De Minimis as a Constraint on Local Retail Market Power*

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Abstract

Trade policy can affect consumers not only through border prices but also by shifting the market power of domestic retailers in segmented local markets. We study this channel using Costa Rica's elimination of its de minimis exemption, which raised the delivered price of direct-to-consumer imports while leaving domestic retailers' cost structure unchanged. We link shipment-level customs records for individual parcels to the universe of retail electronic invoices and to customers' locations and earnings. These data allow us to construct *retailer-specific catchment areas* and observe domestic and foreign expenditure shares in the relevant markets—the collection of neighborhoods each retailer actually serves. We find that more exposed retailer–product cells raise prices and sales, while import and purchase prices, wages, and employment do not respond, implying higher markups rather than cost pass-through. We then develop a catchment-area model with variable markups and strategic complementarities, in which market shares are defined over retailer-specific catchment areas, and discipline its key elasticities using *observed* share changes instrumented by the tariff shock. Guided by the model, we show that price responses are sharply nonlinear in market shares, steepening in the upper tail. Crucially, de minimis exposure is highest in richer neighborhoods (where direct importing was common), but retail concentration is systematically higher in poorer neighborhoods where households have the fewest local alternatives. Because the market-power channel dominates quantitatively, a reform that appears progressive when judged by exposure is regressive in equilibrium. Welfare losses are elusive on average but large in low-competition, lower-income areas. The results show how the de minimis reform—and tariffs more broadly—can amplify local market power and shift incidence toward consumers in low-competition local markets.

Keywords: de minimis, market power, tariffs, variable markups, spatial competition.
JEL codes: F10, F12, L11, L81, R10.

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1 Introduction

Small-parcel imports purchased directly by consumers have expanded rapidly, propelled by global marketplaces, cheaper logistics, and the diffusion of digital payments. In many countries, these shipments receive preferential treatment under de minimis regimes—thresholds below which tariffs are waived. While de minimis policies are often framed as administrative conveniences for low-value items, they can be quantitatively important in aggregate (Fajgelbaum and Khandelwal, 2024) and can provide meaningful competitive pressure on domestic retailers by strengthening households' foreign outside option. This exception has also become the focus of active policy debate: in 2025, the White House announced the suspension of the de minimis provision, prompting renewed discussion in the United States and abroad about eliminating such exemptions.[1]

This paper exploits the elimination of Costa Rica's de minimis exemption as an import-competition shock that raises the price of direct-to-consumer imports and thereby increases domestic retailers' effective market power in exposed local markets, while leaving domestic retailers' marginal costs unchanged. In May 2021, Costa Rica adopted the Central American Uniform Customs Code to harmonize customs procedures within the region. As an unintended consequence, the country eliminated its tariff exemption for non-commercial shipments valued at or below $500, increasing the average tariff-and-tax burden on these shipments by 8 percentage points (about 57 percent) and reducing the value of consumer imports by roughly 50 percent within months.

We study this shock in a data-rich setting that combines individual-level information on de minimis imports by product with detailed retail transaction-level data on the prices and varieties sold by the universe of local stores, as well as information linking consumers to their residence neighborhoods and to the retailers where they shop. These linked data allow us to construct retailer-specific catchment areas, measure markup and assortment responses, and analyze distributional consequences across households.

Building on this setting, we quantify adjustments in markups and in the breadth of retailers' assortments by leveraging variation in tariff changes across products and

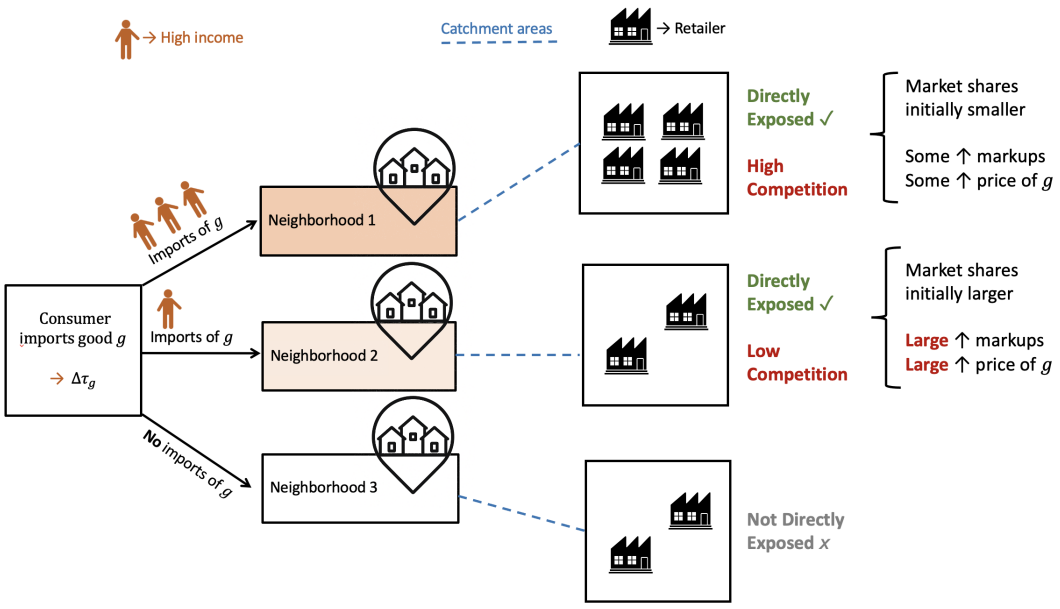
[1] See The White House (2025).

spatial variation in pre-reform de minimis penetration across the neighborhoods that constitute retailers' catchment areas. Specifically, a retailer's *ex ante* exposure depends on (i) the category-specific change in the tariff burden on de minimis imports and (ii) the pre-policy reliance on de minimis imports among households in the neighborhoods the retailer serves. Empirically, we find that more exposed retailers increase prices and sales in protected categories, with no corresponding increase in input costs, wages, or employment. At the same time, domestic assortment expands while foreign variety contracts.

Importantly, the largest price increases do not occur in the *ex ante* most exposed locations—those where residents relied most on de minimis importing prior to the reform. Instead, price responses are strongest in exposed locations *where the reduction in import competition translates into high product-specific concentration*, allowing retailers to attain substantial market power and increase prices sharply as the foreign outside option becomes more expensive. The diagram in Figure 1 summarizes these dynamics. Notably, neighborhoods with high *ex ante* exposure to the de minimis regime tend to be higher-income, whereas neighborhoods with high product-specific retail concentration tend to be lower-income. As a result, a policy that appears progressive when judged solely by exposure can be regressive in equilibrium: the largest price increases arise in highly concentrated markets, which are more prevalent in lower-income areas. This pattern reflects pronounced nonlinearity in price responses at the upper tail of the market-share distribution, where markups are most sensitive to changes in competitive pressure.

These facts motivate a model of spatially segmented local markets with variable markups à la Atkeson and Burstein (2008) with strategic complementarities, in which market shares are defined over retailer–product catchment areas and markup elasticities increase with local market share. Unlike constant-markup, ACR-style sufficient-statistic frameworks, this structure implies that a policy shock that raises the delivered price of the foreign outside option—without commensurately shifting domestic marginal costs—generates first-order markup responses and sharply heterogeneous (and thus distributionally important) local price effects. In this sense, competitive effects that can appear *elusive* in aggregate gravity environments (Arkolakis et al., 2019) become measurable and economically important once local concentration and nonlinear markup elasticities are incorporated.

Figure 1: Exposure vs. Concentration



Notes: The figure summarizes the two dimensions of heterogeneity driving our results. On the left, neighborhoods differ in pre-policy de minimis penetration for product g—high in neighborhood 1, moderate in 2, and zero in 3. On the right, neighborhoods also differ in local retail competition for good g. The policy's impact depends on these two margins.

The model closely replicates the empirical nonlinearity in markup elasticities across the market-share distribution, with implied elasticities in line with Atkin et al. (2018). Quantitatively, we find that, while the median welfare effect is small, there is substantial heterogeneity: welfare losses are concentrated in low-competition, lower-income neighborhoods, despite de minimis importing being more common among higher-income households with access to more retail options. Moreover, within low-competition neighborhoods, there is a sizable increase in inequality as the policy leads to profits for store owners while the cost of living in the region increases.

Related Literature and Contribution. The paper contributes to several strands of the international trade literature that study how trade costs and trade policy shape consumer outcomes and market power in the domestic economy. A first related literature studies de minimis regimes and the rise of direct-to-consumer trade enabled by online marketplaces, cheaper logistics, and simplified cross-border payment systems. Because low-value parcels are often imperfectly captured in standard trade statistics, empirical work on de minimis has only recently become feasible using shipment-level

administrative records. Fajgelbaum and Khandelwal (2024) use novel carrier and customs data to quantify the aggregate and distributional importance of de minimis imports in the United States, emphasizing the role of the threshold and the incidence of tariff and processing costs. Relatedly, Du et al. (2025) document that de minimis e-commerce imports rose during the U.S.–China trade war, alongside the tariff increases. Relative to this emerging literature, we study the elimination of a de minimis exemption as a sharp increase in the delivered price of direct-to-consumer imports that leaves retailers' cost structure unchanged to trace the resulting responses in domestic retail prices, markups, and assortments. Moreover, we emphasize a quantitatively meaningful nonlinearity: price responses steepen sharply at high market shares, so the largest increases occur where retailers have the greatest market power in the relevant product market.

