Import Competition, Management Turnover, and X-Efficiency: Evidence from India

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1 Introduction

This project explores how a previously unstudied, product-specific import competition shock, affecting over a third of Indian manufacturing, impacted the management structures of exposed firms. I estimate event studies to find that exposed firms are significantly more likely to cut management slack by replacing family management with professional managers. These management changes are accompanied by a substantial increase in firm productivity, lower product prices, and a smaller/more concentrated product scope. I am currently working on quantifying the impact of these micro changes within firms on India's aggregate productivity.

The motivation for this study comes from convincing evidence in the literature that despite high returns to good management practices, many firms in developing countries are slow to adopt them (Bloom et al., 2013). Moreover, firm size and productivity are severely constrained by restricting top management to family members, owing to a lack of trust in external managers. In this project, I study whether trade and import competition have a role to play in the choice of top management, particularly in Indian family firms.

In 1998-2001, the WTO mandated that India remove quantitative restrictions (import bans) on 3,000 8-digit products, providing quasi-experimental variation in import competition across product markets. I collect novel manager-firm matched data to trace the churn in top management among firms that were exposed to import competition after this policy. A unique feature of my data is that I can observe family ties between 6 million board members of directors (including top management) employed by the universe of Indian registered firms since 1970. This allows me to shed light on the impact of import competition on the management structures of the predominant form of organizations in India: family firms.

I find significant management turnover in family firms exposed to import liberalization. Specifically, these firms replace family top managers with external professional managers. This represents a significant shift from the traditional corporate culture in Indian family firms, where top management roles are typically reserved for male family members. Furthermore, firms that diversify their management in this manner report higher productivity compared to firms retaining family-dominated boards. These firms also narrow their product scope, lower prices, and increase product concentration.

This empirical setting sheds light on the broader question of X-efficiency—why firms in more competitive markets exhibit higher productivity. The mechanisms behind the correlation between productivity and competition, called "X-efficiency" by Leibenstein (1966), are poorly understood (Backus, 2020). Understanding the mechanisms behind the relationship between competition and firm productivity has implications across various economic applications.

2 Methodology

2.1 Policy Background

India underwent significant economic reforms following a 1991 balance of payments crisis under an IMF structural adjustment program. These reforms dramatically lowered tariffs and eliminated import quotas on intermediate goods[1]. Despite these reforms, India continued to ban imports of all final consumer goods—approximately 30% of all tariff lines—for nearly a decade. Leveraging Article XVIII.B of the GATT, which allows countries with a "weak" balance of payments to impose QRs, India banned over 3000 products, effectively shielding its domestic industries. However, in 1996, the United States, Australia, and the European Union challenged these restrictions at the WTO, leading to their removal by March 31, 2001, following an IMF assessment and a WTO ruling. The first two panels of Figure 1 plot event studies for log value and quantity of of products on which QRs were lifted relative to those

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[1]Several papers in the trade literature such as Topalova (2010); Goldberg et al. (2010); DeLoecker et al. (2016) have documented the impact of these first-generation trade reforms on the Indian economy.

that were unaffected by the QR removal policy. There is a substantial spike in imports of QR products after the policy. This staggered exposure to import competition is used in this study to examine its impact on the management structures of family firms in India. The bottom panels of Figure 1 plot event studies for export value and quantity. As expected, there is no impact on exports of products in which QRs are removed, as the policy did not affect market access for Indian firms.

2.2   Data Construction

The primary data source is the CMIE Prowess, which covers a substantial portion of India's formal economic activity and includes detailed firm data, such as balance sheets and product information. A unique feature of Prowess is that it provides data on each firm's board of directors, including their names, a unique registration number, designation, and tenure. This dataset is enriched with three novel datasets:

Novel Dataset on Product-level Quantitative Restrictions in India.   I digitized archival documents from the Ministry of Commerce to create a detailed dataset of products under QRs, including the exact removal dates. Figure 2a shows an example of such a policy document.

