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The Effect of Anti-Dumping Measures on Egyptian Firms

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Abstract

This paper studies how Egyptian importing firms adjust when a product becomes subject to an anti-dumping investigation or duty. Using firm–product–origin customs data from 2005 to 2016, the analysis documents an investigation effect, with firms reducing quantities and facing higher import prices even before duties are applied. Enforcement generates similar but smaller adjustments. On the extensive margin, investigations slightly reduce entry and raise exit in the targeted product–origin pairs, pointing to a mild destruction effect and to reallocation rather than a collapse of trade. The results clarify how trade-remedy measures shape firm-level sourcing in developing economies.

Keywords: NTMs, Anti-dumping, Firm-level data, Firm Adjustment, Egypt.

JEL Classification: F13,F14

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1 Introduction

The past two decades have witnessed a steady rise in trade protection through anti-dumping (henceforth AD) duties, a form of non-tariff measure (NTMs)[1] that has become one of the most frequently used trade-remedy actions in the global trading system (Bown and Crowley, 2014; WTO, 2025). Since the mid-1990s, thousands of investigations have been initiated across almost fifty economies, and recent waves of contingent protection have attracted renewed attention from researchers and policymakers (Blonigen and Prusa, 2016). Although early users were primarily high-income economies, developing countries now file the majority of new cases as they confront expanding competitive pressure from large emerging exporters. This growing reliance on anti-dumping procedures has intensified in an environment where traditional tariff liberalization has largely stalled and where many countries have turned to alternative forms of protection. The expansion of anti-dumping activity has generated an extensive empirical literature on its drivers and consequences, yet much remains to be uncovered about how these measures shape the behavior of firms that depend on international markets for their inputs and final goods.

The aim of this paper is to identify how importing firms adjust when a product becomes subject to an anti-dumping investigation or to the duty that may follow. The analysis focuses on changes in imported quantities, prices, and participation margins, *and also examines whether firms redirect their sourcing toward alternative origins. A complementary exercise will potentially investigate two-way traders.*

Egypt offers a particularly suitable context to study AD policy. Following WTO accession in 1995, Egypt has become an active user of trade remedies and is ranked second in Africa during the period 1995–2017 behind the Southern African Customs Union. Within the Middle East and North Africa (MENA), Egypt stands out as the primary initiator of AD investigations. The institutional framework also features relatively short investigation periods and recurrent use of provisional measures, creating clear procedural

[1] According to UNCTAD, the International Classification of Non-Tariff Measures (NTMs) includes 16 chapters covering various categories. Chapters A–C are technical measures, while chapters D–O are non-technical. Chapter D groups contingent measures implemented to counteract adverse effects of imports, including measures addressing unfair foreign trade practices (anti-dumping, countervailing, and safeguard measures). Anti-dumping is Chapter D1.

phases that generate time variation useful for empirical identification. Moreover, the combination of administrative customs records and detailed product-level AD policy data enables a granular mapping of firm–product–origin relationships to specific policy actions.

The empirical strategy exploits within-firm variation across products and origins by combining Egyptian firm-level customs data with the universe of anti-dumping (AD) measures imposed by Egypt on specific origin–product pairs over 2005–2016. The baseline specification includes firm–HS6–origin fixed effects, and origin–year and HS6–year fixed effects, which control for global shocks and sector-specific trends. This approach isolates adjustments that occur precisely when a firm–product–origin combination becomes subject to an AD investigation or duty, rather than reflecting broader macroeconomic or policy changes. Tariffs and initial size-trend interactions are included as controls. A key feature of the design is the distinction between the investigation period and the enforcement period, which allows the timing of the adjustment to be examined rather than assuming a single treatment shock. Additional specifications account for other trade policy instruments and alternative fixed-effect structures. *Analysis of diversion responses and additional strategies to address endogeneity concerns remain ongoing.*

Current findings indicate adjustments along both the intensive and extensive margins. Imports of targeted products decline in quantity during both the investigation and enforcement stages, while unit values rise, a pattern consistent with the impact of anti-dumping duties. The adjustment is stronger during the investigation phase, revealing an investigation effect in which firms respond to procedural uncertainty and the likelihood of future duties even before these are imposed. Along the extensive margin, the effects are more modest: investigations slightly reduce entry into targeted product–origin relationships and raise exit probabilities, consistent with a mild destruction effect, but overall participation remains broadly unchanged. This indicates reallocation rather than withdrawal, as firms scale down volumes and selectively discontinue relationships while continuing to import through alternative suppliers. These combined results suggest that AD procedures operate not only as a formal tariff instrument at enforcement but also as a procedural shock during investigation. All findings remain stable when excluding

the largest importing firms, using alternative fixed effects, and controlling for non-tariff measures.

Contribution. A first contribution relates to the empirical setting. Existing firm-level studies on AD have largely focused on measures imposed by high-income importers against China (Chandra and Long, 2013; Jabbour et al., 2019; Konings and Vandenbussche, 2013; Prusa et al., 2022; Sandkamp, 2020). Micro-evidence from developing economies that initiate and enforce AD measures remains limited. Recent exceptions primarily concern China and Peru (Bao et al., 2021; Eckel et al., 2023; Ciani and Stiebale, 2024). In the MENA region, prior work on Egypt has relied on aggregate data (Hazem and Zaki, 2020). This paper is the first to use firm–product–origin customs data to study AD enforcement in Egypt (or any MENA economy) providing micro-level evidence on how trade defence instruments operate in this particular institutional context.

A second contribution concerns perspective. The literature[2] has mainly examined how foreign exporters respond when facing AD duties imposed abroad, focusing on export values, product scope, or prices (Lu et al., 2013; Felbermayr and Sandkamp, 2020; Ciani and Stiebale, 2024). Evidence on how firms in the filing country adjust their sourcing behaviour is scarce. This paper instead studies Egyptian importers' responses, showing how protection reshapes the composition of imported inputs. The analysis therefore complements a small but growing body of work on import-side adjustments, previously documented mostly for the EU and the United States (Konings et al., 2001). Hence, this paper shifts the perspective from targeted exporting countries to the filing country and its importing firms.

A third contribution relates to the dynamics of protection. AD measures unfold over distinct procedural stages, typically generating (i) investigation effects, (ii) enforcement or destruction effects, and (iii) diversion toward non-targeted origins (Hazem and Zaki, 2020). The paper estimates effects during the initiation of an investigation and after the duty is imposed (similar to Lu et al. (2013)). This distinction reveals anticipatory

[2]Blonigen and Prusa (2016) provide a comprehensive overview of the empirical literature on antidumping. They find that the majority of studies focus on the determinants of antidumping filings and the effects of antidumping duties on trade flows.

adjustments during the investigation stage, in line with earlier evidence from the U.S., EU, and China showing that trade flows may respond before duties become effective (Prusa, 2001; Cuyvers and Dumont, 2005). In addition, the analysis documents diversion patterns across supplying countries (Brenton, 2001; Park, 2009), shedding light on how protection reshapes sourcing rather than merely suppressing trade. Hence, this paper uncovers new empirical evidence on the dynamics of adjustment by distinguishing between the investigation and enforcement phases and documenting trade diversion.