Second, we speak to the classic question of whether trade liberalization has pro-competitive effects that reduce markups and distortions in domestic markets. A large theoretical literature allows markups to vary with competitive pressure or market shares, including demand-based models with variable markups and strategic complementarities (e.g., Atkeson and Burstein, 2008; Krugman, 1979; Melitz and Ottaviano, 2008). In influential work, Arkolakis et al. (2019) show that within a broad class of gravity models with monopolistic competition, firm heterogeneity, and variable markups, pro-competitive effects are often *elusive* in aggregate welfare terms: moving from constant- to variable-markup environments does not substantially amplify gains from trade and may even dampen them once the behavior of foreign markups is accounted for. Our paper complements this insight by shifting attention from sector-level competition in aggregate gravity environments to *spatially segmented local markets*. With nonlinear markup elasticities that rise sharply with local market share, an increase in the cost of the foreign outside option generates first-order and sharply heterogeneous markup responses, making pro-competitive effects empirically salient once local concentration and spatial segmentation are incorporated.

Third, our analysis relates to empirical work on how trade shocks affect prices and markups. Using production data and structural restrictions, studies such as De Loecker et al. (2016) document that trade reforms can coincide with rising measured markups even as marginal costs fall, underscoring the importance of separating cost changes from market-power adjustments. In the context of the recent U.S.

trade war, a growing literature finds substantial tariff pass-through to border prices and meaningful effects on trade flows and consumer prices (e.g., Amiti et al., 2019; Cavallo et al., 2021; Fajgelbaum et al., 2020). Relative to these studies, our setting features a particularly clean import-competition shock: the Costa Rican reform raises the delivered price of de minimis imports while leaving domestic retailers' marginal costs unchanged. This separation allows us to attribute price responses to changes in *effective market power*—rather than to cost pass-through or input-price shocks—and to connect these responses to local market structure.

Fourth, we build on work studying retail globalization and consumer welfare, most directly Atkin et al. (2018), who quantify welfare gains from foreign supermarket entry and decompose them into new varieties/amenities and pro-competitive price reductions at incumbent stores. Their approach connects store entry to the broader trade literature on gains from variety (e.g., Broda and Weinstein, 2006; Feenstra, 1994; Feenstra and Weinstein, 2017) and to work measuring heterogeneous and distributional consequences of globalization (e.g., Fajgelbaum and Khandelwal, 2016; Goldberg and Pavcnik, 2007; Porto, 2006; Topalova, 2010). Our setting highlights how the strength of pro-competitive forces depends on local market structure. The removal of a de minimis exemption contracts the foreign outside option faced by consumers, and our linked administrative data—product-level direct-to-consumer imports, the universe of domestic retail transactions, and household shopping links—allow us to measure resulting adjustments in domestic retail markups and assortments. Because we can map households to retailer-specific catchment areas, we identify sharp heterogeneity in these adjustments across markets with different baseline retail concentration, isolating when the outside option meaningfully disciplines incumbent behavior. The latter speaks to Mongey and Waugh (2025), who highlight how heterogeneity in demand elasticities and sorting across firms can generate "pricing inequality" and amplify the welfare consequences of shocks.

Finally, our paper relates to contemporary work by Adão et al. (2025) linking trade policy and market power through concentration, who use harmonized customs records to infer markups for importer firms and study how importer concentration shapes tariff incidence, while abstracting from the pricing of domestic substitutes and foreign producers. We study market power on the domestic retail side and its welfare effect on domestic households, while directly observing retail prices and quantities,

which allow us to measure domestic markups and separate markup adjustments from cost movements. Moreover, instead of relying on concentration across importers and an implicit mapping to downstream structure, we observe retail-market concentration directly, reconstruct retailer-specific catchment areas, and exploit an unintended tariff increase on de minimis parcels—leaving domestic costs unchanged—as an import-competition shock to identify pro-competitive and distributional effects.

2 Data

We now describe the battery of administrative datasets, available from 2019 through 2024, used in our analysis. While the data is anonymized, variables *across* datasets can be linked via unique (pseudonymous) identifiers at the individual or retailer level.

Customs Data. Our analysis draws on Costa Rican customs microdata. Each import declaration reports the most detailed product classification available (up to a 10-digit HS code), together with the transaction value, traded quantity, arrival date, and origin country.[2] As in many settings, the data cover firm-level imports. Importantly for our application, they also record shipments imported by *individuals*—for example, a household purchase from an online retailer abroad shipped directly to Costa Rica.[3] The median value of individual shipments is $30. Customs records also include the tariff and taxes paid for each importation.

Price and Product Detail Per Transaction. In Costa Rica, electronic invoices are digital documents used to record sales transactions in compliance with tax regulations. Businesses are required to issue electronic invoices for *all* taxable transactions to simplify tax reporting and reduce evasion. This includes both firm-to-firm transactions and sales to final consumers. Retailers, in particular, issue one invoice per sale. This invoice includes the retailer's unique ID, and for a significant share of all sales, it also includes the unique ID of the *final customer who purchased the good*—recall that these IDs are all pseudonymous, but they can be linked across datasets. Not

[2] In some product groups an HS-10 classification is not defined, in which case we use the narrowest available HS category (HS-8 or HS-6).

[3] Empirically, nearly all individuals import a given product only once Argente et al. (2025), which is inconsistent with systematic stocking behavior.

all invoices include this detail, but about one-fifth do, as it allows for better tracking of transactions and detailed records for both businesses and consumers. Thus, businesses encourage customers to provide their ID for each sale, and customers have the added value of keeping an electronic record and invoice of each transaction in their email. For each transaction, these electronic invoices list every product sold, with 14-digit product codes for which, conveniently, the first 10 digits coincide with HS codes, along with the price and quantity corresponding with each product code. Each invoice also details the retailer's location.

Household location and income. We link each importer or buyer to their residency leveraging official records maintained by the National Registry. While records include district of residence, with 488 districts in total, they also detail the voting center which is closest to each citizen's residence *for each adult citizen*. With 2,028 voting centers in total, the median number of adults assigned to each voting center is only 586.[4] We then use the voting center information to construct neighborhoods, leveraging that these assignments provide a standardized and highly granular partition of space. To obtain measures of household income, we rely on data from the Registry of Economic Variables of the Costa Rican Central Bank, which tracks formal employment and labor earnings. This employer-employee data includes details on each employee, including her occupation and earnings.

3 Background and Natural Experiment

Prior to May 2021, Costa Rica operated a de minimis regime for small direct-to-consumer parcel imports arriving through postal and express-courier channels. Residents could request an exemption from import duties and related charges for non-commercial shipments with a CIF value below US$500.[5] The regime created a meaningful duty advantage for imported varieties purchased directly by households, relative to domestically retailed varieties that face full domestic taxation and retail markups.

On May 1, 2021, Costa Rica adhered to the Central American Uniform Customs Code and its implementing regulation, in an effort to harmonize customs procedures

[4]For details on the distribution of voting centers, see Méndez and Van Patten (2022).

[5]The exemption could be claimed by each individual once every six months, leaving a paper trace every time an exception was requested.

within Central America. While the overarching objective was administrative standardization and trade facilitation, an incidental implication was the removal of the de minimis exemption channel that consumers had been using for e-commerce purchases under the US$500 threshold.[6]

After the reform, small parcels purchased online are cleared under the standard import regime. The resulting tax wedge combines (i) the applied import duty, (ii) a 1% levy applied to virtually all imports, and (iii) the domestic value-added tax (13% on most goods), with additional product-specific excises in a limited set of categories. A key institutional feature is that the relevant tariff schedule for these consumer parcels is effectively MFN rather than preferential FTA tariffs. Costa Rica is party to multiple free trade agreements, including CAFTA–DR with the United States, under which most U.S.-origin consumer and industrial goods enter duty free (Méndez and Van Patten, 2022). However, preferential treatment requires the importer to satisfy the agreement's rules of origin—documentation that is routinely provided in brokered firm imports but is costly and rarely furnished by individual consumers clearing one-off parcels. Consistent with this friction, and as the administrative customs data records *actual* tariffs paid by shipment, we observe that duties paid on individuals' shipments line up with the applied MFN schedule across products.

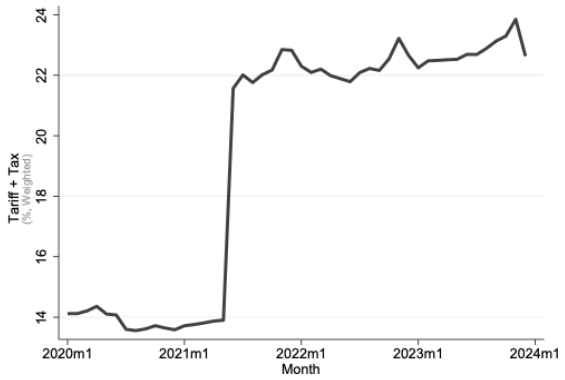
Importantly, the MFN tariff schedule itself long predates the 2021 reform and was designed with conventional commercial trade flows in mind (intermediate inputs and final goods imported by firms), rather than with direct-to-consumer parcel imports. Moreover, Costa Rica adopted its MFN tariff schedule in January 1995 (WTO, 1995), which underscores why cross-product variation in MFN rates at the time of the 2021 reform is plausibly orthogonal to the contemporaneous rise of e-commerce parcels and to the political economy of the de minimis regime in Costa Rica.

