 0 under QIZ).  
 Right: share of total Egyptian exports to the US in 2005.  
 Navy bars: textile and apparel chapters (HS 50-63). Sorted by tariff level.

Figure A2: Tariff Exposure and Export share by HS2 Product

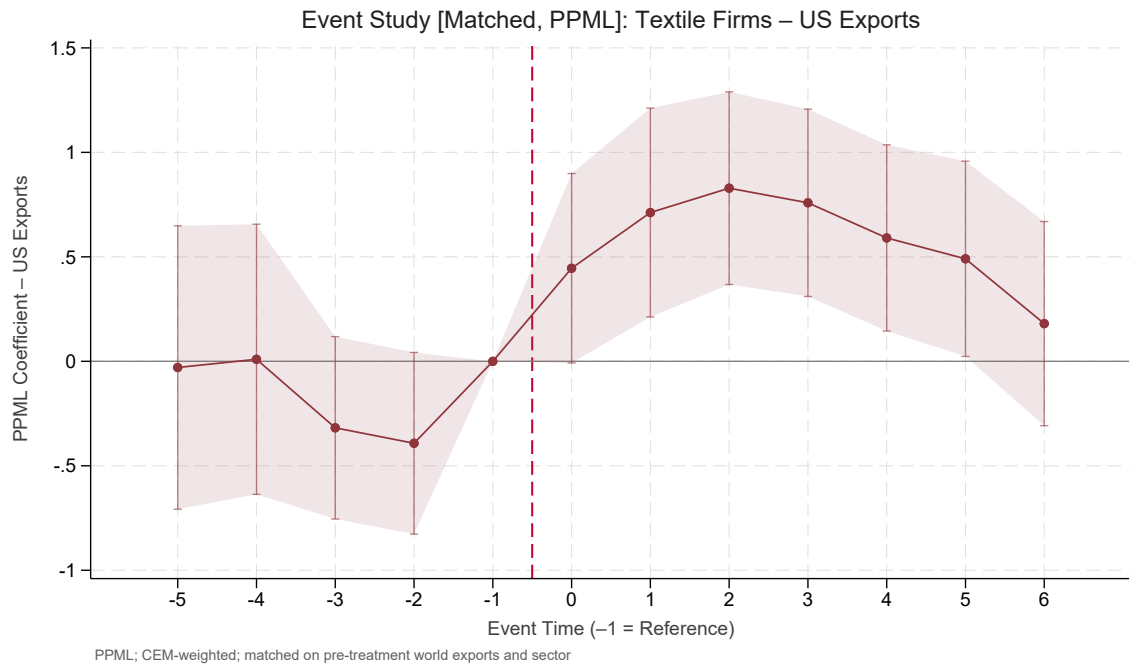


Figure A3: Event Study: Effects of QIZ on exports to the US for Textile and Apparel Firms (PPML)

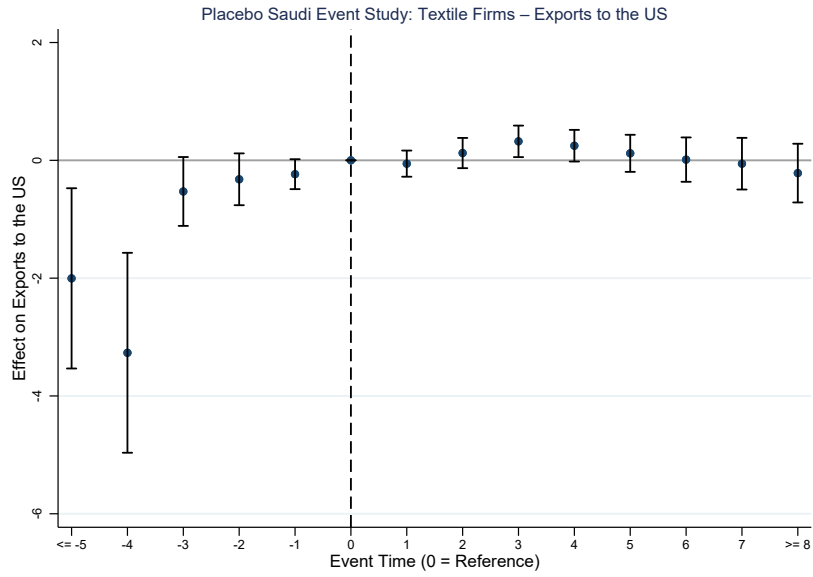


Figure A4: Event Study: Effects of QIZ on exports to the US for Textile and Apparel Firms (PPML)

