

The Demand Side of Firm Growth: Evidence from Mexico

Louise Guillouët¹ and Enrique Seira²

¹Columbia University

²ITAM

In progress
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- Firms in developing countries face many constraints to upgrading
[Verhoogen 2020](#)
- There must exist demand for the additional and/or improved products
[Atkin Khandelwal and Osman 2017](#), [Hjort Iyer and de Rochambeau 2021](#)
- In the long run, firms cannot rely exclusively on exporting [Goldberg and Reed 2020](#)
- This paper: studies informational frictions as a potential demand-side barrier to the growth of firms in the domestic market

- Consumer goods sector in Mexico:
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 - Many instances of product safety issues
 - Efforts to raise national standards

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 - Despite higher prices, Multinational Corporations (MNCs) dominate the market price premium size
- Hypothesis: there is domestic demand for higher-quality products, but quality uncertainty prevents domestic firms from fully capturing it
 - Many instances of product safety issues
 - Efforts to raise national standards
- How does quality uncertainty impact the growth of domestic firms?
 - What can be done to support the domestic sector?

Research Design & Preview of Results

- ① Use rare consumption data to establish new stylized facts
 - ① Domestic firms grow relatively more through surviving goods
 - ② Domestic products have a slower life-cycle
 - ③ Customer acquisition is key to domestic firm growth
 - ④ Domestic firms acquire customers relatively more within products
 - ⑤ The new customers of domestic products are poorer
- ② Propose a model of consumer learning in a context of uncertainty
 - Consumers may learn about quality by experimenting themselves
 - Or by waiting until others experiment.
 - Uncertainty makes waiting valuable for poorer customer, hurting firms
- ③ Test for this uncertainty mechanism

Contribution 1: trade and consumption

How does trade affect consumption in developing countries?

- Using expenditure shares: Fajgelbaum and Khandelwal (2016)
- Using broadly-defined good categories: Atkin (2013)
- Using barcode-level data but without the origin: Atkin, Faber and Gonzalez-Navarro (2018)
- Using barcode-level data with the origin a handful of imported products: Atkin and Donaldson (2015)

This paper: analyzes the impact of MNCs on consumption thanks to the identification of the origin of the universe of CPG consumed in a market.

Contribution 2: marketing

How does marketing affect firms' sales?

- Marketing efforts increase markups: Atkin, Chaudhry, Chaudry, Khandelwal and Verhoogen (2015)
- Marketing costs limit firms' expansion in export markets: Arkolakis (2016)
- Teachable marketing skills can increase firms' market access: Hjort, Iyer and de Rochambeau (2021)
- Marketing expenses may come at the expense of firms' investment in R&D: Einav, Klenow, Levin and Murciano-Goroff (2021)

This paper: suggests how marketing could overcome quality uncertainty issues

Contribution 3: quality uncertainty

- Bai (2021), Bai Gazze and Wang (2017)

Overview

- 1 Introduction
- 2 Setting and Data
- 3 Stylized Facts
- 4 Conceptual Framework
- 5 Mechanism

Outline

1 Introduction

2 Setting and Data

3 Stylized Facts

4 Conceptual Framework

5 Mechanism

Mexico: A large and highly-integrated emerging market

- 15th economy in the world, GDP: \$1.2 TR USD in 2015
- 15.6% growth in constant terms between 2010 and 2015
- Upper middle-income country: GDP/capita \sim \$10,000 GDP/capita
- High inequality and high poverty
- High volatility
- Highly exposed to trade:
 - Imports + exports total over 60% of GDP in goods and services
 - The U.S. is by far the main importer & exporter [USCMA]
 - Up to 50% of the goods consumed are manufactured by MNCs

An extremely detailed consumption panel

Kantar World Panel: similar to Nielsen Homescan

- 8,000 households per year, each followed 3.5 years on average
- Household information: number of people, age, gender, some socio-economic information, some appliances, city

summary stats

An extremely detailed consumption panel

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- Households are surveyed **weekly** about their purchases of at-home consumption packaged goods
- Purchase information: date, price, category, quantity, brand, flavor, color, packaging material, size, etc. **at the barcode level** [data structure](#)

An extremely detailed consumption panel

Kantar World Panel: similar to Nielsen Homescan

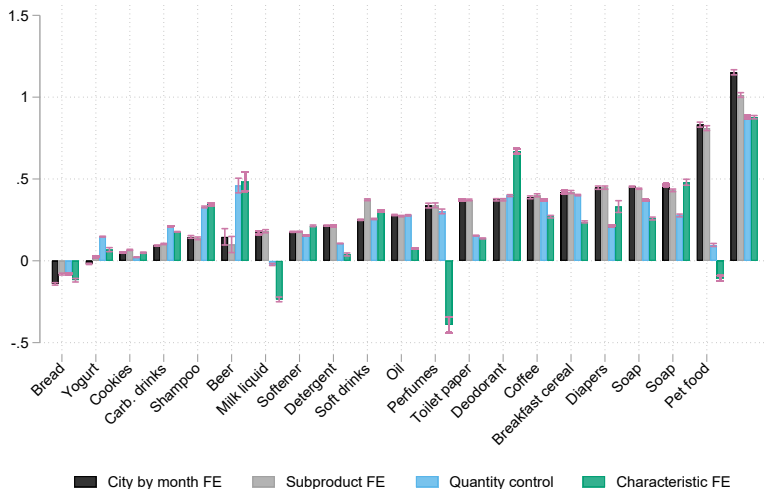
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- Households are surveyed **weekly** about their purchases of at-home consumption packaged goods
- Purchase information: date, price, category, quantity, brand, flavor, color, packaging material, size, etc. **at the barcode level** data structure
- The firms are the “manufacturer” of the products purchased.
 - Directorio Estadístico Nacional de las Unidades Económicas (DENUE)
 - Registro Nacional de Inversiones Extranjeras (RNIE) firms

