When Competition Compels Change: Trade, Management, and Productivity*

Ananya Kotia†

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Abstract

How does competition affect firm management and productivity? I investigate this question by using an import competition shock in India and new data on family-managed firms, the predominant form of corporate governance in the developing world. I construct novel data on tenure records and family ties for more than 6 million company executives and directors. Using an event-study design, I show that the least productive firms respond to import competition by replacing family managers with unrelated professional executives. Firms that professionalize increase productivity by over 20 percent. To quantify the contribution of professionalizing management to aggregate productivity, I develop a theoretical framework, embedding management choice in a Melitz model, where firms balance non-pecuniary private benefits of retaining family management and the contracting frictions avoided by keeping management in-house, against the higher profits from professionalization. The estimated model reveals that import liberalization increased aggregate productivity in India by 9 percent. Within-firm improvements in talent allocation account for almost 30 percent of these gains, underscoring managerial restructuring as a key channel for productivity growth.

Keywords: trade, competition, management, firm productivity, corporate governance, family firms, growth
JEL Codes: D24, F10, G30, L20, O32, O33 O40

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†Department of Economics, London School of Economics. a.kotia1@lse.ac.uk.

1 Introduction

Competition is often credited with boosting firm productivity by reducing operational slack (Hicks, 1935; Leibenstein, 1966; Hart, 1983). A key channel through which competition drives higher productivity is managerial innovation and organizational change. However, in the absence of competition, the incentive to pursue these improvements may wane. As early as 1776, Adam Smith remarked that "*monopoly... is a great enemy to good management*," capturing the intuition that competition plays a disciplining role in managerial behavior (Smith, 1776). In today's global context, marked by a retreat from free trade and a growing emphasis on protectionism, the question of how competition shapes internal firm organization has gained renewed urgency.

I examine this issue by studying how import competition shapes the choice of top managerial personnel within the firm and how this affects firm productivity of Indian firms in the 2000s. My empirical setting is family-managed firms in India, where senior leadership is drawn from the narrow pool of talent of the founder's family. While the lens here is family firms, the mechanism is general: when owners place taste-based value on non-productive attributes such as kinship, caste, religion, color, or gender, managerial selection departs from merit in the spirit of Becker (1957). Moreover, this context is crucial to understanding firm productivity in a wide range of developing countries, where family-managed firms constitute the dominant organizational form (La Porta et al., 1999; Bertrand and Schoar, 2006). However, despite the prominence of family management in developing countries, little is known about how external market forces, particularly trade, can disrupt these entrenched organizational structures (Atkin and Khandelwal, 2020). This raises the central questions of this paper: Can the competitive pressures of globalization induce family-managed firms to professionalize their management and, in doing so, raise firm productivity? How consequential are these within-firm adjustments for aggregate productivity of developing countries?

I address these questions with four contributions. First, I assemble new manager-firm linked administrative data for India, recording tenure histories and confidential family ties for more than 6 million top executives and directors, matched to firm financial and product scope data. Second, exploiting a WTO-mandated dismantling of India's quantitative restrictions on imports, I provide new empirical evidence that exposure to import competition compels firms to restructure their top management and boards, replacing family members with professional executives. This managerial reorganization leads to substantial productivity gains among surviving firms. Third, I develop a theoretical framework in which family firms weigh the private benefits of retaining family management, and the contracting frictions avoided by keeping management in-house, against the higher profits from professionalization, embedding this trade-off in a Melitz (2003) model of heterogeneous firms. Fourth, I estimate this framework on Indian firm-level data to quantify the contribution of within-firm managerial reorganization to the aggregate productivity gains from trade.

My empirical setting is an externally mandated import liberalization in India, which provides quasi-experimental variation in import competition across product markets. Since the 1950s, India had put in place one of the most restrictive trade regimes in the world that became known as India's *Import License Raj*. A hallmark of this trade regime was the use of product-level quantitative restrictions (QRs) on imports, which effectively banned some intermediate goods and nearly all consumer goods. India could maintain these sweeping QRs by utilizing article XVIII:B of the GATT, which allowed developing countries with "weak" balance of payments to restrict imports. Although first-generation reforms in 1991 eased tariffs and QRs on intermediate goods, most QRs on consumer goods remained in place.[1] In this paper, I exploit the staggered removal of QRs on nearly 3,000 HS 8-digit products between 1997 and 2001, a reform compelled by a WTO ruling after multiple member countries challenged India's regime. The removal of QRs was externally mandated, occurred in relative isolation from other domestic policies, and targeted consumer goods, creating clean variation in import competition across product markets. Using product-level customs data, I show that this unilateral trade reform triggered a sharp and persistent rise in imports of treated products, with no comparable effect on exports.

To examine how import competition influences firm-level operations and management, I implement a staggered difference-in-differences event-study design that exploits the removal of quantitative restrictions across narrowly defined product markets. Since the removal of QRs was externally imposed by a WTO ruling on technical balance of payments grounds, there was minimal influence of domestic political considerations in either the scope or timing of the policy. The decision to remove QRs hinged on the IMF's technical assessment, which concluded that India's balance of payments and foreign exchange reserves were no longer sufficiently weak to justify import restrictions under GATT's Article XVIII:B. The strategy compares outcomes of firms producing goods subject to QR liberalization with those of firms in unaffected product markets, while flexibly controlling for firm and industry-year fixed effects. The identifying assumption is that in the absence of the reform, outcomes for firms in affected and unaffected markets would have evolved similarly. To validate this assumption, I provide graphical evidence showing similar trends in various outcome variables in the pre-policy period. Since the treatment is staggered, I employ the estimator proposed by

[1] The 1991 reforms left in place QRs on virtually all final consumer goods, covering roughly 30% of all tariff lines (Hasan et al., 2007; Topalova, 2010; Goldberg et al., 2010a; Topalova and Khandelwal, 2011; DeLoecker et al., 2016).

Sun and Abraham (2021) for my analysis.[2]

I assemble three novel datasets that form the core of my analysis. First, I obtain first-time access to administrative data from the Ministry of Corporate Affairs (MCA), which includes confidential data on family ties and tenure histories of over 6 million company executives and directors. Unlike prior studies that infer family links from last names, this dataset records the fathers' names of executives, enabling precise identification of family connections within firm boards. By merging these administrative records with firm panel data, CMIE Prowess, I build a comprehensive dataset that captures firm production, product scope, and internal organizational structures, paving the way for rigorous analysis of how trade liberalization shapes firm operations, management, and internal firm organization. Second, I digitize archival documents from the Ministry of Commerce to construct a novel HS 8-digit product-level database that chronicles QRs in India during the 1990s and their subsequent removal in the late 1990s and early 2000s. Third, I construct a detailed concordance between nearly 3,000 HS 8-digit codes and over 6,000 firm-level product categories, allowing exposure to import competition to be measured precisely at the product level rather than broad industries.

Exposure to import competition caused significant contractions in firm size and worsened profitability. As domestic firms lost market share to imports, both family and non-family firms producing QR-affected goods experienced sharp declines in total revenues by nearly 50 percent. These revenue declines were accompanied by substantial reductions in operating profit margins, total assets and total wage bill. Importantly, these financial and scale adjustments were not solely driven by firm exit. Similar patterns emerge even when analyses are restricted to surviving firms. Moreover, implementing Lee (2009) bounds to account for differential attrition confirms that these results are robust, alleviating concerns that selective exit might bias the estimates.[3]

The decline in financial performance triggered a marked transformation in managerial turnover and corporate governance of family-managed firms that is the focus of this paper. Firms report a reduction in the share of family members on executive boards by over 15 percent relative to the pre-policy mean. Executive boards represent the C-suite of firms in India and include key managerial leadership such as the CEO, CFO and managing directors. This decline in the share of family among the firms' top executives is driven by a 20 percent decline in the number of family executives and an equal increase in the number of outside professional executives. This managerial turnover is

[2] Estimates based on the two-way fixed effects estimator are almost identical and shown in the appendix.

[3] This method equalizes response rates across treated and control by trimming the higher-response group (the control group in this setting) by the attrition differential. Trimming is from the upper or lower tail depending on the outcome's sign, yielding upper and lower bounds of the treatment effect under a monotone selection assumption.

especially pronounced among firms that were less productive before the reform, indicating a selective move toward professionalization where it was most needed. These results show that trade and competition can have long-lasting effects on firm organization.

Consistent with the idea that the replacement of family managers is motivated by a need to improve management quality, firms that professionalize their management report significant productivity improvements, with revenue and quantity productivity measures increasing by 30 and 50 percent respectively compared to firms that retained family-dominated management. Concurrently, these professionalizing firms also reduce their average output prices. These results suggest that import competition triggers within-firm productivity improvements among surviving firms via managerial reorganization. These gains are distinct from, and augment the canonical gains from trade that operate through between-firm reallocation of resources and the exit of low-productivity producers (Melitz, 2003; Arkolakis et al., 2012; Edmond et al., 2015).

To verify that these productivity gains among professionalizing firms are not simply the result of other channels activated by the trade reform, I conduct a falsification test on firms that were already professionalized before the policy. Consistent with the managerial-quality channel, I find no productivity effects in these firms, reinforcing the interpretation that the observed improvements are attributable to managerial restructuring rather than to alternative channels activated by trade such as access to imported inputs or learning from trade.

Classical price theory leaves no room for competition-induced productivity improvements: Persistent hiring of less-qualified family managers is not consistent with profit-maximizing firm behavior (Stigler, 1976). To capture why such behavior persists and why competition might change it, I develop a theoretical framework by incorporating managerial choice in a Melitz (2003) model. Upon entry, firms choose between family and professional management. Firm owners derive *non-pecuniary private benefits* from retaining family management, such as the satisfaction of having children or siblings run the business (Aghion et al., 1999; Burkart et al., 2003; Bertrand and Mullainathan, 2003; Lippi and Schivardi, 2014; Chen and Steinwender, 2021). Instead, a firm can hire external professionals, which increases productivity by a constant parameter. However, professionalization comes at a cost: The firm's owner loses private benefits associated with family management.[4] Additionally, professional firms may also face costs due to contracting frictions, which are modeled as a wedge on firm profits, signifying losses due to expropriation by external managers.

[4]While professionalization may allow the founder to retain a fraction of private benefits, the important assumption is that these remain strictly lower than the benefits enjoyed under family management.

The model predicts a dual selection mechanism into professionalizing management that hinges on the firm's baseline productivity (that is, a firm's random productivity draw at birth, before managerial decisions have been taken). Specifically, baseline low-productivity firms, hereafter referred to as *laggards*, professionalize management primarily as a *survival mechanism*, because their weak performance makes them vulnerable to competition-induced exit. In contrast, baseline high-productivity firms, termed *frontier firms*, professionalize management due to its *efficiency-boosting effect*, whereby the gains from professional management further enhance their already high level of productivity, as in Bustos (2011). Firms with intermediate baseline productivity levels, however, tend to retain family management since the incremental benefits of upgrading their management do not fully offset the loss of private benefits.

I study this mechanism during an import competition shock that lowers profits for all domestic firms. This setting distinguishes private benefits from contracting frictions. Contracting frictions are already an efficient response to institutional constraints such as weak courts, and are unlikely to be altered by import competition. By contrast, for firms near the exit threshold, declining profits make private benefits relatively more costly: retaining family control would now force exit and the loss of the benefit altogether, so these laggard firms professionalize as a survival strategy. At the other end of the distribution, however, declining profitability reduces the incremental gains from professionalization, weakening frontier firms' incentive to delegate.

I calibrate the model to quantify the impact of trade liberalization on managerial choices and aggregate productivity. To ensure that the model accurately reflects key features of Indian firms, I set its parameters by matching the predictions of the model with empirical moments such as the share of family-managed firms in the economy and the observed productivity gap between family-run and professionally managed companies.

Using this calibrated model, I perform a policy counterfactual to simulate the effects of removing quantitative restrictions, thereby intensifying import competition faced by Indian firms. In response to this competitive pressure, many firms professionalize their management to enhance efficiency, while the least productive family-managed firms exit the market entirely. This managerial restructuring leads to substantial productivity gains: aggregate productivity increases by 9 percent. A decomposition reveals that approximately 70 percent of this increase comes from the exit of less productive firms, with the remaining 30 percent stemming from within-firm productivity improvements driven by professional management. This quantitative exercise highlights the crucial role managerial reorganization plays in mediating the productivity gains from trade liberalization.

This paper adds to three strands of the literature. First, it relates to the literature that asks why firms in more competitive markets exhibit higher productivity, a phenomenon commonly associated with what Leibenstein (1966) termed *"X-inefficiency"*. Although the correlation between competition and firm productivity has been extensively studied in theoretical (Holmstrom, 1982; Nalebuff and Stiglitz, 1983; Schmidt, 1997; Raith, 2003; Acemoglu et al., 2006) and empirical work (Nickell, 1996; Holmes and Schmitz, 2010) the mechanisms behind X-inefficiency remain poorly understood (Backus, 2020). By showing that import competition triggers managerial turnover, specifically, the replacement of family members with professional executives, this paper helps unpack the black box of X-inefficiency and identifies organizational restructuring as a key channel linking competition and firm productivity.

Second, this paper contributes to the literature on gains from international trade. A first strand emphasizes reallocation across firms, through changes in markup distortions or selection on the extensive margin (Melitz, 2003; Arkolakis et al., 2012; Edmond et al., 2015; Arkolakis et al., 2019). I instead show that import competition can raise productivity within surviving firms. While prior work has documented within-firm improvements, these have largely centered on production-side adjustments such as imported inputs (Amiti and Konings, 2007; Topalova and Khandelwal, 2011), shifts in product scope (Bernard et al., 2011; Dhingra, 2013), learning from exporting (Atkin et al., 2017) and joining multinational supply chains (Alfaro-Ureña et al., 2022), and technology adoption and innovation (Bustos, 2011; Bloom et al., 2016; Hombert and Matray, 2018; Perla et al., 2021). By contrast, I highlight a distinct organizational channel: managerial turnover and professionalization. Closest in spirit is Chen and Steinwender (2021), who show that import competition raises managerial effort, especially in family firms. My results are complementary but identify a different mechanismchanges in the composition of management itself. Finally, whereas much of the literature has focused on liberalization episodes that expand export opportunities, I examine the pro-competitive pressures of import competition and show how these shocks compel firms to reorganize their management and improve productivity.[5]

Finally, there is rich literature showing the prevalence of family firms in both rich and poor countries (Bertrand and Schoar, 2006; Burkart et al., 2003; Morck et al., 2005). The literature links such governance structures to weaker management practices, lower managerial effort, smaller firm size, and ultimately lower productivity (Pérez-González, 2006; Bennedsen et al., 2007; Bloom et al., 2012, 2013; Caselli and Gennaioli, 2013; Bandiera et al., 2018, 2020; Lemos and Scur, 2019; Akcigit et al., 2021). By analyzing family firms during a period of dramatic import competition following the QR-

[5]Related work in trade examines how organizational hierarchies respond to trade (Caliendo and Rossi-Hansberg, 2012; Marin and Verdier, 2014). This paper complements that literature by documenting an additional margin through which trade reshapes organizational structures.

removal policy, this paper provides new insights into managerial succession and turnover under crisis conditions. In particular, the shock offers rare empirical leverage to separate the role of private benefits from contracting frictions: while both explain the persistence of family management, only private benefits can account for why laggard firms professionalize when competition erodes profits. These results complement the work of Cuñat and Guadalupe (2005, 2009) who study the impact of product market competition on executive compensation.

The remainder of the paper is organized as follows. Sections 2 and 3 provide the details of the policy setting and data construction, setting the stage for the event study analysis. Section 4 lays out the empirical strategy and Section 5 presents event study results. Section 6 introduces the theoretical framework and Section 7 discusses identification and calibration. Section 8 concludes.

2 Policy Background

In 1947, following independence from British rule, India's economic planning was characterized by a strong desire for self-reliance and minimal dependence on the West for its development objectives. A key outcome of this strategy was the implementation of a comprehensive import substitution and licensing regime, which involved direct control over foreign exchange utilization by Indian firms and households. A balance of payments (BOP) crisis in 1957 further intensified these import controls. Instead of relying on price controls such as tariffs, the Indian government employed quantitative restrictions (QRs) as its main policy instrument. A small group of bureaucrats in Delhi was responsible for allocating scarce foreign exchange across different sectors of the economy and among firms within each industry.[6] Imports of consumer goods were even more heavily regulated and virtually eliminated (Bhagwati and Srinivasan, 1975; Krueger, 2010). A complex web of overlapping agencies responsible for certifications and license issuance managed this process. During this period, there was a lucrative premium on import licenses, and foreign consumer goods were essentially absent from the market.

The framework of India's restrictive trade practices, particularly the use of QRs, was facilitated by specific exceptions within international trade agreements. Although the General Agreement on Tariffs and Trade (GATT) fundamentally prohibited QRs under Article XI, it provided crucial exceptions that India utilized. Article XVIII:B of the GATT allowed countries in the "early" stages of development to impose QRs to

[6] For instance, firms could only obtain an import license if they demonstrated that their imports were essential for production and that the imported product was not manufactured domestically (Bhagwati and Srinivasan, 1975; Pursell and Sattar, 2004).

"safeguard [their] external financial position and ensure a level of reserves adequate for the implementation of their program of economic development".[7] India utilized this provision of Article XVIII:B to support its QR regime since 1957 (Pursell and Sattar, 2004).

2.1 India's First Generation Trade Reform (1991)

By the 1980s, it was evident that India's regime of import-substituting industrialization had failed, yielding a per capita economic growth rate of only 1.7 percent. Although growth accelerated in the 1980s, India's public debt steadily increased throughout the decade, rendering its macro-fiscal situation vulnerable. The rising debt was exacerbated by a spike in oil prices during the Gulf War and a decline in remittances from workers in the Middle East, leading to a downgrade in India's credit rating. By 1991, India was on the brink of default. Consequently, India approached the International Monetary Fund (IMF) for emergency financing and agreed to implement macroeconomic stabilization and structural reforms.

The structural reforms of the early 1990s extended well beyond the scope of the IMF program (Krueger, 2010; Ahluwalia, 2019) and impacted several spheres of the economy. Revisions to the industrial licensing regime facilitated firm entry and capacity expansion, private firms were permitted to enter sectors previously reserved for state-owned enterprises, and foreign direct investment was eased in several industries.

In terms of trade policy, the exchange rate was devalued by over 20 percent, and both quantitative restrictions and tariffs were eased on *intermediate and capital goods*. With the removal of quantitative restrictions, tariffs became the primary restrictions on imports of these goods. Average tariffs were reduced from over 80 percent in 1990 to 36 percent by 1996 (Topalova, 2010). Several papers have studied the various impacts of these tariff reductions (Hasan et al., 2007; Topalova, 2010; Goldberg et al., 2010b; Topalova and Khandelwal, 2011).

Despite these reforms, India continued to impose stringent QRs on almost all consumer goods and a small number of intermediate products, which constitute almost 3000 products at the 8-digit HS level or 30 percent of all tariff lines (Panagariya, 2004). India justified these QRs under Article XVIII:B of the GATT, asserting that they were necessary to safeguard its external financial position due to inadequate foreign exchange reserves. QRs on consumer products were lifted a decade later and are the focus of this paper. One of the challenges in evaluating the impact of the 1991 trade reforms is precisely that they were implemented as part of a broad-based structural reform package. This makes it difficult to attribute post-policy changes in data to trade policy.

[7] For details, see `https://www.wto.org/english/tratop_e/bop_e/bop_e.htm`, accessed July 30, 2024.