By contrast, commercial imports undertaken by firms (before and after the reform) are typically brokered and documented, and thus claim preferential rates. Therefore, firm-level import tariffs are unaffected by the policy change and equal to zero in virtually all categories, reinforcing the interpretation of the reform as a shock to import competition rather than a domestic-cost shock.

[6] After the reform, the duty-free treatment was applied only to the restrictive category of "small family shipments" (*pequeños envíos familiares sin carácter comercial*)—parcels that ahd to be remitted by family members abroad for the recipient's personal or family use.

Average Tariff Changes The elimination of the de minimis exemption generates a sharp increase in tariffs and taxes paid on affected shipments. Figure 2 illustrates the timing and magnitude of the average change in taxes and tariffs paid for individual shipments below the $500 threshold, weighted by importing volume, with an average increase of about 8 p.p. (57%).

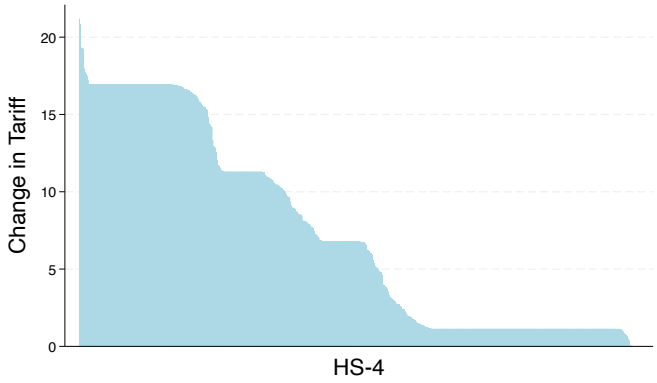
Figure 2: Policy Change: Elimination of De-Minimis Rule and Tariff Changes



Notes: The figure shows the average tariff, inclusive of taxes, paid before and after the policy reform on non-commercial imports with declared value below $500, weighted by importing volume. Prior to May 2021, this amount mostly coincided with the VAT tax. Afterwards, it includes the weighted average tariff.

Variation Across Products The policy change generates substantial heterogeneity in tariff changes across product categories. Figure 3 visualizes the distribution of tariff changes across HS-4 categories, with changes ranging from zero to up to 20 p.p.

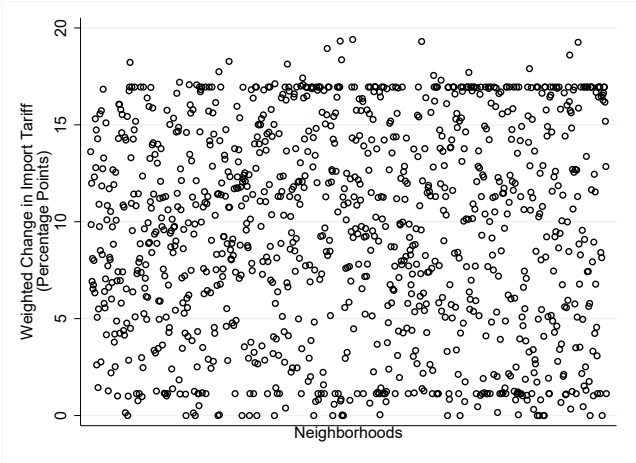
Figure 3: Variation in Tariff Changes Across HS-4 Categories



Notes: The figure shows the average change in tariff faced by each HS-4 category as a result of the elimination of the de-minimis exception. Changes in tariffs correspond with percentage points.

Variation Across Neighborhoods Because neighborhoods differ in pre-policy importing patterns across product categories, the elimination of the de minimis rule generates substantial heterogeneity in the average tariff change faced across space. Figure 4 shows cross-neighborhood variation in import-weighted tariff changes.

Figure 4: Variation in Average Tariff Change Across Neighborhoods

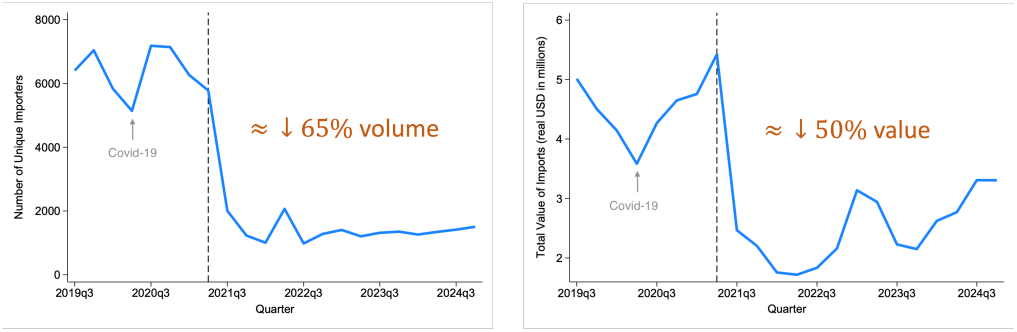


Notes: The figure shows the average tariff change across neighborhoods, weighted by import value, resulting from the elimination of the de-minimis rule. Changes in tariffs are measured in percentage points.

Consumer Imports Response The large, plausibly exogenous increase in the delivered price of the foreign outside option faced by households led to a decline in consumer importing. Figure 5 shows a large decrease in direct-to-consumer imports immediately following the policy change. Panel (a) shows a decrease of about 65% in the number of unique importers per month, while Panel (b) shows a decline of about 50% in the value of individual imports.

A Competition Shock Finally, it is worth highlighting that a key feature of this reform is that it changes the *price of the foreign option* available to households while leaving domestic retailers' costs unaffected—which we will confirm empirically. Thus, it provides a direct, product-specific shock to the competitiveness of local retailers.

Figure 5: Drop in Consumer Imports Following the Policy Change



(a) Total Unique Importers (Count)

(b) Total Imported by Individuals (Millions of USD)

Notes: The figure shows the decline in consumer imports following the policy change, restricting attention to non-commercial individual imports with a declared value under $500. Panel (a) considers the total number of unique importers per month, and Panel (b) shows the total value imported by individuals per month.

4 Catchment Areas and De Minimis Exposure

4.1 Estimating Retailer-Specific Catchment Areas

Retailers serve different sets of neighborhoods. We construct *retailer-specific catchment areas* using the geographic distribution of customers observed in electronic invoices: a retailer's catchment area is the collection of neighborhoods from which its customers originate. This approach is feasible because a sizable share of retail invoices record the buyer's national ID. In our data, roughly one fifth of retail electronic invoices include a customer ID. Consumers frequently provide their ID because it is convenient: the electronic invoice is automatically delivered to the email registered with the tax authority, allowing households to keep receipts for their own records, while retailers value customer IDs to track repeat customers and often incentivize their provision. Consistent with this, 96% of adults in our sample appear at least once as an identified buyer in a retail invoice, and every retailer in our sample records at least some transactions with identified customers. These patterns suggest that selective non-disclosure of IDs is limited and that the identified-invoice subsample provides broad coverage of the shopping population.

We operationalize catchment areas by computing, for each retailer, the share of its identified customers residing in each neighborhood. Intuitively, if two thirds of

a retailer's identified invoices are associated with customers from neighborhood A and one third with customers from neighborhood B, then the retailer's catchment area places weight $2/3$ on A and $1/3$ on B, and so on across all neighborhoods. This customer-weighted construction is especially useful in our setting because it avoids the coarse approximations often used in retail studies, such as administrative districts or fixed-distance radii around store locations. It also naturally accommodates *disconnected* catchment areas—for example, a store located in a commercial district may primarily serve customers who reside in multiple residential neighborhoods that are not contiguous. Finally, our neighborhood geography is unusually fine (about 500 residents per neighborhood), which allows catchment areas to be drawn with high spatial precision.

More formally, we define retailer r's catchment area as the empirical distribution of its sales across customers' neighborhoods of residence. Let Sales_{rh} denote retailer r's sales to customers residing in neighborhood h, measured using transactions for which the buyer can be linked to a neighborhood. We define the weight of neighborhood h in retailer r's catchment area as

$$w_{rh} \equiv \frac{\text{Sales}_{rh}}{\sum_j \text{Sales}_{rj}}. \tag{1}$$

The catchment area of retailer r is then the support of this distribution,

$$Z_r \equiv \{h : w_{rh} > 0\}. \tag{2}$$

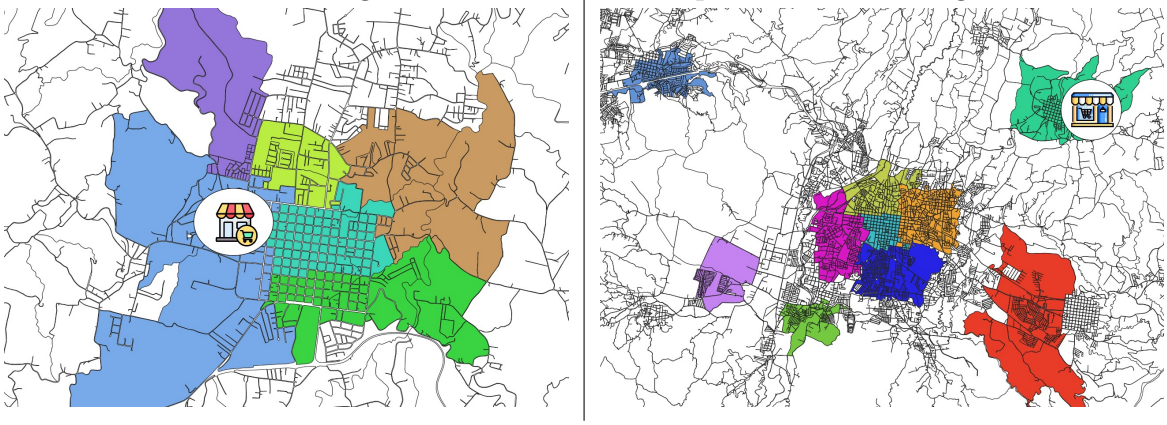
That is, a retailer's catchment area is not defined by a mechanical radius around the store, but by the empirical distribution of the neighborhoods from which its customers are drawn. This definition will map naturally into our exposure measure, which aggregates neighborhood-level import exposure using the same weights.