A panel that's representative of urban Mexican consumers

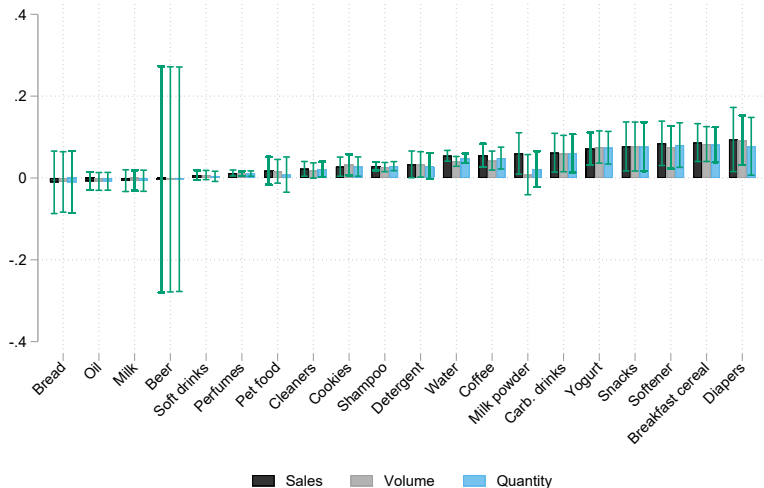
| | ENIGH | | | KWP | | | Difference | |
|------------------------------|---------|--------|-------|---------|--------|------|------------|------|
| | mean | sd | N | mean | sd | N | diff | p |
| Number of household members | 3.94 | 1.98 | 26942 | 4.37 | 1.83 | 8414 | 0.430 | 0.00 |
| Number of women in household | 2.03 | 1.27 | 26942 | 2.29 | 1.22 | 8414 | 0.267 | 0.00 |
| Age head of household | 48.32 | 15.62 | 26942 | 45.61 | 14.02 | 8412 | -2.707 | 0.00 |
| Finished primary | 0.84 | 0.37 | 26942 | 0.96 | 0.20 | 8414 | 0.120 | 0.00 |
| Finished secondary | 0.35 | 0.48 | 26942 | 0.65 | 0.48 | 8414 | 0.307 | 0.00 |
| Finished Post-secondary | 0.26 | 0.44 | 26942 | 0.13 | 0.34 | 8414 | -0.130 | 0.00 |
| Works full time | 0.75 | 0.44 | 26942 | 0.75 | 0.43 | 8414 | 0.006 | 0.24 |
| Number of cars | 0.53 | 0.80 | 26942 | 0.56 | 0.66 | 8414 | 0.030 | 0.00 |
| Number of PCs | 0.31 | 0.61 | 26942 | 0.33 | 0.47 | 8414 | 0.019 | 0.01 |
| Access to Internet (0/1) | 0.19 | 0.39 | 26942 | 0.24 | 0.42 | 8414 | 0.043 | 0.00 |
| Number of color TVs | 1.44 | 0.92 | 26942 | 1.87 | 0.98 | 8413 | 0.426 | 0.00 |
| Number of fridges | 0.83 | 0.43 | 26942 | 0.96 | 0.19 | 8412 | 0.135 | 0.00 |
| Number of microwaves | 0.42 | 0.51 | 26942 | 0.70 | 0.46 | 8414 | 0.287 | 0.00 |
| Number of bedrooms | 2.01 | 0.97 | 26385 | 2.20 | 0.97 | 8412 | 0.188 | 0.00 |
| Debit or credit card (0/1) | 0.21 | 0.41 | 26942 | 0.28 | 0.45 | 8414 | 0.070 | 0.00 |
| Monthly expenditure (MXN) | 1107.30 | 758.20 | 26942 | 1320.09 | 736.49 | 8414 | 212.796 | 0.00 |

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The Foreign price premium in Mexican consumer goods



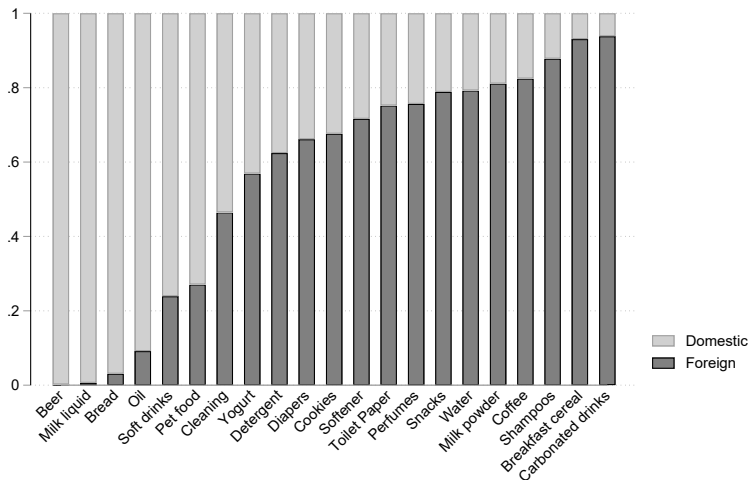
The Foreign share premium in Mexican consumer goods



[back](#)

[all products](#)

The Foreign share in Mexican consumer goods



A large sample of firms manufacturing consumer goods

Over 4,000 manufacturers, $> 90\%$ of them are domestic.

| | Top Foreign Firm | | | Top Domestic Firm | | |
|--------------|------------------|-------|------------------|-------------------|-------|--------------------------------|
| | Rank | Share | Name | Rank | Share | Name |
| Milk | 20 | 0.00 | WAL-MART | 1 | 0.50 | LALA |
| Detergent | 1 | 0.43 | PROCTER & GAMBLE | 2 | 0.27 | LA CORONA |
| Water | 1 | 0.31 | COCA COLA FEMSA | 5 | 0.05 | JOSE RAMOS CHIAPAS |
| Oil | 5 | 0.07 | ACH FOODS | 1 | 0.23 | EMBOTELLADORA MEXICANA |
| Toilet paper | 1 | 0.53 | KIMBERLY CLARK | 3 | 0.09 | FABRICA DE PAPEL SAN FRANCISCO |
| Bread | 3 | 0.01 | GRUPO GAMESA | 1 | 0.93 | BIMBO |
| Cookies | 1 | 0.58 | GRUPO GAMESA | 2 | 0.23 | BIMBO |
| Beer | 5 | 0.00 | HEINEKEN | 1 | 0.51 | CERVECERIA MODELO |
| Yogurt | 1 | 0.37 | DANONE | 2 | 0.19 | LALA |
| Milk powder | 1 | 0.71 | NESTLE | 3 | 0.07 | LICONSA |

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Outline

- 1 Introduction
- 2 Setting and Data
- 3 Stylized Facts**
- 4 Conceptual Framework
- 5 Mechanism

- 1 Domestic firms grow relatively more through surviving goods

What share of growth is due to product innovation?

Following Argente, Lee and Moreira (2020), the growth of sales S of firm i at time t are made of:

- the growth of sales of older products,
- *minus* the $t-1$ share of sales of products that exited between t and $t-1$
- *plus* the sales of new products, which are made of
 - the rate of entry of new products between $t-1$ and t
 - multiplied by the relative average sale of a new product at time t compared to an old, surviving product at time t

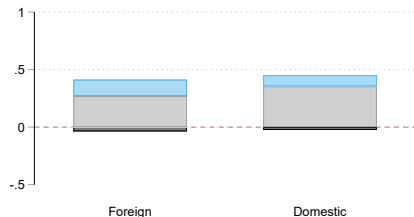
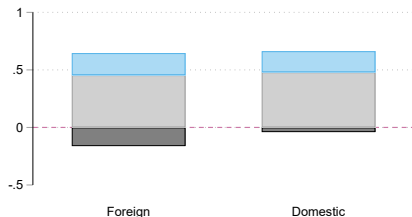
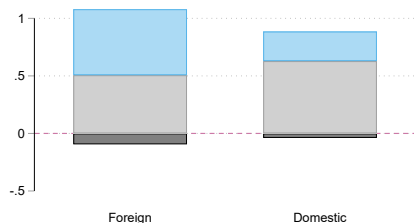
$$\Delta S_{i,t} = \underbrace{\Delta S_{i,t}^{old,survive} - \bar{S}_{i,t-1}^{old,exit}}_{\text{product life-cycle}} + \underbrace{n_{i,t}^{new} \times \bar{s}_{i,t}^{new}}_{\text{new products}}$$