Novel Product Concordances.   The government notifications on QRs use product codes according to the HS product nomenclature. Unfortunately, CMIE Prowess does not use the same product codes. To identify firms in Prowess that produce liberalized consumer goods, I construct a novel concordance of detailed HS-8 digit products to the product nomenclature followed by CMIE Prowess.

Administrative Data on Manager Family Ties.   Finally, I obtained access to novel administrative data from the Ministry of Corporate Affairs (MCA), Government of India, on over 6 million managers in formal Indian firms. Crucially, this dataset features managers' fathers' names, facilitating the identification of family ties within firm boards. For example, the board of directors of Cosco India Ltd., depicted in Figure 2b[2], includes directors A Jain, M Jain, and P Jain, who are confirmed as brothers through their father DK Jain, who is also on the board. Alongside them are NK Jain, DK's brother, and N Jain, DK's nephew. This data allows the analysis of family presence on firm boards and the extent of familial relationships among board members.

2.3   Identification Strategy

The removal of QRs from consumer goods in 1998-2001 offers a distinctive opportunity to analyze the impact of import competition on firm behavior. First, it solely affected the import competition in final consumer goods markets (treated products) while leaving tariff and non-tariff barriers on intermediate goods (control products) unchanged. This setup creates quasi-experimental variation in exposure to import competition between treated and control product markets, ideal for a difference-in-difference analysis. Since this reform only affects import costs of final consumer goods- it leaves the cost function of the firm unchanged, thereby providing a unique opportunity to isolate and identify the impact of a specific demand shock– higher competition in output markets, on firm outcomes. Additionally, the reform did not affect export costs, enhancing its utility in isolating the effects of import competition. Finally, unlike other trade reforms, this period did not see any other significant domestic or trade changes in India that could confound the impacts on treated versus control markets.

I identify a firm as treated in year t, if QRs are removed on its highest-revenue product. In the next section, I show event study plots from estimating the following equation.

$$Y_{ijt} = \beta_{1t}\mathbb{1}\{\mathsf{QR}\}_{jt} + \theta_i + \lambda_t + \varepsilon_{ijt}$$

where $\mathsf{QR}_{jt} = 1$ if import restrictions on product j are removed in year t. θ_i and λ_t are firm and year fixed effects.

The identification assumption is that in the absence of the QR removal, firms that operate in product markets that were exposed to import competition should have had similar paths of outcome variables as compared to firms in other sectors (parallel trends).

3   Preliminary Results

Figure 3 presents event study estimates of the impact of QR removal on various firm outcomes. It shows that firms in liberalized sectors contract sharply relative to control group firms: firm revenues, total wage bill, and total expenditure on raw materials are down by over 50 percent. Operating profits as a share of revenue are down by 5 percent among exposed firms relative to firms in the control firms. Firm assets and borrowings are also lower by 20 to 40

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[2]The initial and middle names have been abbreviated to be concise.

percent for treated firms relative to firms not exposed to import competition. These effects are persist up to 8 years after the reform.

Figures 4 and 5 shows that, in comparison to a control group, firms operating in markets that were liberalized tend to appoint more external managers and decrease the proportion of management positions held by family members.

Finally, firms that "shed" family members from key managerial positions see a bump in their productivity relative to firms who do not change their management in the face of import competition (Figure 6). The first two panels show separate event studies for Firms who shed family vs. those that do not. The bottom panels show the triple difference, i.e., the difference in TFP between firms that shed family vs those that do not.

4 Theoretical Framework

4.1 Goal

The empirical results show that import competition drives *some* (around 40%) family firms in India to replace (bad) family managers with (good) outside professional managers.

In this section, I sketch a simple model that captures the main forces behind the empirical results. There are two goals of the model. First, the model helps clarify the intuition behind the comparative statics of the impact of product market competition on the top management at family firms and on firm productivity. Second, the model provides a framework to quantify the aggregate impact of these firm-level improvements in TFP due to professionalization of top management.