While tariff changes were product-specific, as Topalova and Khandelwal (2011) note, there may be considerable complementarity between sectors that saw the highest tariff reductions and industries that benefited from other industrial reforms such as those mentioned above. This concern is less relevant to the removal of QRs during India's second generation of reforms in the late 1990s and early 2000s, as I will argue in the next section

2.2 Second Generation Trade Reform (1997-2001): Removal of Quantitative Restrictions (QRs)

While there are many studies on how India's 1991 liberalization affected various aspects of the Indian economy, there is virtually no work on the impact of continuing QRs on over 30 percent of tariff lines and the impact of their eventual removal a decade later. This is surprising given that even after the 1991 reforms, over two-thirds of India's tradable GDP remained protected by some kind of non-tariff import restrictions, most commonly QRs (Pursell and Sattar, 2004).

From 1997-2001, these remaining QRs were also removed. The impulse of this policy was external to India. In July 1997, the United States requested consultations with India under the World Trade Organization's (WTO) Understanding on Rules and Procedures Governing the Settlement of Disputes (DSU) to challenge India's QRs as being inconsistent with WTO obligations. In the following months, the US was joined by the European Communities, Switzerland, Australia, Canada, and New Zealand, leading the WTO Dispute Settlement Body to set up a panel to examine the validity of India's QRs in November 1997.The panel submitted its report a year later in December 1998. The panel ruled that India's foreign exchange reserves are adequate and "not facing a serious decline or threat" and concluded that India's QRs therefore do not constitute permissible "necessary" measures to address a weak BOP situation under Article XVIII:B.It further recommended that India remove *all* QRs that it maintains under Article XVIII:B. Subsequently, India and the US mutually agreed for a phase-out plan where India agreed to remove all its outstanding BOP-related QRs by April 1, 2001.

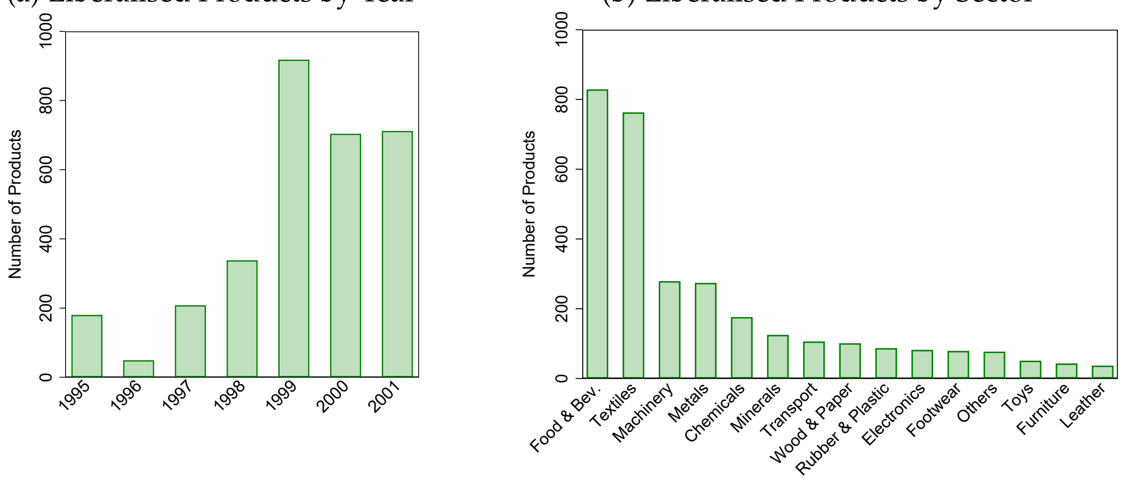
Two features of the institutional procedure leading to the removal of India's QRs have important implications for the empirical strategy outlined in Section 4. First, India's case for maintaining QRs under Article XVIII:B largely hinged on showing that its BOP situation was vulnerable. For such an assessment, instead of relying on materials submitted by the disputing countries, the WTO relies almost exclusively on the independent determination of the International Monetary Fund (IMF), which is a permanent invitee in all Article XVIII consultations.[8] The IMF held that India is well placed

[8] According to Article XV:2 of the GATT, "... *the contracting parties shall accept all findings of statistical*

Figure 1: Composition of Liberalised Products By Year and Sector

(a) Liberalised Products by Year

(b) Liberalised Products by Sector



Notes: The figure displays the number of products that were liberalized over time (panel a) and across different sectors (panel b), based on a dataset created by digitizing archival policy documents from the Ministry of Commerce, Government of India, as outlined in Section 3. *Source:* Ministry of Commerce, Government of India.

to manage its external financial situation and that its reserves are adequate to remove all existing QRs over a relatively short period. Because the IMF was called upon to conduct this technical assessment, it is unlikely that this externally imposed policy reform was influenced by politicians or policymakers in either India or any of the disputing countries.

The second noteworthy feature of this policy is that the single technical assessment by the IMF applied uniformly to almost 3000 products on which India maintained QRs based on India's aggregate BOP position. It was an all-or-nothing approach. Neither the United States could selectively target certain products for the removal of QRs, nor could India selectively retain QRs on specific products. The policy did not allow for any selective application or exemptions. Consequently, India's loss in this dispute resulted in the removal of QRs on almost 3000 products across the board.

and other facts presented by the IMF relating to foreign exchange, monetary reserves and balances of payments, and shall accept the determination of the Fund as to whether action by a contracting party in exchange matters is in accordance with the Articles of Agreement of the International Monetary Fund, or with the terms of a special exchange agreement between that contracting party and the contracting parties. The contracting parties in reaching their final decision in cases involving the criteria set forth in paragraph 2 (a) of Article XII or in paragraph 9 of Article XVIII, shall accept the determination of the Fund as to what constitutes a serious decline in the contracting party's monetary reserves, a very low level of its monetary reserves or a reasonable rate of increase in its monetary reserves, and as to the financial aspects of other matters covered in consultation in such cases."

3 Data

This study leverages three novel sources of data that are merged with comprehensive firm-level panel data. The construction of these data enables an in-depth analysis of how trade shocks affect both the production outcomes and the internal organization of firms.

CMIE Prowess. The primary data source is the CMIE Prowess database, which covers a substantial portion of India's formal economic activity. Firms in the Prowess database collectively account for 60 to 70 percent of the economic activity in the organized industrial sector, 75 percent of corporate taxes, and 95 percent of the excise duty collected by the Government of India (Goldberg et al., 2010a). CMIE has been compiling these data since 1988, primarily drawing on firms' annual reports and audited financial statements. The database contains information on manufacturing firms as well as on financial and non-financial services companies, spanning 775 5-digit industry codes based on the 2008 National Industrial Classification (NIC). Of these, 462 industries belong to manufacturing, which are further grouped into 20 2-digit sectors.

Prowess offers two distinctive features that have received relatively little attention from researchers. First, it provides detailed data on the product scope of each firm. Until 2011, the Companies Act (1956) required firms to report quantitative information, such as the value and quantity of production, revenues, stock, and capacity, for every product they produced. This obligation, coupled with the annual publication of financial statements, enabled Prowess to capture rich data on firms' product scopes. Prowess' product classification contains a total of 6,130 products. I use these data to determine whether a firm was exposed to the QR-removal policy based on the extent of its product offerings and operations in product markets affected by QR removals. Other studies that have employed these product scope data include Goldberg et al. (2010a); DeLoecker et al. (2016).

Second, and less widely recognized, is that Prowess publishes the names, designations, and tenures of all board members of each company for every year. Importantly, it also provides the Director Identification Number (DIN) for these directors, an 8-digit unique identifier issued by the Ministry of Corporate Affairs, Government of India. This feature facilitates matching with a larger administrative dataset from the Ministry of Corporate Affairs, as discussed below. The Prowess dataset includes data for a total of 383,779 directors across 51,125 manufacturing, financial, and non-financial services companies. Unlike the financial and product data, the board data are somewhat incomplete. Director names are often abbreviated to initials and last names, and designations are often missing. A key innovation of this project is the systematic cleaning and imputation of missing information for directors, performed on a firm-by-firm and director-by-director basis by cross-referencing the Prowess data with the administrative records from the MCA.

For cleaning the Prowess data, I follow a the following sample selection steps. First, I restrict the sample to manufacturing firms, thereby excluding service and financial companies. Next, I retain only those firms that began reporting data before the last pre-policy year and that provide at least two observations during the pre-policy period. I also exclude a small number of firms that never report any information on the products they produce. These steps yield a panel dataset comprising 5002 firms observed over the period 1988-2010.

Prowess serves as the baseline dataset for this study. However, to investigate how the import competition shock impacts manufacturing firms in India, particularly regarding their internal organization and top management, I supplement Prowess with three novel datasets. This three-step data construction procedure is described below.

Novel Dataset on Product-level Quantitative Restrictions in India. The first step in identifying which firms are affected by the QR-removal policy is to determine which products are subject to the policy and when the restrictions were removed. There is no central database for this information, and the liberalization policy was implemented over several years (with a particularly heavy emphasis in the final three years, 1999-2001) through more than 26 government notifications issued in the Official Gazette of India.

I obtained these notifications from the archives of the Ministry of Commerce, Government of India, to create a detailed dataset of products under quantitative restrictions (QRs), including the exact removal dates. Figure **??** in Appendix **??** shows an example of one such policy notification. These notifications typically provide a list of products along with their corresponding product codes, based on the 1996 Indian Trade Classification Harmonized System (ITCHS) nomenclature, the import licensing policy applicable to each product, and the date of notification. In most cases, the column for the new import policy indicates "*Free*", implying that there are no quantitative restrictions on the product after the notification date. In some instances, however, the policy may be less liberal, for example, quantitative restrictions might be partially lifted such that the product can be imported into India only by a State Trading Corporation (STC) or only imported through a Special Import License (SIL). I treat a product as liberalized if the imports of that product are completely free of any kind of quantitative or licensing restrictions.

Thus, after processing these data, I obtained a dataset at the 8-digit level that details

Table 1: Family Ties Among the Board Members and Top Managers of an Indian Firm

Name	Father's Name	Sex	Age	City of Birth	Executive Director
A Khosla	D K Khosla	Male	44	Delhi	Yes
M Khosla	D K Khosla	Male	40	Delhi	Yes
P Khosla	D K Khosla	Male	39	Delhi	Yes
N Khosla	N K Khosla	Male	38	Delhi	Yes
D K Khosla	K L Khosla	Male	72	Delhi	Yes
N K Khosla	K L Khosla	Male	69	Jhelum	Yes
M P Gupta	P D Gupta	Male	70	Delhi	No
V K Sood	H R Sood	Male	67	Lahore	No
M L Mangla	T Chand	Male	70	Sangrur	No

Notes: The table shows the board of directors of a sports goods firm in India. It lists all board members of the firm from 2000 to 2010, illustrating the board's domination by the Khosla family (name changed to maintain anonymity). The table contains information on the name of each director, with first and middle names abbreviated for brevity (column 1), the father's name of each director (column 2), the director's sex (column 3), age in 2010 (column 4), and place of birth (column 5), and whether the director is on the executive board, which includes top management positions such as the CEO, CFO, and the managing director (column 6). *Source:* CMIE Prowess and Ministry of Corporate Affairs, Government of India.

the year in which QRs were removed for each product. Based on the above classification, out of a total of 10,839 ITCHS 8-digit products, 3,109 products appear in the QR-removal government notifications, and out of these 2,982 are made completely free of any kind of quantitative restriction between 1997 and 2001.

Novel Product Concordances. In the next step, I construct novel product concordances between the 1996 ITCHS product nomenclature used by the Indian customs authority with the product nomenclature in the firm-level CMIE Prowess data. These concordances were prepared by hand by going through the following resources: (1) detailed product descriptions of each of the 3,109 ITCHS 8-digit products contained in the QR notifications and matching them with the descriptions of 6,130 products reported by Prowess firms, (2) The HS-6 digit to Prowess product code concordance in Barrows and Ollivier (2021) for manufacturing products, and (3) an incomplete concordance between ITCHS products and Prowess products provided by CMIE. Significant manual work was required for this step despite existing concordances, because existing concordances use new vintages of HS products, while the QR notifications used older 1996 vintage of ITC-HS codes. Moreover, existing concordances are at the coarser 6-digit HS level. Table **??** in Appendix **??** provides a few examples of how this matching is performed. As a result, I identified 1,168 unique Prowess products that correspond to at least one ITCHS product for which QRs were removed during the policy window. The next section discusses how these data are used to assign treatment at the firm level.

Table 2: Summary Statistics

	Obs	Mean	p10	p50	p90
Treated Firms (%)	4,996	47	0	0	100
Company Age	83,726	27	7	21	56
Wages	82,745	207	0	21	305
Gross Fixed Assets	82,067	2307	20	213	2618
Revenues	82,745	3399	1	363	4385
Expenses on Raw Materials	82,745	1386	0	136	1785
At least 2 Family Member on Board (%)	4,852	45	0	0	100
Family Share on Board (%)	39,644	38	10	33	75
Family Share on Executive Board (%)	39,644	64	0	100	100

Notes: This table presents summary statistics for firms included in our analysis, using data from CMIE Prowess and the Ministry of Corporate Affairs, Government of India. "Treated Firms" represents the percentage of firms whose main, highest-revenue product was affected by the QR-removal policy. "Company Age" measures the number of years since incorporation. "Wages" denotes the total wage bill of the firm and is deflated using the GDP deflator. "Gross Fixed Assets" refers to the book value of fixed assets and is deflated using the gross fixed capital formation deflator. "Revenues" indicate total firm revenue and are deflated using NIC output deflators, while "Expenses on Raw Materials" reflect expenditures on material inputs and are deflated using NIC input deflators. "At least two Family Member on Board" represents the percentage of firms in which at least two members on the company's board are from the same family. The next two variables are defined only for firms who have at least two directors from the same family. The first is "Family Share on Board" and the second is "Family Share on Executive Board" representing the percentage of family members on the full board and the executive board of the firm respectively. All monetary values are deflated using 2004 as the base year. Columns represent the total observations, mean, 10th percentile, median, and 90th percentile of each variable at the firm level. *Source:* CMIE Prowess and Ministry of Corporate Affairs, Government of India.

Administrative Data on Manager Family Ties. Finally, I obtained access to novel administrative data from the Ministry of Corporate Affairs (MCA), covering over 6 million board directors from approximately 1.3 million registered Indian companies. Each director is assigned a unique 8-digit Director Identification Number (DIN), and each firm has a unique 23-digit Company Identification Number (CIN). The dataset records the full legal names of individuals, with official spellings that are rigorously verified against government-issued IDs, along with key demographic details such as date of birth, gender, and place of birth.

Moreover, these data provide a rich historical record of board director tenures dating back to the 1970s. They capture the designations held by directors during their tenure at each firm. For example, while some directors serve solely as independent board members, attending meetings without involvement in daily operations, others hold executive roles (e.g., Managing Director, CEO, or CFO) that entail active participation in the firm's day-to-day management. The dataset also includes the start and end dates of each directorship, which is crucial for analyzing turnover among top managers.

Most crucially for this study, the data feature each director's father's name, thereby facilitating the identification of family ties within firm boards. Since the MCA registration process requires directors to provide their father's name, this information is reliably recorded and enables the tracking of familial relationships across board members.

For instance, Table 1[9] illustrates the board composition of a sports goods firm between 2000 and 2010. The table reveals that directors A Khosla, M Khosla, and P Khosla share the same father's name (D K Khosla), confirming that they are brothers. Additionally, N K Khosla, identified as D K Khosla's brother, and N Khosla, noted as his nephew, are also listed. This example underscores how the inclusion of familial information in the administrative data enables a detailed analysis of family presence on firm boards and sheds light on the extent of familial networks among top managers in Indian companies.

3.1 Descriptive Statistics

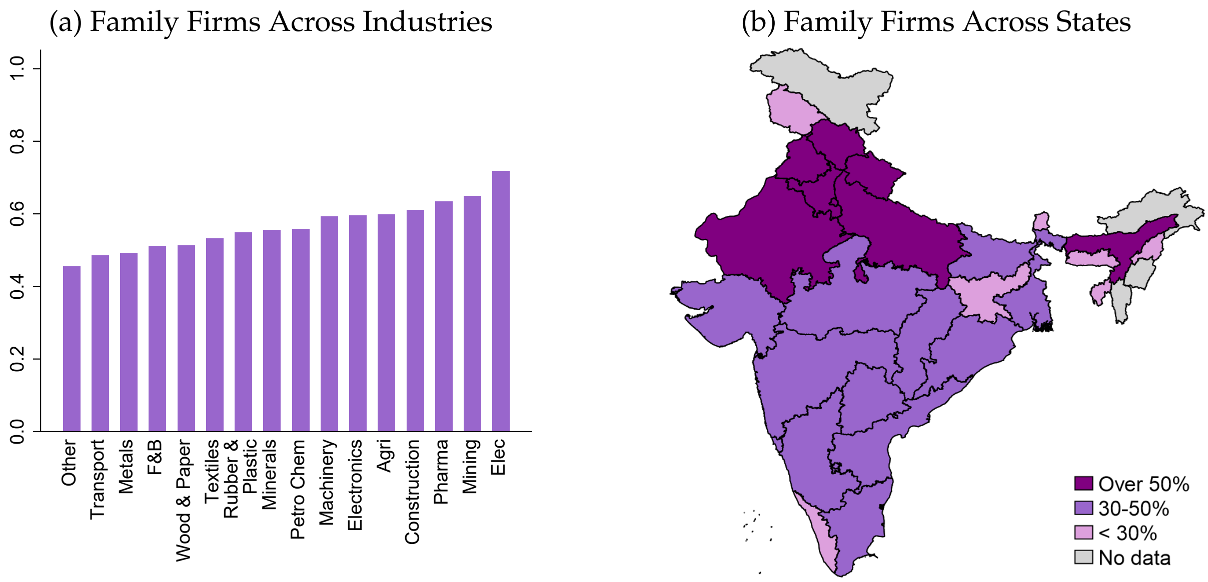
This section provides a detailed description of the graphical results presented in Figures 2 and 3, focusing on the descriptive characteristics of family-managed firms in India. I define a firm as a family firm if it has at least two board members from the same family.

Figure 2 illustrates the distribution of family-managed firms across different industries and geographic regions. Panel (a) reveals some variation across industries in the share of family firms. While some sectors such as Food & Beverages, Textiles, and Rubber & Plastic exhibit a higher prevalence of family management, all industries have at least 40 percent of firms with at least two board of directors who are from the same family. Panel (b) highlights the geographical distribution of family firms across Indian states. It shows that family firms are widespread in India: despite different local business culture and economic structures, nearly half of the firms are family firms in most states across India.

Figure 3 provides kernel density plots that compare firm-level outcomes based on the degree of family involvement in top management (panels (a)-(d)) and firm growth over the life cycle (panels (e) and (f)). Panels (a) and (b) depict the distribution of firm size measured by log revenues and log fixed assets, respectively. Firms with a higher

[9] The initial and middle names have been abbreviated for clarity.