Data-driven definition of new goods

- Data-driven definition
- Product that appears at least one year into the dataset
- Introduced by households who have been **active** in the dataset for at least one year
- Verification: Based on marketing releases, for example Coca-Cola Life or Ocean Spray Pomegranate and Blueberry, released in 2013

rate

Domestic firms grow more through surviving goods



- 1 Domestic firms grow relatively more through surviving goods
- 2 Domestic products have a slower life-cycle

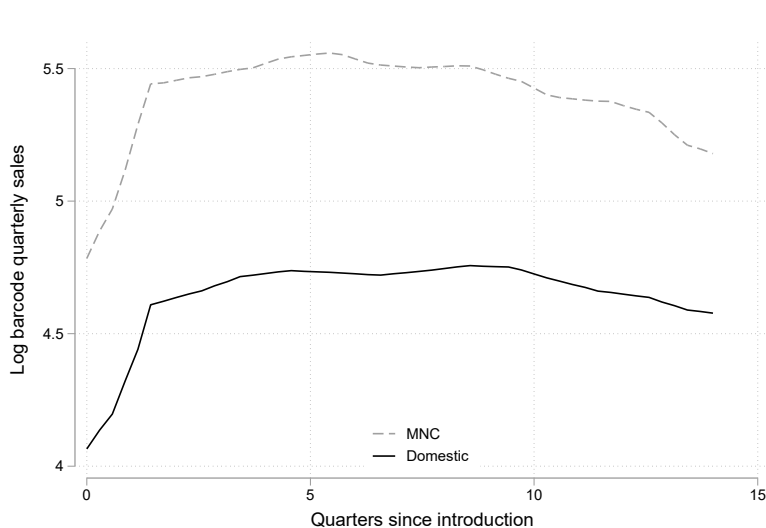
We estimate the effect of age on product sales following Argente, Lee and Moreira (2020):

$$\log Y_{u,t} = \alpha + \sum_{a=2} \beta_a D_a + \lambda_{jt} + \theta_c + u_{u,t}$$

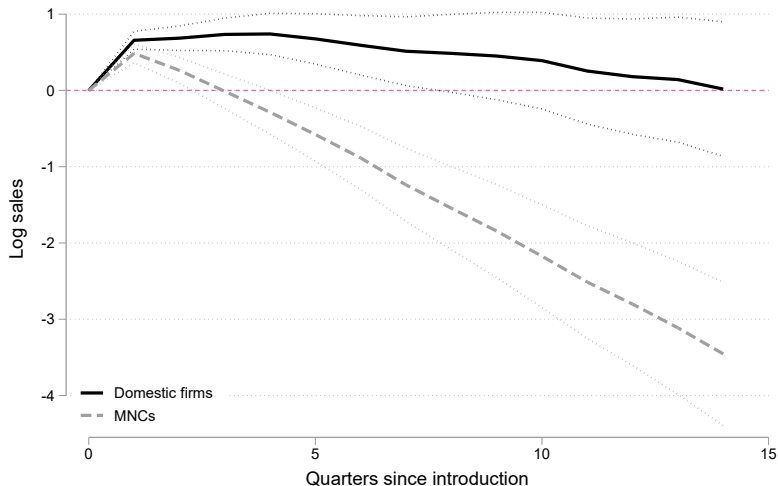
- u product
- a age in quarters - D_a are fixed effects for each age
- j product category
- t quarter - we control for time and product category fixed effects
- c cohort - we control for cohort effects [Deaton 1997](#)

Balanced panel comprised of products introduced starting in 2011 Q1 and that survived at least 14 quarters, observed for 14 quarters.

Domestic products have a slower life-cycle



Domestic products have a slower life-cycle



larger definition of product

narrower fixed effects

12 quarters

16 quarters

quantity

price

exit

- 1 Domestic firms grow relatively more through surviving goods
- 2 Domestic products have a slower life-cycle
- 3 Customer growth is key to firm growth, especially for domestic firms

How can firms grow sales?

Following Einav, Klenow, Levin and Murciniao-Goroff (2021):

$$\text{Sales} \equiv \text{Customers} \frac{\text{Quantity}}{\text{Customers}} \underbrace{\frac{\text{Sales}}{\text{Quantity}}}_{\text{Unit value}}$$

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$$\log(\text{Customers}_{it}) = \alpha + \beta_C \log(\text{Sales})_{it} + \gamma_i + \delta_t + \epsilon_{it}$$

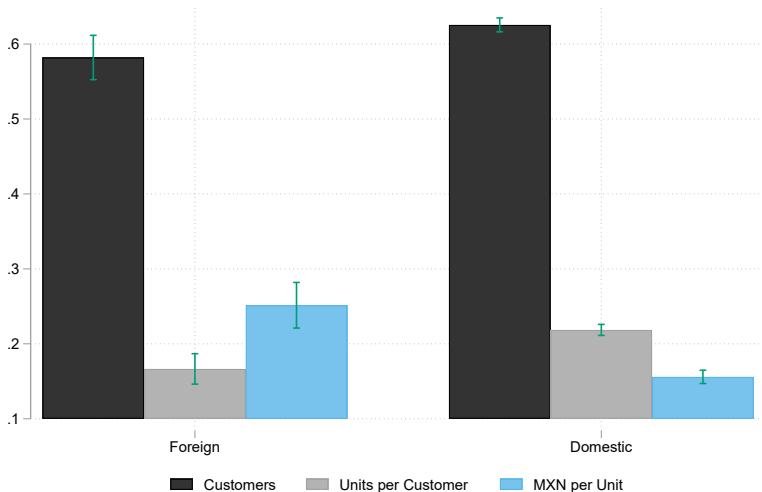
$$\log(\text{Quantity per Customer}_{it}) = \alpha + \beta_Q \log(\text{Sales})_{it} + \gamma_i + \delta_t + \epsilon_{it}$$

$$\log(\text{Unit value}_{it}) = \alpha + \beta_U \log(\text{Sales})_{it} + \gamma_i + \delta_t + \epsilon_{it}$$

$$\beta_C + \beta_Q + \beta_U \equiv 1$$

γ_i are firm fixed effects and δ_t are year fixed effects

The fastest-growing firms also acquire customers the fastest



purchases

sector

- 1 Domestic firms grow relatively more through surviving goods
- 2 Domestic products have a slower life-cycle
- 3 Customer growth is key to firm growth, especially for domestic firms
- 4 Domestic firms acquire customers relatively more within product markets

How can firms acquire more customers?

$$\text{Customers} \equiv \text{Markets} \frac{\text{Customers}}{\text{Markets}}$$

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$$\text{Customers} \equiv \text{Markets} \frac{\text{Customers}}{\text{Markets}}$$

$$\log(\text{Customers}) = \log(\text{Markets}) + \log(\text{Customers per markets})$$

$$\log(\text{Markets})_{it} = \alpha + \beta_M \log(\text{Customers})_{it} + \gamma_i + \delta_t + \epsilon_{it}$$