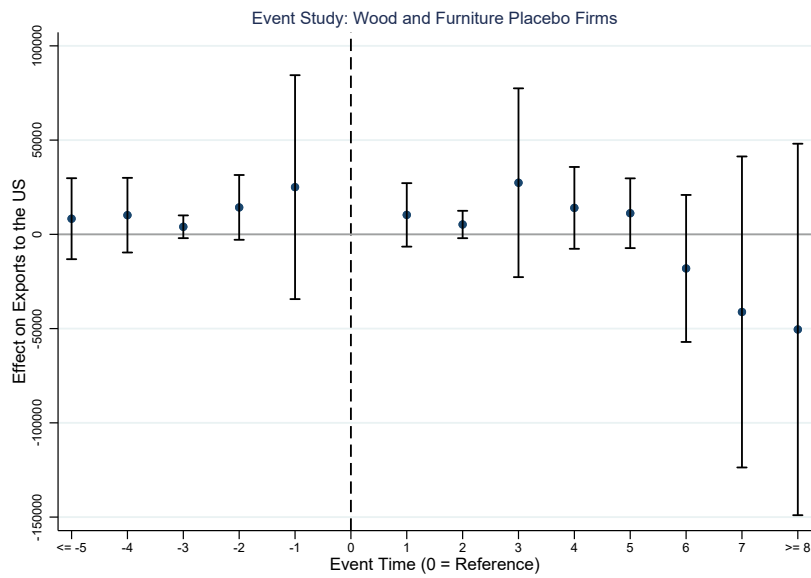


Figure A5: Placebo Sector Event Study: Wood and Furniture (OLS)