Figure 6 illustrates examples of estimated retailer catchment areas. In Panel (a), customers are concentrated in neighborhoods near the store, yielding a compact catchment area. In Panel (b), customers are instead distributed across neighborhoods that are spatially disconnected and relatively distant from the store's location, generating a more dispersed catchment area.

Figure 6: Examples of Retailer-Specific Catchment Area

(a) Example 1:
Clustered Clients' Neighborhoods

(b) Example 2:
Dispersed Clients' Neighborhoods



Notes: The figure presents illustrative examples of estimated catchment areas for two different retailers. Each colored polygon represents a neighborhood, and retailers are denoted by storefront icons. The retailer in Panel (a) has a compact catchment area concentrated in nearby neighborhoods. By contrast, the retailer in Panel (b) has a dispersed catchment area that would be poorly approximated by restricting attention to neighborhoods in the immediate vicinity of the store.

4.2 Retailer–Product Exposure

The joint availability of product codes in electronic invoices and HS codes in customs records allows us to connect the foreign outside option for a product group to local retail outcomes at high frequency. This mapping is especially clean because product codes in Costa Rica's electronic invoicing system are built directly on the Harmonized System: the first 10 digits of the 14-digit invoice code coincide exactly with the HS-10 classification reported in customs records. As a result, imports and retail transactions can be linked using a common product taxonomy, with minimal scope for discretionary concordance. In the empirical analysis, we aggregate these product definitions to the HS-4 level, which provides a natural balance between product detail and statistical power.

Let g denote a product group (HS-4), r a retailer, and h a neighborhood. Let $S_{h,fg0}$ denote the pre-policy share of direct-to-consumer imports in local consumption of category g for neighborhood h. Because retailer r serves multiple neighborhoods, we summarize the foreign competitive pressure it faces in category g by taking a

catchment-area weighted average of these neighborhood-level foreign shares:

$$\bar{S}^{r}_{fg0} \equiv \sum_{h} w_{rh}\, S_{h,fg0}, \qquad \text{where} \quad w_{rh} \equiv \frac{\text{Sales}_{rh}}{\sum_{j} \text{Sales}_{rj}}, \tag{3}$$

where w_{rh} is the share of the retailer r's sales accounted for by neighborhood h.

We then define retailer–product exposure to the reform as

$$IC_{rg} \equiv \bar{S}^{r}_{fg0}\, \Delta\tau_{g}, \tag{4}$$

where $\Delta\tau_g$ is the policy-induced increase in the tariff burden on consumer imports in category g. Intuitively, IC_{rg} is larger when a retailer sells disproportionately to neighborhoods that relied heavily on de minimis imports in category g before the reform, and when category g experiences a larger increase in the cost of importing under the new regime.

A key advantage of this measure is that the cross-product component, $\Delta\tau_g$, is plausibly exogenous to contemporaneous retail outcomes. As discussed above, the reform replaced the previous zero-duty treatment for eligible consumer parcels with the pre-existing MFN schedule. These MFN rates were set decades before the reform and with commercial trade by firms—including intermediates and final goods—in mind, rather than direct-to-consumer parcel imports. In this sense, the reform delivers a sharp and predetermined shift in the foreign outside option, while the retailer-specific component of exposure is governed by pre-policy importing patterns across the neighborhoods in each retailer's catchment area.

5 Empirical Strategy

We estimate horizon-specific long-difference specifications that compare a common pre-reform baseline to outcomes measured at different horizons after the reform. Let $h \in \mathcal{H}$ index a post-policy horizon. For any outcome z, define

$$\Delta_h \ln z_i \equiv \ln z_{i,h} - \ln z_{i,0},$$

where $z_{i,0}$ is the average of outcome z in the pre-policy period and $z_{i,h}$ is the corresponding average in the post-policy window associated with horizon h. Estimating

separate long differences by horizon allows the effects of the reform to evolve flexibly over time, while abstracting from high-frequency noise, transitory fluctuations, and short-run adjustment dynamics.

Our baseline specifications are estimated at the retailer–product level. Let $y_{rg,t}$ denote an outcome for retailer r in product category g and period t, where g indexes HS-4 categories. Depending on the specification, $y_{rg,t}$ is either the average retail price or total sales of retailer r in category g. For each horizon h, we estimate

$$\Delta_h \ln y_{rg} = \beta_h \, IC_{rg} + \lambda_r + \lambda_g + \varepsilon_{rgh}, \tag{5}$$

where IC_{rg} is the retailer–product exposure measure defined in equation (4), λ_r denotes retailer fixed effects, λ_g denotes product-category fixed effects, and ε_{rgh} is an error term.

Because the reform is nationwide, identification does not come from a comparison between treated and untreated retailers. Instead, it comes from differences in *exposure intensity*. In the full-sample specification, the comparison group for a highly exposed retailer–category cell (r, g) is a set of less-exposed cells: on the one hand, other categories sold by the same retailer that were less exposed to the reform; on the other hand, the same category sold by other retailers whose catchment areas were less reliant on de minimis imports before the policy. Put differently, β_h is identified by whether retailer–category cells with higher pre-policy exposure experience larger post-reform changes than less-exposed cells, after netting out retailer-wide and category-wide changes.

The two-way fixed effects play an important role in isolating the mechanism of interest. Since IC_{rg} combines a retailer-specific component—the pre-policy foreign share in the retailer's catchment area—with a category-specific component—the tariff change in category g—the retailer fixed effects λ_r absorb any retailer-level change common across categories, such as changes in local demand, store-wide pricing policies, management, sourcing conditions, or retailer-specific cost shocks over the horizon considered. Likewise, the category fixed effects λ_g absorb any category-wide change common across retailers, such as national demand shifts, changes in product-level costs, or secular trends in category g. As a result, the coefficient β_h is identified from the interaction of category-level tariff shocks with predetermined cross-retailer differences in pre-policy exposure.

To study whether the effect of the reform varies with market power, we also estimate heterogeneous effects by pre-policy market-share buckets. Let $MS_{rg,0}$ denote retailer r's pre-policy market share in category g, and let B^b_{rg} be an indicator equal to one if cell (r, g) belongs to market-share bucket b. We either estimate equation (5) separately within each bucket or, equivalently, estimate

$$\Delta_h \ln y_{rg} = \sum_b \beta_{h,b} \left(IC_{rg} \times B^b_{rg} \right) + \lambda_r + \lambda_g + \varepsilon_{rgh}. \tag{6}$$

In this specification, $\beta_{h,b}$ captures the response to exposure among retailer–category cells in bucket b. The relevant comparison group is now composed of less-exposed cells within the same market-share bucket, again net of retailer and category fixed effects. This specification is useful because our mechanism predicts that the elasticity of prices and markups with respect to the shock should vary systematically over the market-share distribution, becoming steeper in high-share markets.

For outcomes defined at the retailer level, such as employment or average wages, we aggregate exposure across product categories using pre-policy sales weights. Specifically, define retailer-level exposure as

$$IC_r \equiv \sum_g \omega_{rg} \, IC_{rg}, \quad \text{where} \quad \omega_{rg} \equiv \frac{\text{Sales}_{rg,0}}{\sum_k \text{Sales}_{rk,0}}, \tag{7}$$

and where $\text{Sales}_{rg,0}$ denotes retailer r's pre-policy sales in category g, so that ω_{rg} is the share of retailer r's baseline sales accounted for by category g. Using pre-policy weights is helpful because it keeps the exposure measure predetermined and avoids mechanically incorporating post-policy changes in product composition.

We then estimate, for each horizon h,

$$\Delta_h \ln x_r = \gamma_h \, IC_r + u_{rh}, \tag{8}$$

and $x_{r,t}$ is a retailer-level outcome in period t, such as total employment or average wages. Since this regression is estimated on one long-difference observation per retailer for each horizon, retailer fixed effects are absorbed by construction. Here, the comparison group for a more exposed retailer is simply a less exposed retailer, where exposure is defined by the retailer's pre-policy sales composition and the tariff

changes in the categories it sold.

6 Reduced Form Results

We now turn to the reduced-form evidence on how the elimination of the de minimis exemption affected domestic retail outcomes. The central result is that retailer–product cells more exposed to the reform experienced larger increases in prices and sales. Just as importantly, however, the same exposed cells do *not* exhibit corresponding increases in input costs, wages, or employment. This pattern confirms the logic developed in the previous sections: the reform operates by raising the delivered price of the foreign outside option faced by households, not by raising domestic retailers' cost structure. As a result, the observed increase in retail prices aligns with a markup response to weaker import competition.