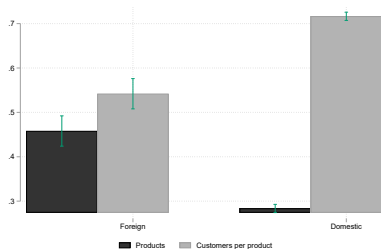
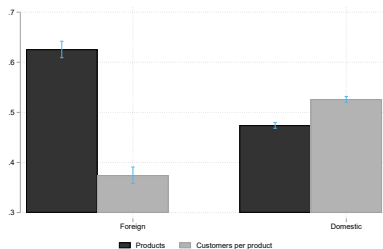
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$$\beta_M + \beta_C \equiv 1$$

γ_i are firm fixed effects and δ_t are year fixed effects

Domestic firms acquire customers relatively more within product markets

Across firms / Within firms over time



table

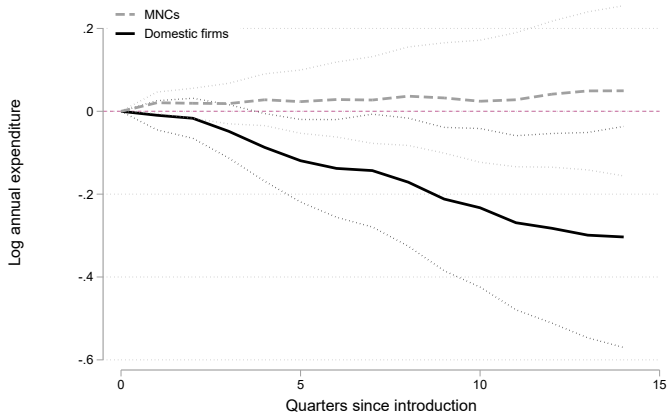
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- 4 Domestic firms acquire customers relatively more within products
- 5 The new customers of older domestic products are poorer

Who are the new customers of older goods?

$$\log Y_{u,t} = \alpha + \sum_{a=1} \beta_a D_a + \lambda_{jt} + \theta_c + u_{u,t}$$

Where $Y_{u,t}$ is the sales-weighted average of the annual expenditure of the new customers of product u at quarter t

The new customers of older domestic goods are poorer



City FE

subproduct

city

SES

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- New good of unknown quality x R. V. with prior μ_0
- Agents maximize utility

$$u(x) = \max \{ \mu - \beta_i p, 0 \}$$

- There are two agents i , where price-sensitivity $\beta_i \in \{\beta_L, \beta_H\}$, $\beta_H > \beta_L$.
- They each represent a share γ_i of the market, where $\gamma_i \in \{\gamma_L, \gamma_H\}$, $\gamma_H > \gamma_L$.

Sequence of events

- In each period, agents decide whether to buy the new good or not.
- Once they have tried the good, they immediately learn the true quality.
- If they like the good, they continue buying for 3 periods and exit.
- If they don't, they immediately exit.
- Everybody observes whether the good has been purchased or not.

Period t

- Suppose no agent has purchased the good yet.
- Everyone has the same prior μ_t .

$$\mu_t - \beta_i p > 0?$$

Period t

- Suppose no agent has purchased the good yet.
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$$\mu_t - \beta_i p > 0?$$

- Suppose one agent purchases the good.
- It must be the agent with the lowest β : the “leader”.
- Immediately after, she learns the true quality x .

Period $t+1$

- The “follower” has not purchased and not learned. For him,

$$\mu_{t+1} = \mu_t$$

- The “leader” has learned and faces a new problem:

$$x - \beta_L p > 0?$$

She decides whether to buy the good again or not.

Period $t+2$

- If the “leader” has not bought in $t + 1$:
 - The “follower” agent learns that that $x < \beta_L p$
 - Updates his belief $\mu_{t+2}(x < \beta_L p) < \mu_{t+1} = \mu_t$
 - If he didn't experiment with μ_t , he won't with μ_{t+2} .
- If the the “leader” has bought in $t + 1$:
 - The “follower” agent learns that $x > \beta_L p$
 - He updates his belief $\mu_{t+2}(x > \beta_L p) > \mu_{t+1}$
 - He might decide to start buying the good.

Life-cycle of a successful product

With unknown quality:

| Quarter | 0 | 1 | 2 | 3 | 4 | 5 |
|------------|------------|------------|-----------------------|------------------------|------------------------|-------------|
| β_L | γ_L | γ_L | γ_L | 0 | 0 | 0 |
| β_H | 0 | 0 | γ_H | γ_H | γ_H | 0 |
| Total | γ_L | γ_L | $\gamma_L + \gamma_H$ | γ_H | γ_H | 0 |
| Quarter FE | . | 0 | $+\gamma_H$ | $+\gamma_H - \gamma_L$ | $+\gamma_H - \gamma_L$ | $-\gamma_L$ |

Life-cycle of a successful product

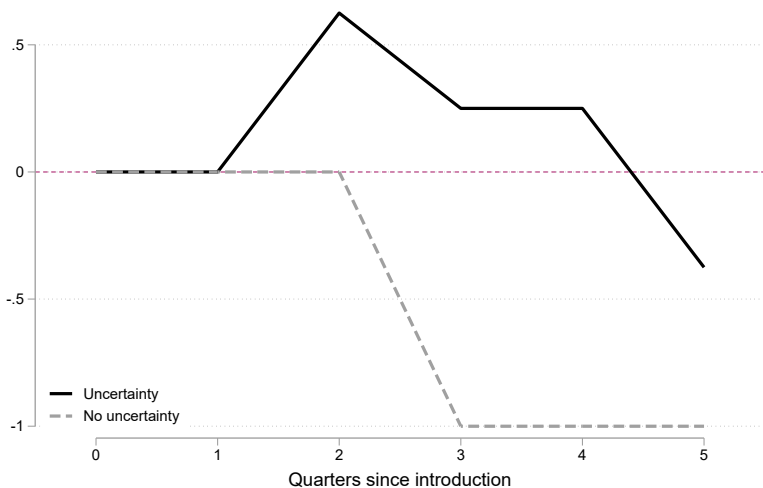
With unknown quality:

| Quarter | 0 | 1 | 2 | 3 | 4 | 5 |
|------------|------------|------------|-----------------------|------------------------|------------------------|-------------|
| β_L | γ_L | γ_L | γ_L | 0 | 0 | 0 |
| β_H | 0 | 0 | γ_H | γ_H | γ_H | 0 |
| Total | γ_L | γ_L | $\gamma_L + \gamma_H$ | γ_H | γ_H | 0 |
| Quarter FE | . | 0 | $+\gamma_H$ | $+\gamma_H - \gamma_L$ | $+\gamma_H - \gamma_L$ | $-\gamma_L$ |

With known quality:

| Quarter | 0 | 1 | 2 | 3 | 4 | 5 |
|------------|-----------------------|-----------------------|-----------------------|------------------------|---|---|
| β_L | γ_L | γ_L | γ_L | 0 | 0 | 0 |
| β_H | γ_H | γ_H | γ_H | 0 | 0 | 0 |
| Total | $\gamma_L + \gamma_H$ | $\gamma_L + \gamma_H$ | $\gamma_L + \gamma_H$ | 0 | 0 | 0 |
| Quarter FE | . | 0 | 0 | $-\gamma_H - \gamma_L$ | . | . |

Trajectory



What can be done to accelerate adoption?