4.2 Firms

The final goods sector aggregates N intermediate varieties, y_i, to produce the final good Y, which is taken to be the numeraire.

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

where $\sigma > 1$ is the elasticity of substitution. Cost minimization implies that the demand for good i is given by

$$y_i = Y p_i^{-\sigma} \tag{1}$$

The production function for each intermediate product i is

$$y_i = \varphi_i m_i(\mathcal{B}_i, \sigma) l_i \tag{2}$$

φ_i is the productivity "potential" of the firm. m is the share of top management of the firm that comprises professional/outside managers. The firm can only realize its full productivity potential if it delegates its entire top management to professionals (i.e. when $m = 1$). On the other hand, if the firm retains a significant share of top management within the family, it can realize only a low fraction m of its productivity potential.

For a given $m(\mathcal{B}_i, \sigma)$, firm maximize profits subject to the demand curve given by equation 1, leading to the usual expression of equilibrium prices being a constant markup over marginal cost:

$$p_i^* = \frac{\sigma}{\sigma-1} \left(\frac{w}{\varphi_i m(\mathcal{B}_i, \sigma)} \right) \tag{3}$$

which implies that firm profits are given by:

$$\Pi_i = \frac{1}{\sigma} \left(\frac{\sigma-1}{\sigma} \right)^{\sigma-1} Y \left(\frac{\varphi_i m(\mathcal{B}_i, \sigma)}{w} \right)^{\sigma-1} \tag{4}$$

[This is identical to Melitz except for the m term]

The firm owner derives utility $u(\Pi, \mathcal{B}_i)$ from monetary profits as well as private benefits. Unlike standard models, where the firm owner only derives utility from the discounted sum of lifetime profits, in this setting the firm's owner also cares about exogenously distributed private benefits $\mathcal{B}_i$. The owner chooses the optimal level of delegation to outside professional managers, m^*, by solving the following problem:

$$\arg\max_{m}\{u(\Pi_i, \mathcal{B}_i)\}$$

I use a simple functional form for the utility function, $u(\Pi_i, \mathcal{B}_i) = log(\Pi_i) + (1 - m_i)\mathcal{B}_i$, which leads tot he following closed-form solution for m^*:

$$m_i^* = \frac{\sigma - 1}{\mathcal{B}_i} \tag{5}$$

Thus, firms with high private benefits, $\mathcal{B}_i$, will retain more top management within the family. This simple expression also implies that an increase in competition in the product market will drive firms to professionalize in order to compensate for lower profits.

Firm profits for optimally chosen m^* are

$$\Pi_i(\varphi_i, \mathcal{B}_i) = Y\frac{(\sigma - 1)^{2(\sigma-1)}\varphi_i^{\sigma-1}}{\sigma^\sigma w_i^{\sigma-1}\mathcal{B}_i^{\sigma-1}}$$

Note that profits are determined by the joint distribution of productivity φ_i and private benefits $\mathcal{B}_i$.

Future Plans

In future work, I plan to find an instrument for "family shedding" so that these reduced-form results can be causally interpreted. At the same time, I am working on the theoretical framework outlined above so I am able to quantify the aggregate impact of firm-level productivity increases due to trade-induced management professionalization.