6.1 Prices and Sales

Table 1 reports the baseline two-year long-difference estimates.[7] Retailer–product cells with greater effective exposure to the reform experience larger increases in both prices and sales. Namely, a one percentage point increase in IC_{rg} raises log prices by 0.009 and log sales by 0.007. Thus, in categories where the policy more strongly increased the cost of direct importing, domestic retailers both charge more and sell more.

The joint increase in prices and sales is already suggestive of mechanism. Under a conventional cost shock, one would expect higher prices to be accompanied by weaker sales. Here, the opposite occurs: the same retailer–category cells that raise prices also expand sales. This pattern is more naturally interpreted as a shift in residual demand toward domestic retailers. As direct foreign purchases become more expensive, households substitute toward local sellers, and those sellers respond by increasing prices.

The retailer-level outcomes in columns (3) and (4) reinforce that interpretation. More exposed retailers do not expand employment, and wages do not rise. If anything, the employment coefficient is slightly negative. This is important because it rules out

[7] Results based on long-difference of six months, 12 months, 18 months, and three years are statistically equal to these baseline estimates.

a broader firm-cost channel operating through labor inputs. The increase in prices is therefore not accompanied by evidence of higher wage bills, more hiring, or a general rise in operating costs.

Table 1: Reduced Form Impact by Retailer

	$\Delta \ln(\text{Price}_{rg})$	$\Delta \ln(\text{Sales}_{rg})$	$\Delta \ln(\text{Employment}_{r})$	$\Delta \ln(\text{Wage}_{r})$
	(1)	(2)	(3)	(4)
IC_{rg}	0.009^{***}	0.007^{***}		
	(0.001)	(0.002)		
IC_{r}			-0.004^{***}	0.006
			(0.001)	(0.008)
Retailer FE	✓	✓	✓	✓
HS-4 FE	✓	✓		
Observations	323,593	323,593	21,450	21,450

Notes: Standard errors in parentheses. Employment and wages are retailer-level outcomes using aggregated exposure IC_r. Significance is denoted by * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

6.2 Ruling Out Cost Pass-Through

Table 2 is a key result because it confirms how the reform changed the competitiveness of foreign direct-to-consumer imports without materially altering the cost structure of domestic retailers. Institutionally, this is to be expected: the policy changes the treatment of parcels imported by households, but it does not change the tariff schedule applied to retailers' standard commercial sourcing. We are able to study this directly, as customs data include details on retailers' import prices by product (for firms that import directly) and electronic invoice data record product prices for firm-to-firm transactions (for retailers purchasing from other local firms).

Consistent with that institutional feature, the estimates in Table 2 show no meaningful increase in retailer import prices or purchase prices in the affected product categories. Both coefficients are economically small relative to the retail price response in Table 1, and statistically indistinguishable from zero. This reduced-form evidence speaks against a cost-pass-through interpretation. If retail prices were rising because retailers themselves were paying more to source goods, one would expect corresponding increases in import or purchase prices. We do not observe that.

Taken together, the results in Table 1 and Table 2 indicate that the reform does

not appear to increase retailers' traded-input costs, labor costs, or overall operating costs. Yet exposed retailers still raise final prices. The latter aligns with a shift in demand toward domestic retailers and allows them to extract higher markups, rather than forcing them to pass-through higher costs. This distinction is central for the rest of the paper, because it allows us to interpret the reform as a shock to effective market power.

Table 2: Input costs: retailer import and purchase prices

	$\Delta \ln(\text{Import Price}_{rg})$	$\Delta \ln(\text{Purchase Price}_{rg})$
	(1)	(2)
IC_{rg}	0.003	0.001
	(0.002)	(0.005)
Retailer FE	✓	✓
HS-4 FE	✓	✓
Observations	169,021	201,573

Notes: Standard errors in parentheses. The regressions include retailer and HS-4 fixed effects. Significance is denoted by * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

6.3 Assortment and Entry/Exit

The reform also affects the set of varieties available to households. Table 3 shows that more exposed categories gain domestic varieties and lose foreign varieties. Thus, once direct importing becomes more expensive, local retailers expand their presence in the affected categories, while foreign direct-to-consumer supply contracts. These assortment responses show that the reform changes the effective set of options available to consumers, not just the prices of a fixed basket of goods, and that domestic expansion and foreign retreat occur alongside rising retail prices.

7 A Model of Variable Markups with Retailer-Specific Catchment-Areas

This section develops a quantitative framework that maps the policy-induced increase in the cost of direct-to-consumer importing into retail price changes and welfare effects. The model is built to mirror three features of the data emphasized in the

Table 3: Changes in Varieties by Product Category

	$\Delta\text{Varieties}_g^{\text{Domestic}}$	$\Delta\text{Varieties}_g^{\text{Foreign}}$
	(1)	(2)
IC_g	1.124^{***}	-0.862^{***}
	(0.462)	(0.211)
Observations	595	522

Notes: Product categories coincide with HS-4 product codes. Standard errors in parentheses. Significance is denoted by * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

reduced-form analysis: (i) direct imports provide a foreign outside option at the product-group level; (ii) retailers set prices for their catchment areas rather than for a single integrated national market; and (iii) there is a markup response to weakened import competition.

The model is closely related to the variable-markup environment in Atkeson and Burstein (2008), but departs from the standard Atkeson–Burstein setup in a key way: *market shares are not defined in an economy-wide sectoral market.* Instead, they are defined over *retailer-specific catchment-area markets* constructed from household shopping links. This wedge allows the same foreign cost shock to generate very different markup and price responses across locations, even within the same product group.

7.1 Preferences

Neighborhoods are indexed by h and time by t. Households have CES preferences over a continuum of product groups and CES within groups across retailer options:

$$U_{ht} = \left[\int_{g \in \Omega_h} \phi_{hgt} \, C_{hgt}^{\frac{\gamma-1}{\gamma}} \, dg \right]^{\frac{\gamma}{\gamma-1}}, \tag{9}$$

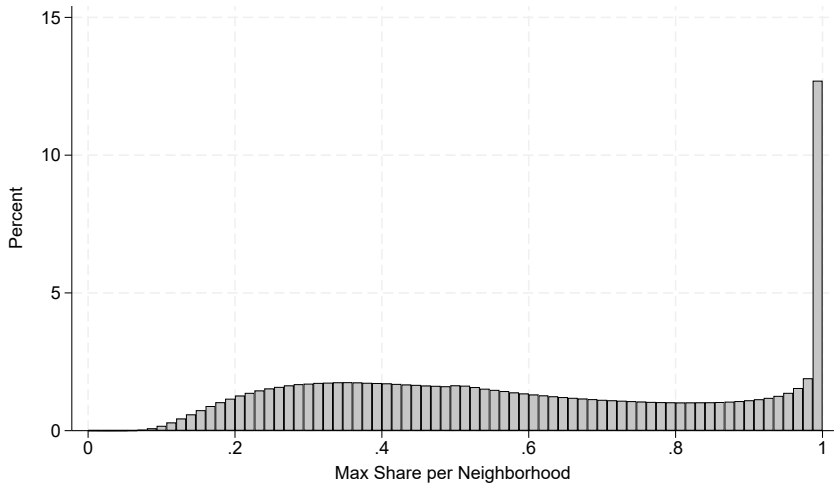
$$C_{hgt} = \left[\sum_{r \in \Omega_{hgt}} \phi_{hrgt} \, C_{hrgt}^{\frac{\sigma-1}{\sigma}} \right]^{\frac{\sigma}{\sigma-1}}, \qquad 1 < \gamma < \sigma. \tag{10}$$

Households face the budget constraint $P_{ht}C_{ht} = E_{ht}$. The set Ω_{hgt} includes a foreign retailer option that represents direct consumer importing. The key policy shock is a change in the delivered price of this foreign option through the tariff wedge on de

minimis parcels.

Two aspects of the aggregation are worth emphasizing. First, the upper-level integral in equation (9) treats product groups as a continuum, delivering standard CES expenditure allocation across categories. Second, and crucially for market power, the within-group aggregator in equation (10) is a *sum* over a *finite (or countable)* set of retailer options available in neighborhood h for product group g. This discreteness is essential: it implies that individual retailers can have non-negligible expenditure shares in a neighborhood–product market, consistent with the thick upper tail of local concentration documented in Figure 7, which plots the distribution of the maximum retailer market share within neighborhood–HS-4 markets. As shown in the figure, concentration varies widely across markets, and a nontrivial mass lies in the upper tail, with a single retailer accounting for a large fraction of local sales. In fact, over 12% of neighborhood–HS-4 markets are served by a single local retailer.

Figure 7: Distribution of Maximum Market Shares Across Neighborhood–HS-4 Markets



Notes: The figure shows the distribution of maximum market shares across neighborhood-HS-4 markets.

In contrast, if retailer options formed a continuum within g, each retailer's share would be infinitesimal and the perceived elasticity would collapse to the constant σ, implying a constant markup and eliminating the channel through which a pure change in import competition moves domestic prices when marginal costs are unchanged.[8]

[8]Formally, in the limit where each retailer has $S_{hrgt} \to 0$, the perceived elasticity becomes

The nested CES structure in equation (9)–equation (10) therefore delivers a demand elasticity faced by each retailer that is *endogenously* decreasing in its market share. This demand curvature is what allows retail prices to respond to the policy even when domestic marginal costs remain unchanged: when the foreign outside option becomes more expensive, retailers gain share, the perceived elasticity falls, and markups rise. Importantly, because market shares are defined over retailer-specific catchment areas in the implementation below, the same foreign-price shock generates heterogeneous markup responses across retailers even within the same HS-4 category.