- 1 Provoke experimentation: subsidize first purchase
- 2 Reduce uncertainty: raise and enforce quality regulation
- 3 Substitute for social learning: leverage brand power

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Measuring brand effects

I study the effect of consumption of a brand on the probability of consuming a (new) good from the same brand a year later

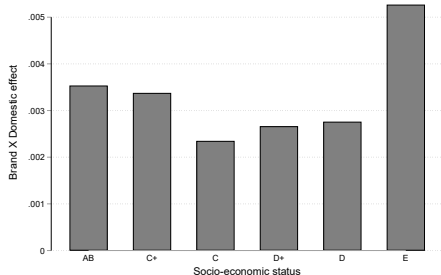
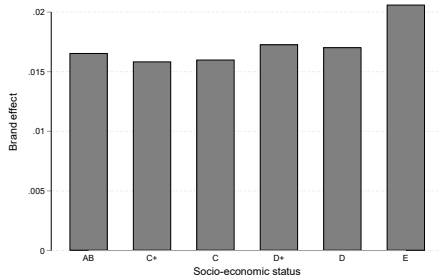
$$y_{i,jk,t} = \alpha + \beta y_{j,t-1} + \gamma D_j + \delta D_j \times y_{j,t-1} + d_i + \epsilon_{i,t}$$

- i is the consumer
- j is the brand, k the product
- t is the year
- D_j is a dummy that turns on if the brand is domestic

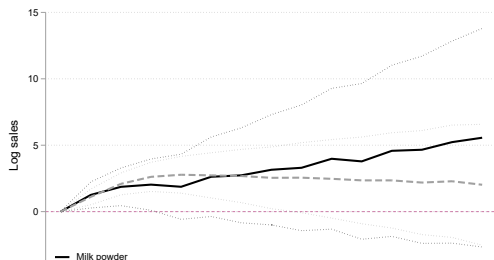
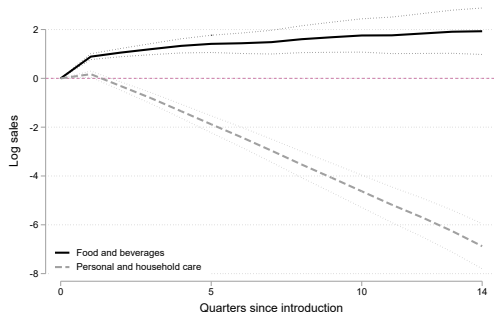
Domestic brand effects are larger

| | Current barcode consumption | | | | | | |
|---|-----------------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|
| | All (1) | New (2) | All (3) | New (4) | All (5) | New (6) | All (7) |
| Domestic | -0.006 (0.000) | -0.002 (0.000) | -0.003 (0.000) | -0.001 (0.000) | -0.004 (0.000) | -0.001 (0.000) | -0.005 (0.000) |
| Previous country consumption | 0.010 (0.000) | 0.002 (0.000) | | | | | |
| Previous country consumption X Domestic | 0.000 (.) | 0.000 (.) | | | | | |
| Previous firm consumption | | | 0.020 (0.000) | 0.006 (0.000) | | | |
| Previous firm consumption X Domestic | | | 0.017 (0.000) | 0.005 (0.000) | | | |
| Previous brand consumption | | | | | 0.035 (0.000) | 0.010 (0.000) | |
| Previous brand consumption X Domestic | | | | | 0.015 (0.000) | 0.005 (0.000) | |
| Previous barcode consumption | | | | | | | 0.354 (0.001) |
| Previous barcode consumption X Domestic | | | | | | | 0.058 (0.001) |
| Hhd FEs | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Control mean | 0.011 | 0.006 | 0.006 | 0.003 | 0.008 | 0.004 | 0.015 |
| N | 4270968 | 1923345 | 4270968 | 1923345 | 4270968 | 1923345 | 2347623 |
| R2 | 0.00 | 0.00 | 0.01 | 0.00 | 0.02 | 0.01 | 0.12 |

Poorer households rely more on brand effects



Products for which uncertainty matters more



- In the Mexican consumer goods sector, domestic firms have quite different growth patterns compared to MNCs.
- Part of these differences can be attributed to hesitant demand for new domestic goods.
- Uncertainty about product quality may be one contributor.
- Marketing strategies may help address this problem.
- Policy intervention raising quality and transparency could also help support the domestic sector.

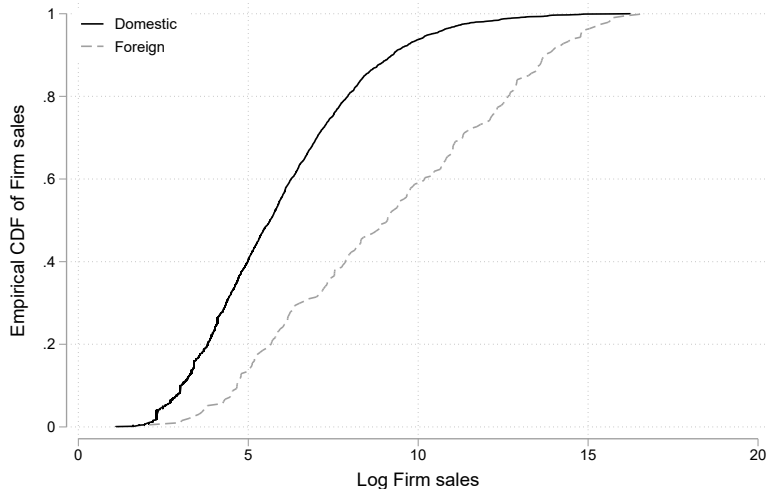
Thank you

Thank you!

www.louiseguillouet.com
louise.guillouet@columbia.edu

Appendix slides

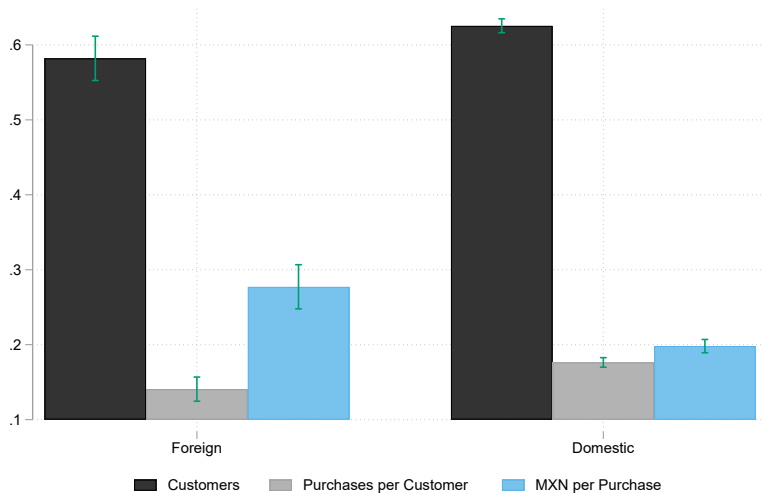
The distribution of firm size in the Mexican Consumer goods sector