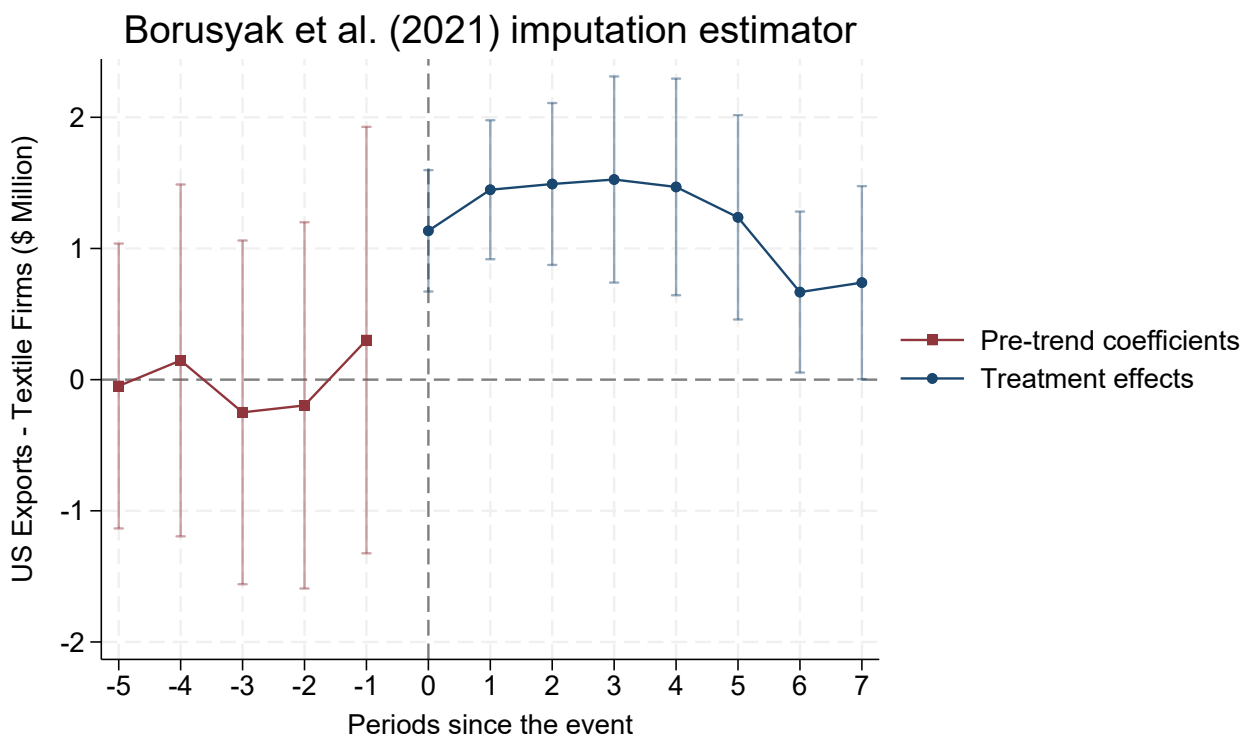
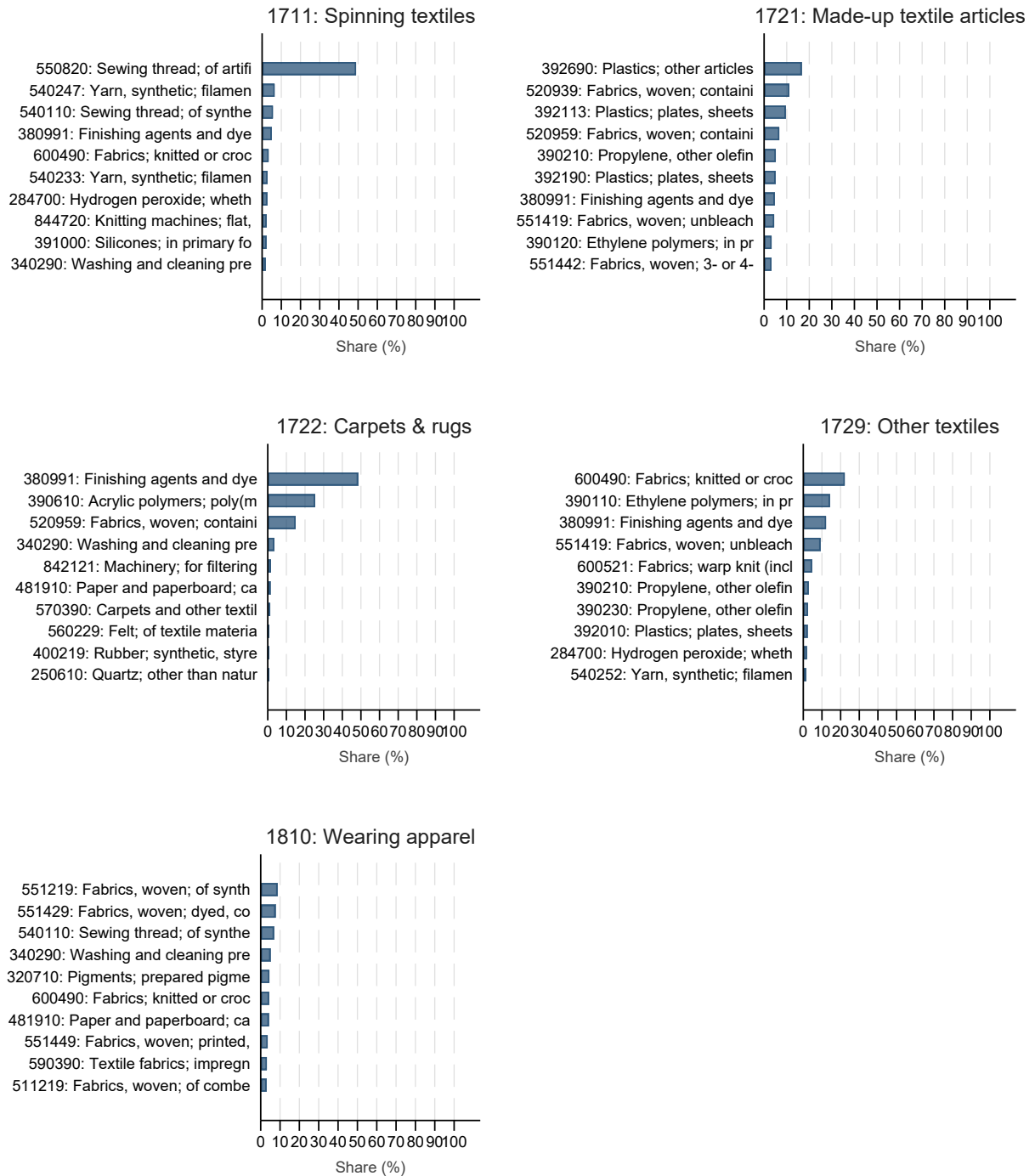