The paper is structured as follows. Section 2 presents the institutional framework governing anti-dumping procedures under WTO rules and their implementation in Egypt. Section 3 describes the data and provides descriptive statistics. Section 4 outlines the empirical framework and identification strategy. Section 5 reports the main results and robustness checks. Section 6 concludes.

2 Institutional Framework

2.1 The WTO Framework on Anti-Dumping Measures

Article VI of the General Agreement on Tariffs and Trade (GATT) 1994 explicitly authorizes the imposition of specific anti-dumping (AD) duties on imports from a particular source, in excess of bound tariff rates, in cases where dumping causes or threatens injury to a domestic industry or materially retards its establishment. Anti-dumping measures are the most frequently used form of temporary trade barrier (TTB). Under Article VI and national trade laws, dumping occurs when goods are exported at a price "less than fair value," that is, for less than they are sold in the domestic market or below production cost. Multilateral trade rules allow countries to impose unilateral measures against dumped imports that cause material injury to domestic producers. While AD duties are formally justified as a defence against unfair import competition, they are widely viewed in practice as a modern instrument of protection (Blonigen and Prusa, 2003).

The World Trade Organization (WTO) regulates the use of anti-dumping measures through the Agreement on Implementation of Article VI of the GATT 1994, commonly

known as the Anti-Dumping Agreement (ADA). This agreement establishes the legal framework governing how member countries may impose anti-dumping duties when foreign producers sell goods below their normal value and such imports injure domestic industry.

Under the WTO framework, anti-dumping investigations are conducted by national authorities following detailed procedural rules. These rules specify how dumping margins are calculated, how injury must be demonstrated, and how the causal link between dumped imports and injury is established. Importantly, a petition for investigation must be made by or on behalf of a domestic industry, defined as the producers of a major proportion of the total domestic production of the like product. This collective criterion ensures that investigations reflect broad industrial concerns rather than isolated firm-level interests. The process of initiating an investigation is therefore complex and resource-intensive, requiring detailed cost, price, and injury data for the entire industry.

To ensure fairness and transparency, the ADA requires public notice of investigations, opportunities for interested parties to present evidence, and publication of the final determinations. Institutionally, the Committee on Anti-Dumping Practices (AD Committee) oversees the implementation of the ADA. WTO members must notify the Committee of their national anti-dumping legislation and any new measures adopted. The Committee serves as a platform for peer review, monitoring, and consultation regarding members' compliance with the ADA.

The WTO's institutional framework for anti-dumping therefore combines national autonomy in investigation and enforcement with multilateral oversight and legal discipline through notification and peer monitoring mechanisms. The requirement that cases be initiated by an industry, rather than a single firm, and the substantial administrative costs associated with filing and pursuing such cases, help explain why anti-dumping actions often arise in sectors with organized and influential producer groups rather than as reactions to individual firm-level trade shocks.

2.2 The Egyptian Anti-Dumping Framework

Egypt's approach to anti-dumping regulation has evolved gradually in response to changes in trade policy and international commitments. Although Egypt acceded to the General Agreement on Tariffs and Trade (GATT) in 1970, early trade policy relied mainly on import restrictions and quantitative controls rather than legal trade remedies. Until the early 1990s, there was no clear domestic framework for addressing dumping or subsidization, and Customs Law No. 66 of 1963 provided only indirect reference to such practices.

The situation changed with the economic reform and structural adjustment program launched in 1991, which shifted policy toward trade liberalization and tariff-based protection. Following Egypt's accession to the World Trade Organization (WTO) in 1995, the government was required to align its trade legislation with multilateral disciplines, including those contained in the WTO Anti-Dumping Agreement.

In response, Law No. 161 of 1998 on the Protection of the National Economy from the Effects of Harmful Practices in International Trade was enacted. This law established Egypt's modern trade-remedies regime. The law and its executive regulations set out detailed procedures for anti-dumping, countervailing, and safeguard investigations. They explicitly link domestic rules to WTO principles while preserving some interpretive flexibility in their application.

Under this framework, the Anti-Dumping and Subsidy Investigation Authority within the Ministry of Trade and Industry serves as the competent authority. It comprises four main directorates, including those responsible for anti-dumping measures. The department is tasked with receiving and examining complaints, conducting investigations, calculating dumping margins, assessing injury, and recommending measures to the Minister of Trade. The executive regulations specify the stages of an investigation, ranging from the determination of dumping and injury to the imposition of provisional and final duties, the acceptance of undertakings, and periodic reviews.

Although these procedures closely follow the WTO Anti-Dumping Agreement, several provisions, especially those related to injury assessment and final duties, give Egyptian authorities broad discretionary powers. In borderline cases, this may favour domestic

producers.[3] Scholars note that the system has evolved from a protectionist regime to a rules-based framework. It is formally consistent with WTO disciplines, while still shaped by local institutional realities and administrative capacity (Abdel-Azim and Khalil, 2022).

In practical terms, anti-dumping actions in Egypt reflect industry-level rather than firm-level dynamics. A complaint must be submitted by or on behalf of domestic producers representing a substantial share of national output of the like product. Preparing such petitions requires detailed data on prices, costs, and injury indicators, which entails significant administrative and financial costs. As a result, investigations are typically initiated by organized industry groups or large firms with sufficient capacity to coordinate evidence and pursue legal procedures. This collective mechanism explains why anti-dumping measures in Egypt tend to arise from sectoral lobbying and coordinated industry petitions rather than individual firm reactions. This institutional feature is important when interpreting these measures as policy shocks in empirical analysis.

3 Data and Stylized facts

3.1 Data on Anti-dumping Measures

3.2 Data on Anti-dumping Measures

Information on anti-dumping measures is drawn primarily from the Integrated Trade Intelligence Portal (I-TIP Goods) maintained by the World Trade Organization (WTO). The I-TIP database provides a single access point for notifications of non-tariff measures (NTMs) submitted by WTO members and includes a comprehensive record of technical barriers to trade, sanitary and phytosanitary measures, anti-dumping actions, countervailing measures and specific trade concerns raised in WTO committees.

To ensure consistency and accuracy, these data were aligned and verified using the Global Anti-Dumping Database (GAD), part of the Temporary Trade Barriers Database

[3]See Andersen Egypt (2024), Anti-Dumping Law Reforms," available at https://eg.andersen.com/ar/Anti-dumping-law-reforms/ and Anti-Dumping and Competition Law in Egypt," available at https://eg.andersen.com/ar/anti-dumping-and-competition-law-egypt/.

compiled by Signoret et al. (2020) and hosted by the World Bank, which builds on earlier work by Bown (2005) and Bown (2011). According to this database, Egypt is the most frequent user of anti-dumping measures within the group of "Other Antidumping User Countries with Limited Data," confirming its active use of this policy instrument during the period under study.

Using these sources, a detailed dataset was constructed to identify, at the HS6-digit level, the products subject to anti-dumping duties imposed by Egypt on specific trading partners in each year. The database distinguishes between the investigation phase and the enforcement phase, based on the recorded initiation, implementation and withdrawal dates of each measure. This information was merged with the GOEIC import panel at the HS6 level to indicate, for each product, origin and year, whether imports were affected by an active anti-dumping duty.