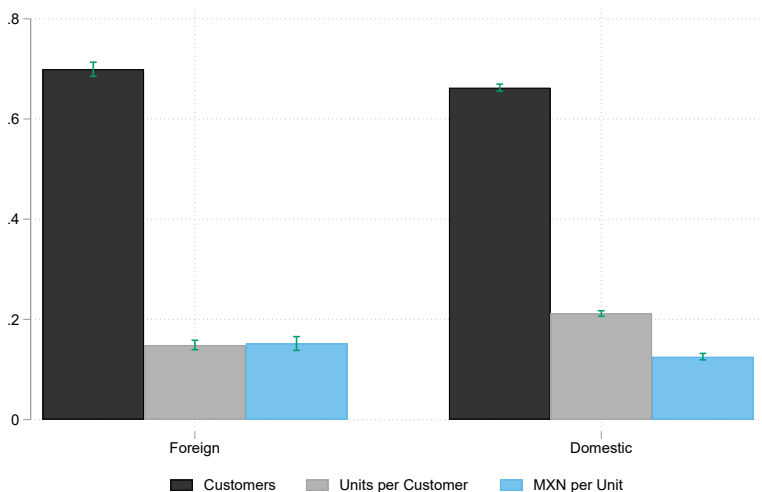
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The fastest-growing firms also acquire customers the fastest

Number of purchases instead of Volume



The fastest-growing firm-industry pairs also acquire customers the fastest



The customer margin is the key one to increase sales

| Panel A: All firms | | | |
|--------------------|---------------------|---------------------|---------------------|
| Dep. var: | Customers | Items per C | MXN per item |
| All | 0.622*** (0.005) | 0.215*** (0.004) | 0.162*** (0.004) |
| N | 12064 | 12064 | 12064 |
| R2 | 0.97 | 0.91 | 0.89 |

| Panel B: Mexican firms | | | |
|------------------------|---------------------|---------------------|---------------------|
| Dep. var: | Customers | Items per C | MXN per item |
| All | 0.625*** (0.005) | 0.218*** (0.004) | 0.157*** (0.005) |
| N | 10943 | 10943 | 10943 |
| R2 | 0.97 | 0.91 | 0.88 |

| Panel C: Foreign Firms | | | |
|------------------------|---------------------|---------------------|---------------------|
| Dep. var: | Customers | Items per C | MXN per item |
| All | 0.586*** (0.015) | 0.171*** (0.010) | 0.243*** (0.016) |
| N | 1121 | 1121 | 1121 |
| R2 | 0.99 | 0.96 | 0.91 |

How to get more customers

| Panel A: All firms | | | | | | |
|--------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|
| Dep. var: | Cities | per city | Chains | per chain | Products | per product |
| All | 0.630*** (0.004) | 0.370*** (0.004) | 0.595*** (0.004) | 0.405*** (0.004) | 0.294*** (0.005) | 0.706*** (0.005) |
| N | 12257 | 12257 | 12428 | 12428 | 12428 | 12428 |
| R2 | 0.97 | 0.95 | 0.96 | 0.94 | 0.96 | 0.95 |

| Panel B: Mexican firms | | | | | | |
|------------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|
| Dep. var: | Cities | per city | Chains | per chain | Products | per product |
| Mexican firms | 0.629*** (0.004) | 0.371*** (0.004) | 0.596*** (0.004) | 0.404*** (0.004) | 0.283*** (0.005) | 0.717*** (0.005) |
| N | 11165 | 11165 | 11283 | 11283 | 11283 | 11283 |
| R2 | 0.96 | 0.94 | 0.96 | 0.93 | 0.95 | 0.95 |

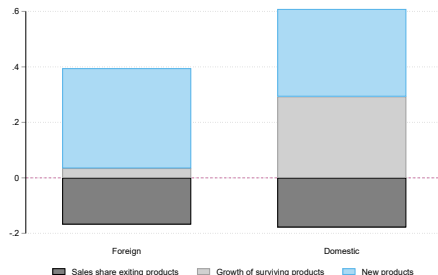
| Panel C: Foreign Firms | | | | | | |
|------------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|
| Dep. var: | Cities | per city | Chains | per chain | Products | per product |
| Foreign firms | 0.649*** (0.012) | 0.351*** (0.012) | 0.565*** (0.014) | 0.435*** (0.014) | 0.451*** (0.017) | 0.549*** (0.017) |
| N | 1092 | 1092 | 1145 | 1145 | 1145 | 1145 |
| R2 | 0.99 | 0.98 | 0.98 | 0.98 | 0.98 | 0.96 |

Mexican firms introduce relatively more new goods

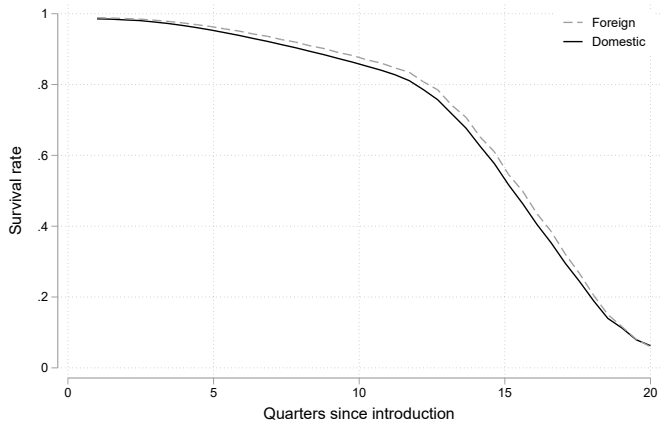
| | Share new products | | | | | |
|--------------------------|--------------------|-------------------|-------------------|------------------|-------------------|-------------------|
| | (1) | (2) | (3) | (4) | (5) | (6) |
| Mexican | 0.053 (0.013) | 0.042 (0.013) | 0.053 (0.014) | 0.046 (0.012) | 0.035 (0.013) | 0.045 (0.013) |
| Firm sales | | -0.026 (0.007) | 0.008 (0.009) | | -0.025 (0.006) | 0.007 (0.009) |
| Number of varieties | | | -0.199 (0.061) | | | -0.196 (0.060) |
| Firm leader in category | | | -0.071 (0.034) | | | -0.067 (0.034) |
| Firm controls | No | No | No | Yes | Yes | Yes |
| Year FEs | No | No | No | Yes | Yes | Yes |
| Baseline share (foreign) | 0.22 | 0.22 | 0.22 | 0.22 | 0.22 | 0.22 |
| N | 12128 | 12128 | 12128 | 12127 | 12127 | 12127 |
| R2 | 0.00 | 0.00 | 0.08 | 0.06 | 0.06 | 0.12 |

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Domestic firms grow much more through surviving goods over 5 years