Figure A6: Event Study using the imputation estimator as suggested by Boursayk et al (2021).

# Israeli Import Products by Textile Sector: Top 10 HS6



Share of total Israeli import value, pooled 2005-2016. Textile firms only.

Figure A7: Share of Israeli Imports by Product for Textile and Apparel Firms

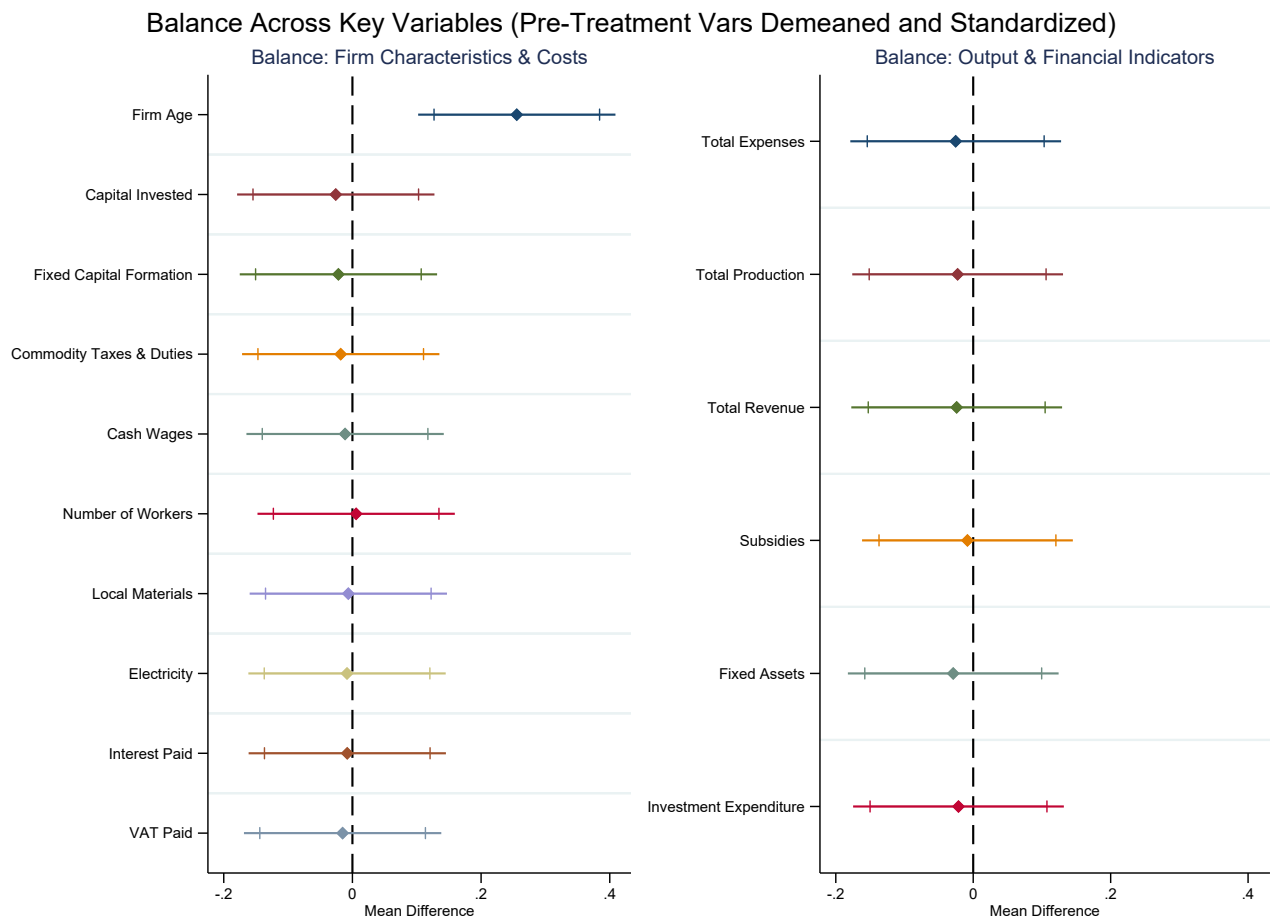


Figure A8: Pre-Treatment Period (2012) Balance Test Results

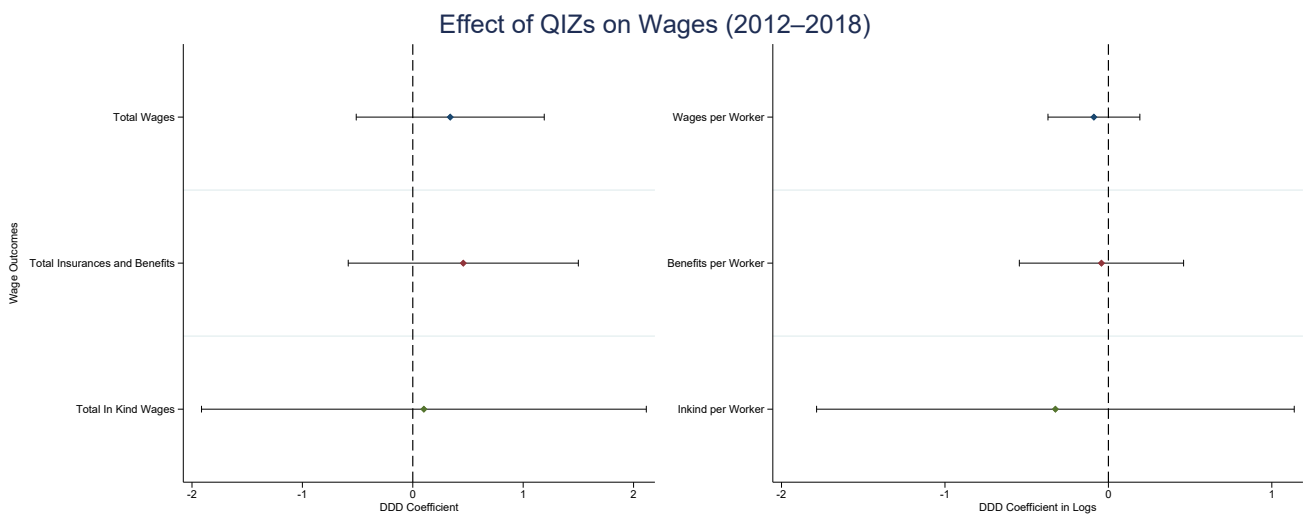


Figure A9: Firm Wages Outcomes: DDD Estimates. Confidence Intervals are at the 90% level