Figures

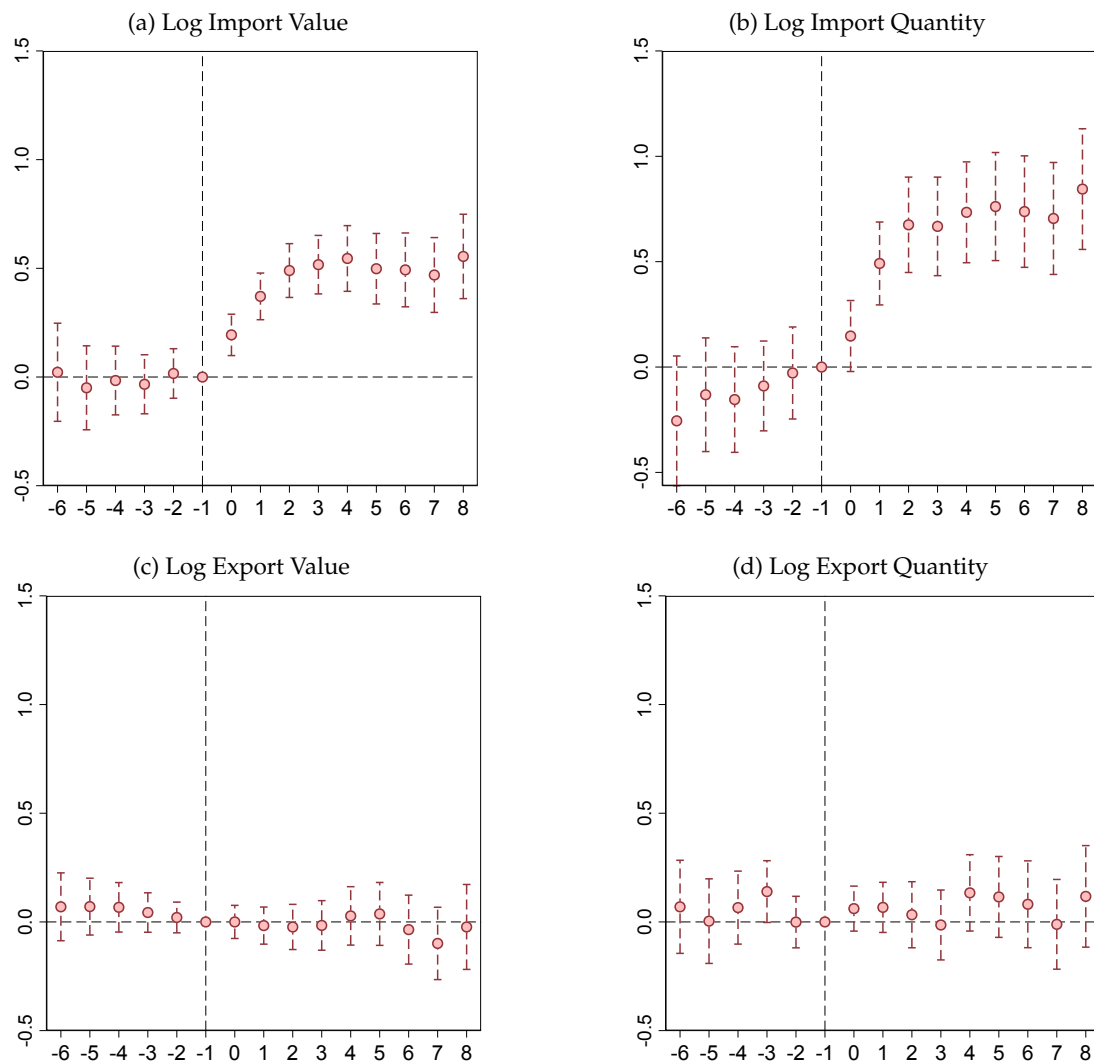Figure 1: Imports of Products on which QRs were Removed Increased after the Policy

(a) Log Import Value

(b) Log Import Quantity

(c) Log Export Value

(d) Log Export Quantity

Figure 2: Data Construction

(a) Product-specific Data on QRs

(b) Data on Manager Family Ties

Company	Name	Father's Name
COSCO (INDIA) LTD	A JAIN	D K JAIN
COSCO (INDIA) LTD	M JAIN	D K JAIN
COSCO (INDIA) LTD	P JAIN	D K JAIN
COSCO (INDIA) LTD	V K SOOD	H R SOOD
COSCO (INDIA) LTD	D K JAIN	K L JAIN
COSCO (INDIA) LTD	N K JAIN	K L JAIN
COSCO (INDIA) LTD	N JAIN	N K JAIN
COSCO (INDIA) LTD	M P GUPTA	P D GUPTA
COSCO (INDIA) LTD	S SHARMA	R K SHARMA
COSCO (INDIA) LTD	R JAIN	S RAJ
COSCO (INDIA) LTD	M L MANGLA	T CHAND