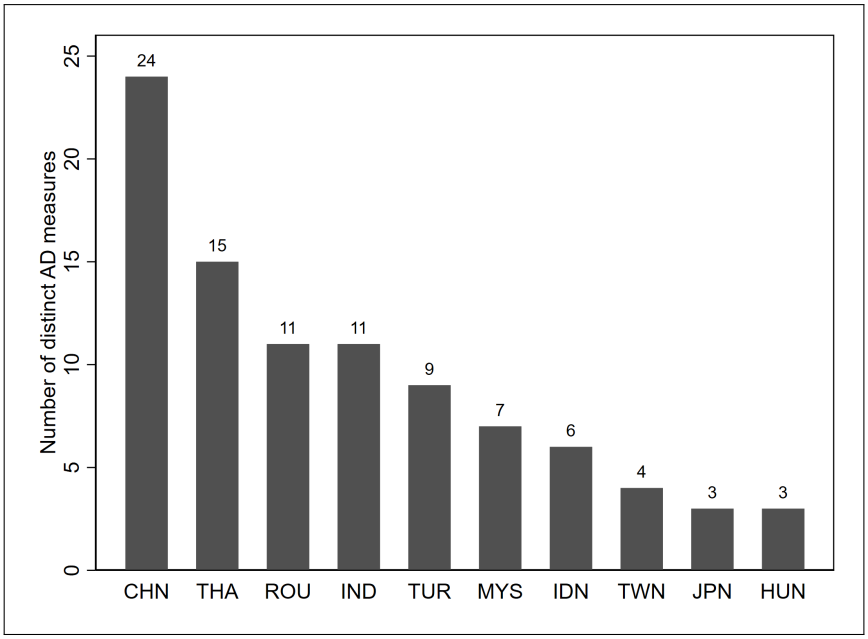
As a robustness exercise, and to account for the broader trade policy environment, the analysis also incorporates applied import tariffs by origin and sector (HS2 level). This allows separating the effect of anti-dumping actions from standard tariff protection. Tariff data were obtained from the World Integrated Trade Solution (WITS) for the same set of origin countries covered in the sample for the period 2005–2016.

Table A1 reports the full list of HS6 products subject to Egypt's anti-dumping (AD) enforcement over 2005–2016. The pattern is consistent with Egypt's industrial structure: the targeted products are predominantly low- to medium-technology manufactures such as plastics, rubber tyres, blankets, ceramics, welding electrodes, electrical components, batteries, lamps and simple stationery goods. These are sectors in which domestic production capacity exists, often with large state-owned or long-established private producers, and where foreign competition, especially from Asia, has historically been strong. The fact that these items are relatively standardised and widely produced locally makes it economically plausible that Egyptian firms would file AD complaints, since they directly compete with imported like-products and are sensitive to price undercutting. The product-level targeting therefore fits well with the institutional and economic context behind Egypt's use of AD instruments.

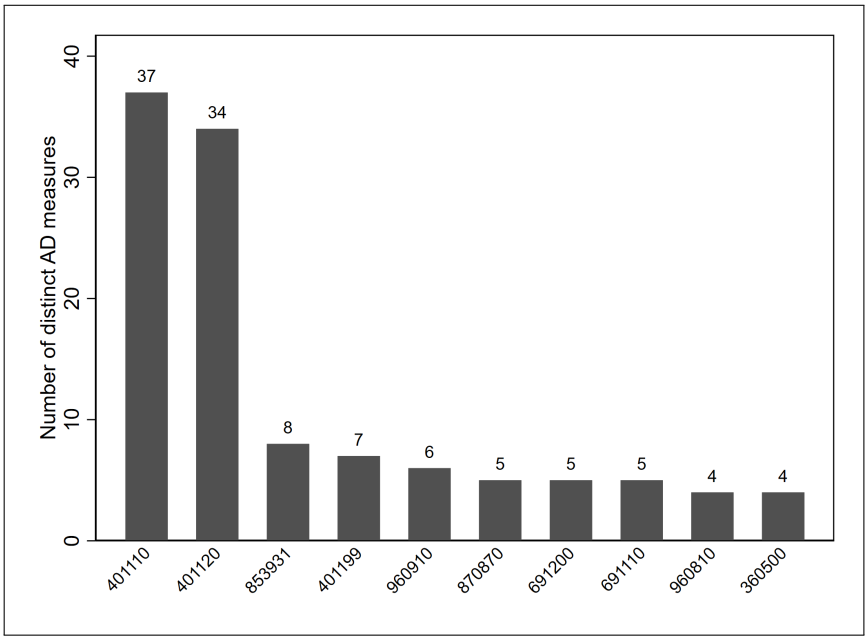
During the 2005–2016 period, Egypt obtained WTO approval for roughly 70 percent of the anti-dumping investigations it initiated. This success rate indicates that, once a case is opened, the investigating authority generally possesses evidence of dumping and material injury strong enough to justify a definitive duty. The institutional process is well established: investigations typically last around 12 months, with a maximum duration of 18 months permitted under WTO rules and a minimum of 7 months.

Figure 1 reports the distribution of anti-dumping measures across partner countries (panel a) and across HS6 product lines (panel b). Each bar corresponds to a distinct country–HS6 action, so a duty applied to several products from the same origin is counted multiple times. Panel (a) shows a clear concentration: China accounts for 24 measures, more than the next two countries combined, followed by Thailand (15), Romania (11), India (11) and Türkiye (9). A second tier of Asian suppliers, such as Malaysia, Indonesia, Taiwan, Korea and Japan, is also present but with considerably fewer cases.

Panel (b) reveals a similarly uneven pattern across products. Two rubber-tire categories (HS 401110 and 401120) dominate, with 37 and 34 actions respectively, far above any other item. A smaller set of products, including electrical components (HS 853931), rubber articles (401199), stationery (960910, 960810), vehicle parts (870870), and ceramics (691200, 691110), appears with much lower frequencies, typically between four and eight cases. Taken together, these patterns show that Egypt's use of anti-dumping measures is highly concentrated, both across origins and across product lines. This uneven exposure creates clear variation in partner-product combinations, which is central for the empirical analysis that follows.



(a)



(b)

Figure 1: Anti-dumping measures: (a) distribution by country of origin and (b) coverage by HS6 products.

Notes: Panel (a) shows the number of distinct anti-dumping measures applied to imports from each origin country; panel (b) shows the number of distinct HS6 products subject to anti-dumping measures in the sample period. Products description are in table A1.
Source: Author's calculations using WTO I-TIP Goods notifications.