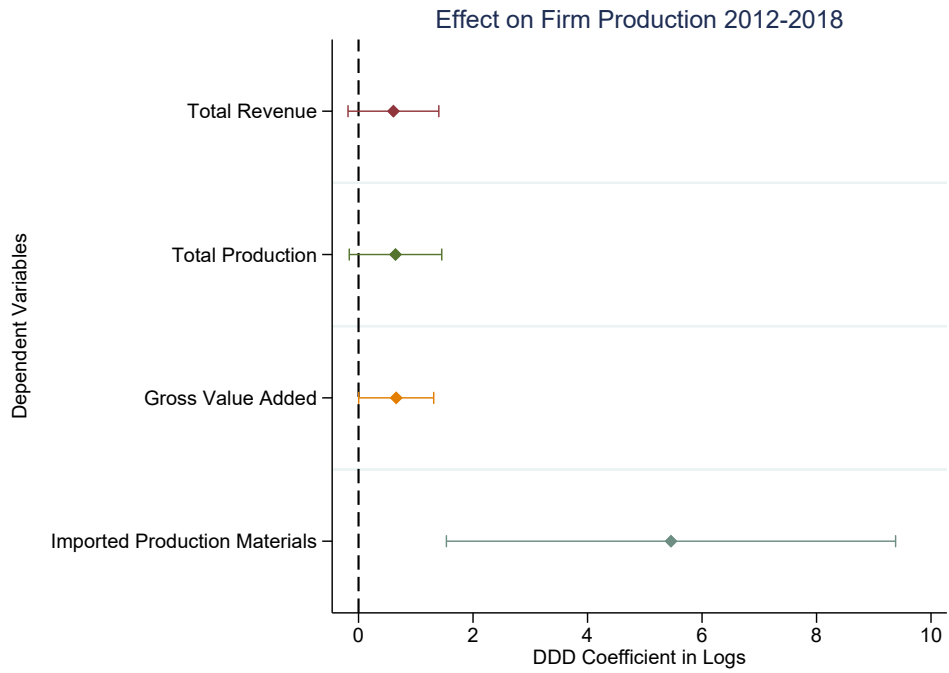


Figure A10: Firm Production Outcomes: DDD Estimates. Sample is restricted to manufacturing firms only. Confidence Intervals are at the 90% level

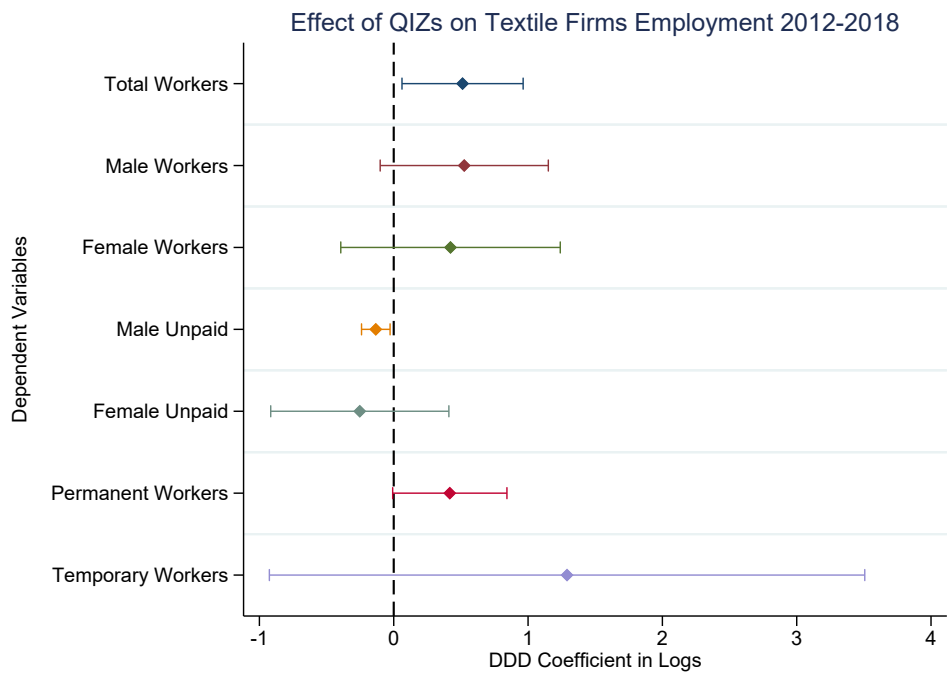


Figure A11: Firm Employment Outcomes: DDD Estimates. Sample is restricted to manufacturing firms only. Confidence Intervals are at the 90% level