Figure 2: Share of Family Firms Across Industries and States



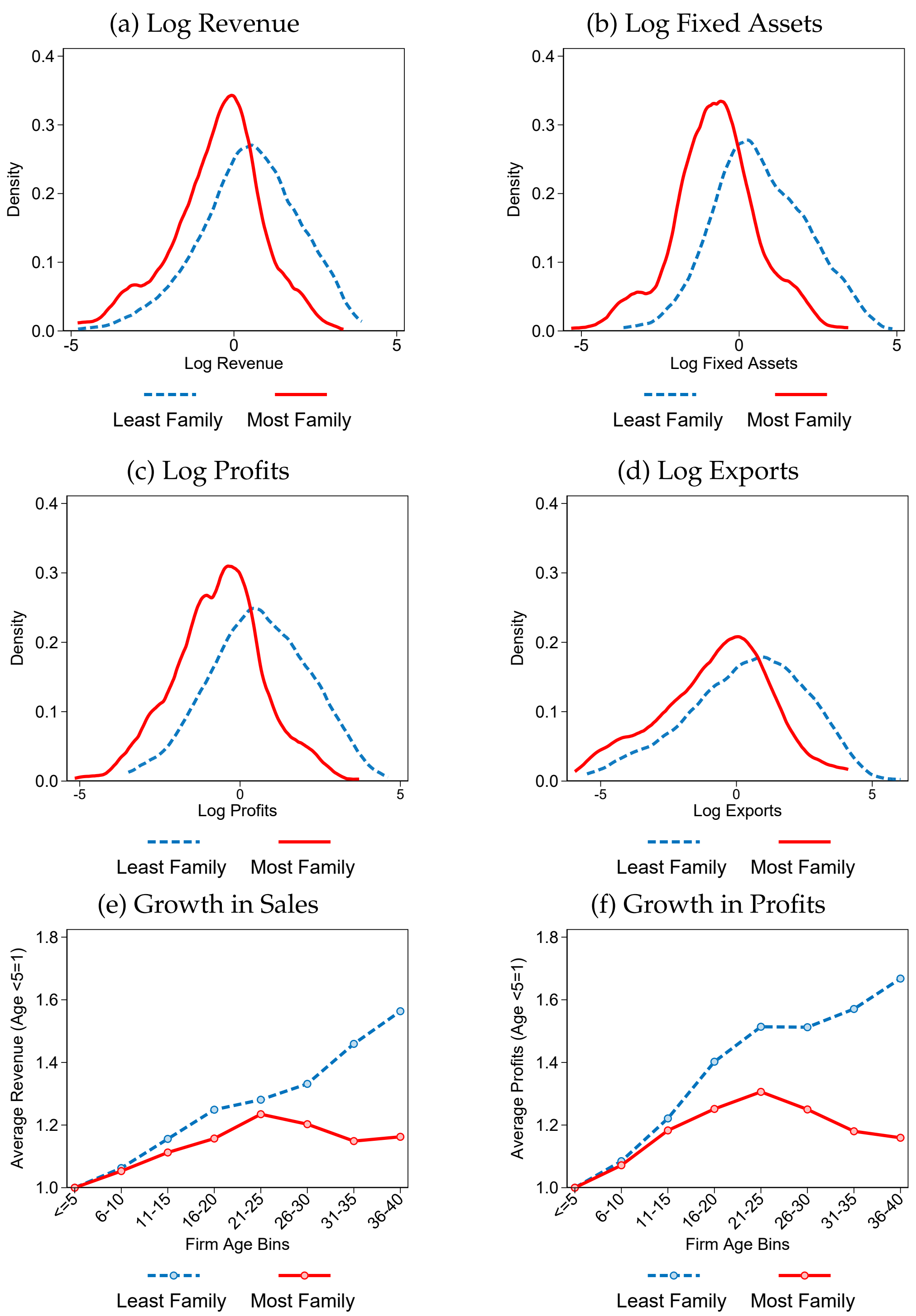
Notes: This figure displays the share of family firms across 2-digit NIC industries (panel a) and across Indian states (panel b). A family firm is defined as a firm in which at least two members on the company's board are from the same family. All data is for the year 2000. *Source:* CMIE Prowess$_{dx}$ and the Ministry of Corporate Affairs, Government of India.

share of family managers (top tercile of share of family among company directors, indicated in red) generally tend to be smaller, exhibiting lower revenues and fixed assets. Panel (c) indicates that these family-involved firms also have a lower profits. Panel (d) demonstrates that firms with extensive family management also tend to export less.

Panels (e) and (f) of Figure 3 trace the expansion of family-managed versus professionally managed firms over their life cycle. The horizontal axis groups firms into five-year age bins, while the vertical axis reports the *mean* size of all firms in each binmeasured by total sales in panel (e) and profits in panel (f). For ease of comparison, the average size of the youngest cohort (firms younger than five years) is normalized to 1.

Two patterns stand out. First, professionally managed firms scale up quickly: within two decades their revenues and profits rise by 50 percent. Second, family-managed firms barely grow; the average size of a 30-year-old family firm is less than 20 percent larger than that of a 5-year-old family firm, signaling persistently weaker financial performance relative to professionally-run firms. This within-country divergence echoes the cross-country evidence of Hsieh and Klenow (2014), who show that firms in developing economies such as India and Mexico grow far less over their life cycle than firms in the United States (see Figure 1 in Hsieh and Klenow (2014)). In the figure 3, I take a similar approach, except that I look within one country, India, and compare two types of firms, those that are dependent on family management and those that are not. Figure 3 highlights distinctive differences in firm characteristics based on family

Figure 3: Firms with High Share of Family Top Managers are Smaller



Notes: The figure plots kernel density plots of firm revenue (panel (a)), fixed assets ((panel (b)), profits (panel(c)), exports (panel (d)). The blue (red) lines correspond to firms that have the bottom (top) tercile of share of family on the board in the pre-policy period. Variables in panel (a) to (d) are residualized by 5-digit industry dummies. Panels (e) and (f) are life cycle panels where panel (e) plots total sales and panel (f) plots profits across eight five-year age bins. Values are normalized to the youngest bin (5 years) within each group. All data is for the year 2000. *Source:* CMIE Prowess$_{dx}$ and Ministry of Corporate Affairs, Government of India.

involvement, underscoring the significant role of family management in influencing firm size and profitability.

4 Empirical Strategy

The removal of QRs from consumer goods in 1997-2001 offers a unique opportunity to analyze the impact of import competition on firm behavior. First, the reform was product-specific, with India removing QRs on about 3000 products at the 8-digit HS level. The 8-digit HS classification provides a detailed breakdown of traded goods (about 10,000 goods in total). This quasi-experimental variation in exposure to import competition across the product space offers a natural setting for a difference-in-difference identification strategy.

Second, this policy is unusual in its primary focus on final consumer goods. Trade reforms typically affect product markets throughout the production network, influencing both intermediate inputs and final goods. Lowering import costs for intermediate goods directly reduces firm costs and may enhance firm productivity (Amiti and Konings, 2007; Goldberg et al., 2010a; Topalova and Khandelwal, 2011). However, this mechanism plays a limited role in the present case, as the QR removal primarily targeted final consumer goods. This narrower scope of the policy provides a unique opportunity to isolate and identify the impact of a specific *demand* shock—heightened import competition in consumer goods markets—on firm outcomes.

Third, the QR removal was a unilateral trade liberalization policy, granting foreign firms access to the Indian market without reducing export costs for Indian firms. Thus, the policy mainly reflects the effects of import competition, not export incentives.

Fourth, similar to the 1991 trade reform, and as discussed earlier, India's removal of QRs was externally imposed. The timing and scope of this liberalization were determined by the WTO, and critically, the IMF played a decisive role in the process. The IMF's decision to no longer allow India to rely on Article XVIII:B of the GATT was based on a technical assessment of India's external financial position. This assessment concluded that India's foreign exchange reserves were adequate, and the decision was made independently of political or other policy considerations. This externally driven process underscores that the QR removal was not influenced by domestic policy preferences or strategic interests, providing a uniquely exogenous shock for empirical analysis.

Finally, unlike the 1991 trade reforms, which coincided with widespread domestic liberalization, the removal of QRs in the late 1990s and early 2000s occurred in relative isolation, unaccompanied by other major domestic or trade policy changes. This limited scope reduces the likelihood of confounding effects, making it easier to attribute observed changes in firm behavior to the QR removal policy.

To analyze the effects of QR removal, I employ an event study framework at two levels:

1. **Aggregate product level:** To examine how the policy influenced aggregate imports.
2. **Firm level:** To assess how firms adjusted in response to increased import competition.

The aggregate product-level analysis allows me to quantify the policy's direct effect on trade flows. The firm-level analysis investigates its implications for the financial and managerial outcomes of exposed firms. Below, I outline the empirical specifications for each level of analysis.

Product-Level Event Studies To estimate the effect of QR removal on aggregate imports, I use the following event study specification at the product level:

$$y_{pt} = \sum_{k=\underline{T}}^{\bar{T}} \beta_k D_{pt}^k + \delta_p + \lambda_{qt} + \varepsilon_{pt} \tag{1}$$

where y_{pt} is the log import or export value or quantity of an 6-digit HS product p in year t, δ_p are HS-6 digit product fixed effects, and λ_{qt} are 4- digit HS product $\times$ year fixed effects.[10] The inclusion of λ_{qt} means that the β_k coefficients are identified using liberalized and unaffected HS-6 products within HS 4-digit product $\times$ time. Event time dummies D_{pt}^k are defined as $D_{pt}^k := 1\left[t = \tau_p + k\right] \forall k \in (\underline{T}, \overline{T})$ where τ_p is the year in which QRs were removed for product p. The coefficient for the event year $(k = 0)$ is normalized to zero. I set $\underline{T} = -5$ and $\overline{T} = +8$. Standard errors are clustered at the HS-6 digit product level.

The key identification assumption is that, in the absence of the QR removal, products affected by the policy would have followed similar import trends as unaffected products, after accounting for time-invariant differences between 6-digit products and common 4-digit product $\times$ year shocks.

Firm-Level Event Studies. To estimate the impact of the QR-removal policy on firm outcomes, I use an event study approach. The policy was implemented in a staggered manner from 1997 to 2001. All results presented in the next section rely on the estimator

[10] I currently have access to annual trade flow data for India at the 6-digit HS level. a 6-digit HS product is classified as treated if any of its constituent 8-digit products are affected by QR-removal. I am in the process of procuring monthly trade flow data at the 8-digit HS level and plan to update these event studies once the new data becomes available.

of Sun and Abraham (2021). For robustness, I also estimate the event study using a two-way fixed effects specification, which yields similar results (see Appendix **??**). The event study specification is as follows:

$$y_{it} = \sum_{k=\underline{T}}^{\overline{T}} \theta_k D_{it}^k + \delta_i + \lambda_{jt} + \varepsilon_{it}, \tag{2}$$

where y_{it} is an outcome of firm i in accounting year t, δ_i is a firm fixed effect, and λ_{jt} are three-digit industry $\times$ year fixed effects. Therefore, θ_k coefficients are estimated comparing treated and untreated firms within sector $\times$ time.[11] In robustness analysis, I show that the results are similar after controlling for location (state or district) $\times$ year fixed effects and firm size $\times$ year fixed effects. Event time dummies D_{it}^k are defined as follows. $D_{it}^k := \mathbb{1}[t = \tau_i + k] \forall k \in (\underline{T}, \overline{T}), D_{it}^{\overline{T}} = \mathbb{1}\left[t \geqslant \tau_i + \overline{T}\right]$, and $D_{it}^{\underline{T}} = \mathbb{1}\left[t \leqslant \tau_i + \underline{T}\right]$, where $\mathbb{1}[.]$ is the indicator function and τ_i is the year in which QRs are removed on the highest-revenue product of firm i. ε_{it} is an error term. I normalize $\theta_0 = 0$ and set $\underline{T} = -5$ and $\overline{T} = +8$. Standard errors are clustered at the three-digit industry $\times$ year level.

The key identification assumption for estimating θ_k is that, in the absence of the QR removal, firms operating in product markets exposed to import competition would have followed similar trends in outcome variables as firms in unaffected sectors. This implies that the latter serve as a reasonable counterfactual for the treated firms after accounting for time-invariant differences between firms and common 3-digit industry $\times$ year shocks.

5 Results

In this section, I first examine the impact of the QR-removal policy on product-level trade flows into India. After establishing that the policy significantly increased imports of liberalized products, I then analyze its effects on the financial and managerial behavior of manufacturing firms in India.

5.1 Impact of QR Removal on Aggregate Imports

Figure 4 presents event-study estimates from Equation (1), capturing how products exposed to the removal of QRs differed from unaffected products in terms of import and

[11] I am able to include three-digit sector $\times$ year fixed effects because the QR-removal policy was implemented at the more granular 8-digit HS code level. This ensures that within each three-digit sector, exposure to the policy varies across products, allowing for the inclusion of sector-level time controls without absorbing the treatment effect.

export outcomes. Panels (a) and (b) illustrate a substantial and persistent increase in both the value and the quantity of imports for the treated products. Notably, by the third year following QR removal, the import value of these products exceeds that of the control group by over 50 percent (panel (a)). The import value of treated products remains high through the eighth year after the reform, highlighting the persistence of the policy's effect. The impact on import quantities (panel (b)) follows a similar trajectory but is even more pronounced in magnitude, with the treated products reaching an increase of roughly 1 log point (over 150 percent) compared to the control group.

The stability of pre-trend coefficients suggests that treated and untreated products followed comparable trajectories before the reform. Moreover, the inclusion of HS-4 digit product $\times$ year fixed effects (where HS-4 is a broader product classification than HS-6) ensures that any time-varying shocks at the HS-4 digit level do not drive the results. Thus, the post-reform divergence in imports can be credibly attributed to the removal of quantitative restrictions.

The bottom panels confirm that the policy had little to no discernible effect on exports of the same set of products. This is precisely what one would expect from a reform that exclusively liberalized India's domestic market for foreign producers without granting any reciprocal benefits to Indian exporters. The absence of a parallel export response underscores the unilateral nature of the policy: it primarily heightened competition from foreign producers for Indian firms, without materially altering Indian firms' access to foreign markets. The divergence between imports (which rise sharply and persist) and exports (which remain unchanged) helps rule out alternative explanations related to changes in export opportunities.

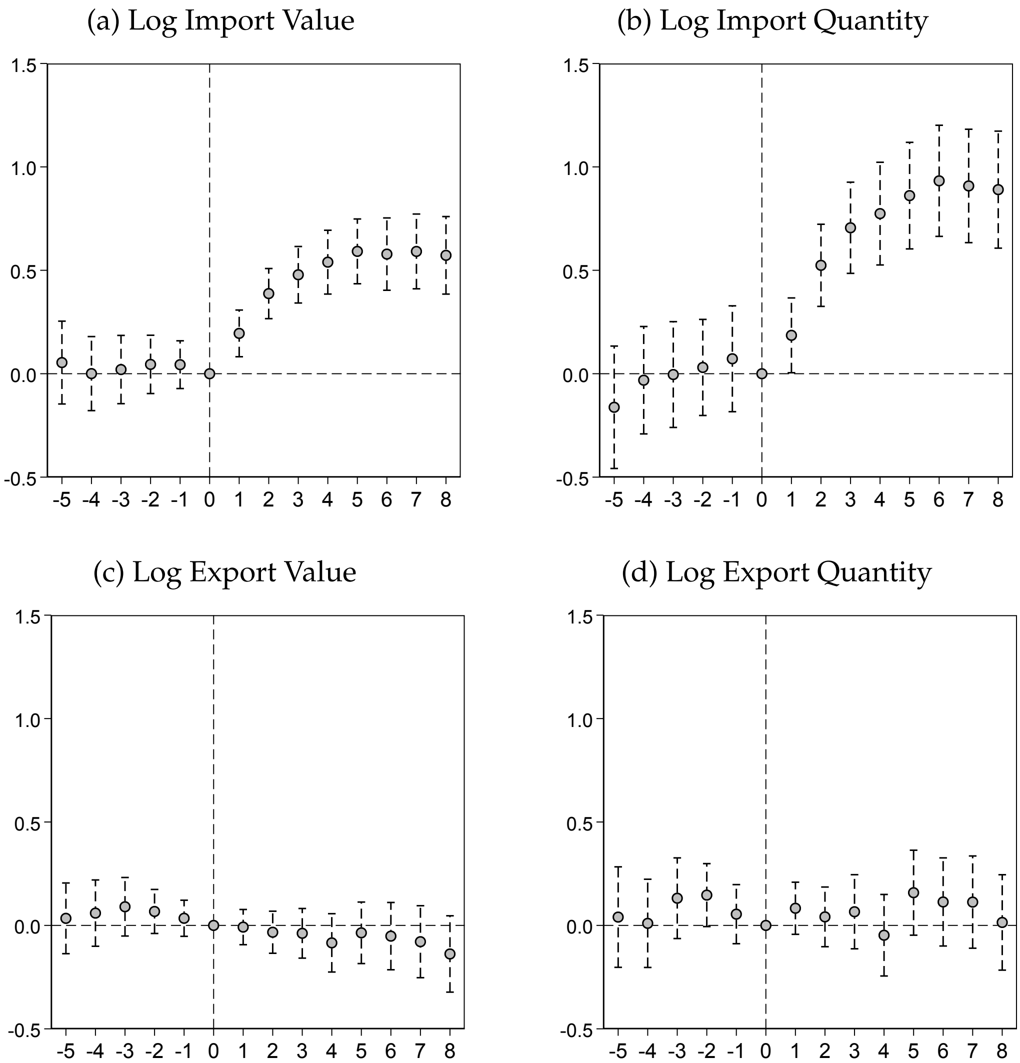
These findings confirm that the removal of QRs substantially intensified import competition in India. Having established the surge in imports at the product level, I now turn to examining how firms responded to this heightened competition. Specifically, I employ an event-study framework comparing firms that produce goods affected by QR removal against firms whose product portfolio remained unaffected, enabling me to isolate the causal impact of import competition on firms' financial and managerial outcomes.

5.2 Impact on Firm Size and Financial Performance

Figure 5 presents event-study estimates from Equation (2), offering a 360-degree view of how intensified import competition influences key dimensions of firm size and financial performance. The panels cover firm revenues, costs, and capital structure, allowing us to trace the broad impact of foreign competition on domestic firms.

This first panel shows a substantial decline in total revenue for firms exposed to QR

Figure 4: Value and Quantity of Imports Increase after QR Removal with No Impact on Exports



Notes: The figure presents β_k event study coefficients from Equation (1) using the Sun and Abraham (2021) estimator on annual HS-6 digit product-level panel data on imports and exports. The coefficients plotted correspond to Table **??**, columns (1)-(4). The dependent variables are log import value (panel (a)), log import quantity (panel (b)), log export value (panel (c)), and log export quantity (panel (d)). An HS-6 digit product is identified as treated if QRs were removed from any of its constituent HS-8 digit products. β_0, the coefficient corresponding to the year in which QRs were removed, is normalized to zero. The policy is staggered from 1997 to 2001, with the x-axis denoting years relative to the event. All regressions include HS-6 digit product fixed effects and HS-4 digit product $\times$ year fixed effects. Standard errors are clustered by HS-6 digit product. The vertical lines are the 95 percent confidence intervals. *Source:* CMIE Trade$_{dx}$ and archives of the Ministry of Commerce, Government of India.

removal, relative to unaffected firms. By the third year following the policy change, treated firms' revenues fell by approximately 20 percent compared with the control-group firms. The gap widens further in subsequent years: by the eighth year, revenues of treated firms are almost 50 percent lower than those of the control group. This pronounced and persistent decrease underscores the depth of the import-competition shock. In panel (b), I examine the operating profit-to-revenue ratio, which captures how effectively firms convert sales into operating profits. This ratio declines by about 0.04 for treated firms, equivalent to nearly halving the pre-policy average among control group firms of 0.09. Such a drop highlights that competitive pressures not only reduce overall revenue but also compress margins.