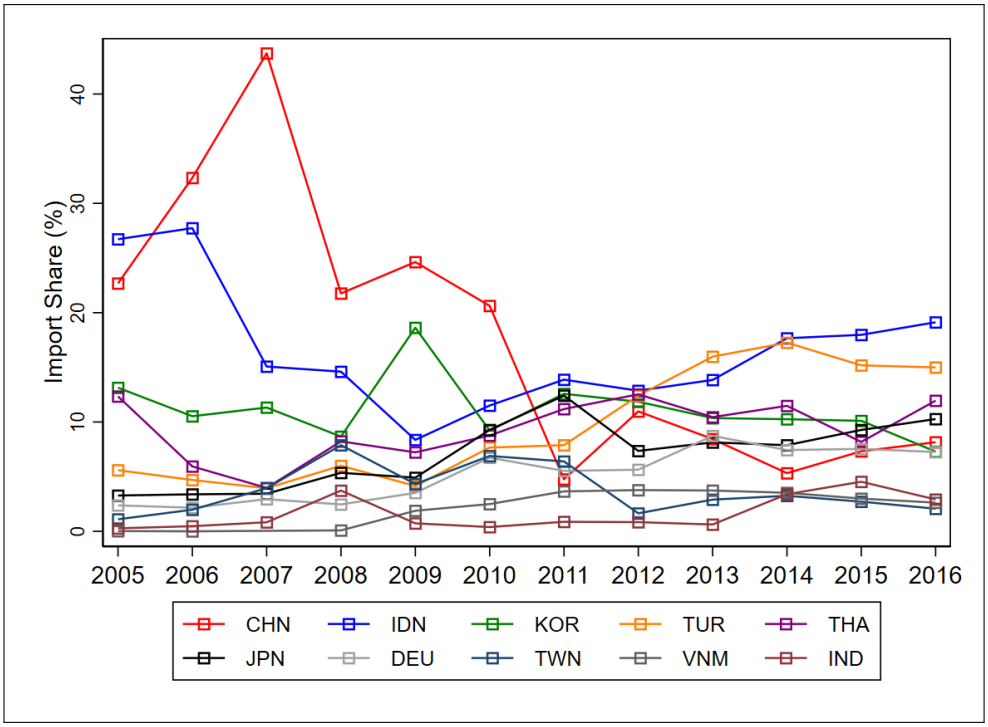
3.3 Firm-level customs data

The analysis relies on firm-level transactions obtained from the General Organization for Export and Import Control (GOEIC), which operated under the Ministry of Industry and Foreign Trade in Egypt during the period 2005–2016. The database is constructed from customs declarations and provides annual information on importing firms, including the six-digit Harmonized System (HS6) product codes, the country of origin, and the total value and quantity of trade flows (OAMDI, 2017).

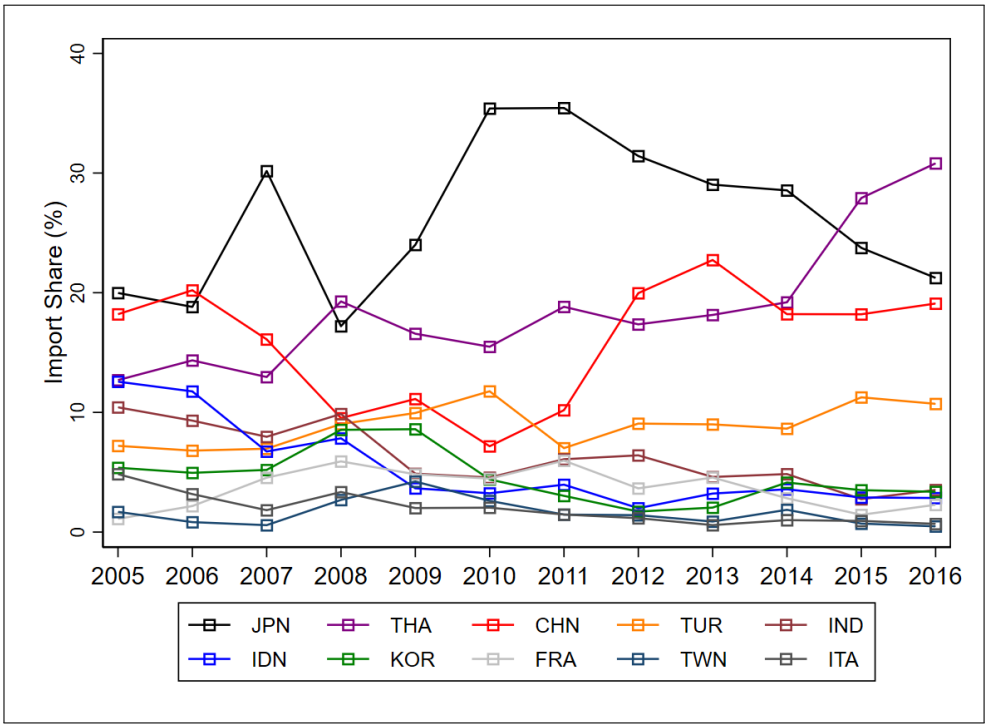
A key strength of these data lies in their granularity, which allows tracing trade activities at the firm–product–origin level. This detailed structure makes it possible to examine how anti-dumping measures shape the intensive and extensive margins of trade, the likelihood of firms exiting foreign markets, and the evolution of import prices.

A notable limitation, however, is the absence of firm-level characteristics such as employment, productivity, or wages. The database cannot be merged with other firm-level sources, as the identifiers used in GOEIC records differ from those in other administrative or survey data. To address this constraint and preserve the universe of Egyptian importers, the analysis relies on import-based indicators when controlling for firm heterogeneity in the estimation of the effects of anti-dumping measures.

Figure 2 present the evolution of import shares for the two most frequently targeted products: New pneumatic tyres (panel (a) for HS 401110 and panel (b) for 401120). The patterns show that the composition of Egypt's suppliers is highly fluid over time. When a major exporter—such as China—faces an AD action, its import share often declines, while the shares of alternative suppliers like Thailand, Indonesia, Korea, Turkey, or Japan appear to increase in the same period. This rotation in market shares suggests the possibility of trade diversion, where imports shift across origins rather than disappearing entirely. Although descriptive, these patterns suggest that anti-dumping measures may be linked to shifts in Egypt's sourcing structure, both along the intensive margin through changes in import shares and along the extensive margin through changes in the set of supplying countries. This also motivates the empirical analysis that follows.



(a)



(b)

Figure 2: Evolution of Imports share for : (a) New pneumatic tyres, of rubber, used for motor cars (401110) and (b) New pneumatic tyres, of rubber, used on buses or lorries (401120).

Notes: Import share is defined as the percentage of Egypt's total imports of the HS6 product sourced from each partner country in a given year. Country codes: CHN = China; JPN = Japan; KOR = Republic of Korea; IDN = Indonesia; THA = Thailand; TUR = Türkiye; IND = India; FRA = France; ITA = Italy; TWN = Taiwan.

Source: Author's calculations using GOEIC customs data (Egypt, 2005–2016).

4 Empirical Strategy

4.1 Identification Strategy

To investigate the impact of anti-dumping enforcement on firms' import behavior, the analysis estimates the following linear regression model [4]:

$$y_{fopt} = \beta_1 ADP_{op,t-1} + \beta_2 \big(\text{Size}_{f,t_0} \times \mu_t\big) + \gamma_{fop} + \delta_{ot} + \delta_{p,t} + \varepsilon_{fopt}. \tag{1}$$

where f denotes firm, o the country of origin, p the product at the HS6 level, and t the year.