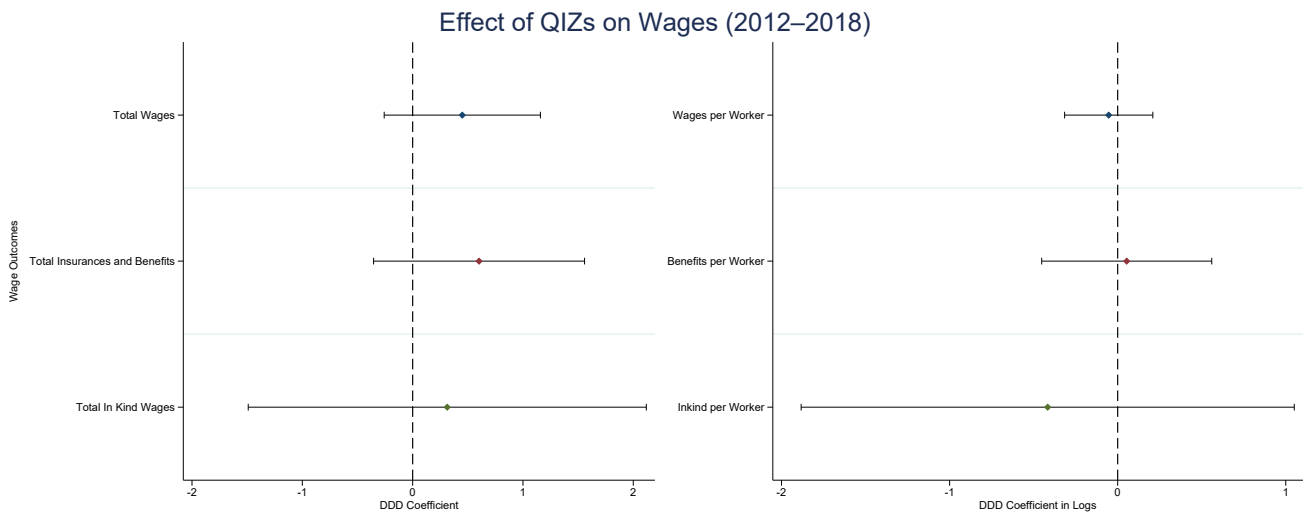


Figure A12: Firm Wages Outcomes: DDD Estimates. Sample is restricted to manufacturing firms only. Confidence Intervals are at the 90% level

Table A1: Impact of QIZ Designation on Log Wages and Social Insurance by Gender

	Log Wages		Social Insurance	
	Men	Women	Men	Women
QIZ Gov $\times$ Textile $\times$ Post	0.122* (0.061)	0.376 (0.315)	0.092* (0.052)	0.095 (0.065)
Observations	127,904	28,089	308,545	86,324
Within $R^2$	0.068	0.189	0.009	0.008
Gov $\times$ Year FE	Yes	Yes	Yes	Yes
Industry $\times$ Year FE	Yes	Yes	Yes	Yes
Industry $\times$ Gov FE	Yes	Yes	Yes	Yes
Individual Controls	Yes	Yes	Yes	Yes

*Notes:* Standard errors clustered by governorate in parentheses. Triple difference-in-differences: QIZ Governorate  $\times$  Textile  $\times$  Post. All lower-order interactions absorbed by fixed effects. QIZ governorates: 15, 18, 22, 24. Food and chemical sectors excluded. Individual controls: education dummies, age squared. Survey weights applied.

\*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

## B Logs with Zeros

Throughout the paper when working with trade data, I use a transformation of exports designed for settings with many zero or very small trade flows. Following Chen and Roth (2024), I recode export values below 100,000 to a common threshold and take logs only for export values at or above that threshold. This transformation addresses the problem of zeros in trade data while focusing attention on the intensive margin, since firms with negligible exports are effectively pooled at the lower bound rather than contributing variation through entry into exporting.

$$y_{it} = \begin{cases} 100,000, & \text{if Exports}_{it} < 100,000, \\ \log(\text{Exports}_{it}), & \text{if Exports}_{it} \geq 100,000. \end{cases} \quad (21)$$

## C Model Appendix

This appendix provides the derivations and technical details for the quantitative model presented in Section 9.

### C.1 Preferences and demand

Consumers in each destination  $j$  have nested CES preferences over sectors and varieties within sectors. Upper-tier utility in  $j$  is

$$U_j = \left( \sum_{s \in S} \beta_s^{1/\eta} U_{js}^{\frac{\eta-1}{\eta}} \right)^{\frac{\eta}{\eta-1}}, \quad (22)$$

where  $\beta_s > 0$  are sector weights and  $\eta > 0$  is the elasticity of substitution across sectors. Within each sector  $s$ ,

$$U_{js} = \left( \int_{\omega \in \Omega_{js}} q_{js}(\omega)^{\frac{\sigma_s-1}{\sigma_s}} d\omega \right)^{\frac{\sigma_s}{\sigma_s-1}}, \quad (23)$$

where  $\sigma_s > 1$  is the within-sector elasticity of substitution and  $\Omega_{js}$  is the set of varieties available in destination  $j$ .