Figure 3: Firms Reduce their Size after Exposure to Import Competition

(a) Log Total Sales

(b) Operating Profits/Revenue

(c) Log Total Compensation

(d) Log Total Expense on Raw Materials

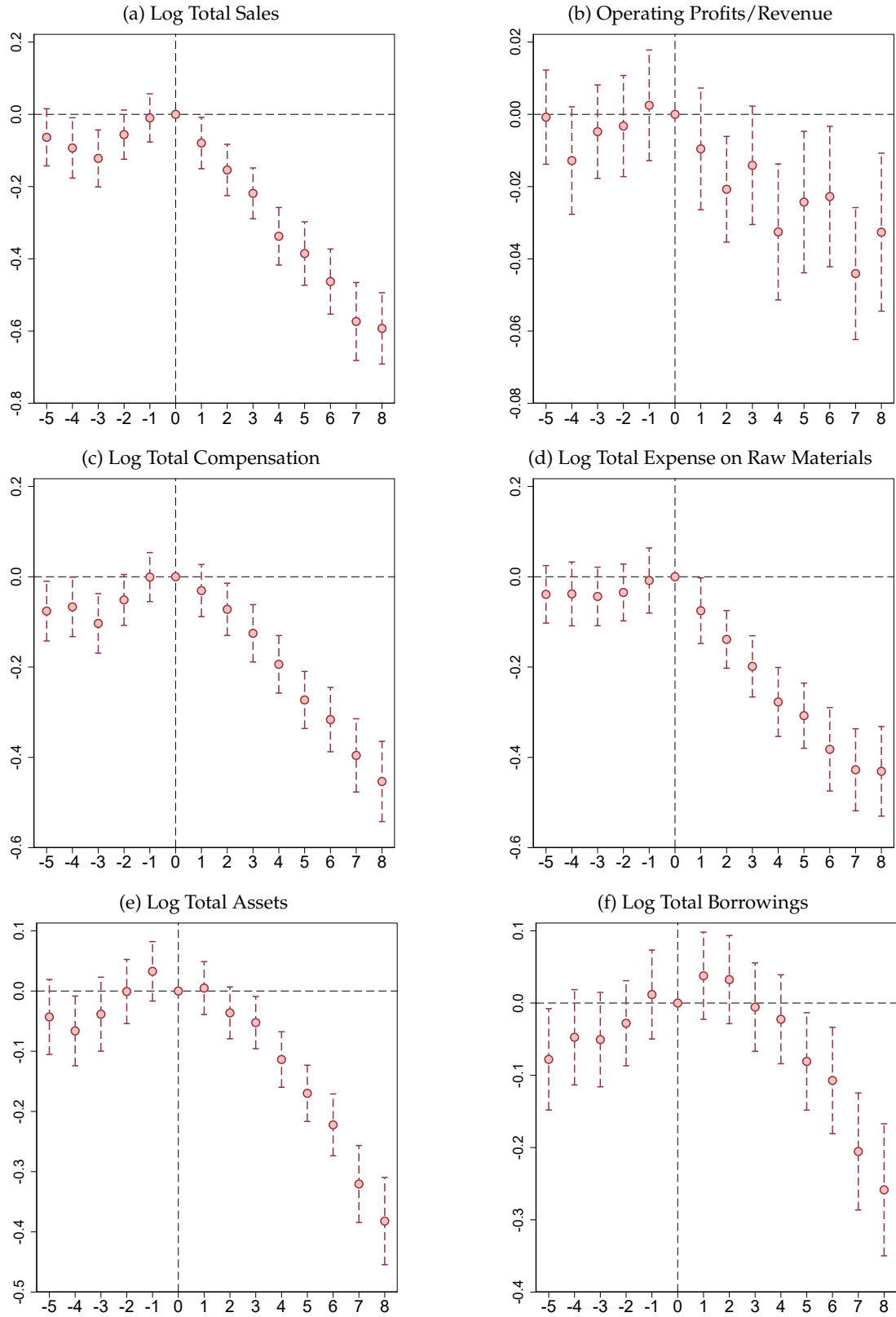(e) Log Total Assets

(f) Log Total Borrowings

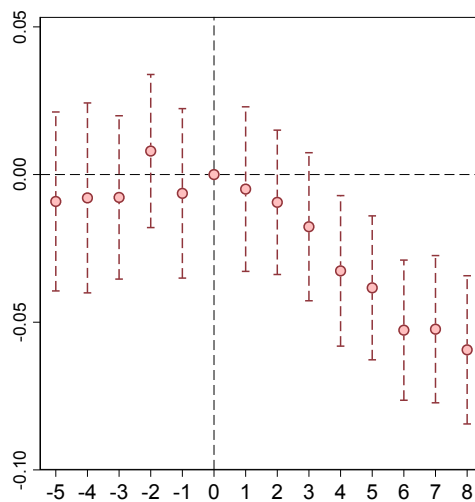Figure 4: Firms Reduce Share of Family Executive Board Members after Exposure to Import Competition