The dependent variable y_{fopt} captures different import margins. To study the *intensive margin*, two measures are considered: (i) the logarithm of imported quantities and values; (ii) the logarithm of import prices, proxied by trade unit values. These variables capture how anti-dumping measures affect both the volume and the pricing of firms' imports.

To analyze the *extensive margin*, three variables are used: (iii) a dummy for firm–product import participation, which equals one if a firm records a positive import flow for a given product–origin combination in year t; (iv) a dummy for firm entry, equal to one if a firm begins importing a product from a given origin in years t and $t+1$ but did not import it in $t-1$ and $t-2$; and (v) a dummy for firm exit, equal to one if a firm stops importing a product from a given origin in years t and $t+1$ but had imported it in $t-1$ and $t-2$. This definition of entry and exit reduces the influence of short-term churning in trade relationships and isolates more persistent changes in import participation.

The explanatory variable of interest, $ADP_{op,t-1}$, is a dummy equal to one when an anti-dumping duty imposed by Egypt is active on product p imported from origin o in year $t-1$. This variable captures the direct effect of anti-dumping enforcement on firm-

[4] A linear probability model is used for binary outcomes such as participation, entry or exit. This approach is standard in empirical trade work (e.g. Fontagné et al. (2015) ; Fernandes et al. (2019) ; Lee et al. (2023)). Non-linear estimators like probit or logit would be less suitable in this setting because the inclusion of multiple high-dimensional fixed effects can lead to incidental parameter bias and considerable computational burden. Since fixed effects are essential to the identification strategy, the linear probability model provides a practical alternative that preserves the required specification, with the caveat that point estimates should be interpreted cautiously. Estimation is performed using reghdfe in STATA (Correia, 2023).

level imports. In an alternative specification, the variable $ADP^{invest}_{op,t-1}$ is used to capture the effect of the investigation phase preceding the enforcement of the measure. All policy variables are lagged by one year to ensure that contemporaneous firm decisions cannot influence the imposition of anti-dumping duties.

To capture the heterogeneous adjustment of firms to trade policy, firm size is included as a control and interacted with the time fixed effects. Since the dataset does not provide comprehensive information on firms' balance sheets, size is measured by the value of total imports rather than total sales. Firm size is taken in the initial year of observation to avoid endogeneity concerns and to ensure that firms entering after the first year of data are retained in the sample. This approach avoids confounding size with the anti-dumping variable and controls for systematic differences in firm trajectories.

The estimation includes a rich set of fixed effects [5]. Firm–product–origin fixed effects (γ_{fop}) absorb all time-invariant characteristics specific to each firm's trading relationship with a given product and origin, such as technology intensity, long-term supply arrangements, or product specialization. The model additionally includes origin–year and HS6–year fixed effects to account for origin-specific shocks and sector-level policy changes. In alternative robustness specifications, the HS2–origin–year fixed effects ($\delta_{o,HS2,t}$) control for macroeconomic fluctuations, import-demand shocks, and multilateral trade resistance factors that vary jointly across origins and sectors, as emphasized by Head and Mayer (2014).

A particular feature of the data structure deserves attention. To track firm–product–origin combinations over time and to compute entry, participation, and exit, the dataset is squared, meaning that zero observations were added for firm–product–origin combinations with no recorded trade in a given year. This procedure is essential for constructing the extensive-margin variables and ensures that changes in import participation are observed over the full period. Because the analysis is conducted at the HS6 level—rather than the HS4 level used in many earlier studies—this step considerably increases the number of observations, especially for the extensive-margin estimations.

[5] A similar identification strategy has been used in Kamal and Zaki (2018) and Iodice and Reverdy (2025), where, however, they study the effect of TBTs.

The identification strategy aims to address two main sources of endogeneity: omitted variable bias and reverse causality. The inclusion of firm–product–origin and origin–sector–year fixed effects mitigates omitted variable bias by absorbing unobserved heterogeneity related to firm capabilities, sectoral subsidies, or origin-specific shocks that could simultaneously affect both import behavior and the likelihood of anti-dumping protection. Reverse causality, on the other hand, may arise if Egypt initiates anti-dumping investigations in response to unusually high import penetration from a particular origin. However, the focus on firm-level outcomes within narrowly defined product–origin markets substantially reduces this concern. While sector-level dynamics may influence the overall probability of trade barrier enforcement, as shown by Bown et al. (2021), these effects are unlikely to bias firm-level estimates that exploit within-product and within-origin variation over time.

Finally, standard errors are clustered at the level of treatment assignment. Specifically, they are clustered at the product–origin–year level (po, t) to account for the possibility that firms exposed to the same anti-dumping measure may experience correlated shocks in their import margins. This structure provides conservative inference and is consistent with the empirical design.

4.2 Endogeneity concerns: Further discussion

A central challenge in identifying the causal effects of anti-dumping (AD) policy is the potential endogeneity of the filing decision. Petitions are initiated by domestic producers who compete with foreign suppliers. These industries tend to request protection when they experience rising import penetration, falling market shares, or financial distress.

Working at the firm–HS6–origin level helps mitigate several of these concerns. The analysis does not rely on industry-level aggregates, and the HS6 granularity maps treatment directly to the exact product lines named in AD petitions. This reduces the risk that broader sectoral shocks or compositional changes drive the results. Moreover, the empirical specification includes an extensive set of fixed effects: firm–HS6–origin fixed effects absorb all time-invariant bilateral sourcing patterns; origin–year fixed effects cap-

ture shocks affecting exporting countries; and HS6–year fixed effects net out global or sector-specific trends. Together, these absorb many of the factors that jointly influence import competition and the likelihood of filing.

Nevertheless, endogeneity concerns cannot be eliminated entirely. Domestic producers may lobby for AD at times of heightened foreign competition, and politically influential sectors may be more successful in securing investigations. Evidence for Egypt shows that political connections shaped access to non-tariff protection, including trade remedies (Eibl and Malik, 2016). To provide insight into timing and potential anticipation, the analysis distinguishes the investigation phase—before duties are imposed—from the enforcement phase. Detecting adjustments in the investigation window offers suggestive evidence of behavioural responses prior to duty imposition, consistent with strategic petitioning or market expectations.

While this design limits several sources of bias, the possibility that AD initiation responds to unobserved, time-varying domestic producer shocks remains an identification challenge. Addressing this is a priority for future extensions.