Turning to labor-related expenditures, panel (c) shows that the total wage bill experiences a decline comparable in magnitude to the drop in total sales. The effects manifest soon after the policy takes effect and persist through the eighth year. The protracted nature of this decline suggests that firms engage in sustained cost-cutting on labor, likely in response to shrinking market share and profitability. Expenditure on raw materials (panel (d)) also follows a downward trajectory, decreasing by as much as 30 percent by the eighth year. This reduction is consistent with firms scaling back production and operations in the face of heightened import competition, using fewer inputs in line with reduced output and sales.

The bottom two panels show changes in firms' capital structure. Panel (e) illustrates a substantial and growing decline in the total assets of treated firms. By the third year, assets are around 10 percent lower relative to the control group, and this disparity accelerates over time. By year eight, the total assets of treated firms have fallen by almost 30 percent compared with their unaffected counterparts. This pattern points to a long-term contraction in capacity, possibly due to underutilized assets, disinvestment, or an inability to generate sufficient cash flow to sustain capital stocks. Finally, panel (f) examines total firm borrowings. Unlike other indicators, borrowing remains relatively stable in the early years post-reform but eventually declines to around 25 percent below the level of control-group firms.

Figure 5 also helps confirm the lack of pre-trends in the outcome variables. Pre-policy event-study coefficients are insignificant and close to zero.

Overall, these results demonstrate that the QR-removal policy delivered a substantial negative shock to Indian firms' operations and balance sheets. As foreign products entered the domestic market at scale, many Indian firms struggled to protect their revenue base and profit margins, leading to cutbacks in labor, materials, and capital. These patterns remain very similar when conditioning on a survivor panel (Figure **??** in Appendix **??**), indicating that the intensive-margin effects are not mechanically driven by firm exits. In the next subsection, I formally examine exit dynamics and implement Lee (2009) bounds to address potential concerns about selection.

Firm Exit. I next turn to the extensive margin of firm adjustment, firm exit. Measuring firm exit poses a challenge. Although, CMIE Prowess is very detailed in its coverage of financial and product scope data, it was never designed to track firm entry and exit. A company disappears from the panel as soon as CMIE fails to source its annual report, so attrition conflates true firm exit with more mundane lapses of data recording. Several papers therefore warn against treating raw Prowess attrition as exit (Goldberg et al., 2010a; Topalova and Khandelwal, 2011; DeLoecker et al., 2016).

To overcome this limitation, I match Prowess firms with firms in the Ministry of Corporate Affairs (MCA) registry, using a 23-digit unique firm identification code called the Company Identification Number (CIN). The CIN is issued to all firms registered under the Indian Companies Act (1956) and Prowess reports the CIN for all firms. Every firm that vanishes from Prowess between 2000-2022 is matched to its MCA record in 2021 (the earliest year in which I have access to the MCA registry). I define an indicator $Exit_i$ for firm i, which equals 1 only when the firm both drops out of Prowess and is shown in MCA as struck off, liquidated, dissolved, amalgamated, or otherwise non-filing. All other cases, including "missing" but still-active firmsenter as zeros. This allows me to test whether there is higher exit in the long run (2000-2022) in product markets that were exposed to QR-removal as compared to the control group.

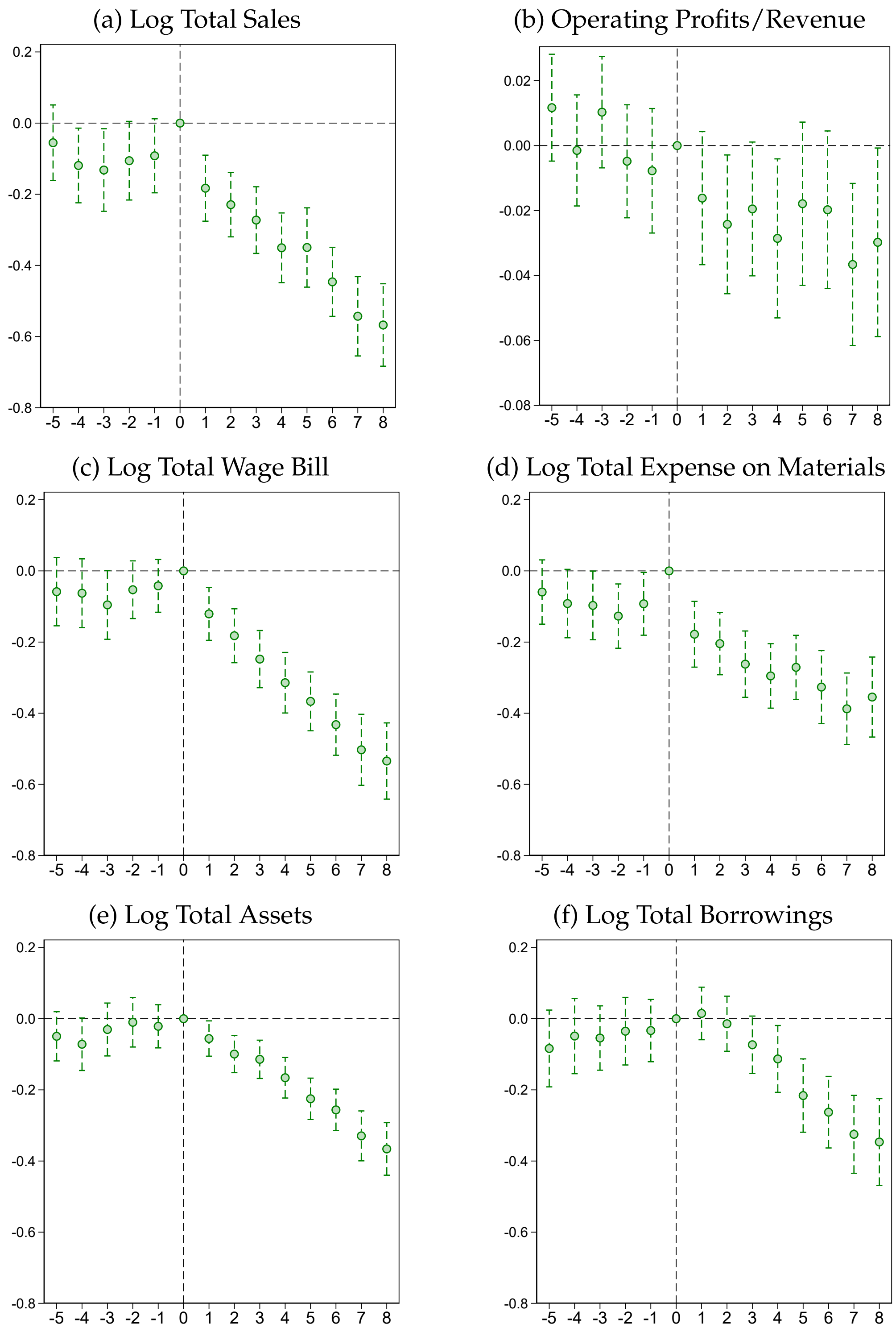
A cross-sectional Poisson regression of $Exit_i$ on the treatment dummy, controlling for firm age reveals sizable effects of QR-removal on firm exit. Treated sectors face 15-20 percent higher verified exit probabilities, confirming that the contractions documented earlier manifest into extensive-margin churn when competition bites. This result is robust to controlling for various fixed effects such as listed-status, three-digit industry, state, and industry-by-state fixed effects.

In the next section, I explore how firms adapt organizationally in the face of this heightened competition, focusing on the turnover of top managerial positions, particularly among family-run firms that opt to bring in professional outside managers.[12]

To address the concern that higher exit in treated markets may mechanically bias post-reform estimates among survivors, I implement Lee (2009) bounds. The idea is to equalize selection (survival) rates across treated and control groups and then compute best- and worst-case treatment effects. Concretely, using my preferred specification in

[12]Figure **??** in Appendix **??** reproduces the event study estimates in Figure 5 for family firms (i.e. firms that have at least two board members from the founder's family). Out of about 5,000 total firms in the sample, almost half of the firms meet this criteria. The results are qualitatively similar to results presented for the whole sample in Figure 5.

Figure 5: Domestic Firms Contract after QR Removal



Notes: The figure plots the estimated θ_k event study coefficients from a regression of the form given in (2), estimated using the Sun and Abraham (2021) estimator. The coefficients correspond to those in Table **??**, columns (1)-(6). The dependent variables are: log total sales (panel (a)), operating profits/revenue (panel (b)), log total compensation (panel (c)), log total expense on raw materials (panel (d)), log total assets (panel (e)), and log total borrowings (panel (f)). A firm is identified as treated in a year if QRs were removed on its highest-revenue product. θ_0, the coefficient for the year in which QRs were removed, is normalized to zero. The event is staggered from 1997 to 2001, with the x-axis denoting years relative to the event. All regressions include firm and three-digit industry $\times$ year fixed effects. Standard errors are clustered at three-digit industry $\times$ year level. The vertical lines are the 95 percent confidence intervals.
Source: CMIE Prowess$_{dx}$ and archives of the Ministry of Commerce, Government of India.

Table 3: Higher Firm Exit in Treated Sectors in the Long Run

	(1)	(2)	(3)	(4)	(5)
Treated	0.20***	0.16**	0.15**	0.15**	0.17**
	(0.062)	(0.067)	(0.068)	(0.073)	(0.070)
Age	Yes	Yes	Yes	Yes	Yes
Listed FE	Yes	Yes	Yes	No	Yes
Industry FE	No	Yes	Yes	No	No
State FE	No	No	Yes	No	No
Industry x State FE	No	No	No	Yes	Yes
Number of Firms	5,008	4,980	4,963	4,081	4,081

Notes: The table reports coefficient estimates from firm-level Poisson regressions of a verified exit indicator on a treatment dummy. The regression specification is $\mathsf{Exit}_i = \beta_1 \mathsf{Treated}_i + \gamma \mathsf{Age}_i + \alpha_{\ell(i)} + \lambda_{j(i)} + \delta_{s(i)} + \psi_{j(i)\times s(i)} + \varepsilon_i$, where Age_i is firm age in years; $\alpha_{\ell(i)}$ are listed-status fixed effects; $\lambda_{j(i)}$ are three-digit NIC-2008 industry fixed effects; $\delta_{s(i)}$ are state fixed effects; and $\psi_{j(i)\times s(i)}$ are industry-by-state fixed effects. The dependent variable, $\mathsf{Exit}_i = 1$ if (i) the firm disappears from the CMIE PROWESS database *and* (ii) a one-to-one match with the Ministry of Corporate Affairs (MCA) registry confirms that the company has been struck off, liquidated, dissolved, amalgamated, or otherwise ceased to file statutory returns. It is set to 0 for all other observations, including firms that drop out of PROWESS but remain active in MCA data. *Key regressor*. Treated equals 1 for firm *i* if QRs are removed on its highest-revenue product and zero otherwise. Columns (1)(5) progressively add the fixed effects as indicated in the table, while firm age is included in every specification. Robust standard errors clustered at the five-digit industry level are reported in parentheses. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively. "Number of Firms" refers to unique firms in each regression. Sources: CMIE Prowess, administrative data from the Ministry of Corporate Affairs, Government of India and archives of the Ministry of Commerce, Government of India.

Table 3, column (3), treated sectors have roughly 15 percent higher verified exit; I therefore trim 15 percent of the control group (the higher-survival group) and re-estimate event-study coefficients on the trimmed samples. For example, for the upper bound of the treatment effect on firm revenues, I trim the lowest-revenue control survivors in each event time; for the lower bound, I trim the highest-revenue control survivors. This exercise delivers, respectively, the most and least favorable estimates consistent with monotone selection (treatment weakly increases exit). The resulting bound paths for selected key outcome variables are plotted in Figure **??**. The blue and red shaded regions reflect the 95 percent confidence interval bands for the upper and lower bound of the treatment effect respectively. While results are only shwown fof firm revenues, across all panels of Figure 5, profit margins, wage bill, materials, assets, and borrowings, the bounded coefficients follow the same post-reform trajectory as the baseline and remain economically large, confirming that the contractions are not an artifact of differential attrition among treated firms. This implementation follows the practical "manual trimming" approach used by McKenzie (2017) to handle attrition.

5.3 Impact of QR Removal on Firm Management

As established in the previous section, the removal of QRs imposed a significant negative shock on the financial health of exposed firms. A natural question follows: what organizational actions did these firms undertake to mitigate the shock? In this paper, I focus specifically on top-management changes, motivated by both theoretical considerations and the empirical regularities documented in the corporate governance and organizational economics literature.

A large body of research demonstrates that negative shocks to profitability and poor firm performance often precipitate forced or voluntary departures of top executives (Jenter and Kanaan, 2015; Kaplan and Minton, 2011; Parrino, 1997). However, the mechanism of managerial restructuring in the context of family-owned or family-controlled firms differs in a critical way from standard CEO or executive turnover models. In many developing economies, including India, family members frequently occupy the most senior positions such as CEO, CFO, or Managing Director, irrespective of whether they are the best-qualified individuals to navigate competitive challenges. Such arrangements may be beneficial when family managers possess significant firm-specific knowledge or when they help maintain continuity and trust. Yet, when adverse market shocks arisein this case, heightened import competitionthese same family-oriented hiring practices can become a liability.

Faced with a substantial erosion of profitability and revenue, domestically owned family firms may find themselves compelled to reassess the merit of keeping family members in top-level posts. Replacing family managers with external professionals can bring fresh expertise, more experience, access to wider networks, strategic thinking, and managerial skills that are often critical for adapting to intensified competitive pressures. In this study, I capture this phenomenon by looking beyond the traditional turnover measures (e.g., whether the CEO or CFO changes) and instead examining the extent of family involvement in senior management positions and the executive board of directors.

Figure 6 illustrates these organizational responses and shows how family firms respond to increased import competition by altering the composition of their executive boards. In panel (a), the dependent variable is the *share* of family members on the board, which has a pre-shock control-group mean of 0.60. By the third year after QR removal, this share declines by about 5 to 6 percentage points, widening to roughly 8 percentage points by the eighth year. In relative terms, these coefficients represent a substantial reduction of about 15 percent in the fraction of family executives at the top.

Panel (b) zooms in on which firms are *most likely* to shed family managers by comparing the bottom tercile of pre-policy productivity (red circles) to the rest of the sample (gray triangles).[13] The figure reveals that *almost all* of the reduction in the share of family members in top managerial roles is driven by firms that were relatively *less productive* before the QR removal. Indeed, these bottom-tercile firms show a pronounced and persistent decline in family share, while higher-productivity firms display little to no change. By the fourth year after QR removal, the share of top family managers in ex-ante declined by about 15 percentage points, almost three times as high as the overall impact for all firms in panel (a). Higher productivity firms showed no such change in their management structure. This pattern implies that the decision to replace family managers with external professionals is more prevalent and extensive among firms that were initially weaker performers. Such selection into professionalization highlights a mechanism through which less-competitive firms may attempt to bolster their managerial capabilities when faced with heightened import competition. As elaborated in Section 6, this finding forms a core basis of my theoretical framework: those firms most in need of improving their productivity are the ones most likely to seek outside talent.

Panels (c) and (d) split the churn in top management into family and non-family managers. Before the shock, the average family firm in the control group had 1.3 family members on its executive board, compared to 0.5 non-family managers. After QR removal, the number of family managers steadily drops, culminating in a decrease of roughly 0.2 by the end of the sample window. Notably, panel (d) shows a nearly

[13] Firm productivity is estimated using the method proposed in Petrin and Levinsohn (2012).

mirror-image increase in non-family professionals over the same horizon, pointing to a one-to-one replacement effect. In other words, for every family manager who exits, almost exactly one external professional is joining the board.

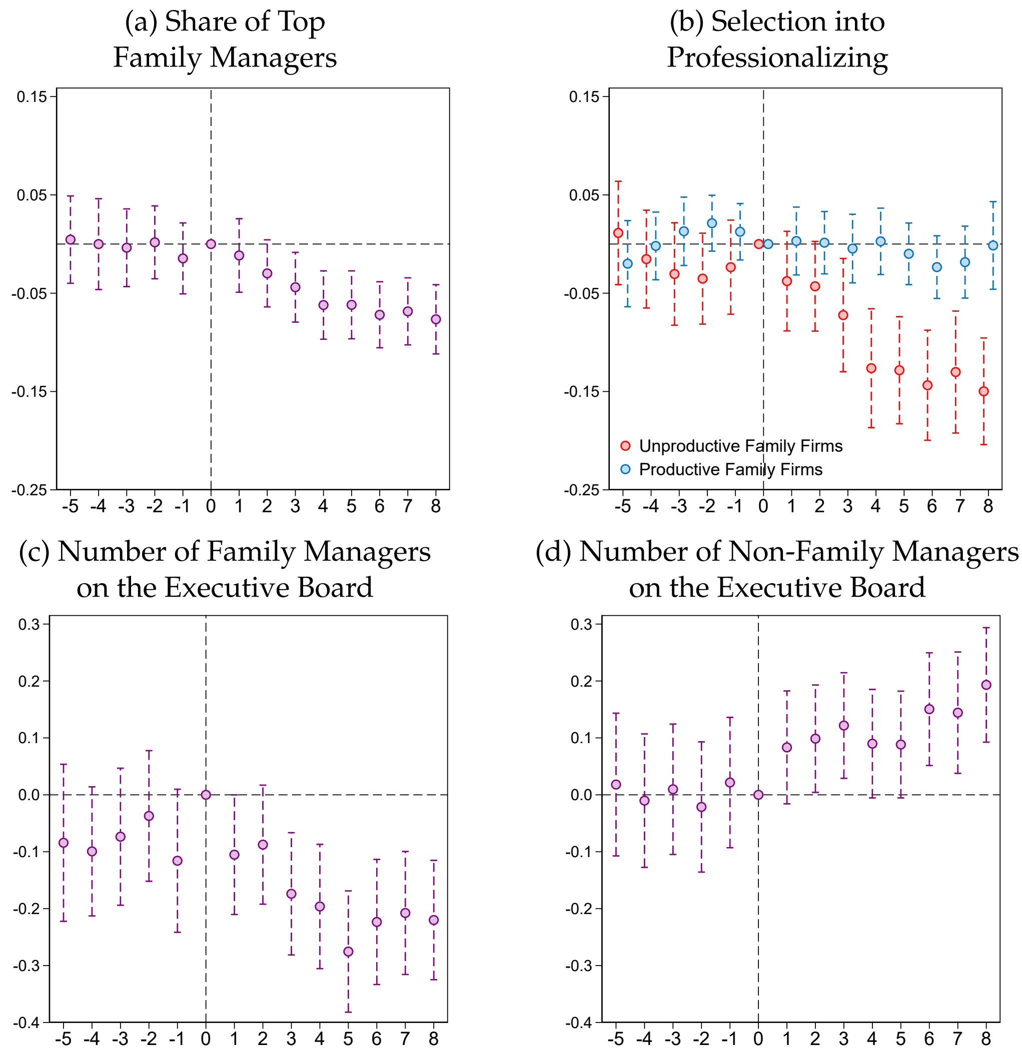
To confirm that these results are not driven by differential exit in the treatment and control groups, Figure **??**, panel (b) shows that even the conservative Lee (2009) lower-bound estimates remain negative and sizable, while the upper bound is more negative. This confirms that the managerial reorganization documented above is not driven by selective attrition but reflects within-firm changes in management and governance.

Taken together, these event-study results suggest that, under heightened competitive pressure, family-controlled firms do not simply shed family executives. Rather, they actively seek outside managerial talent to fill vacated positions, reconfiguring the firm's top hierarchy. To the best of my knowledge, this is the first study to show that globalization can trigger deeper changes in organizational structure within firms. An important point of comparison is Chen and Steinwender (2021), which studies how managers, particularly in family firms exert more effort in response to import competition. My focus is different in that I link a negative trade shock to the *composition* of senior management within the firm.