Standard CES demand implies that, in destination  $j$  and sector  $s$ , demand for a variety priced at  $p_{js}(\omega)$  is

$$q_{js}(\omega) = \left( \frac{p_{js}(\omega)}{P_{js}} \right)^{-\sigma_s} \frac{E_{js}}{P_{js}}, \quad (24)$$

where  $E_{js}$  is total expenditure on sector  $s$  in destination  $j$ , and  $P_{js}$  is the sectoral CES price index:

$$P_{js} = \left( \int_{\omega \in \Omega_{js}} p_{js}(\omega)^{1-\sigma_s} d\omega \right)^{\frac{1}{1-\sigma_s}}. \quad (25)$$

Revenue from sales to destination  $j$  is therefore

$$R_{js}(\omega) = p_{js}(\omega)q_{js}(\omega) = E_{js} \left( \frac{p_{js}(\omega)}{P_{js}} \right)^{1-\sigma_s}. \quad (26)$$

For Egypt ( $j = \text{EG}$ ), expenditures and price indices are endogenous. Aggregate income is

$$Y_{\text{EG}} = w_Q L_Q + w_N L_N + T, \quad (27)$$

where  $w_r$  and  $L_r$  are wages and employment in region  $r$ , and  $T$  is a net transfer. Sector expenditures satisfy

$$E_{\text{EG},s} = \beta_s \left( \frac{P_{\text{EG},s}}{P_{\text{EG}}} \right)^{1-\eta} Y_{\text{EG}}, \quad (28)$$

with aggregate price index

$$P_{\text{EG}} = \left( \sum_{s \in S} \beta_s P_{\text{EG},s}^{1-\eta} \right)^{\frac{1}{1-\eta}}. \quad (29)$$

## C.2 Firms: entry, technology, and marginal costs

In each region  $r$  and sector  $s$ , a mass of potential entrants pays a sunk entry cost  $w_r f_{rs}^E$  to draw productivity  $\phi$  from a Pareto distribution:

$$G_s(\phi) = 1 - \left( \frac{\phi_{\min,s}}{\phi} \right)^{\theta_s}, \quad \phi \geq \phi_{\min,s}, \quad (30)$$

with shape parameter  $\theta_s > \sigma_s - 1$ .

A firm with productivity  $\phi$  produces output using labor  $l$  and a composite intermediate input  $m$ :

$$y = \phi l^{\alpha_s} m^{1-\alpha_s}. \quad (31)$$

Cost minimization yields the marginal cost of production:

$$mc_{rs}(\phi; c_{m,s}) = \frac{1}{\phi} \cdot \frac{w_r^{\alpha_s} c_{m,s}^{1-\alpha_s}}{\alpha_s^{\alpha_s} (1-\alpha_s)^{1-\alpha_s}}. \quad (32)$$

The model distinguishes two sourcing regimes.

**Noncompliance (free sourcing).** Noncompliant firms source intermediates from the rest of the world at unit cost

$$c_{m,s}^N = p_{\text{RW},s}. \quad (33)$$

**Compliance (ROO sourcing).** Compliant firms must satisfy a minimum Israeli-content requirement  $\gamma_s \in (0, 1)$ , implemented as a Cobb–Douglas input bundle:

$$m = (m_{\text{IL}})^{\gamma_s} (m_{\text{RW}})^{1-\gamma_s}. \quad (34)$$

The corresponding unit cost index is

$$c_{m,s}^C(\gamma_s) = \frac{p_{IL,s}^{\gamma_s} p_{RW,s}^{1-\gamma_s}}{\gamma_s^{\gamma_s} (1-\gamma_s)^{1-\gamma_s}}, \quad (35)$$

and complying also requires paying a fixed compliance cost  $w_Q f_s^C$ .

### C.3 Trade costs, pricing, and revenues

Shipping from region  $r$  to destination  $j$  in sector  $s$  incurs iceberg trade costs  $d_{rjs} \geq 1$ . In addition, exporting to the U.S. is subject to an MFN tariff  $t_s^{\text{MFN}}$  unless the firm complies with QIZ. Let the total delivered wedge be

$$\tau_{rjs} = d_{rjs} \times \begin{cases} 1 + t_s^{\text{MFN}}, & j = \text{US and noncomplier}, \\ 1, & j = \text{US and complier}, \\ 1, & j \in \{\text{EG, RW}\}. \end{cases} \quad (36)$$

Delivered marginal cost is  $\widetilde{m}c_{rjs}(\phi) = \tau_{rjs} mc_{rs}(\phi; c_{m,s})$ .

Under monopolistic competition and CES demand, profit maximization implies constant-markup pricing:

$$p_{rjs}(\phi) = \mu_s \widetilde{m}c_{rjs}(\phi), \quad \mu_s = \frac{\sigma_s}{\sigma_s - 1}. \quad (37)$$

Substituting into the revenue expression yields

$$R_{rjs}(\phi) = E_{js} \left( \frac{\mu_s \widetilde{m}c_{rjs}(\phi)}{P_{js}} \right)^{1-\sigma_s}, \quad (38)$$

which is strictly increasing in productivity  $\phi$ .