5 Results

5.1 Baseline Results

5.1.1 Intensive Margin

Table 1 examines the effect of opening an anti-dumping (AD) investigation on the intensive margin of Egyptian importers. The estimates reveal a consistent pattern: firms begin adjusting as soon as a case is initiated. Imports of the targeted products decline, as reflected in lower quantities, while unit values increase. This anticipatory response suggests that the initiation of an investigation alters expectations, raises procedural frictions, and may entail provisional actions during the investigation phase, as permitted under WTO rules. The findings are consistent with evidence for Egypt reported by Hazem and Zaki (2020), who document investigation-phase responses prior to the imposition of duties. Table 2 reports the corresponding effects for the enforcement phase. The direction of

Table 1: Intensive Margin Estimation: Investigation Effect

	(1)	(2)	(3)	(4)	(5)
	ln(Quantity)	ln(Quantity)	ln(Unit Value)	ln(Unit Value)	ln(Import Value)
$ADP^{Invest}_{op,t-1}$	-0.354**	-0.337**	0.336***	0.316**	-0.006
	(0.149)	(0.150)	(0.128)	(0.129)	(0.054)
$Tariff_{o,hs2,t-1}$		-0.914***		0.377	-0.560***
		(0.349)		(0.304)	(0.141)
Size Trend	No	Yes	No	Yes	Yes
Firm–HS6–Origin FE	Yes	Yes	Yes	Yes	Yes
Origin–Year FE	Yes	Yes	Yes	Yes	Yes
HS6–Year FE	Yes	Yes	Yes	Yes	Yes
Observations	2,476,401	2,439,870	2,476,401	2,439,870	2,439,870
R^2	0.787	0.786	0.759	0.759	0.832

Notes: Outcomes and variables are defined in section 4.1. Investigation effect refers to the period in which an anti-dumping case is opened but not yet enforced. Robust standard errors clustered at the HS6–origin–year level in parentheses.
* p<0.10, ** p<0.05, *** p<0.01.

adjustment remains the same: quantities decrease and unit values rise. The magnitudes are more moderate than during the investigation period. A plausible interpretation is that firms undertake most of their reallocation during the investigation, so that the incremental effect of enforcement is smaller. By the time the duty takes effect, importers have already reduced exposure or shifted to alternative suppliers. In column (5), the estimated effect on import values is small and statistically insignificant, indicating that the contraction in quantities and the increase in unit values tend to offset one another. Tariffs, included as a control, are as expected negatively correlated with quantities. However their role is quantitatively modest relative to the anticipatory effects triggered by AD procedures.

Table 2: Intensive Margin Estimation: Enforcement Effect

	(1)	(2)	(3)	(4)	(5)
	ln(Quantity)	ln(Quantity)	ln(Unit Value)	ln(Unit Value)	ln(Import Value)
$ADP_{op,t-1}$	-0.205*	-0.214*	0.215**	0.212**	0.017
	(0.111)	(0.112)	(0.099)	(0.100)	(0.044)
$Tariff_{o,hs2,t-1}$		-0.920***		0.382	-0.560***
		(0.349)		(0.304)	(0.141)
Size Trend	No	Yes	No	Yes	Yes
Firm–HS6–Origin FE	Yes	Yes	Yes	Yes	Yes
Origin–Year FE	Yes	Yes	Yes	Yes	Yes
HS6–Year FE	Yes	Yes	Yes	Yes	Yes
Observations	2,476,401	2,439,870	2,476,401	2,439,870	2,439,870
R^2	0.787	0.786	0.759	0.759	0.832

Notes: Outcomes and variables are defined in section 4.1. Enforcement effect refers to the period in which an anti-dumping duty is imposed by Egypt. Robust standard errors clustered at the HS6–origin–year level in parentheses.
* p<0.10, ** p<0.05, *** p<0.01.

5.1.2 Extensive Margin

Table 3: Extensive Margin Estimation: Investigation Effect

	(1)	(2)	(3)	(4)	(5)	(6)
	Participation	Participation	Entry	Entry	Exit	Exit
$ADP^{Invest}_{op,t-1}$	0.006	0.007	-0.003*	-0.003*	0.004**	0.005**
	(0.005)	(0.005)	(0.001)	(0.001)	(0.002)	(0.002)
$Tariff_{o,hs2,t-1}$		-0.067***		-0.015***		-0.012**
		(0.012)		(0.004)		(0.005)
Size Trend	No	Yes	No	Yes	No	Yes
Firm–HS6–Origin FE	Yes	Yes	Yes	Yes	Yes	Yes
Origin–Year FE	Yes	Yes	Yes	Yes	Yes	Yes
HS6–Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	34,015,404	33,370,176	34,015,404	33,370,176	34,015,404	33,370,176
R^2	0.186	0.193	0.149	0.153	0.132	0.142

Notes: Robust standard errors clustered at the HS6–origin–year level in parentheses.
* p<0.10, ** p<0.05, *** p<0.01.

The extensive-margin patterns offer additional insight into how Egyptian importers adjust when a product becomes subject to an anti-dumping case. Table 3 reports the effects during the investigation phase. The coefficient on participation is small and statistically insignificant, suggesting that firms do not exit the market for the targeted product on average when a case is first initiated. Instead, the adjustment takes place within the product–origin relationship. The negative effect on entry, although modest in size, indicates that fewer new firm–product–origin links are created during an investigation. At the same time, the positive coefficient on exit implies a slight increase in the probability

Table 4: Extensive Margin Estimation: Enforcement Effect

	(1)	(2)	(3)	(4)	(5)	(6)
	Participation	Participation	Entry	Entry	Exit	Exit
$ADP_{op,t-1}$	-0.004	-0.005	-0.002	-0.002	0.001	0.000
	(0.004)	(0.004)	(0.001)	(0.001)	(0.001)	(0.001)
$Tariff_{o,hs2,t-1}$		-0.067***		-0.015***		-0.012**
		(0.012)		(0.004)		(0.005)
Size Trend	No	Yes	No	Yes	No	Yes
Firm–HS6–Origin FE	Yes	Yes	Yes	Yes	Yes	Yes
Origin–Year FE	Yes	Yes	Yes	Yes	Yes	Yes
HS6–Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	34,015,404	33,370,176	34,015,404	33,370,176	34,015,404	33,370,176
R^2	0.186	0.193	0.149	0.153	0.132	0.142

Notes: Robust standard errors clustered at the HS6–origin–year level in parentheses.
* p<0.10, ** p<0.05, *** p<0.01.

that an existing relationship is discontinued. Taken together, these results point to a mild reallocation away from the targeted origin: firms are somewhat more likely to stop importing from the investigated source and less likely to begin new relationships with it. The magnitudes are small compared with the intensive-margin responses reported above. This aligns with the idea that investigations raise uncertainty and may temporarily increase compliance costs, but they do not generate abrupt market exits. Most of the adjustment remains at the intensive margin, where firms scale down quantities before discontinuing a relationship altogether. Table 4 presents the extensive-margin estimates for the enforcement phase. The coefficients are again small and mostly statistically insignificant. Enforcement does not appear to trigger substantial entry or exit responses beyond what occurs during the investigation. Entry remains slightly lower and exit probability slightly higher, but the effects are weaker than those observed during the initiation of the case. This pattern is consistent with firms having already adjusted their sourcing strategies during the investigation period. By the time duties take effect, the extensive-margin response has largely taken place. The overall picture is that anti-dumping measures in Egypt reshape import patterns primarily through the intensive margin. The extensive-margin effects—reduced entry into the targeted market segment and a mild increase in exit—are present but limited in size. These results suggest a process of reallocation rather than collapse: importers scale down volumes from the affected origins and selectively dis-

continue relationships, while maintaining participation in the product category through alternative suppliers.