7.2 Retail Pricing And Catchment-Area Market Shares

Retailer r sets a uniform price P_{rgt} for category g across neighborhoods in its catchment area Z_{rg} and faces constant marginal cost A_{rgt}. The retailer's pricing rule is

$$P_{rgt} = \frac{\sigma(1 - S_{rgt}) + \gamma S_{rgt}}{\sigma(1 - S_{rgt}) + \gamma S_{rgt} - 1} A_{rgt}, \tag{11}$$

where S_{rgt} is the retailer's *catchment-area market share* in category g:

$$S_{rgt} \equiv \sum_{h \in Z_{rg}} \omega_{hrgt} S_{hrgt}, \qquad \omega_{hrgt} \equiv \frac{E_{hrgt}}{\sum_{\ell \in Z_{rg}} E_{\ell rgt}}. \tag{12}$$

This definition highlights the main departure from the standard Atkeson–Burstein environment. In Atkeson–Burstein, a firm's market share is defined within an integrated sectoral market, so the same market share concept applies to all consumers. Here, market shares are *retailer specific* because each retailer serves a different set of neighborhoods. Two retailers selling the same product group need not compete over the same set of consumers, and thus face different effective elasticities even within the same HS-4 category.

In the empirical implementation, catchment areas Z_{rg} and weights ω_{hrgt} are disciplined by the shopping links in electronic invoices. This is the object constructed in Section 4.1 (catchment areas from customer neighborhoods). The model there-

$\varepsilon_{hrgt} \to \sigma$, yielding the constant-markup rule $P_{rgt} = \frac{\sigma}{\sigma-1} A_{rgt}$. In that case, a shock that only raises the foreign price would reallocate expenditure away from the foreign option but would not generate the markup-driven domestic price increases that we document in the data.

fore embeds the empirically measured segmentation of retail competition into the structure that determines markups.

7.3 Strategic Complementarities, Import Competition, And Exposure

The policy shock in our setting raises the delivered price of the foreign retailer option (direct-to-consumer importing) while leaving domestic retailers' marginal costs unchanged. We treat domestic marginal costs A_{rgt} as constant over the horizon of the reform, consistent with the evidence in Table 2 and the lack of systematic changes in wages and employment in Table 1. We also assume full pass-through of tariffs into the delivered price of the foreign option.[9]

The key mechanism is a strategic complementarity between market shares and markups. Under the nested CES structure in equation (9)–equation (10), a retailer's perceived demand elasticity depends on its market share:

$$\varepsilon_{rgt} \equiv \sigma(1 - S_{rgt}) + \gamma S_{rgt}, \qquad \mu_{rgt} = \frac{\varepsilon_{rgt}}{\varepsilon_{rgt} - 1}.$$

When a retailer gains share, it faces a lower perceived elasticity and optimally chooses a higher markup. Because prices affect shares and shares affect markups, shocks that shift market shares—such as an increase in the foreign price—are amplified into endogenous markup and price responses.

A convenient way to summarize this complementarity is through the *markup elasticity* (or "strategic complementarity" term)

$$\Gamma_{rgt} \equiv -\frac{\partial \log \mu_{rgt}}{\partial \log P_{rgt}} = \frac{(\sigma - \gamma)(\sigma - 1) S_{rgt}}{\varepsilon_{rgt}(\varepsilon_{rgt} - 1)}, \tag{13}$$

which is increasing and convex in S_{rgt}. Thus, in high-share markets, small changes in competitive pressure generate disproportionately large changes in desired markups.

An Exact Mapping From Shares To Prices. A key advantage of our setting is that we observe catchment-area market shares S_{rgt}. This allows us to connect price

[9] This is a natural benchmark in our setting because the tariff wedge is applied mechanically at customs for consumer parcels.

changes to share changes using the model's exact pricing relationship rather than relying on a first-order approximation. From equation (11),

$$\log P_{rgt} = \log A_{rgt} + \log \mu(S_{rgt}; \sigma, \gamma).$$

With constant marginal costs, the change in domestic prices is therefore exactly

$$\Delta \log P_{rgt} = \log \mu(S_{rgt}; \sigma, \gamma) - \log \mu(S_{rg,t-1}; \sigma, \gamma), \tag{14}$$

so observed changes in shares can be translated directly into implied changes in markups and prices for any candidate pair (σ, γ).

It is also useful to relate equation (14) to the differential form often used in the literature. Under CES within group, the retailer's share responds to its relative price with elasticity $(\sigma - 1)$, so by the chain rule

$$d \log P_{rgt} = d \log \mu_{rgt} = \frac{\Gamma_{rgt}}{\sigma - 1} d \log S_{rgt}. \tag{15}$$

Equation (15) highlights the strategic complementarity transparently: when Γ_{rgt} is large (high-share markets), a given increase in market share translates into a larger endogenous price response.

Exposure As A Demand Shifter (And An Instrument). In empirical applications, market shares are often unobserved, which leads to using a first-order approximation to map the foreign price shock into domestic price changes. In our context, if the foreign price rises by

$$d \log P^f_{gt} \approx \frac{\tau_{gt} - \tau_{g,t-1}}{1 + \tau_{g,t-1}},$$

then a standard first-order argument implies

$$d \log P_{rgt} \approx \Gamma_{rgt} \underbrace{\left[S^r_{fg,t-1} \left(\frac{\tau_{gt} - \tau_{g,t-1}}{1 + \tau_{g,t-1}} \right) \right]}_{\text{Exposure}}, \tag{16}$$

where $S^r_{fgt} \equiv \sum_{h \in Z_{rg}} \omega_{hrgt} S_{hfgt}$ is the foreign share in the retailer's catchment area.

Our setting is unusual because we observe both (i) the foreign-share component that governs the strength of the demand shifter, and (ii) the domestic market shares that determine the markup elasticity. We therefore do not need to treat exposure as a reduced-form proxy for price changes. Instead, we use exposure as an *instrument* for the observed change in the retailer's catchment-area market share, and then discipline (σ, γ) using the exact relationship between prices and shares in equation (14) (or equivalently the differential form equation (15)). This is the key step that allows us to construct Figure 8: a plot of implied markup elasticities across the market-share distribution, disciplined by quasi-experimental variation in import competition.

Finally, the same mechanism delivers a sharp prediction for expenditure responses. When the foreign option becomes more expensive, domestic expenditure rises mechanically through competitive displacement, but is partially offset by the endogenous markup response. In a first-order approximation,

$$d \log E_{rgt} \approx (\sigma - 1)\Big(1 - (1 - S_{rgt})\Gamma_{rgt}\Big) \times \left[S^r_{fgt} \left(\frac{\tau_{gt} - \tau_{g,t-1}}{1 + \tau_{g,t-1}} \right) \right], \tag{17}$$

which decomposes into a *price-index effect* (competitive displacement toward domestic retailers) and a *markup effect* (strategic complementarity). This decomposition helps interpret why, in the data, expenditure shifts can be large even where price increases are modest, while high-share markets exhibit the opposite pattern: large price responses with weaker quantity expansion (Figure 10).

7.4 Model Calibration And Fit

We discipline the two key demand elasticities (γ, σ) using the policy-induced shifts in competition and the observed joint behavior of prices and market shares across the share distribution. The identifying observation is that the model's strategic complementarity term Γ_{rgt} in equation (13) depends *only* on the market share S_{rgt} and the two elasticities (γ, σ). Since we observe market shares, we can recover the mapping between market structure and markup elasticities directly from the data.

Step 1: Construct Shares, Prices, And Exposure In Catchment-Area Markets. We compute retailer–product catchment-area shares S_{rgt} using the same retailer-specific catchment areas constructed from electronic invoices. For each retailer r and

HS-4 category g, we aggregate neighborhood-level expenditure shares using catchment weights, yielding S_{rgt} as in the model. Retail prices P_{rgt} are measured as average transaction prices at the retailer–HS-4 level. Finally, we construct a predetermined exposure shifter

$$Z_{rg} \equiv S^{r}_{fg,0}\, \Delta \log(1+\tau_g),$$

where $S^{r}_{fg,0}$ is the pre-policy foreign share in the retailer's catchment area for category g, and $\Delta \log(1+\tau_g)$ is the policy-driven change in the tariff wedge for de minimis imports in category g. This exposure measure is the same economic object that motivates the reduced-form IC_{rg}, but here it is used to identify exogenous changes in domestic market shares.

Step 2: Use Exposure To Instrument For Changes In Market Shares. Share changes are not mechanically exogenous: they can also reflect local demand shocks, retailer-specific shocks, or category trends. We therefore isolate the component of share growth driven by the import-competition shock using exposure as an instrument. In practice, within bins of the pre-policy share distribution (defined by $S_{rg,0}$), we estimate

$$\Delta \log S_{rg} = \pi_b\, Z_{rg} + \lambda_r + \lambda_g + u_{rg}, \qquad \Delta \log P_{rg} = \beta_b\, Z_{rg} + \lambda_r + \lambda_g + v_{rg},$$

and form the corresponding Wald/2SLS estimand

$$\widehat{\kappa}_b \equiv \frac{\widehat{\beta}_b}{\widehat{\pi}_b} \;=\; \left.\frac{\partial \Delta \log P_{rg}}{\partial \Delta \log S_{rg}}\right|_b, \tag{18}$$

which measures the causal elasticity of prices with respect to market shares within share bin b, driven by the foreign competition shock.