### C.4 Export participation and cutoffs

Serving destination  $j$  requires paying a fixed cost  $w_r f_{rjs}$ . Variable profits satisfy

$$\pi_{rjs}^{\text{var}}(\phi) = \frac{1}{\sigma_s} R_{rjs}(\phi). \quad (39)$$

Exporting is profitable iff

$$\frac{1}{\sigma_s} R_{rjs}(\phi) \geq w_r f_{rjs}. \quad (40)$$

This defines a unique productivity cutoff  $\phi_{rjs}^*$  such that firms export to destination  $j$  iff  $\phi \geq \phi_{rjs}^*$ .

## C.5 Endogenous ROO compliance

Only firms in region  $Q$  are eligible to comply and receive tariff-free U.S. access. Let  $\Pi_{Q_s}^N(\phi)$  denote maximized operating profits under noncompliance and  $\Pi_{Q_s}^C(\phi; \gamma_s)$  denote profits under compliance. The firm complies iff

$$\Pi_{Q_s}^C(\phi; \gamma_s) - w_Q f_s^C \geq \Pi_{Q_s}^N(\phi). \quad (41)$$

Because compliance raises intermediate input costs but removes the U.S. MFN tariff, compliance is more attractive when tariffs are high and the firm is sufficiently productive.

## C.6 Productivity upgrading and export spillovers

The model allows exporting to induce productivity upgrading. Upgrading scales productivity by  $\delta_s > 1$  at fixed cost  $w_r f_s^U$ , so that  $\phi' = \delta_s \phi$ . Let  $\Pi_{rs}(\phi)$  denote maximized operating profits at productivity  $\phi$ . The firm upgrades iff

$$\Pi_{rs}(\delta_s \phi) - \Pi_{rs}(\phi) \geq w_r f_s^U. \quad (42)$$

Under CES demand and constant markups, holding destination-level shifters fixed, revenues scale with productivity as  $R \propto \phi^{\sigma_s - 1}$ . Hence,

$$\frac{R'_{rjs}}{R_{rjs}} = \delta_s^{\sigma_s - 1}. \quad (43)$$

This mapping motivates the use of non-U.S. export growth to identify upgrading, since those spillovers are not mechanically driven by U.S. tariff preferences.

## C.7 Labor mobility and equilibrium

Total labor supply is  $L$ . Workers choose region based on real wages. A logit mobility structure implies regional labor shares

$$\lambda_r = \frac{(w_r / P_{EG})^\kappa}{\sum_{r' \in \{Q, N\}} (w_{r'} / P_{EG})^\kappa}, \quad L_r = \lambda_r L, \quad (44)$$

where  $\kappa > 0$  governs responsiveness to real wage differences. Regional labor-market clearing requires

$$L_r = \sum_{s \in S} M_{rs} \int l_{rs}(\phi) dG_s(\phi) + L_r^{fix}. \quad (45)$$

Domestic price indices are determined by the set of varieties available in Egypt and their prices.

An equilibrium is a set of wages  $\{w_r\}$ , labor allocations  $\{L_r\}$ , masses of entrants  $\{M_{rs}\}$ , export cutoffs  $\{\phi_{rjs}^*\}$ , compliance and upgrading decisions, and domestic price indices such that: (i) households optimize given prices and income, (ii) firms optimize input use, pricing, exporting, compliance, and upgrading, (iii) free entry holds in each  $(r, s)$ , (iv) labor mobility holds, (v) regional labor markets clear, and (vi) domestic price indices are consistent with CES aggregation. Foreign sectoral shifters  $(E_{js}, P_{js})$  for  $j \in \{\text{US}, \text{RW}\}$  and intermediate prices  $(p_{\text{IL},s}, p_{\text{RW},s})$  are taken as given.

## C.8 Counterfactuals and calibration details

The model is used for three counterfactual exercises.

**(i) Welfare effects of QIZ.** I compare the observed equilibrium to a counterfactual without preferential access. In the counterfactual, all firms exporting to the U.S. face MFN tariffs. Welfare in Egypt is measured as

$$W \equiv \frac{Y_{\text{EG}}}{P_{\text{EG}}}. \quad (46)$$

**(ii) Counterfactual ROO stringency.** I vary the Israeli content requirement  $\gamma_s \in [0, \bar{\gamma}_s]$ , where  $\bar{\gamma}_s$  is the baseline requirement in the agreement. Setting  $\gamma_s = 0$  removes the sourcing constraint while preserving preferential access; increasing  $\gamma_s$  raises the variable cost of compliance through equation (35).

**(iii) Additional decompositions.** I also consider counterfactuals that shut down upgrading, eliminate compliance costs, or turn off labor mobility in order to isolate the quantitative role of each mechanism.

**Calibration overview.** The model parameters are calibrated to match moments from the data. Sector elasticities and tariffs are taken from external sources, while

the Pareto shape, fixed costs, compliance costs, and upgrading parameters are disciplined by micro moments including exporter shares, export premia, changes in destination scope, changes in Israeli intermediate sourcing, and the magnitude of export spillovers to non-U.S. destinations.