Such trade-induced change in corporate culture can be important, particularly in the context of developing countries where family-run firms and business groups are pervasive. As highlighted by recent work (Bloom and Van Reenen, 2007; Caliendo and Rossi-Hansberg, 2012; Akcigit et al., 2021), tight family control can constrain a firm's ability to adjust organizational layers or recruit external talent, potentially limiting the firm's capacity to respond effectively to competitive pressures. Bloom et al. (2013) identify weak competitive pressure (for instance, due to protection from imports) and the predominance of family members in top management as major impediments to adopting effective management practicespractices that, in turn, can substantially boost firm performance. By showing that intensified import competition motivates family-owned firms to replace family managers with outside professionals, this paper offers fresh insights into how greater trade openness can reshape a firm's internal governance structure.

These results also speak to broader debates on whether business groups and family ownership in emerging markets facilitate or hinder growth. While such organizational forms may help mitigate imperfect capital markets or reputational frictions (Khanna and Yafeh, 2007), they can also exhibit weaker corporate governance, such as tunneling or underinvestment (Bertrand et al., 2002; Bertrand and Schoar, 2006). The evidence presented here suggests that, when faced with an exogenous shock such as the removal of QRs, family-controlled firms do not necessarily remain locked into poten-

Figure 6: Firms Reduce Family Members on the Executive Board of Directors after the QR Shock



Notes: The figure plots the estimated θ_k event study coefficients from a regression of the form given in (2) and estimated using the Sun and Abraham (2021) estimator. The coefficients correspond to those in Table **??**, columns (1)-(3). The dependent variables are: the share of family members on the executive board of directors of a firm (i.e., top management positions like CEO, CFO, MD, etc.) in panels (a) and (b), the number of family members on the executive board of directors in panel (c) and the number of non-family professionals on the executive board of directors in panel (d). In panel (b), I examine selection into professionalizing by comparing firms based on their pre-policy productivity. Firms are divided into two mutually exclusive groups: first are firms that are in the bottom tercile of pre-policy productivity (shown in red) and second are all remaining firms (shown in blue). A firm is identified as treated in a year if QRs are removed on its highest-revenue product. θ_0, the coefficient for the year in which QRs were removed, is normalized to zero. The event is staggered from 1997 to 2001, with the x-axis labels denoting years relative to the event. All regressions include firm and three-digit industry $\times$ year fixed effects. Standard errors are clustered at three-digit industry $\times$ year level. The vertical lines are the 95 percent confidence intervals. *Source:* CMIE Prowess$_{dx}$, administrative data from the Ministry of Corporate Affairs, Government of India, and archives of the Ministry of Commerce, Government of India.

tially suboptimal leadership arrangements. Instead, they appear capable of adopting professional management structures to enhance competitiveness. Thus, the dismantling of protective barriers in India reveals how trade liberalization can catalyze deeper organizational changes, prompting even family-based firms to reconfigure their top management in pursuit of higher productivity and improved performance.

A natural question arising from the preceding analysis is: what are the implications of this push toward professionalization for firm productivity? In the following section, I explore this issue in greater detail.

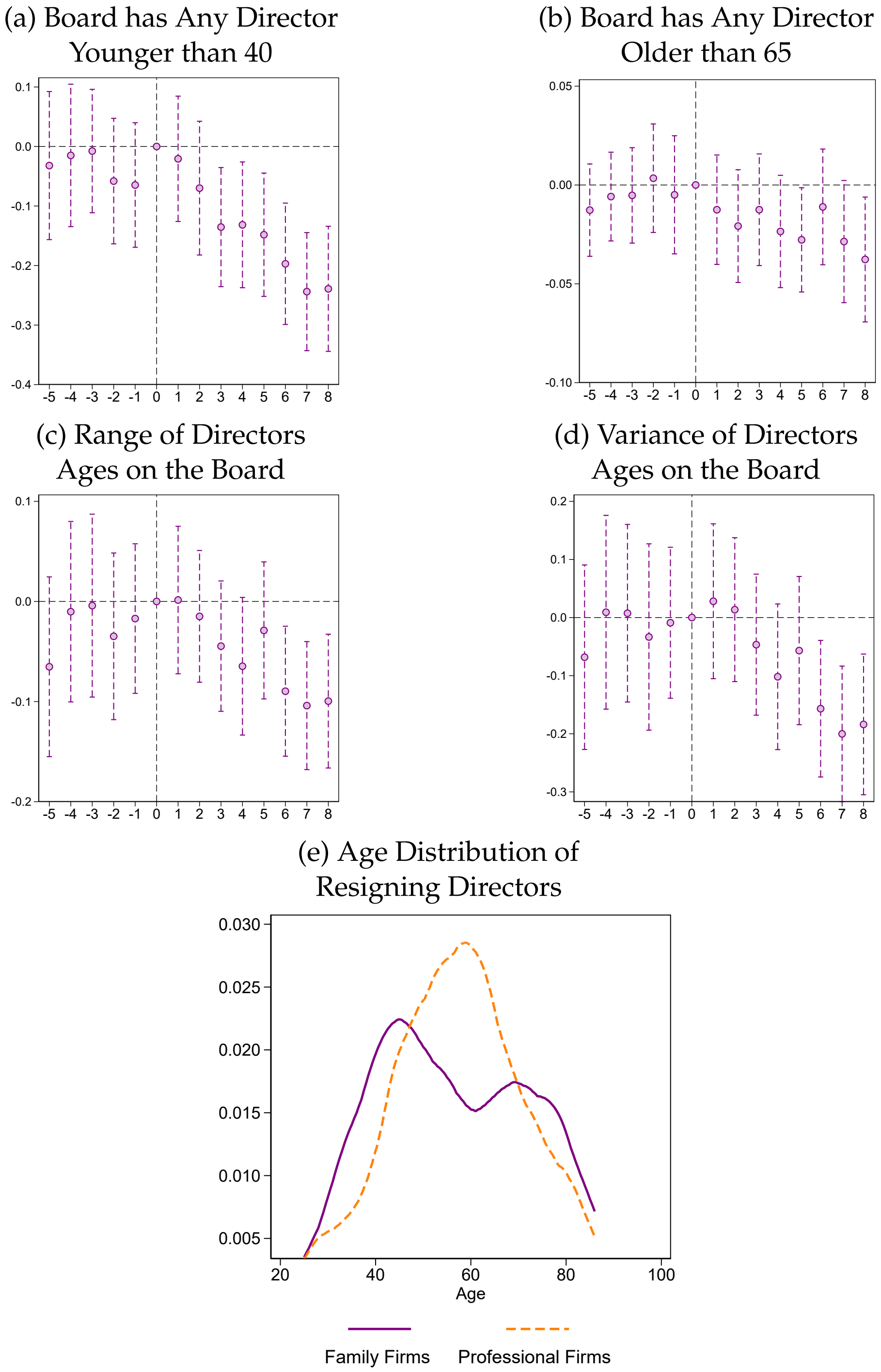
5.4 Impact of QR Removal on the Age Structure of Company Directors

After documenting in Figure 6 that firms rebalance their executive boards away from family members and toward outside professionals, Figure 7 turns to the entire board of directors and asks *who* exactly is moving. It is the board that ultimately sets oversight, appointments, and strategy, so it is the right level at which to assess governance upgrading. A simple way to see professionalization on the full board is to look at age at the extremes, the young "dynastic apprentices" placed very early in their careers and the old entrenched patriarchs who linger long after their prime. Panel (a) shows that following the QR removal, the probability a firm has any director younger than 40 falls sharply by roughly a quarter relative to the pre-policy baseline. Panel (b) shows a corresponding decline in the probability of any director older than 65, albeit much smaller magnitude and noisier.

Because both tails thin out, second moments compress. Panels (c) and (d) show that both the within-firm age range and variance on the board contract meaningfully post-reform. This is exactly what we would expect if trade pressure trims the young boardroom scions and phases out the emeritus patriarchs, making the age structure of the boards converge toward a tighter, more professiona5lly typical age profile.

Panel (e) corroborates these findings by focusing on the age distribution of resigning directors in treated firms after the policy.The age distribution of resigning directors in family firms is distinctly bimodal, a spike among the very young and another among the very old, whereas in professional firms it looks much closer to a unimodal, bell-shaped profile. This pattern lines up neatly with the mechanism: import competition induces family firms to clear out both the junior scions and the long-tenured patriarchs, while professionally run firms, already staffed from the market, show no such two-hump churn.

Figure 7: Import Competition Prunes Board Age Extremes and Compresses Age Dispersion



Notes: Panels (a) to (d) of this figure plot the estimated θ_k event study coefficients from a regression of the form given in (2) and estimated using the Sun and Abraham (2021) estimator. The dependent variables are: an indicator equal to one if the board has any director younger than 40 years (panel (a)) or older than 65 years (panel(b)), the range of directors ages on the board in panel (c), and the variance of directors ages on the board in panel (d). θ_0, the coefficient for the year in which QRs were removed, is normalized to zero. The event is staggered from 1997 to 2001, with the x-axis labels denoting years relative to the event. All regressions include firm and three-digit industry $\times$ year fixed effects. Standard errors are clustered at the three-digit industry $\times$ year level. The vertical lines are the 95 percent confidence intervals. Panel (e) shows kernel density estimates of the age distribution of directors who resign from treated firms after the QR removal policy. The solid line representing family directors and the dashed line representing professional directors. *Source:* CMIE Prowess$_{dx}$, administrative data from the Ministry of Corporate Affairs, Government of India, and archives of the Ministry of Commerce, Government of India.

5.5 The Impact of Professionalizing Management: Suggestive Evidence

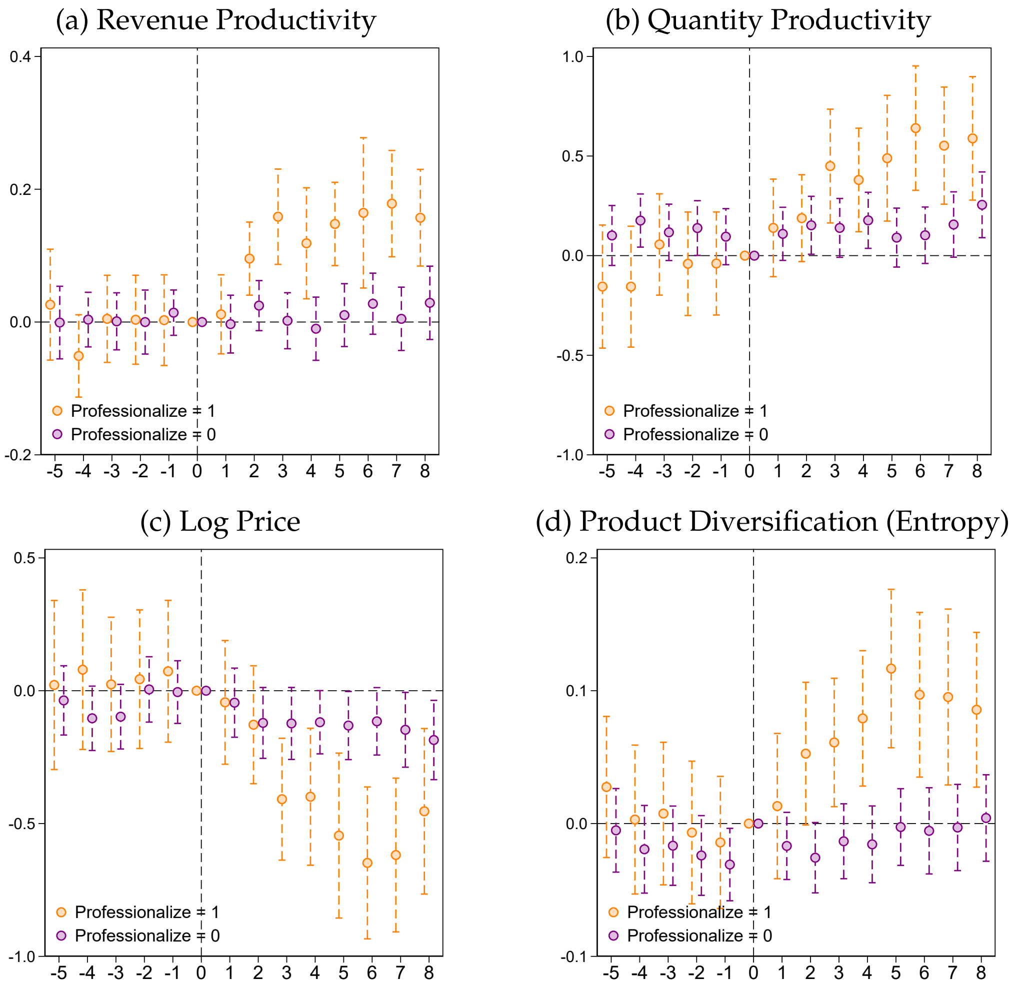
Figure 8 offers indicative evidence that family-controlled firms that *professionalized* their top management—by reducing the share of family members in senior executive roles—enjoyed a greater post-reform boost in productivity relative to those that did not. I classify a firm as having professionalized if its share of family top managers declined between the pre-policy period and the end of the sample window (i.e., by $t = 8$ for the last-treated cohort). Figure 8 presents the event-study estimates from equation 2 separately for each group, focusing on productivity and prices.

Panels (a) and (b) in Figure 8 depict the evolution of two productivity measures, TFPR and TFPQ (both estimated following Petrin and Levinsohn 2012). For *professionalizing* firms (in red), both TFPR and TFPQ begin to diverge positively from zero in the first or second year following the policy and continue rising thereafter. By contrast, firms that retain family managers (in gray) show little change in either TFPR or TFPQ. Within about five to six years post-reform, TFPR for professionalizing firms lies roughly 20-30 percentage points above that of firms retaining family-dominated management, suggesting that the decision to bring in non-family managers may have facilitated substantial efficiency gains.

It is useful to clarify the relationship between these results and the selection into professionalization result in panel (b) of Figure 6. Figure 6 illustrates that firms selecting into professionalization are predominantly those in the lowest tercile of pre-reform productivity, suggesting a negative selection mechanism. Subsequently, Figure 8 shows that these professionalizing firms exhibit productivity gains. One might mistakenly attribute these gains to simple mean reversion, given that the professionalizing firms are initially less productive. However, the regression specification underlying Figure 8 includes firm fixed effects, which fully absorb any baseline (pre-policy) productivity level differences between firms that professionalize and those that do not. Consequently, what Figure 8 captures is exclusively the differential productivity trajectories (parallel trends in the pre-policy period followed by divergence in the post-policy period) between firms that professionalize and those that do not, rather than a mere reversion of initially low-productivity firms to a higher mean productivity.

Panel (c) of Figure 8 shows the trajectory of average log prices, defined as the total value of a firm's output divided by the total quantity produced. Among professionalizing firms, prices drop notably after the reform, stabilizing at about 0.5 to 0.6 log points below pre-policy levels. By contrast, the non-professionalizing group exhibits minimal price adjustment. One interpretation is that firms with new (outside) management either implemented efficiency and cost-cutting measures that enabled price

Figure 8: Increase in Productivity as Firms Shed Family Members after QR Removal



Notes: This figure presents the estimated θ_k event study coefficients from a regression specified in equation (2) and estimated using the Sun and Abraham (2021) estimator. The dependent variables are revenue productivity (TFPR) (panel (a)), quantity productivity (TFPQ) (panel (b)), and log price (panel (c)) and product diversification in panel (d)). TFPR and TFPQ are estimated using the method proposed in Petrin and Levinsohn (2012). Log price is defined as the ratio of a firm's total value of products produced and the total quantity of products produced. Product diversification is measured using an entropy measure based on Bernard et al. (2011); Baldwin and Gu (2009). Entropy is calculated as $\sum_k s_{ikt} \ln(s_{ikt})$, where s_{ikt} represents the revenue share of product k for firm i in year t. Event studies are conducted separately for firms that professionalized their management after QR removal (in orange) and those that did not (in purple). I classify a firm as having professionalized if its share of family top managers declined between the pre-policy period and the end of the sample window (i.e., by $t = 8$ for the last-treated cohort). A firm is classified as treated in a year if QRs are removed on its highest-revenue product. θ_0, the coefficient for the year in which QRs were removed, is normalized to zero. The event is staggered from 1997 to 2001, with the x-axis indicating years relative to the event. All regressions include firm and three-digit industry $\times$ year fixed effects. Standard errors are clustered at three-digit industry $\times$ year level. The vertical lines represent 95 percent confidence intervals. *Source:* CMIE Prowess$_{dx}$, administrative data from the Ministry of Corporate Affairs, Government of India, and archives of the Ministry of Commerce, Government of India.

reductions or shifted toward lower-price varieties. This differential change in prices is a key reason for the much larger impact on TFPQ as compared to TFPR in the preceding two panels.

Panels (d) sheds additional light on how these reorganizing firms adjusted their product portfolios. Panel (d) plots an entropy-based measure of product diversification (following Bernard et al. 2011 and Baldwin and Gu 2009). Professionalizing firms exhibit higher product concentration relative to firms that do not professionalize their management. Thus, firms reallocate resources in ways that yield a more concentrated revenue distribution across their product lines, suggesting that in times of higher import competition, firms are forced to focus on their core competencies as in (Bernard et al., 2011) .

Overall, these patterns are consistent with the notion that heightened import competition catalyzes a deeper reorganization in firms that actively replace family managers with professional outsiders. The evidence in Figure 8 is inherently suggestive. Firms self-select into professionalization, and not all organizational changes may be captured. Some firms may have other unobserved advantages (e.g., more liquid credit lines, and stronger networks) that facilitate the hiring of external managers. These hidden characteristics could shape both the likelihood of professionalizing and subsequent performance improvements. Firms may also adapt in ways other than changing their top management, e.g., changes in mid-level managerial layers, shifts in organizational culture, etc. Nevertheless, the event study results highlight two important themes. First, top-management turnover can be a critical margin of adjustment in response to negative trade shocks. Second, in family-run firms, bringing in external managerial talent appears to correlate with enhanced productivity performance.

Falsification Test: No Productivity Change in Firms Already Professionalized. To verify that the productivity gains documented in Figure 8 are driven by the replacement of family managersrather than by alternative channels activated by the trade shock, I examine the productivity of firms that had *already* professionalized their top management before the policy. If the improvements in Figure 8 were instead caused by trade-related forces unrelated to managerial quality, comparable gains should also appear among these baseline professional firms.

Table **??** in Appendix **??** reports difference-in-differences estimates for two mutually exclusive groups: *(i) Baseline family firms*, which had at least two family members on the executive board in the pre-policy period, and *(ii) Baseline professional firms*, which had no family members on the executive board. Consistent with the managerial-quality channel, baseline professional firms exhibit coefficients that are small, negative, and statistically insignificant for both TFPQ and TFPR. By contrast, baseline family firms display positive and statistically significant gains in both measures.

The magnitudes for family firms in Table **??** are smaller than those in panels (a) and (b) of Figure 8 because the table includes *all* family firms, i.e., those that maintain family management and those that later professionalize, while Figure 8 focuses exclusively on the subset that *does* professionalize after the reform.

Robustness to Differential Attrition. Finally, I show that the productivity results are robust to the same Lee-bounds exercise. Using the same trimming share (15 percent) implied by Table 3, column (3), I recompute the productivity event studies. In Figure **??**, panels (c)(d) (quantity and revenue productivity), the lower-bound (red) estimates remain positive and sizable throughout the post-period, while the upper-bound (blue) estimates are larger, implying that even under the most adverse selection consistent with Lee's monotonicity assumption, surviving treated firms become more productive relative to controls. Hence, within-firm productivity gains documented in this section are not driven by selection induced by higher exit in treated markets.