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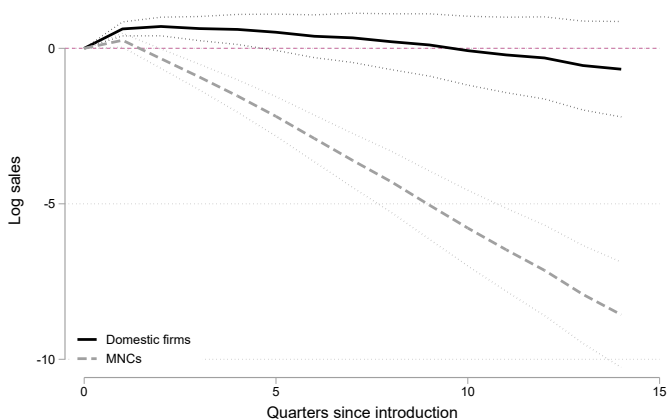
No differential exit



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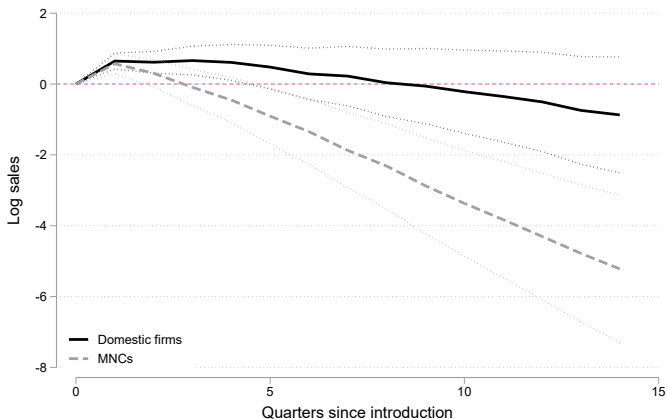
Domestic products have a slower life-cycle

Product-subproduct-manufacturer-brand-characteristics definition (excludes size changes)



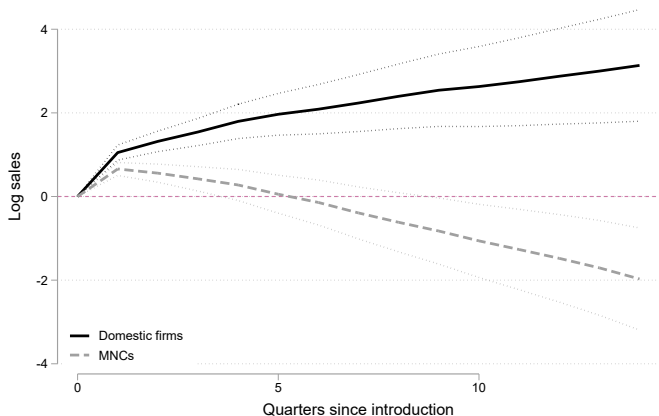
Domestic products have a slower life-cycle

Product-subproduct-manufacturer-brand-2 characteristics definition
(excludes size changes and some minor changes)



Domestic products have a slower life-cycle

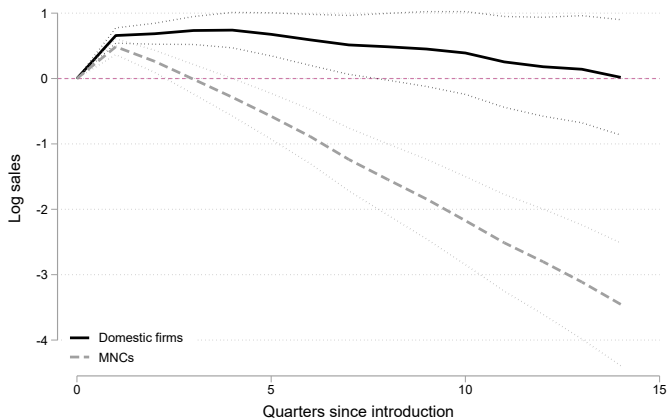
balanced panel



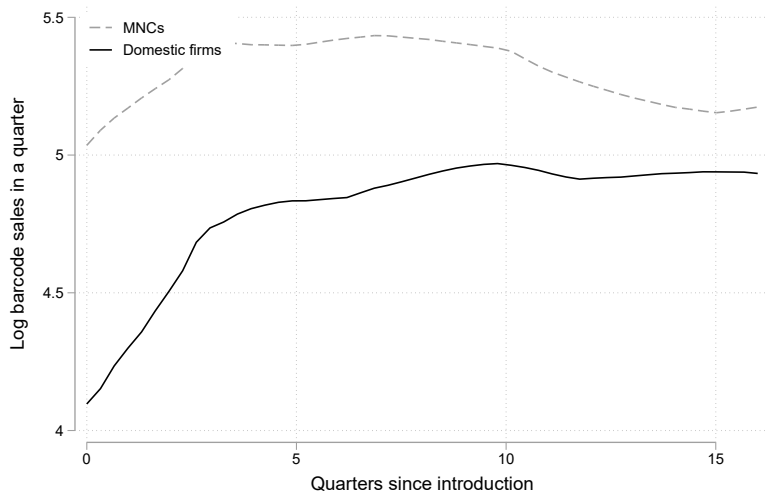
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Domestic products have a slower life-cycle

Twice narrower fixed effects at the product category level (X quarter level)



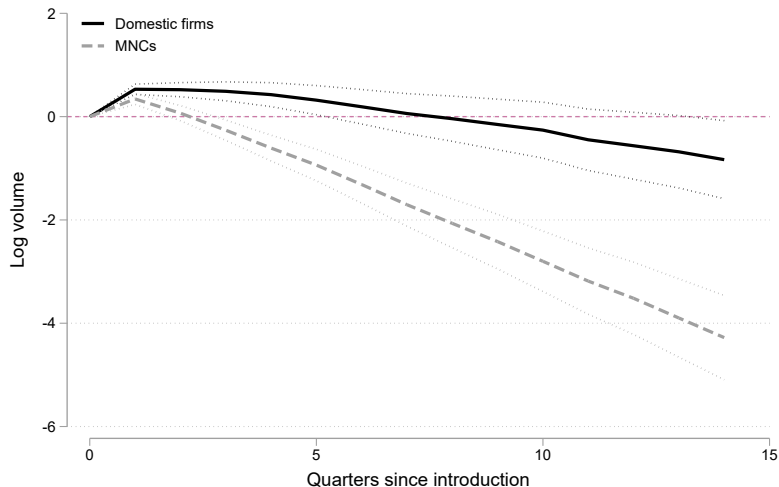
Product life-cycle, log sales for cookies



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[price](#)