5.2 Robustness Checks

5.2.1 Joint Effect

Table A2 reports a specification including investigation, enforcement, and tariffs simultaneously. The results confirm the baseline pattern: both investigation and enforcement retain their expected signs, with investigation effects larger in magnitude. This indicates that the two stages of the AD process exert independent influence on the intensive margin rather than capturing the same underlying variation. Tariffs behave as expected and remain distinct from the effects associated with AD procedures. The consistency of the coefficients across the three outcomes shows that the baseline findings are not driven by omitted overlap between the investigation and enforcement periods.

5.2.2 Fixed HS2–Origin–Year

Table A3 introduces HS2–origin–year fixed effects, which absorb any shocks common to all HS6 products from a given origin within the same two-digit sector and year. The estimates remain qualitatively similar to the baseline: investigation and enforcement reduce quantities and raise unit values. The magnitudes are slightly attenuated for investigation and somewhat amplified for enforcement, but the direction of adjustment is unchanged. This robustness check shows that the main results do not hinge on broader sector–origin dynamics and instead reflect product-level adjustments within narrowly defined categories.

5.2.3 Dropping top importers

Table A4 excludes the largest importers, a group that could potentially drive the results if they adjust differently from the rest of the distribution or influence the initiation of investigations. The coefficients remain very close to the baseline: investigation continues to be associated with lower quantities and higher unit values, and enforcement produces

similar but smaller adjustments. Import values remain largely unaffected. The stability of the estimates after removing the top importers indicates that the main results are not driven by a handful of dominant firms and instead reflect a broad-based reaction among most importers. The extensive-margin results in Tables A5 and A6 confirm that excluding the largest importers does not alter the main conclusions. Investigation continues to be associated with a small decline in entry and a slight increase in exit probabilities, while overall participation remains effectively unchanged. Enforcement effects remain negligible and statistically insignificant. The magnitudes are very close to the baseline estimates, indicating that the extensive-margin adjustments—although modest—are not driven by dominant firms. As with the intensive margin, the responses reflect a broad-based pattern across importers rather than behavior concentrated among the largest traders.

5.2.4 Trade Policy: NTMS

Table A7 augments the specification with the average ad valorem equivalent (AVE) of non-tariff measures at the industry-year level, based on the dataset of Niu et al. (2018), which follows the methodology of Looi Kee et al. (2009) and uses UNCTAD-MAST data. The AVEs are available for 2006, 2009, 2013, and 2016, so consecutive years are lost and hence the extensive margin is be estimated in this specification. The inclusion of NTMs leaves the qualitative pattern unchanged. AD investigation and enforcement continue to be associated with lower quantities and higher unit values, although the estimates become less precise due to the smaller sample. NTMs themselves are positively correlated with prices, consistent with higher regulatory barriers increasing exporters' costs. The persistence of the AD coefficients after controlling for NTMs indicates that the main results are not confounded by broader regulatory shocks affecting the same products.

6 Conclusion

This current version of the paper examined how importing firms adjust when a product becomes subject to an anti-dumping investigation or duty. Firms respond early: quantities

decline and import prices rise during the investigation stage, with enforcement prompting similar but smaller adjustments. On the extensive margin, investigations slightly reduce entry and raise exit in the targeted product–origin pairs, generating a mild destruction effect without triggering a collapse of trade. Overall, the evidence points to reallocation rather than withdrawal, as firms scale down volumes and shift toward alternative suppliers.

Policy Discussion. Although this study focuses on empirical patterns rather than causal inference, it nevertheless highlights areas of the trade-remedy framework where greater coordination and information sharing could be valuable.

Competition policy and trade protection are administered through separate channels. The Egyptian Competition Authority, created under Law No. 3 of 2005, operates independently from the anti-dumping decision process. Greater involvement of the Authority in the review of trade-remedy cases could help ensure that potential effects on market structure and downstream users are fully considered when duties are evaluated.

Public-interest assessment is another area where additional structure could be beneficial. Anti-dumping investigations are initiated on the basis of petitions from domestic industries, yet the legal framework does not currently require a systematic review of the implications for consumers or for firms that rely on imported inputs. Introducing a more formal approach to assessing these broader effects could support balanced decision-making, especially in sectors with complex value chains.

Recent legislative reforms, including Customs Law No. 207 of 2020 and Investment Law No. 72 of 2017, signal efforts to modernize trade governance and improve the investment climate, and there is scope to strengthen their alignment with trade-remedy administration. These points also echo multilateral discussions. Although the WTO Anti-Dumping Agreement introduced important disciplines, several provisions remain open to interpretation, which gives national authorities flexibility and contributes to the continued rise in global anti-dumping use. Greater transparency, closer inter-agency coordination, and attention to sector-wide effects can help ensure that trade-remedy actions support fair competition and efficient integration into global markets.

Appendix

Table A1: Anti-Dumping measures enforced on products initiated by Egypt (2005–2016)

HS Code	Product Descriptions
291732	Dioctyl orthophthalate
3307	Essential oils, perfumes, cosmetics, toiletries
360500	Matches
390760	Polyethylene terephthalate, in primary forms
392310	Plastic containers (boxes)
401110	New pneumatic tyres, of rubber, used for motor cars (including station wagons and racing cars)
401120	New pneumatic tyres, of rubber, used on buses or lorries
401161	New pneumatic tires, of rubber, with a "herring-bone" or like tread, used on agricultural or forestry vehicles and machines
401162	New pneumatic tires, of rubber, with a "herring-bone" or like tread, used on construction or industrial handling vehicles, rim size n/o 61 cm
401163	New pneumatic tires, of rubber, with a "herring-bone" or like tread, used on construction or industrial handling vehicles, rim size over 61 cm
401169	New pneumatic tires, of rubber, with a "herring-bone" or like tread, used on equipment or vehicles nesoi
401192	New pneumatic tires, of rubber, nesoi, used on agricultural or forestry vehicles and machines
401193	New pneumatic tires, of rubber, used on construction or industrial handling vehicles and machines, rim size not over 61 cm, nesoi
401194	New pneumatic tires, of rubber, for construction or industrial handling vehicles and machines, rim size over 61 cm, nesoi
401199	Pneumatic tyres, new, of rubber (excl. having a "herring-bone" or similar tread.)
630140	Blankets of synthetic fibers (excluding electric blankets) and traveling rugs
691110	Porcelain and ceramic tableware
691200	Ceramic tableware, kitchenware, other household and toilet articles, other than of porcelain or china
831110	Coated electrodes of base metal, for electric arc-welding
8501	Electrical machinery and equipment
850152	AC motors, multi-phase, of an output exceeding 750 W but not exceeding 75 kW
850610	Manganese dioxide cells and batteries (excl. spent)
853931	Discharge lamps, fluorescent, hot cathode
870870	Road wheels and parts and accessories
960711	Slide fasteners fitted with chain scoops of base metal
960719	Slide fasteners (excl. fitted with chain scoops of base metal)
960810	Ball-point pens
960910	Pencils and crayons, with leads encased in a rigid sheath

Source: Author's compilation from GOEIC customs data (2005–2016).