6 Theoretical Framework

I consider an economy with one sector with monopolistic competition. Firms are heterogeneous in productivity and produce a unique variety indexed by i. The final good output, Y, is a CES aggregate of all intermediate varieties:

$$Y = \left(\sum_{i=1}^{N} y_i^{\frac{\sigma-1}{\sigma}} \right)^{\frac{\sigma}{\sigma-1}} .$$

where $\sigma > 1$ is the elasticity of substitution and N is the total number of varieties.

The aggregate price index is defined as $P \equiv \left(\sum_{i=1}^{N} p_i^{\frac{\sigma-1}{\sigma}} \right)^{\frac{\sigma}{\sigma-1}}$, where p_i is the price charged by the firm producing variety i. Cost minimization implies that the demand for variety i is given by

$$y_i = Y P^{\sigma} p_i^{-\sigma}. \tag{3}$$

Firm Entry, Management, and Firm Productivity. In this economy all firms start as family firms.[14] Each firm has the choice to professionalize firm management by hiring

[14]While incorporating a firm, entrepreneurs, particularly in developing countries, often rely on social networks such as family, religion, caste, and geography, to manage their firm. There are many reasons for this, for e.g., trust among family members may substitute for weak legal institutions and contract enforcement in developing countries (Bertrand and Schoar, 2006; Burkart et al., 2003).

unrelated executives. The trade-offs associated with this choice are discussed below.

Firms pay a fixed cost f_e, paid in labor units, to enter the market and produce. After paying the fixed entry cost, the firm draws a productivity parameter $z \geq 1$ from a Pareto distribution

$$G(z) = 1 - z^{-k}$$

with $k > 1$ and $k > \sigma - 1$. Thus, z is the firm's productivity, if it decides to operate as a family firm. Owners of family-managed firms enjoy a non-monetary private benefit, $\mathcal{B}$, which is common for all firms. Private benefits measure the non-pecuniary utility that a firm's owner enjoys from running a firm as a family firm and holding the firm's *management* within the family. For example, a firm owner may derive pleasure if their children or siblings run the firm. Such amenity potential of family control of firm management has a long tradition in the corporate finance literature (Demsetz and Lehn, 1985; Burkart et al., 2003; Bertrand and Schoar, 2006). Firm owners can only enjoy private benefits if the firm is active. If the firm exits, its owner loses all private benefits associated with running the family enterprise.

Alternatively, firms may choose to professionalize their management by recruiting highly skilled external executives, thereby accessing a broader talent pool that surpasses the limitations of relying solely on family members. If the firm decides to do so, it loses its private benefit, $\mathcal{B}$, but at the same time, professionalization raises the productivity of the firm to γz, $\gamma > 1$, therefore earning the firm higher *monetary profits*. I assume that, other than losing private benefits, there is no other cost of professionalization.[15]

Professionalization is costly to reverse. Once management is professionalized to unrelated managers, the firm pays cost κ to revert back to family management. κ captures several real-world frictions that make switching from professional management back to family difficult. Professional directors are typically bound by contractual commitments and fixed terms, which, along with the enhanced credibility and robust governance structures they provide, significantly boost the firm's market reputation and stakeholder confidence. Moreover, dismantling these established systems would not only disrupt the firm's operations but also risk reputational damage and a loss of investor trust. Together, these factors ensure that once professionalization occurs, the path back to family management is fraught with substantial costs, which our model

[15] It's plausible that, in reality, firms incur fixed hiring or search costs when delegating management. However, introducing such costs into the model would not alter any qualitative predictions, as these costs are analytically similar to an increase in private benefits. Thus, for simplicity, I assume that the only cost of professionalization is the loss of private benefits.

captures with a high κ. Thus, the payoff from reverting becomes

$$\pi(z) + \mathcal{B} - \kappa,$$

instead of the usual family management payoff $\pi(z) + \mathcal{B}$.

Therefore, the decision to professionalize depends on the costs and benefits of delegating. The advantage of delegating is higher monetary profits due to better management. The cost is foregoing private benefits.

Technology. The production function for each intermediate variety i is

$$y = z\ell.$$

where ℓ is labor employed. To produce, the firm pays a fixed cost of wf, which is paid in labor units. w is the wage rate and is used as the numeraire ($w = 1$). The firm maximizes profits subject to demand for its product (3), leading to the usual expression of equilibrium prices being a constant markup over marginal cost:

$$p_i = \frac{\sigma}{\sigma - 1}\left(\frac{w}{z}\right) = \frac{w}{\rho z}. \tag{4}$$

where $\rho = \frac{\sigma-1}{\sigma}$. This implies that firm profits are given by:

$$\begin{aligned} \pi(z) &= p(z)y(z) - w\ell(z) - wf \\ &= Az^{\sigma-1} - wf, \end{aligned} \tag{5}$$

where $A = \frac{1}{\sigma}\rho^{\sigma-1}EP^{\sigma-1}w^{1-\sigma}$ and $E = YP$ is the aggregate expenditure in the economy.

Labor demand can be expressed as a function of firm profits

$$\begin{aligned} \ell(z) &= \frac{y(z)}{z} \\ &= \frac{(\sigma-1)}{w}(\pi(z) + f) \end{aligned} \tag{6}$$

In this setup, the total payoff to the firm owner from an active firm is the sum of monetary profits, π, and non-monetary private benefits, $\mathcal{B}$, that the firm owner enjoys only if management is held within the family.

Define an indicator variable $\mathcal{P}$, where $\mathcal{P} = 1$ if the firm professionalizes management and $\mathcal{P} = 0$ if it retains family management. Then firms' optimal payoff which is given by:

$$\text{Firm's payoff} = \begin{cases} \pi(z) + \mathcal{B} & \text{if } \mathcal{P} = 0 \\ \pi(\gamma z) & \text{if } \mathcal{P} = 1 \\ 0 & \text{if firm exits} \end{cases}$$

Liquidity Constraints and Hand-to-Mouth Owners. To endogenize the exit decision, I assume that firm owners are *hand-to-mouth*, that is, they have no liquid wealth (formally, I set owner wealth, $\omega = 0$ for all firms). In each period, a firm must cover its operating costs (including the fixed cost wf) solely from its monetary profits. Because the non-pecuniary benefit $\mathcal{B}$ provides no liquidity, a negative monetary profit (i.e., $\pi(\cdot) < 0$) leaves the firm unable to cover its operating expenses, forcing it to exit. This mechanism endogenizes the no-negative-profits condition: a firm cannot continue operating with $\pi(\cdot) < 0$ because it cannot finance its fixed costs.

$$z_f = \left(\frac{wf}{A}\right)^{\frac{1}{\sigma-1}} \tag{7}$$

Thus, for a firm to be able to operate as a family firm, its productivity must be at least z_f. For firms that have professionalized management, the exit threshold, denoted z_e, is defined by by $\pi(\gamma z_e) = 0$:

$$z_e = \frac{1}{\gamma}\left(\frac{wf}{A}\right)^{\frac{1}{\sigma-1}} = \frac{z_f}{\gamma} \tag{8}$$

Professionalization to Survive among Laggard Firms. Note that the survival productivity cutoff for family firms is higher than that of firms that have professionalized management. This is because firms that professionalize management enjoy a productivity boost of $\gamma > 1$. This observation implies that any time a firm draws a productivity parameter less than z_e, it will immediately exit. For such a firm, even professionalization of management does not sufficiently boost its productivity to make enough profits to pay its fixed cost of operation. If a firm draws a productivity parameter $z \in (z_e, z_f)$, it will always choose to professionalize. This is because such a firm cannot make sufficient profits to pay its fixed operating costs as a family firm. However, it can survive if it decides to professionalize management, in which case its productivity will rise to γz, resulting in higher profits, potentially avoiding exit. Thus, the firm chooses to forgo its private benefits as professionalization is essential for preserving the firm. To summarize, for laggard firms with low productivity, there is negative selection into professionalizing. Conditional on survival $(z > z_e)$, firms professionalize if they draw an initial productivity parameter $z < z_f$.

Professionalization to Boost Profits among Frontier Firms. If both $\pi(z)$ and $\pi(\gamma z)$ are positive, a firm chooses to professionalize its management if this choice yields a higher payoff than from staying a family firm. Since the firm gives up private benefits if it professionalizes, $\pi(\gamma z)$ must be sufficiently larger than $\pi(z)$ to compensate the firm for the loss of private benefits. Thus, the professionalization decision rests on the trade-off between retaining private benefits associated with running the firm as a family firm and higher profits associated with professionalization. This decision yields another productivity threshold, z_d, at which the firm is indifferent between remaining a family firm and upgrading its management by professionalizing:

$$\begin{aligned} &\pi(z_d) + \mathcal{B} = \pi(\gamma z_d) \\ &\implies z_d = \left(\frac{\mathcal{B}}{wf(\gamma^{\sigma-1} - 1)} \right)^{\frac{1}{\sigma-1}} \cdot z_f \end{aligned} \tag{9}$$

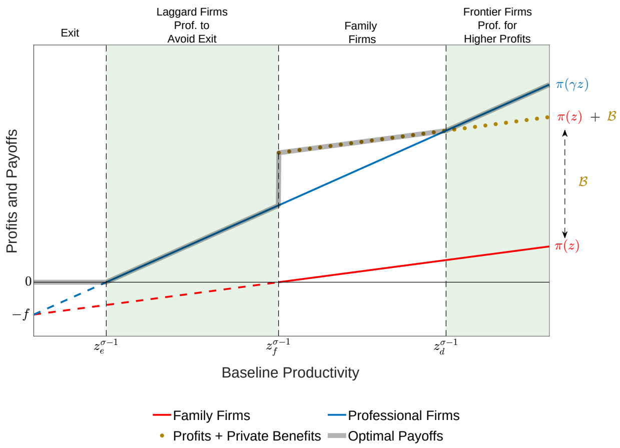
Thus, frontier firms professionalize management if their initial productivity $z > z_d$, i.e. we have more productive firms delegating, implying a positive selection into professionalization. Firms with intermediate levels of productivity, i.e., productivity firms with $z \in [z_f, z_d)$, choose to retain family management as the gains from delegating are not sufficient to compensate the firm owner for the loss of private benefits.

Comparing equations (7) and (9) shows that the parameter restriction required for $z_d > z_f$ is that the non-monetary private benefits from family management are high enough relative to the fixed cost of operation:

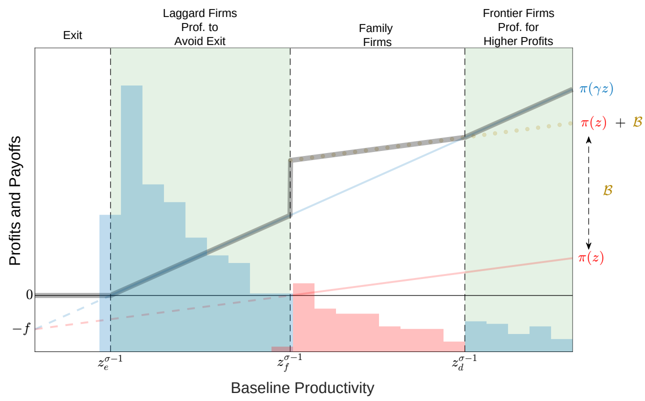
$$\frac{z_d}{z_f} = \left(\frac{\mathcal{B}}{wf(\gamma^{\sigma-1} - 1)} \right)^{\frac{1}{\sigma-1}} > 1 \tag{10}$$

Figure 9: Management Choice

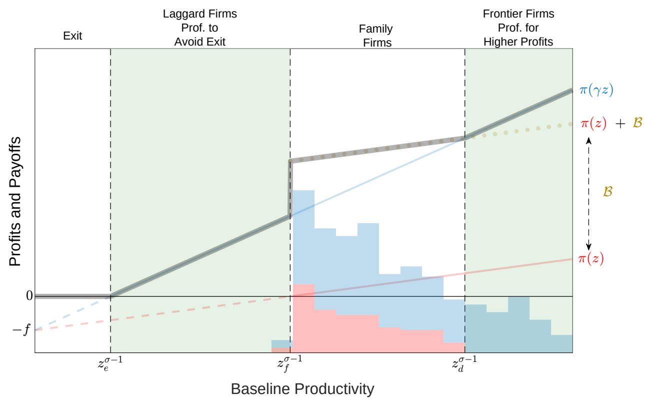
(a) Baseline Equilibrium



(b) Baseline Productivity Distribution



(c) Observed Productivity Distribution



Notes: This figure depicts firm-level profits and payoffs as a function of baseline productivity in the calibrated theoretical model. The red line represents monetary profits for family-managed firms, while the blue line denotes profits for professionally-managed firms. Non-monetary private benefits derived by family firm owners are depicted by the golden dotted line, with the total payoff to family firms equal to the upper envelope of the red profit line and the golden private benefits line. The vertical dashed lines indicate productivity thresholds: z_e (exit threshold), z_f (family-professionalization threshold to avoid exit), and z_d (threshold for professionalization to achieve higher profits). These thresholds divide the productivity space into four distinct regions, corresponding to (from left to right) firm exit, laggard firms professionalizing management to avoid exit, firms retaining family management, and frontier firms professionalizing management for increased profits. Panel (b) superimposes the initial or baseline productivity distribution on this framework. family firms are colored in red and professional firms are depicted in blue. The realized productivity distribution, observed after firms make their management choices, is depicted in panel (c), demonstrating shifts due to managerial restructuring.

The following proposition summarizes the dual selection mechanism of the model.

Proposition 1 (Dual Selection Mechanism). *Consider a firm drawing an initial productivity parameter z from the Pareto distribution*

$$G(z) = 1 - z^{-k}, \quad k > 1 \text{ and } k > \sigma - 1.$$

Define

$$z_f = \left(\frac{wf}{A}\right)^{\frac{1}{\sigma-1}},$$

as the minimum productivity level required for profitable operation under family management. The corresponding survival threshold under professional management is given by

$$z_e = \frac{z_f}{\gamma}.$$

Moreover, let z_d denote the productivity cutoff at which a firm is indifferent between retaining family management (with the associated non-pecuniary benefit $\mathcal{B}$) and delegating to professional management, so that

$$\pi(z_d) + \mathcal{B} = \pi(\gamma z_d)$$

Then, the firm's optimal production and managerial decisions are characterized as follows:

1. ***Exit:*** *If $z < z_e$, the firm cannot generate positive monetary profits even after the managerial productivity boost from professionalization. Consequently, the firm exits the market.*

2. ***Professionalization to Avert Exit (Negative Selection):*** *If $z \in [z_e, z_f)$, the firm would incur losses under family management but can achieve positive profits by delegating management. In this range, professionalization is a necessary survival strategy.*

3. ***Retention of Family Management:*** *If $z \in [z_f, z_d)$, the firm is sufficiently productive to cover its fixed costs as a family firm. However, the incremental profit gain from professionalization does not offset the loss of the non-pecuniary benefit $\mathcal{B}$; hence, the firm opts to retain family management.*

4. ***Professionalization for Profit Enhancement (Positive Selection):*** *If $z \geq z_d$, the additional profits from delegating management more than compensate for the forfeited private benefits. As a result, highly productive firms choose to professionalize management.*

Figure 9 shows the professionalization thresholds in a diagram. In this diagram, the horizontal axis measures firm productivity, $z^{\sigma-1}$, and the vertical axis reports both the firm's *monetary profits* and its *total payoff* (monetary profits plus non-pecuniary private benefits). The three vertical dashed lines divide the productivity space into four distinct regions that capture how firms decide whether to exit, remain family-managed, or professionalize management. Profits are proportional to $z^{\sigma-1}$, and denoted in red for family firms and blue for professional firms. The difference in slope between the two profit lines reflects the gains from professionalizing, γ. The total payoffs of family firms are denoted in the golden dotted line and include the non-pecuniary private benefits $\mathcal{B}$, which are measured by the vertical distance between the profit and total payoff lines of family firms.

Panel (a) shows the baseline equilibrium of the model. Starting from the left, the first vertical dashed line at z_e represents the *survival cutoff under professionalization*. Any firm drawing productivity $z < z_e$ will exit immediately because even with the productivity boost from professionalization (from z to γz), it would still not earn enough revenue to cover the fixed cost of operating. Thus, in this *exit region*, monetary profits are below zero, and no strategy can prevent the firm's failure.

Between z_e and z_f, firms survive *only* if they professionalize. As the red dashed line (profit without professionalization) remains below zero in this region, these "laggard" firms cannot cover their fixed costs under family management; however, by delegating management to outside professionals, they can increase their productivity parameter to γz, thereby generating positive profits. I refer to this as *negative selection into professionalizing management* since relatively unproductive firms upgrade their management out of necessity rather than choice.

Note that firms between z_e and z_f would ideally prefer to retain family management due to the inherent private benefits associated with it. However, since firms cannot operate with negative profits, they are compelled to professionalize purely as a survival strategy. Crucially, firms lose all private benefits if they exit, identical to the outcome if they professionalize. Hence, within this region, the magnitude of private benefits $\mathcal{B}$ has no impact on the professionalization decision. The imperative to remain viable thus overrides any preference for family management.

Once firm productivity surpasses z_f, indicated by the second dashed line, the firm would be profitable even as a family firm. The red line ($\pi(z)$) is now above zero, reflecting positive profits. However, in the intermediate region $[z_f, z_d)$, it is optimal for the owner to *retain family management*: while monetary profits from delegating (solid blue line, $\pi(\gamma z)$) are higher than monetary profits from running the firm as a family firm (solid red line), they are not large enough to offset the owner's loss of the private benefit $\mathcal{B}$.

Finally, at the third vertical dashed line, z_d, we reach a threshold beyond which high-productivity "frontier" firms *professionalize to increase profits* rather than to avoid exit. Past this cutoff, the profit increase from γz exceeds the loss of the private benefit.

Hence, the blue dashed curve representing $\pi(\gamma z)$ lies above the red dashed curve plus the shaded private-benefit segment. This is termed *positive selection into professionalizing management*, capturing how the most productive firms choose professional management to further boost their earnings. The thick gray line shows optimal firm payoffs for different levels of productivity.

The next two panels of Figure 9 illustrate simulated distributions of firm productivity drawn from a Pareto distribution. Family firms are shown in orange, while professional firms are depicted in blue. Panel (b) represents the baseline productivity distribution upon firm entry. At this initial stage, firms decide whether to remain family-managed or to professionalize. The distribution features a large mass of initially low-productivity firms opting for professional management to avoid exit, followed by family firms positioned in the intermediate productivity range. Firms with high initial productivity also professionalize, but their choice is driven by the potential for higher profits.

Importantly, the baseline productivity of a firm is not directly observable in data. Instead, Panel (c) shows the realized or observed productivity distribution, which reflects firm productivity after management choices have been made. After firms make their management decisions, professional firms experience a productivity boost by a factor of $\gamma > 1$. This productivity gain redistributes the initially concentrated mass of lower-productivity professional firms, spreading them across higher productivity levels. Consequently, the observed productivity distribution in the model mirrors empirical findings (see Figure 3 panels (a)-(d)): professional firms exhibit a rightward-shifted size distribution relative to family-managed firms.