This step is where our setting is unusual relative to most empirical applications of variable-markup models. In settings without observed market shares, exposure-type shocks must be mapped into prices through approximations like equation (16). Here, because we observe shares directly, we can estimate the structural relationship between prices and shares and then interpret exposure as an instrument for exogenous share movements.

Step 3: Identify (γ, σ). The model implies that the price–share elasticity in equation (18) is pinned down by (γ, σ) through

$$\kappa^{\text{model}}(S; \gamma, \sigma) = \frac{\Gamma(S; \gamma, \sigma)}{\sigma - 1}, \qquad \Gamma(S; \gamma, \sigma) = \frac{(\sigma - \gamma)(\sigma - 1)S}{\varepsilon(S)\big(\varepsilon(S) - 1\big)}, \quad \varepsilon(S) = \sigma(1-S)+\gamma S. \tag{19}$$

Because $\kappa^{\text{model}}(\cdot)$ depends on the market share S and only two unknown parameters, matching the empirical elasticity at two points in the share distribution yields two equations in two unknowns. Concretely, letting $S^{(1)}$ and $S^{(2)}$ denote representative shares (e.g., the average pre-policy share within a low-share and a high-share bin), we solve

$$\widehat{\kappa}(S^{(1)}) = \kappa^{\text{model}}(S^{(1)}; \gamma, \sigma), \qquad \widehat{\kappa}(S^{(2)}) = \kappa^{\text{model}}(S^{(2)}; \gamma, \sigma),$$

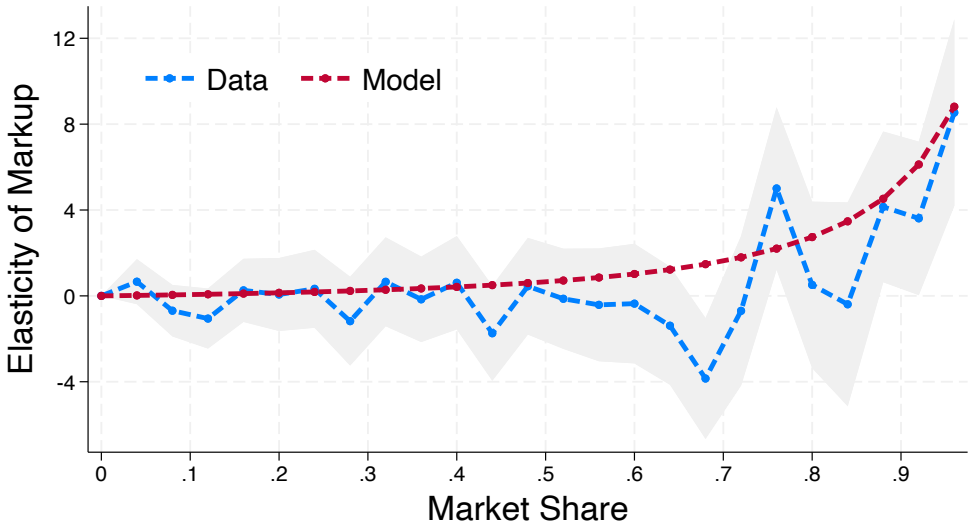
for (γ, σ). Intuitively, the low-share point pins down the baseline curvature, while the high-share point disciplines the steepening of markup elasticities in the upper tail, which is the central nonlinearity in the data.

This procedure yields $\gamma = 1.1$ and $\sigma = 2.3$. These values are in line with Atkin et al. (2018), who estimate $\gamma = 1$ and $\sigma \in [2.28, 4.36]$. Our within-group elasticity lies at the lower end of their range, and our across-group elasticity is close to unity, consistent with the notion that households substitute relatively strongly across retailer options within a product group, while substitution across broad product groups is more limited.

Step 4: Fit Across The Full Share Distribution. Having identified (γ, σ), we compute $\kappa^{\text{model}}(S; \gamma, \sigma)$ for all values of S and compare it to the empirical $\widehat{\kappa}_b$ across share bins. Figure 8 shows that the model replicates the key empirical feature: the elasticity is modest at low shares and rises sharply in the upper tail. This fit is crucial because it is exactly the tail behavior that will drive the welfare heterogeneity in Section 8; the intuition being that, when import competition weakens, high-share markets exhibit disproportionately large markup and price responses, translating into larger cost-of-living increases for households in concentrated areas.

Finally, Figure 9 provides a placebo validation. Repeating the same exercise in retailer–HS-4 cells with zero exposure yields no systematic relationship between price

Figure 8: Retail Price Changes Are Larger For High-Share Retailers



Notes: The figure shows how the elasticity of markups varies across the space of market shares, both in the data and in the model under our estimated elasticities.

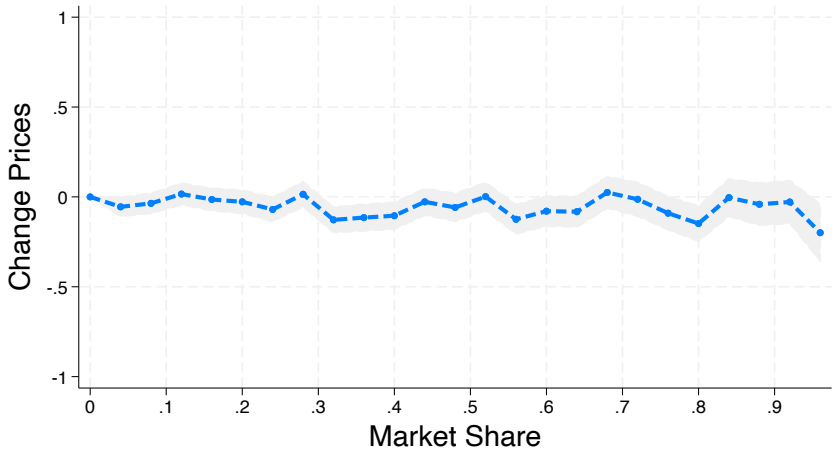
changes and market shares. This supports the interpretation that the nonlinearity in Figure 8 is generated by the interaction between the policy-induced foreign competition shock and local market structure, rather than by share-correlated trends or unrelated shocks.

8 Welfare And Distributional Effects

We quantify welfare impacts using compensating variation at the neighborhood level. The key advantage of the model-based approach is that it allows us to translate heterogeneous retailer-level price and assortment responses into heterogeneous changes in neighborhood cost of living, and then into welfare effects that can be compared across the income distribution.

Compensating Variation Let P_t^h denote the neighborhood price index and I_t^h total income. For small changes, compensating variation (as a fraction of initial

Figure 9: Placebo Exercise: Price Changes For Retailers × HS-4 With Zero Exposure



Notes: The figure repeats the pass-through-by-share exercise, restricting attention to retailer–HS-4 pairs with zero exposure to the policy.

expenditure) can be written as

$$\widetilde{CV}_t^h \approx \%\Delta P_t^h - \%\Delta I_t^h, \tag{20}$$

so welfare losses arise from higher cost of living and lower income. In our setting, the reduced-form results suggest that income changes through wages and employment are limited, implying that heterogeneity in welfare effects is primarily driven by heterogeneity in price index changes and by changes in profits and variety.

Cost Of Living We construct the neighborhood price index using observed price changes among continuing retailer options and an adjustment for entry and exit:

$$\%\Delta P_h = \left[\prod_{g\in\Omega_h} \left(EPI_g^h\right)^{\omega_g^h}\right] - 1, \qquad EPI_g^h = \left(\frac{\lambda_{hgt}}{\lambda_{hg,t-1}}\right)^{\frac{1}{\sigma-1}} \prod_{r\in\Omega_g^h} \left(\frac{P_{hrgt}}{P_{hrg,t-1}}\right)^{\omega_{rg}^h}, \tag{21}$$

where λ_{hgt} is the share of expenditure on continuing stores and ω are log-expenditure weights.

This structure links directly to the reduced-form assortment evidence. The en-

try/exit term $\left(\lambda_{hgt}/\lambda_{hg,t-1}\right)^{1/(\sigma-1)}$ captures the welfare-relevant effect of changes in the set of available retailer options. Thus, the expansion of domestic variety and contraction of foreign variety documented earlier maps into cost-of-living changes through λ_{hgt}, while the heterogeneous price changes documented in the reduced form map into the intensive-margin term.

Income Effects Neighborhood income changes reflect labor income, profits, and tariff rebates:

$$\%\Delta I_h = \omega_L^h \%\Delta W_h + \omega_\Pi^h \%\Delta \Pi_h + \omega_T^h \%\Delta T_h. \tag{22}$$

Empirically, we find no meaningful change in wages or employment, consistent with Table 1. Moreover, Table 2 shows no meaningful change in retailers' input costs. Together, these facts imply that the dominant force behind the observed retail price increases is a change in markups, not a change in marginal costs. In the welfare accounting, this means that distributional effects operate primarily through the cost-of-living channel, with an additional role for profit and tariff-revenue components depending on how profits and rebates are distributed across households.