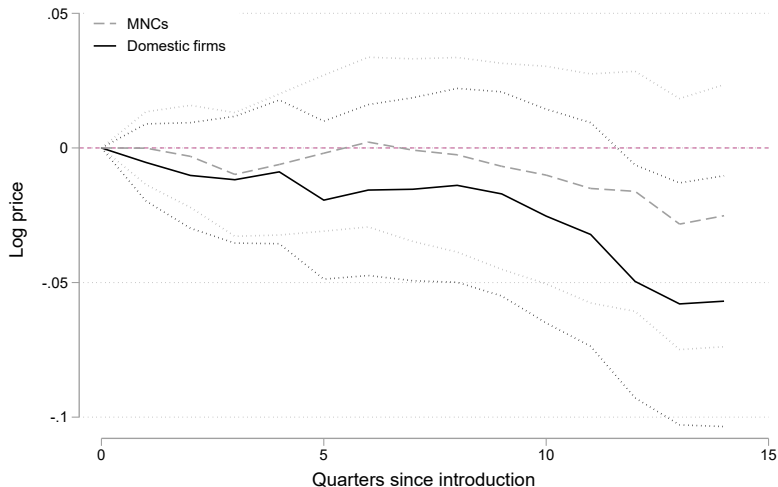
Product life-cycle, quantity



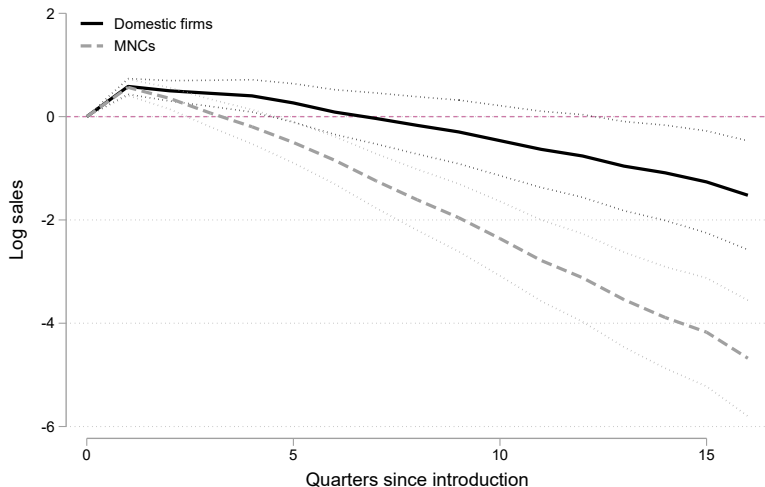
sales

price

Product life-cycle, price



Product life-cycle, longer period



narrower fixed effects

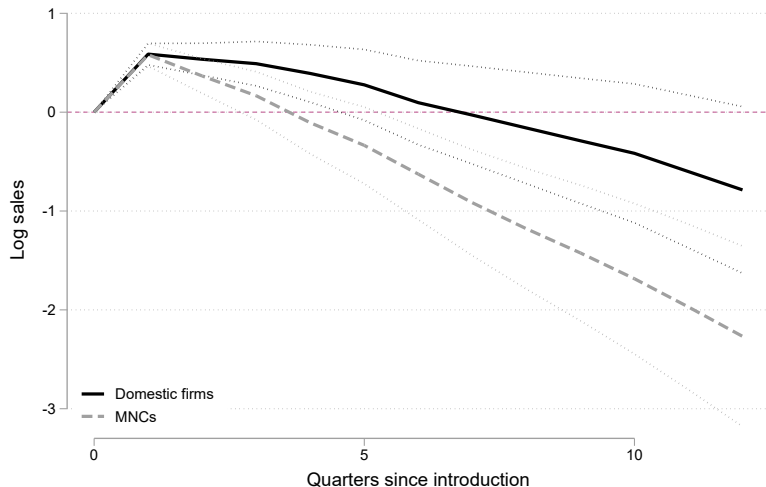
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12 quarters

quantity

price

Product life-cycle, shorter period



narrower fixed effects

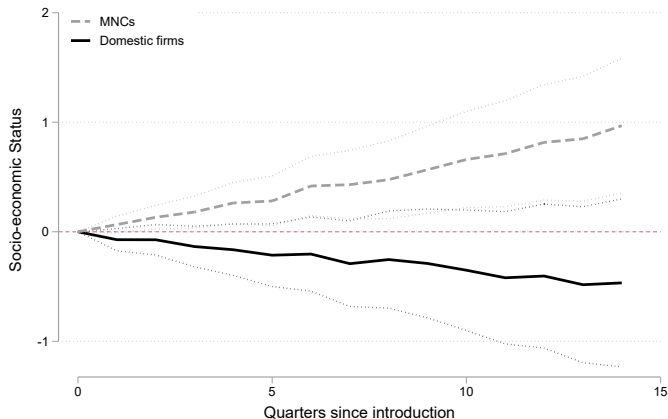
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16 quarters

quantity

price

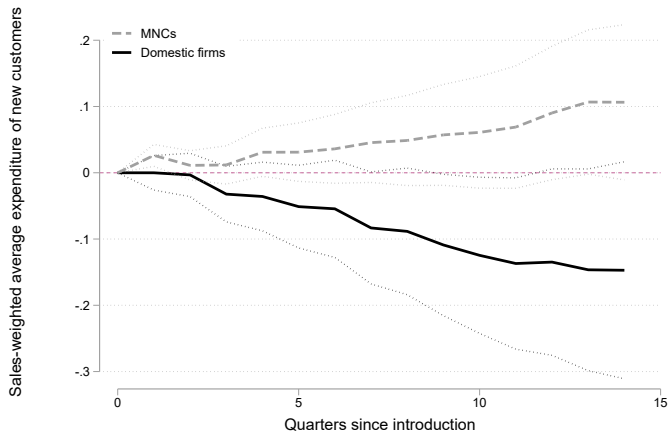
The new customers of older foreign goods have a higher SES



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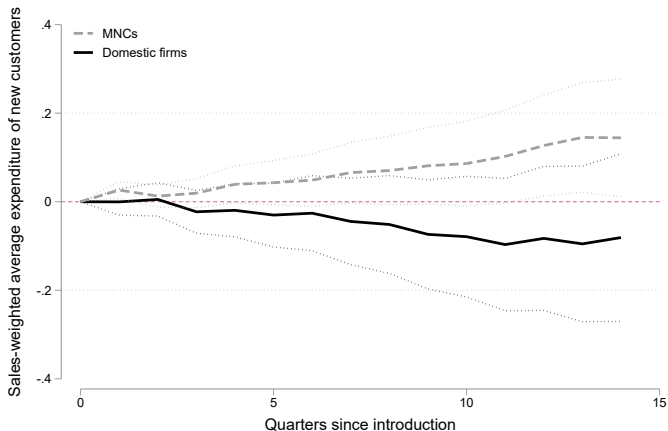
The new customers of older domestic goods are poorer

Controlling for city FE

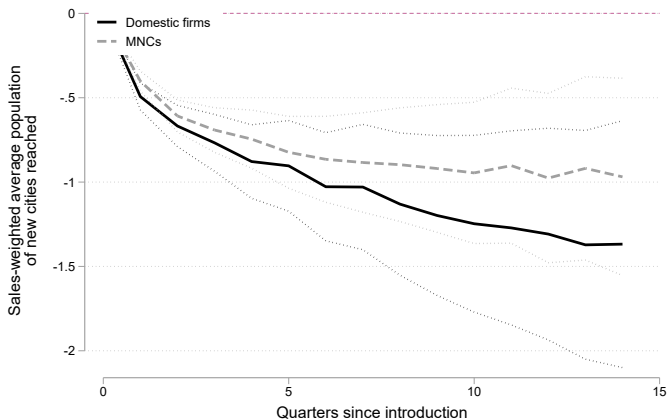


The new customers of older domestic goods are poorer

Controlling for subproduct



The new cities of domestic products are not different from the new cities of foreign product



The new cities of domestic products are not different from the new cities of foreign product