Figure 5: Reduction in the Share of Family Members on Executive Board is due to Decrease in the Number of Family Members and an Increase in External/Professional Managers
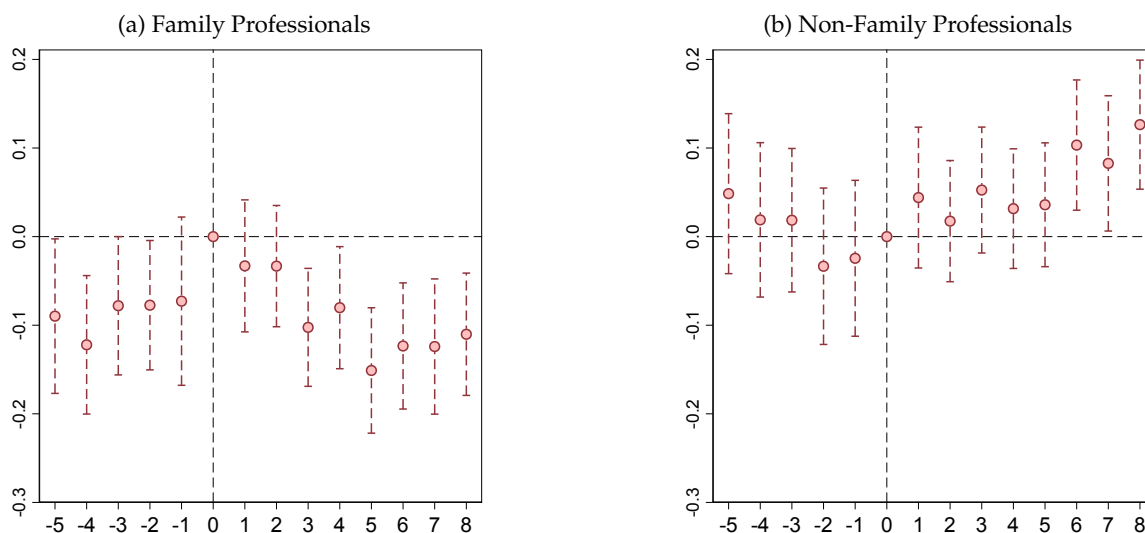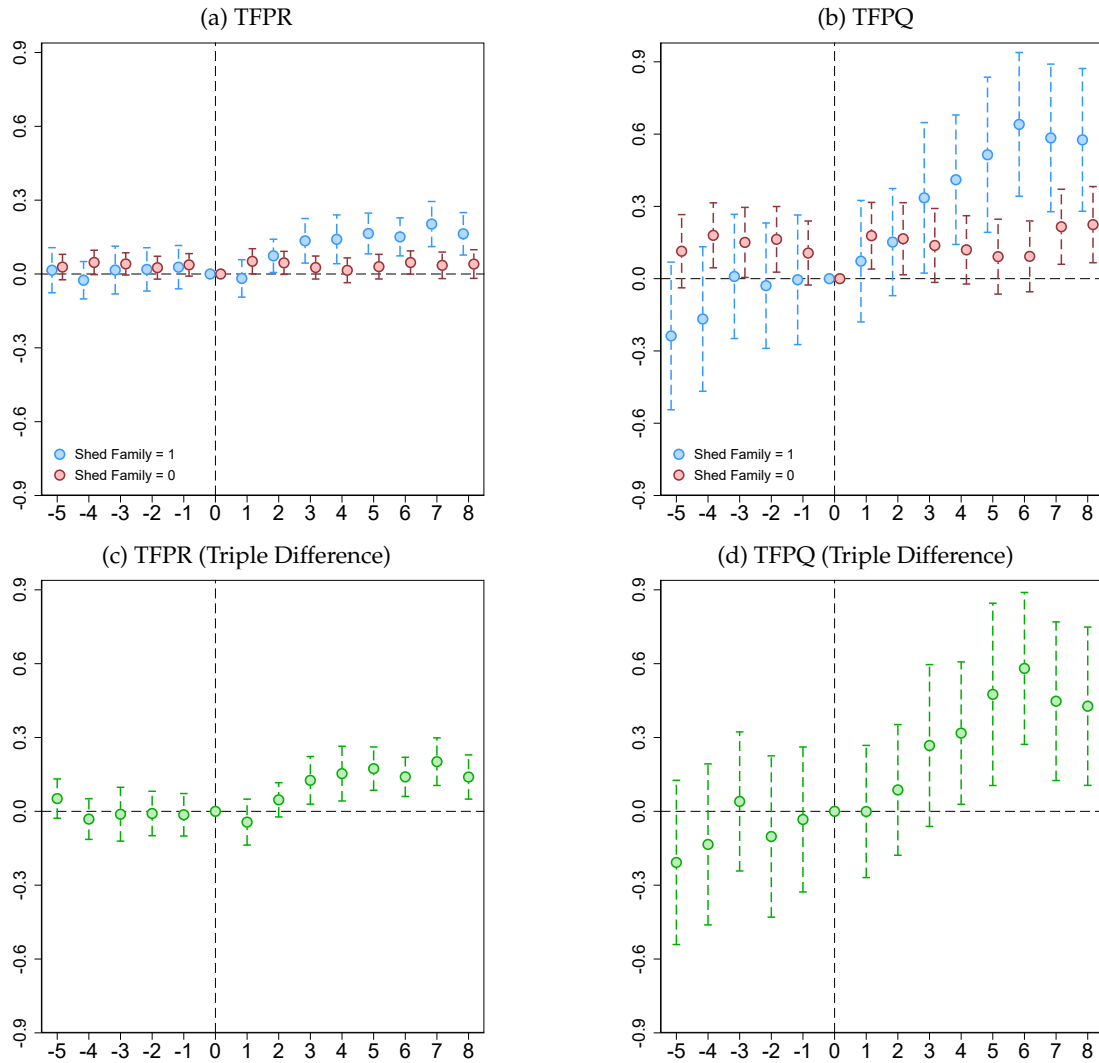
(a) Family Professionals

(b) Non-Family Professionals

Figure 6: Firms that Shed Family from their Executive Board Report Substantially Higher Revenue and Quantity Productivity

Notes: TFPR and TFPQ are estimated using the method proposed in Petrin and Levinsohn (2012).

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