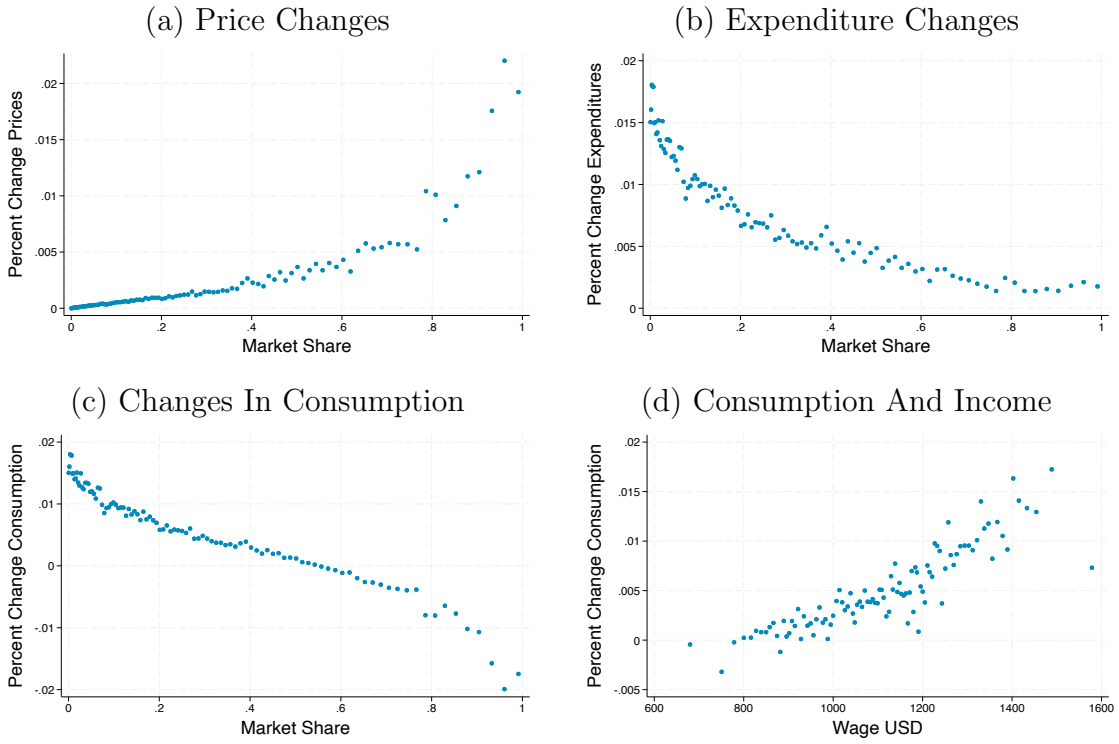
To better understand the forces behind the income and cost of living effects, we differentiate between two types of agents by neighborhood: consumers and store owners. While for consumers income is not changing, store owners' profits increase with the policy. The latter implies an increase in within-neighborhood inequality as both agent types face the same change cost of living, which is sharpest in low-competition, low-income neighbrohoods.

8.1 Results and Heterogeneity By Market Structure

The model implies modest median welfare effects but substantial heterogeneity across neighborhoods. Figure 10 summarizes how the key objects vary across the market-share distribution. Panel (a) shows that the largest price increases arise in high-share retailer–HS-4 markets, consistent with the nonlinear markup elasticity Γ_{rgt} in equation (13). Panel (b) shows that expenditure responses are instead largest at lower shares, reflecting the fact that in more competitive markets, substitution across domestic retailers remains strong even after the foreign option becomes more expensive. Panel (c) combines these forces: in high-concentration markets, the dominant ad-

justment is an increase in prices rather than an expansion in quantities, leading to larger declines in consumption. Finally, Panel (d) connects these consumption declines to neighborhood income: the catchment areas experiencing the most negative consumption changes are disproportionately low-income.

Figure 10: Responses By Retailer

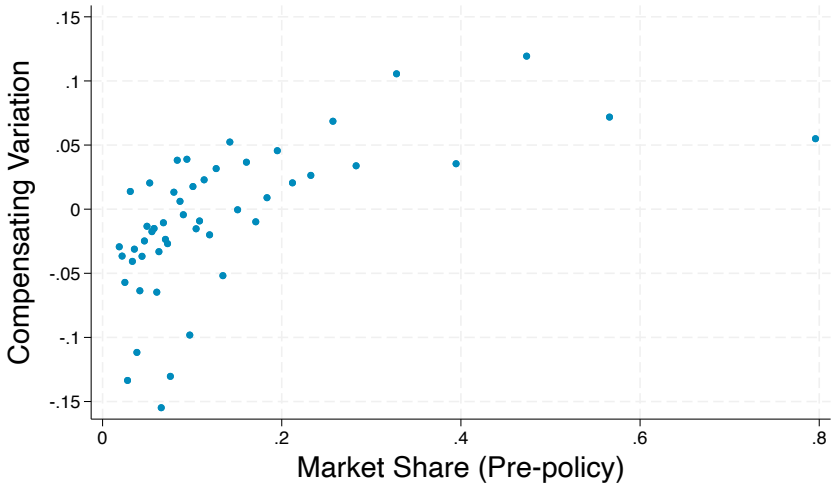


Notes: The figures show the responses by retailer–HS-4 categories and how they vary across market shares. Panel (a) shows that the largest price increases occur when concentration is the highest. Panel (b) shows that the largest expenditure changes occur in low-concentration pairs. Panel (c) shows that high concentration is associated with negative changes in consumption. Panel (d) shows that catchment areas where consumption changes are negative are those with the lowest income levels.

Figure 11 reports the resulting distribution of compensating variation across the market-share distribution. Consistent with the patterns above, compensating variation is most negative in high-share (low-competition) areas. This figure provides a direct summary of the paper's central distributional implication: the welfare consequences of eliminating de minimis are not determined solely by who used direct importing prior to the reform, but also by the spatial distribution of retail market power. When the foreign outside option becomes more expensive, households in concentrated markets face a large increase in cost of living with limited scope for

substitution toward competing retailers, generating substantially larger welfare losses.

Figure 11: Compensating Variation and Market Shares



Notes: The figure shows how the estimated compensating variation varies across the space of market shares. The estimated compensating variation is positive where concentration is high.

9 Conclusion

De minimis regimes have become a central institution of modern trade. By lowering the all-in cost of buying abroad—especially for direct-to-consumer shipments—it expands households' choice sets and strengthens the foreign outside option that disciplines domestic retailers.[10] This paper studies what happens when that outside option is abruptly made more expensive. We exploit Costa Rica's May 2021 elimination of duty-free treatment for non-commercial parcels below $500 as a large and plausibly exogenous increase in the delivered price of direct-to-consumer imports.

Using linked administrative data that combine shipment-level customs records for individual imports with the universe of retail electronic invoices and household locations and earnings, we construct retailer-specific catchment areas and measure

[10]While de minimis shipments are small relative to total trade by value, they constitute a large share of cross-border e-commerce shipments by count. For the United States, the USITC reports that Section 321 (de minimis) imports are a substantial share of e-commerce imports by quantity and estimates that by value they were less than 2 percent of total U.S. goods import value in 2021.

retailer–product exposure as the interaction of product-level tariff changes with pre-reform foreign import penetration in each catchment area. In the data, more exposed retailer–HS-4 cells raise both prices and sales, while retailers' import prices and purchase prices do not rise and labor outcomes (employment and wages) do not meaningfully increase. These patterns are difficult to reconcile with cost pass-through and instead point to an increase in domestic markups driven by weakened import competition. At the same time, assortment adjusts: exposed categories gain domestic retail varieties and lose foreign varieties, indicating that the reform reshapes both intensive- and extensive-margin components of consumer welfare.

A central finding is that incidence depends sharply on local market structure. Retail price responses are highly nonlinear in pre-policy market shares: pass-through is modest in low-share markets but steep in the upper tail, where concentration is highest. To interpret these facts and quantify welfare effects, we develop a catchment-area model of spatial competition with variable markups and strategic complementarities. Relative to the standard Atkeson–Burstein framework, the key departure is that market shares—and thus markups—are defined over *retailer-specific catchment-area markets* rather than integrated sectoral markets. A distinctive feature of our setting is that we observe the relevant domestic and foreign shares directly, allowing us to use the policy-induced foreign price shock to instrument for observed share changes and discipline the markup-elasticity schedule. The model matches the steep upper-tail nonlinearity and implies modest median welfare effects but substantial heterogeneity: welfare losses are concentrated in low-competition, lower-income neighborhoods.

These findings speak directly to current policy debates over de minimis. For example, in the United States, the White House issued an Executive Order on July 30, 2025 suspending duty-free de minimis treatment under 19 U.S.C. 1321(a)(2)(C) (Section 321 of the Tariff Act of 1930)—historically a channel for low-value shipments to enter without duties—with implementation effective August 29, 2025.[11] This episode illustrates that tightening de minimis is no longer a hypothetical reform but an active instrument of trade policy.

More broadly, the mechanism we document applies *beyond* de minimis. Any policy that raises the delivered price of imports—including tariffs, non-tariff barriers,

[11]The implementation notice specifies the suspension of the duty-free de minimis exemption for covered products valued at $800 or less, with operational details and exceptions for certain postal flows.

and enforcement frictions that disproportionately burden small shipments—can relax the foreign competitive constraint and induce endogenous increases in domestic markups. Because local retail competition is spatially segmented and highly heterogeneous, the consumer incidence of tariffs need not track exposure alone; it can be amplified in concentrated markets and thus generate regressive outcomes even when the directly exposed importers are relatively high income. Incorporating local market structure and variable markups is therefore essential for evaluating the consumer and distributional consequences of trade policy.

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