6.1 Comparative Static: Unilateral Import Competition

In this section, I analyze the partial equilibrium impact of a *unilateral trade liberalization*, like the removal of QRs, that takes the form of an exogenous increase in foreign varieties, lowering the aggregate price index, P. From equation (5), recall that firm profits depend on the composite market demand parameter

$$A = \frac{1}{\sigma} \rho^{\sigma-1} E \, P^{\sigma-1} \, w^{1-\sigma}.$$

A fall in P directly reduces A, thereby lowering per-period profits for *all* firms in the domestic market. As profits shrink, the key productivity thresholds derived in the previous section respond as follows:

(i) **Rise in the Exit Thresholds.** From equations (7) and (8), both z_f (the minimum productivity required for profitable operation under family management) and

z_e (the minimum productivity under professionalization) increase when A decreases. Intuitively, each firm's revenues drop, so it becomes more difficult to cover the fixed production cost wf. This implies:

- **More exit at the bottom:** As z_e rises, some firms in the lower tail now fall below this new, higher productivity threshold and must exit the market, even if they would have been able to survive under professionalization prior to the shock.
- **More negative-selection professionalization :** Because z_f also rises, there is a broader range of "laggard" firms whose productivity *as a family firm* would no longer cover fixed costs. Such firms now *must* professionalize to boost productivity to γz in order to avoid exit.

(ii) **Rise in the Frontier Professionalization Threshold.** Turning to equation (9), the cutoff z_d at which a firm is indifferent between retaining family management and delegating (purely to enhance profits) also increases as A falls. In essence, lower market-wide profitability makes the private benefit $\mathcal{B}$ more valuable in relative terms, while the additional profit gain from professionalization (beyond covering costs) is smaller. Consequently, fewer *frontier* firms (i.e. those above z_d) wish to professionalize purely for revenue expansion.

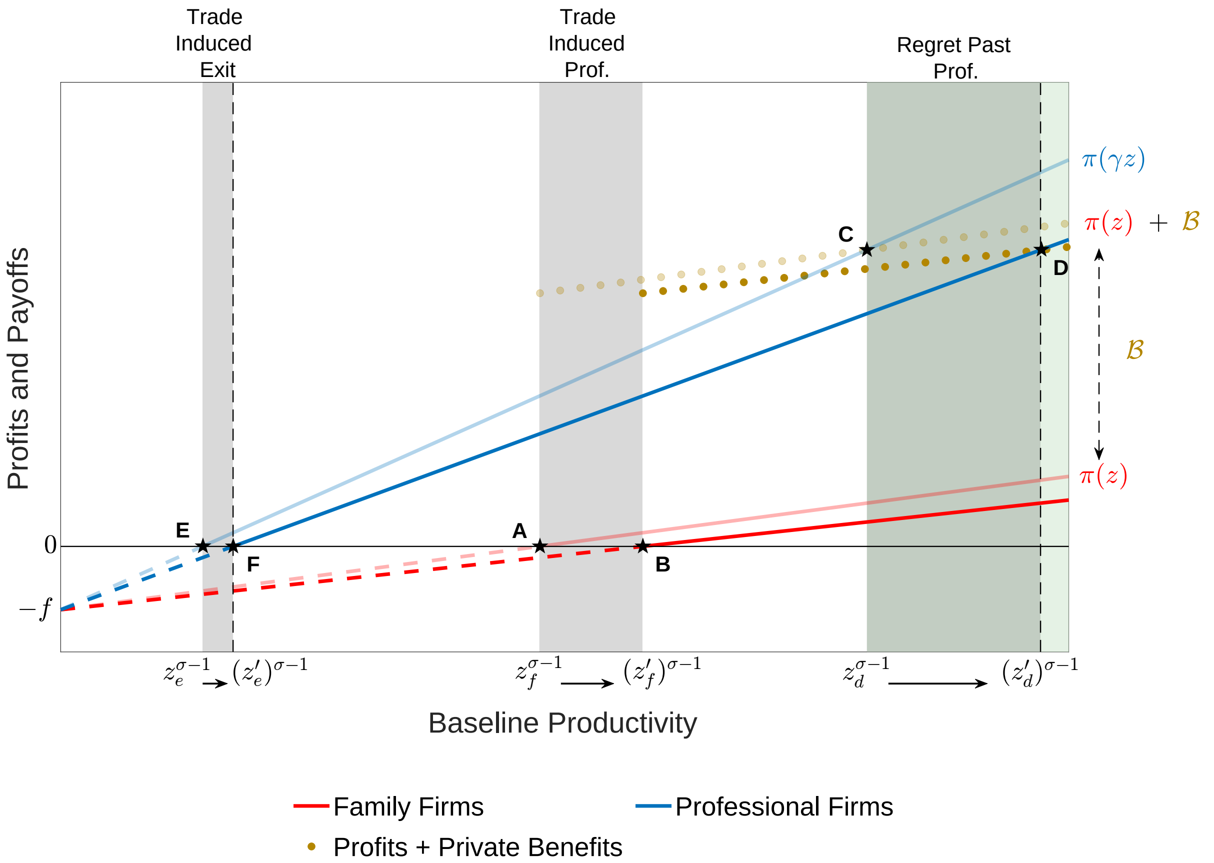
To explicitly connect professionalization decisions across periods $t = 0, 1$, define indicator variables $\mathcal{P}_t$, where $\mathcal{P}_t = 1$ if the firm professionalizes management in period t, and $\mathcal{P}_t = 0$ otherwise. This extension simply appends an additional period and a switching cost κ to the static framework introduced earlier; all primitives and threshold conditions from the one-period model remain unchanged. Professionalization boosts productivity from z to γz, with $\gamma > 1$, but entails the loss of private benefits B. Reverting to family management after previously delegating incurs a switching cost κ. Thus, period-1 payoffs are given by:

$$\pi(z, \mathcal{P}_0, \mathcal{P}_1) = \mathcal{P}_1 \cdot \pi(\gamma z) + (1 - \mathcal{P}_1) \left[\pi(z) + \mathcal{B} - \kappa \mathcal{P}_0 \right]$$

Case 1: $\mathcal{P}_1 = 1$**.** If the firm professionalizes in period $t = 1$, profits are $\pi(\gamma z)$, irrespective of previous choices.

Case 2: $\mathcal{P}_1 = 0$**.** If the firm remains family-managed in period $t = 1$, profits depend on past choices. For firms family-managed in period $t = 0$ ($\mathcal{P}_0 = 0$), profits are $\pi(z) + \mathcal{B}$. However, firms previously delegating in period $t = 0$ ($\mathcal{P}_0 = 1$) incur the switching cost κ, earning profits $\pi(z) + \mathcal{B} - \kappa$. As discussed in the section, the empirical evidence presented in Section 5 is indicative of such a high

Figure 10: The Impact of Import Competition on Firm Management and Productivity



Notes: This figure illustrates firm-level responses to import competition, modeled as a comparative static resulting from a decrease in market demand. The original profit and payoff lines for family-managed firms (red), professionally-managed firms (blue), and non-monetary private benefits (golden dotted line) are now affected by the decrease in market demand. For family-managed firms, lower profits shift the exit threshold from z_f to z_f'. Similarly, the professional firms' exit threshold moves from z_e to z_e'. Additionally, the productivity threshold for frontier firms considering professionalization for higher profits increases from z_d to z_d'. Importantly, due to professionalization being an absorbing state, firms that previously professionalized but now find themselves below z_d' experience regret of past professionalization but cannot revert to family management.

value of κ.

Figure 10 illustrates the heterogeneous responses of firm profits to the import competition shock induced by the removal of quantitative restrictions (QRs). The dashed lines indicate pre-shock profit levels, while solid lines represent post-shock profits. Panel (a) shows that for low-productivity 'laggard' firms, the import competition shock reduces profits significantly below their pre-shock levels, compelling these firms to delegate management to external professionals as a survival strategy. Panel (b) depicts that for high-productivity 'frontier' firms, lower profits following the shock, reduce the appeal of professionalization relative to private benefits.

6.2 Comparing Model Predictions with Empirical Evidence

The comparative-statics results of the previous section suggest that a unilateral trade shock—modeled here as an exogenous increase in foreign varieties that lowers the aggregate price index P—leads to two central predictions about professionalization among domestic firms:

(i) *Exit and "Negative-Selection" Professionalization Rise for Laggard Firms.* Because the shock reduces the composite profitability parameter A, both the exit cutoffs z_e and z_f increase. More low-productivity (or "laggard") firms find themselves at risk of making negative profits if they retain family management; these firms can survive only by delegating and thus enjoying the productivity boost γz. This group therefore exhibits a surge in professionalization driven by the need to avert exit.

(ii) *Professionalization Becomes Less Attractive for Frontier Firms.* The higher "frontier" threshold z_d also moves upward, reducing the fraction of large, highly-productive firms that choose to professionalize solely for profit enhancement. In other words, lower overall profitability tightens the trade-off between forgoing private benefits and realizing higher productivity, leading fewer of the most productive firms to initiate professionalization *ex-post*. Whether this change in incentives induces professional firms to switch back to family to not depends on how high the re-switching costs, κ are.

These predictions align closely with the empirical results shown in Section 5, where the removal of quantitative restrictions (QRs) in India increased import competition and generated new incentives for organizational change in domestic firms. Below, I highlight how the main findings map to the theoretical comparative statics:

A Rise in Professionalization among Laggard Firms. Figure 6 documents that, after the removal of QRs, there is a notable decline in the share of family members occupying top executive positions. Moreover, panel (b) in Figure 6 clarifies that this *aggregate* shift is driven almost entirely by firms in the *bottom tercile of pre-policy productivity*. This selection pattern is precisely the "negative selection into professionalization " mechanism described in the model: less-productive firms, i.e., those closest to the family-firm exit threshold (z_f), are the ones that restructure their top management in order to boost productivity and mitigate the profitability shock. In short, the firms whose survival is most imperiled by rising foreign competition are precisely the ones that replace family managers with external professionals. The fact that the total number of professionalized firms increases, while highly productive incumbents *do not* systematically shift from family to professional management, confirms that it is predominantly the negative-selection professionalization margin that shapes the new equilibrium under unilateral trade liberalization.

No Change in Professionalization among Frontier Firms. As discussed in the previous section, import competition makes professionalization less appealing for frontier firms. As heightened competition reduces overall profitability, the private benefit $\mathcal{B}$ looms larger in the firm's payoff calculation, making the incremental profit gains from professionalization insufficient to justify forgoing family control. In the data, there is little evidence that the most productive firms respond to the shock by reversing professionalization. Empirically, higher-productivity enterprises do not show any change in the share of family members on the executive board (Figure 6(b)). This is indicative of the high cost of switching back from professional to family firms, κ.

6.3 Alternative Mechanisms

Contracting Frictions and Trust. An extensive literature on family firms emphasizes contracting frictions and trust as key reasons why family ownership and management might be optimal, particularly in economies with weak judicial capacity and inadequate contract enforcement. While contracting frictions are important to understanding the origins of family firms, it is unlikely to explain why family firms professionalize their management in response to import competition.

To formally examine the impact of contracting frictions within my model, I introduce an exogenous wedge, τ, that represents the proportion of firm profits expropriated by professional managers. This wedge captures contracting frictions in a simple, reduced-form manner, and can be interpreted as reflecting the the quality of judicial and administrative state capacity in a country. A higher τ implies greater expropriation and poorer judicial quality. Thus, the firm's payoffs are given by

$$\text{Firm's payoff} = \begin{cases} \pi(z) + \mathcal{B} & \text{if } \mathcal{P} = 0 \\ (1-\tau)\cdot\pi(\gamma z) & \text{if } \mathcal{P} = 1 \\ 0 & \text{if firm exits} \end{cases}$$

First, it is crucial to recognize that import competition alone is unlikely to directly affect institutional features, such as judicial state capacity, which underpin contracting frictions. Such institutional frameworks typically exhibit inertia and are unlikely to change materially due to trade policy. Nevertheless, for completeness, I consider the hypothetical scenario in which trade liberalization reduces contracting frictions. For instance, one might argue that import competition could indirectly ease input procurement frictions, thereby reducing overall contracting costs. Even if this were plausible, which is doubtful in the context of my trade shock that primarily targeted consumer goods, Figure 11 demonstrates that such a reduction in contracting frictions cannot qualitatively explain my empirical findings.

Panel (a) of Figure 11 depicts firm profits under high contracting frictions ($\tau = 0.2$). In this setting, the profit curve for professionally managed firms is rotated downward, reflecting the losses due to expropriation by professional managers. Panel (b) illustrates the scenario where import competition reduces contracting frictions by setting τ to zero. This reduction increases the slope of the professional firms' profit line, shifting the intersection with the total payoff of family firms from point A to point B. Consequently, more firms find it optimal to professionalize management due to the increased net benefit after accounting for lower contracting frictions.

However, this reveals an important discrepancy with the empirical results. Such a reduction in contracting frictions predominantly induces the most productive firms, i.e., those between the original professionalization threshold z_d and the new threshold z'_d- to professionalize. Empirically, however, Figure 6 panel (b) clearly demonstrates that it is the least productive firms that professionalize in response to import competition. Thus, even under the scenario of reduced contracting frictions, the qualitative pattern of firm selection into professionalization observed in the data cannot be replicated.

This section highlights that incorporating contracting frictions alone does not qualitatively explain the empirical patterns of managerial professionalization following increased import competition. Nonetheless, this does not diminish the potential quantitative importance of contracting frictions. In future work, I plan to structurally incorporate contracting frictions as outlined here, estimating the parameter τ at the state level in India using an instrumental variables approach similar to Boehm and Oberfield (2020).

Monetary Fixed Costs of Professionalizing. Another plausible mechanism influencing firms' managerial decisions is the presence of monetary fixed costs associated with professionalizing management. Such costs might include search expenses incurred while identifying suitable external managers, hiring transition costs, training and integration costs for new managers, and potential disruptions during organizational restructuring.

In principle, monetary fixed costs, by their very nature, constitute a barrier to managerial transitions. Thus, higher monetary fixed costs would *reduce* firms' incentives to professionalize their management, especially following a negative profitability shock such as intensified import competition. The empirical findings documented in Section 5 run contrary to this straightforward intuition. This implies that monetary fixed costs alone, as an isolated mechanism, cannot rationalize the key empirical regularity documented in this paperthat less productive, family-managed firms professionalize in response to increased import competition. Future work aims to explicitly integrate and estimate these monetary fixed costs in the structural model.

Professionalisation with Partial Private-Benefit Retention. In the baseline model I abstracted from residual tunnelling by setting the private-benefit flow to zero once a firm hires professional managers. In this section, I discuss the implication of this simplifying assumption by letting the founder retain a fraction $\rho \in (0,1)$ of the per-period private benefit $\mathcal{B}$. Under family management, the owner's payoff remains $\pi(z) + \mathcal{B}$; under professional management it becomes $\pi(\gamma z) + \rho\mathcal{B}$, so the incremental private-benefit loss is only $(1-\rho)\mathcal{B}$. The indifference condition that pins down the "frontier" productivity cut-off therefore generalises from

$$\pi(\gamma z_d) = \pi(z_d) + \mathcal{B} \quad \Longrightarrow \quad z_d^{\text{baseline}} = \left[\frac{\mathcal{B}}{w_f\left(\gamma^{\sigma-1} - 1\right)}\right]^{\frac{1}{\sigma-1}} z_f$$

to

$$\pi(\gamma z_d) = \pi(z_d) + (1-\rho)\mathcal{B} \quad \Longrightarrow \quad z_d(\rho) = \left[\frac{(1-\rho)\mathcal{B}}{w_f\left(\gamma^{\sigma-1} - 1\right)}\right]^{\frac{1}{\sigma-1}} z_f$$

Because $(1-\rho)\mathcal{B} > 0$ so long as $\rho < 1$, the cut-off $z_d(\rho)$ is finite and strictly decreasing in ρ. Hence firms still professionalise only when productivity is high enough for the profit gain $\pi(\gamma z) - \pi(z)$ to compensate the remaining private-benefit loss.

All key comparative statics follow unchanged: (i) the negative-selection region $[z_e, z_f)$ is unaffected because firms there would exit if they did not professionalise, and private benefits drop out of the payoff comparison; (ii) the share of professional firms still rises when trade raises A or lowers w_f; and (iii) the model's aggregate-productivity and welfare implications remain intact, with $z_d(\rho)$ entering the same closed-form expressions that drive the quantitative results in Sections 6 and 7. Although the qualitative selection results remain intact, setting $\rho > 0$ will shift the calibrated cut-offs and therefore the quantitative outcomes of the structural estimation; incorporating this richer specification is a priority for future work.

This extension also directly speaks to the corporate finance evidence that professional CEOs seldom completely eliminate tunneling (La Porta et al., 1999; Burkart et al., 2003). By allowing $\rho > 0$ the model admits precisely this coexistence of improved management and residual private benefits, yet it shows that any reduction in tunneling, no matter how partial, is sufficient to generate the dual selection pattern and the trade-induced productivity gains that the paper documents.

Beyond the Binary: A Continuous Professionalization Choice The model delivers similar insights if I let the owner choose a degree of professionalization $d \in [0,1]$. A higher d simultaneously (i) raises operating productivity through a concave multiplier $\varphi(d)$ with $\varphi'(d) > 0 > \varphi''(d)$ and (ii) lowers private benefits through a convex loss $\mathcal{B}(d) > 0$ with $\mathcal{B}'(d) < 0 \leq \mathcal{B}''(d)$. The owner therefore maximises

$$U(d) = \varphi(d)Az^{\sigma-1} - f + \mathcal{B}(d)$$

The interior optimum $d^{\star}(z, A)$ is characterised by the first-order condition

$$\varphi'\left(d^{\star}\right)Az^{\sigma-1} + \mathcal{B}'\left(d^{\star}\right) = 0, \quad \varphi''\left(d^{\star}\right)Az^{\sigma-1} + \mathcal{B}''\left(d^{\star}\right) < 0$$

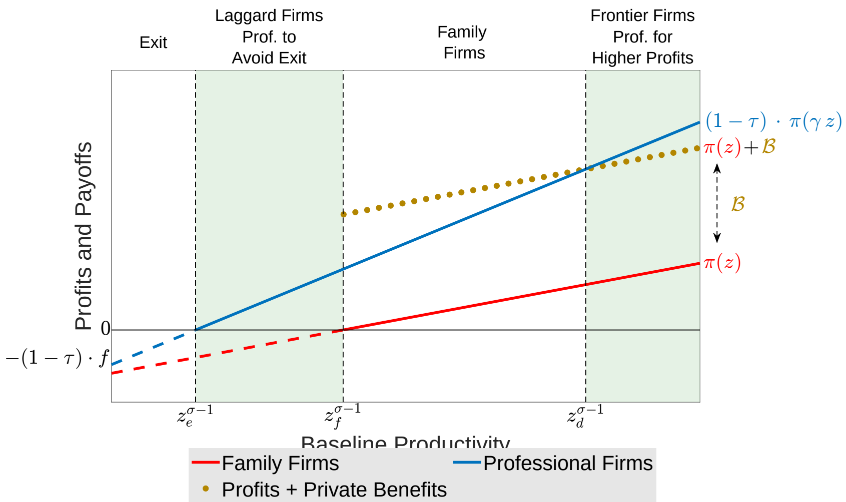
so that $\partial d^{\star}/\partial A > 0$ by the implicit-function theorem: tougher product-market conditions induce more delegation on the intensive margin.

Crucially, the corner predictions of the binary model re-emerge naturally. When a import competition shock (fall in market demand, A) threatens survival, the firm jumps to the lowest d such that $\varphi(d)Az^{\sigma-1} = f$; all firms with productivity $z \in \left(z_e, z_f\right)$ therefore "delegate to avoid exit", exactly as before. Likewise, high-z frontier firms still delegate further whenever the marginal profit gain exceeds the marginal private-benefit loss, so the dual selection pattern and all comparative-static results carry through unchanged.