Table A2: Joint Effects of Anti-Dumping Investigations, Enforcement –Robustness

	(1)	(2)	(3)
	ln(Quantity)	ln(Unit Value)	ln(Import Value)
$ADP^{Invest}_{op,t-1}$	-0.352**	0.331**	-0.005
	(0.149)	(0.128)	(0.054)
$ADP_{op,t-1}$	-0.230**	0.227**	0.017
	(0.109)	(0.097)	(0.044)
$\ln(1+\text{tariff})_{o,hs2,t-1}$	-0.916***	0.379	-0.560***
	(0.349)	(0.304)	(0.141)
Size Trend	Yes	Yes	Yes
Firm–HS6–Origin FE	Yes	Yes	Yes
Origin–Year FE	Yes	Yes	Yes
HS6–Year FE	Yes	Yes	Yes
Observations	2,439,870	2,439,870	2,439,870
R^2	0.786	0.759	0.832

Notes: Outcomes and variables are defined in section 4.1. Robust standard errors clustered at the HS6–origin–year level in parentheses.
* p<0.10, ** p<0.05, *** p<0.01.

Table A3: Alternative fixed effect – Robustness

	(1)	(2)	(3)	(4)
	ln(Quantity)	ln(Quantity)	ln(Unit Value)	ln(Unit Value)
$ADP^{Invest}_{op,t-1}$	-0.344*		0.323**	
	(0.183)		(0.165)	
$ADP_{op,t-1}$		-0.353**		0.358***
		(0.145)		(0.135)
Size Trend	Yes	Yes	Yes	Yes
Firm–HS6–Origin FE	Yes	Yes	Yes	Yes
HS2–Origin–Year FE	Yes	Yes	Yes	Yes
Observations	2,438,439	2,438,439	2,438,439	2,438,439
R^2	0.765	0.765	0.730	0.730

Notes: Outcomes and variables are defined in section 4.1. Tariffs are fully absorbed by HS2–origin–year FE and therefore omitted. Robust standard errors clustered at the HS6–origin–year level in parentheses.
* p<0.10, ** p<0.05, *** p<0.01.

Table A4: Removing Top Importers (Intensive Margin) – Robustness

	(1)	(2)	(3)	(4)	(5)	(6)
	ln(Quantity)	ln(Unit Value)	ln(Imports)	ln(Quantity)	ln(Unit Value)	ln(Imports)
$ADP^{Invest}_{op,t-1}$	-0.352**	0.313**	-0.023			
	(0.150)	(0.129)	(0.054)			
$ADP_{op,t-1}$				-0.207*	0.201**	0.013
				(0.114)	(0.101)	(0.044)
$\ln(1+\text{tariff})_{o,hs2,t-1}$	-0.904**	0.353	-0.578***	-0.910**	0.358	-0.579***
	(0.349)	(0.305)	(0.141)	(0.349)	(0.305)	(0.141)
Size Trend Controls	Yes	Yes	Yes	Yes	Yes	Yes
Firm–HS6–Origin FE	Yes	Yes	Yes	Yes	Yes	Yes
Origin–Year FE	Yes	Yes	Yes	Yes	Yes	Yes
HS6–Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	2,393,591	2,393,591	2,393,591	2,393,591	2,393,591	2,393,591
R^2	0.786	0.759	0.833	0.786	0.759	0.833

Notes: Outcomes and variables are defined in section 4.1. Robust standard errors clustered at the HS6–origin–year level in parentheses.
* p<0.10, ** p<0.05, *** p<0.01.

Table A5: Removing Top Importers (Extensive Margin I) – Robustness

	(1)	(2)	(3)
	Import participation	Import participation	Import participation
$ADP^{Invest}_{op,t-1}$		0.007	0.007
		(0.005)	(0.005)
$ADP_{op,t-1}$	-0.005		-0.005
	(0.004)		(0.004)
$Tariff_{o,hs2,t-1}$	-0.069***	-0.069***	-0.069***
	(0.012)	(0.012)	(0.012)
Size Trend	Yes	Yes	Yes
Firm–HS6–Origin FE	Yes	Yes	Yes
Origin–Year FE	Yes	Yes	Yes
HS6–Year FE	Yes	Yes	Yes
Observations	33,003,349	33,003,349	33,003,349
R^2	0.191	0.191	0.191

Notes: Outcomes and variables are defined in section 4.1.Robust standard errors clustered at the HS6–origin–year level in parentheses.
* p<0.10, ** p<0.05, *** p<0.01.

Table A6: Removing Top Importers (Extensive Margin II) – Robustness

	(1)	(2)	(3)	(4)	(5)	(6)
	Entry	Entry	Entry	Exit	Exit	Exit
$ADP^{Invest}_{op,t-1}$	-0.003*	-0.003*	-0.003*	0.005**	0.005**	0.005**
	(0.001)	(0.001)	(0.001)	(0.002)	(0.002)	(0.002)
$ADP_{op,t-1}$			-0.002			0.000
			(0.001)			(0.001)
$Tariff_{o,hs2,t-1}$		-0.015***	-0.015***		-0.013**	-0.013**
		(0.004)	(0.004)		(0.005)	(0.005)
Size Trend	No	Yes	Yes	No	Yes	Yes
Firm–HS6–Origin FE	Yes	Yes	Yes	Yes	Yes	Yes
Origin–Year FE	Yes	Yes	Yes	Yes	Yes	Yes
HS6–Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	33,003,349	33,003,349	33,003,349	33,003,349	33,003,349	33,003,349
R^2	0.153	0.153	0.153	0.142	0.142	0.142

Notes: Robust standard errors clustered at the HS6–origin–year level in parentheses.
* p<0.10, ** p<0.05, *** p<0.01.

Table A7: Other Non-Tariff Measures – Robustness

	(1)	(2)	(3)	(4)
	ln(Quantity)	ln(Quantity)	ln(Unit Value)	ln(Unit Value)
$ADP^{Invest}_{op,t-1}$	-0.360		0.422*	
	(0.278)		(0.231)	
$ADP_{op,t-1}$		-0.807**		0.791***
		(0.299)		(0.258)
$\ln(1+\text{tariff})_{o,hs2,t-1}$	-1.910*	-1.917*	1.068	1.074
	(1.071)	(1.071)	(0.959)	(0.958)
$NTMs_{p,t}$	-0.026	-0.026	0.026*	0.026*
	(0.016)	(0.016)	(0.015)	(0.015)
Size Trend	Yes	Yes	Yes	Yes
Firm–HS6–Origin FE	Yes	Yes	Yes	Yes
Origin–Year FE	Yes	Yes	Yes	Yes
HS2–Year FE	Yes	Yes	Yes	Yes
Observations	476,885	476,885	476,885	476,885
R^2	0.789	0.789	0.758	0.758

Notes: NTMs are measured at the HS6–year level and are available for a subset of years following Niu et al. (2018) : 2006, 2009, 2013 and 2016.
Robust standard errors clustered at the HS6–origin–year level in parentheses.
* p<0.10, ** p<0.05, *** p<0.01.

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