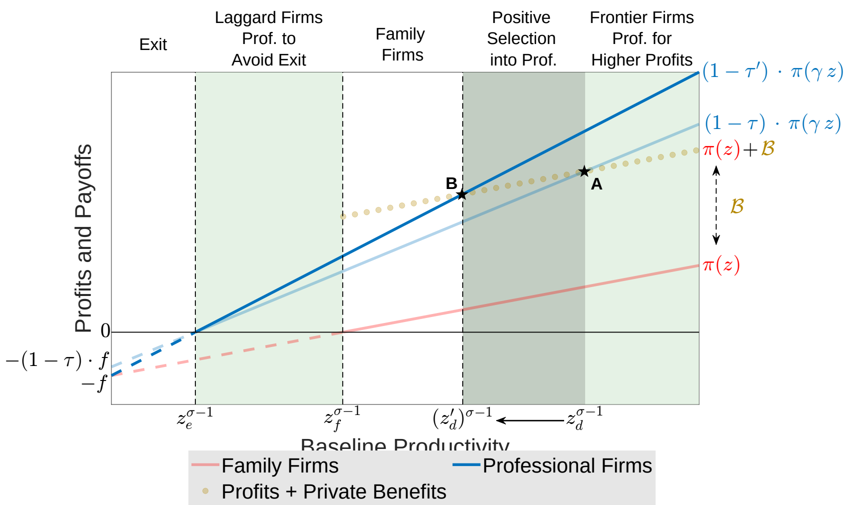
This continuous formulation also addresses the tunneling consideration: because $\mathcal{B}(d)$ is strictly decreasing, the founder always retains some private benefits, and the effective loss $\Delta\mathcal{B} = \mathcal{B}(0) - \mathcal{B}\left(d^{\star}\right)$ is endogenously determined by the optimal $d^{\star}$. In other words, residual tunneling is built into the model instead of imposed ex-post. Quantitatively, introducing d will alter the calibrated cut-offs and elasticitiesbut only through the estimated shape of $\varphi(\cdot)$ and $\mathcal{B}(\cdot)$, a refinement I plan to incorporate in the forthcoming structural estimation.

Figure 11: Contracting Frictions

(a) High Contracting Fictions: $\tau = 0.2$



(b) Zero Contracting Fictions



Notes: This figure examines the theoretical implications of contracting frictions on firm-level management choices. Panel (a) illustrates firm profits and payoffs in an economy with high contracting frictions, represented by an expropriation wedge ($\tau = 0.2$) on the profits of professionally managed firms. The red line denotes monetary profits for family-managed firms, the blue line depicts profits for professionally managed firms subject to expropriation, and the golden dotted line represents non-monetary private benefits for family firms. Panel (b) considers a scenario where import competition hypothetically reduces contracting frictions (τ reduced to zero). This shifts the professional firms' profit curve upward, effectively increasing the profitability of professionalization relative to family management.

7 Identification and Estimation

The model features five structural parameters

$$\Theta = \{\sigma, f, k, \gamma, \mathcal{B}\},$$

where σ is the constant elasticity of substitution across varieties, f is the fixed operating cost, k is the Pareto-shape parameter governing firm heterogeneity, $\gamma > 1$ measures the productivity gain realized when a family firm professionalizes its management, and $\mathcal{B}$ measures the non-pecuniary benefit founders derive from retaining family management. I fix the σ exogenously based on the literature and calibrate the remaining moments by minimizing the distance between a small set of model moments and their empirical counterparts.

Following the existing literature, σ is set at 4, which aligns with estimates commonly used for India (Hsieh and Klenow, 2009, 2014; Fan et al., 2023).

Pareto shape parameter, k. To calibrate the Pareto shape parameter k, I employ the methodology proposed by Head et al. (2014), who suggest estimating k by matching the slope of the empirical size distribution in the upper tail of firm revenues.

Firms are first ranked by total sales. For each observation I compute the transformed rank as:

$$\mathsf{rank}_i = -\ln(1 - F_i),$$

where F_i is the empirical cumulative distribution function (CDF) of log total sales. Head et al. (2014) show that, when sales follow a Pareto distribution, regressing log sales on rank_i for sufficiently high percentiles yields a slope $\hat{\beta}$ that maps to the shape parameter through

$$k = \frac{\sigma - 1}{\hat{\beta}}.$$

Applying this method to my data for the top 5 percent of firms, and using the standard CES elasticity $\sigma = 4$, yields an estimate of $\hat{k} = 3.47$. Re-estimating this slope using progressively tighter cutoffs (96th to 99th percentiles) produces consistent estimates ranging between 3.40 and 3.60. Additionally, alternative transformations (such as a log-normal benchmark) do not significantly alter the point estimate. Given this robustness, I set $k = 3.5$ for my calibration.

The remaining parameters, $\gamma, \mathcal{B}$, and f are pinned down jointly by matching a parsimonious set of empirical moments that summarize the management and exit choices of the firm. While these three parameters are estimated jointly, I provide the intuition for identification and discuss which moment is the most informative about each of the parameters below.

Firm Management: Identifying $\mathcal{B}, \gamma$. The parameter $\mathcal{B}$ directly affects the payoffs of family firms and is identified using the observed share of family firms in the Indian economy. Panel (a) of Figure 9 illustrates how increasing $\mathcal{B}$ expands the region between productivity thresholds z_f and z_d, in which firms choose to retain family management. A higher $\mathcal{B}$ increases the threshold productivity z_d, indicating that firms with higher private benefits require greater monetary incentives to switch to professional management.

The parameter γ is identified by the difference in average monetary profits between family and professional firms. Panel (a) of Figure 9 further demonstrates how a higher γ directly boosts the profits of professional firms, leaving family firms' profits unchanged. Thus, this moment clearly isolates the productivity gain realized by firms when transitioning to professional management.

Fixed operating cost, f. The main identifying challenge in estimating f is that the CMIE Prowess data is not suited to measure firm entry and exit (see also the discussion in Section 5). Therefore, I do not use exit rates directly as calibration targets. Instead, I identify the fixed operating cost parameter, f, using the share of firms that exhibit negative profits in the data, which captures how many firms are close to the zero-profit threshold. This moment serves as a proxy in the absence of reliable exit counts in Prowess. Note that in the model, active firms cannot operate with $\pi < 0$, so $\Pr[z < z_e]$ reflects the mass of entrants that immediately draw productivity below the survival threshold and thus exit. In the data, I approximate this exit margin using the share of firms that report negative accounting profits. This proxy is motivated by two considerations. First, in steady state the mass of firms drawing $z < z_e$ each period equals the observed flow of exits. Second, firms in practice often post accounting losses for some years before formally exiting, so the prevalence of loss-making firms provides an informative measure of the relevant exit margin.

7.1 Estimation Routine

As described above, σ is fixed at 4 and the Pareto shape parameter, k, is calibrated to 3.5 by matching the slope of the empirical size distribution in the upper tail of firm revenues. Conditional fixing these parameters, $\gamma, \mathcal{B}$, and f are jointly estimated by minimizing the distance between the three model moments and their empirical counterparts described above.

Let $\mathcal{M}_E$ denote the set of empirical moments constructed from firm level data. For any candidate vector $\vartheta = (\sigma, f, k, \gamma, \mathcal{B})$, all the model moments have analytical solutions (see appendix **??**). Therefore, each equilibrium evaluation reduces to solving closed-form expressions for the productivity cut-offs, ensuring rapid convergence and precision in parameter estimation. Denote this vector of model moments by $\mathcal{M}_M$. Then, the parameters are chosen to minimize the quadratic loss given by

$$SSR(\vartheta) = \sum_j \left[\mathcal{M}_E(\text{data}) - \mathcal{M}_M(\vartheta)\right]^2,$$

subject to $\gamma \geq 1$, $f \geq 0$, and the feasibility condition that the exit threshold for family firms exceeds that for professional firms (10). Because each equilibrium evaluation reduces to closed-form expressions for the productivity cut-offs, convergence is rapid.

7.2 Estimated Results

Table 4 summarizes the results of the structural estimation procedure, presenting both the targeted empirical moments and the corresponding moments generated by the calibrated model, along with the parameter values themselves. The model-generated moments closely match their empirical counterparts. Specifically, the share of family firms, the average revenue productivity gap between family and professional firms, and the share of firms exhibiting negative profits are precisely replicated by the model.

Turning to the magnitudes of the key estimated parameters, the productivity gain from professionalizing management, γ, is estimated to be approximately 1.23. This value is notable because it closely aligns with independent empirical findings presented earlier in Figure 8. The event-study evidence indicated that firms who professionalize management report higher firm-level revenue productivity by about 20 percent, a magnitude comparable to the 23 percent productivity gain implied by the calibrated parameter. Although the event-study analysis and structural estimation utilize entirely separate empirical inputsfirm-level responses to a trade shock versus steady-state calibration based on firm-level momentsthe similarity between the two estimates suggests that the model captures a realistic magnitude of productivity gains from professionalization.

Additionally, the estimated non-pecuniary private benefit of retaining family management, $\mathcal{B}$, is around 0.05. To interpret this magnitude, consider that average profits in the model economy are roughly three times this estimate. Therefore, private benefits represent about one-third of average profits, underscoring that family owners place substantial value on maintaining family management despite the clear potential for higher monetary returns from professionalizing. This magnitude highlights the signif-

Table 4: Estimated Parameters

Parameter	Interpretation	Target	Moments	
			Data	Model
$\mathcal{B}$	Private benefits of family management	Share of family firms	0.283	0.283
γ	Gain from professionalizing management	Difference in mean log revenue between family and professional firms	1.829	1.829
f	Fixed cost of operation	Share of firms with negative accounting profits	0.216	0.216
k	Pareto shape parameter	Slope of upper tail (Head et al., 2014)	-	-
σ	Elasticity of substitution	Externally calibrated	-	-

Notes: This table summarizes the calibration of the model parameters. Parameters are calibrated using data from CMIE Prowess and the methodology outlined in the text. The elasticity of substitution, σ, is fixed at following existing estimates for India. The Pareto shape parameter, k, is estimated by matching the slope the empirical size distribution in the upper tail of firm revenues as per Head et al. (2014). Parameters γ, $\mathcal{B}$, and f are jointly calibrated by minimizing the distance between model-generated moments and their empirical counterparts.

icant role non-monetary preferences play in shaping firm governance structures, particularly in economies dominated by family-managed businesses.

7.3 Aggregate Importance of Professionalizing Management

To quantify the aggregate importance of professionalizing management, I conduct a policy experiment within the calibrated model. Specifically, I simulate a reduction in aggregate market demand that precisely matches the average decline in firm revenues observed empirically in response to the QR removal, approximately a 45 percent decrease in the long run (Figure 5). I then trace the economys transition from the baseline equilibrium at $t = 0$ to the new equilibrium at $t = 1$ to evaluate the aggregate consequences.

Figure 12, Panel (a), shows that this import-competition shock significantly increases professionalization among family-managed firms. Initially, about 28 percent of firms were family-managed; this share falls substantially following the policy shock. The underlying mechanism driving this response is depicted in Figure 10, which illustrates how increased import competition shifts the exit threshold for family firms upward (from z_f to z'_f), compelling many firms to professionalize management as a strategy to avoid exit. This effect is especially pronounced among low-productivity, family-managed firms.

Besides incentivizing management changes, the import competition shock also increases firm exit, as suggested in Figure 10. The policy also raises the exit threshold for professional firms from z_e to z_e') so that only more productive firms survive.

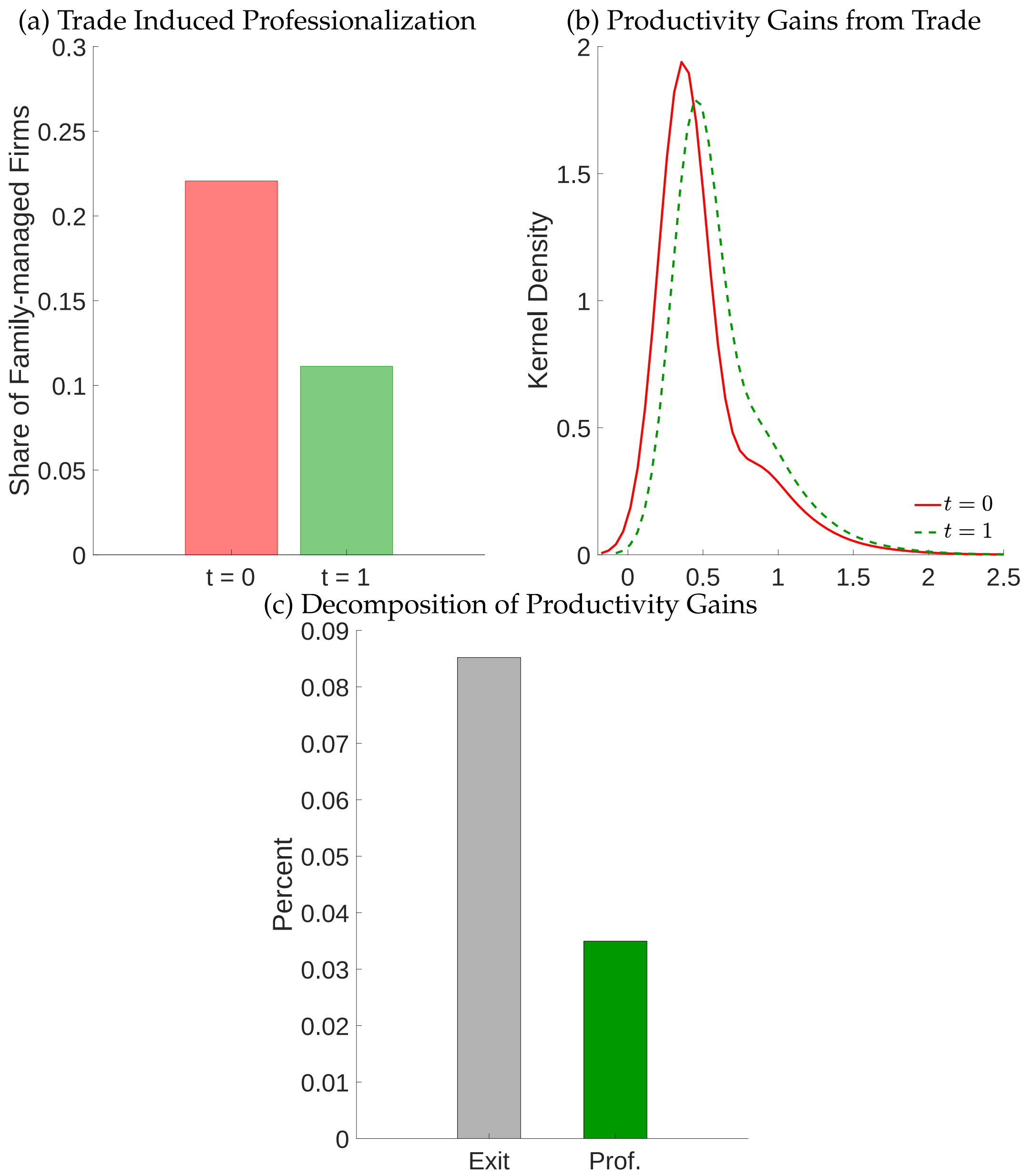
Both the extensive-margin selection effects due to exit and the within-firm productivity improvements die to professionalizing management contribute to increasing aggregate productivity by 12 percent following the import competition shock. Figure 12, Panel (b), shows kernel density estimates comparing the distribution of firm productivity before and after the import-competition shock. The rightward shift in the productivity distribution at $t = 1$ relative to the baseline at $t = 0$ clearly demonstrates these aggregate productivity gains.

These gains arise from two distinct sources, each operating through fundamentally different mechanisms. The extensive margin selection effect is emphasized extensively in existing trade literature (e.g., Melitz (2003)). This mechanism operates through the exit of the least productive firms from the market, thereby raising aggregate productivity by reallocating resources toward more productive firms. Second, and qualitatively distinct, are the within-firm productivity gains resulting from professionalizing management. Unlike the selection mechanism, these productivity improvements occur among surviving firms. While the extensive margin selection effects have received substantial attention and are a staple in canonical models of trade and heterogeneous firms, within-firm productivity improvements due to management restructuring have been relatively understudied and remain quantitatively unexplored. The analysis here aims to explicitly quantifies these within-firm productivity gains

Figure 12, Panel (c), displays this statistical decomposition. While a substantial portion of the aggregate productivity improvement (around 70 percent) is driven by selection through firm exit, within-firm productivity gains due to professionalization also play a significant role. Specifically, approximately 30 percent of the aggregate productivity gains come directly from professionalizing management. These within-firm efficiency gains underscore the role that organizational restructuring plays in enhancing aggregate productivity. Ignoring such within-firm organizational improvements can underestimate the total benefits of trade liberalization policies.

Thus, fostering an environment that encourages professionalization in management, particularly in economies dominated by family-managed firms, could amplify the gains from international trade.

Figure 12: Trade Induces Professionalization and Productivity Gains



Notes: This figure simulates a trade liberalization episode within the estimated model by implementing a reduction in market demand sufficient to lower average firm profits by approximately 45%, consistent with empirical findings from the event studies presented in Figure 5. Panel (a) tracks the share of family-managed firms, demonstrating a decline that corresponds directly to increased professionalization in response to import competition. Panel (b) illustrates the aggregate productivity gains by presenting kernel density plots of the productivity distribution before and after the import competition shock, highlighting shifts toward higher productivity due to two firm-level adjustments: within firm gains due to professionalizing and extensive-margin effects due to eit. Panel (c) decomposes the total productivity increase into these two mutually exclusive components, underscoring the distinct mechanisms through which aggregate productivity is enhanced in response to import competition.

8 Conclusion

This study demonstrates that trade liberalization, through a productspecific import competition shock, reshapes firm management structures in a profound way. Focusing on family firms, the predominant mode of corporate governance in many developing countries, I find that heightened import competition compels these firms to undertake significant managerial turnover. Empirically, firms facing increased foreign competition are more likely to replace family managers with professional executives, a shift that is closely associated with improved withinfirm productivity. The evidence, drawn from a novel managerfirm matched dataset and detailed board director tenure records for over 6 million Indian directors, reveals that the restructuring of top management is not merely a byproduct of declining sales or contracting firm size. Instead, it reflects a deliberate organizational response to external competitive pressures.

The event study analysis highlights that following the removal of quantitative restrictions, family-controlled firms, particularly those with lower pre-policy productivity, experience a marked decline in the share of family members on their executive boards. This replacement is accompanied by a corresponding rise in non-family professional managers, suggesting a one-to-one substitution effect. Furthermore, these changes in management composition are linked to subsequent productivity improvements, as evidenced by rising revenue and quantity productivity measures and declining average output prices. Such findings support the broader hypothesis that organizational reform is a key channel through which competition reduces X-inefficiency.

To further interpret these empirical results, I develop a simple model of industrial equilibrium in which family firms face a trade-off between the non-monetary private benefits of retaining family management and the monetary gains from delegating management to professionals. The model predicts a dual-selection mechanism: less productive family firms delegate management out of necessity to avert exit, while more productive firms delegate to further boost efficiency. The data primarily reflect the negative-selection channel, with laggard firms undergoing managerial changes to survive under harsher competitive conditions.

These insights have important policy implications. In contexts where family firms dominate, trade liberalization can trigger internal restructuring that not only improves firm-level productivity but also contributes to aggregate efficiency gains.

In sum, this paper contributes to the literature on trade-induced productivity improvements by highlighting an often-overlooked internal adjustment mechanism. It underscores the importance of managerial innovation in response to external shocks and suggests that policies promoting competitive pressures can stimulate organizational reforms that bolster firm performance.

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