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ABSTRACT: We study how access to bank financing affects product innovation in a developing country context by analyzing a reform that broadened credit eligibility for many small Indian manufacturing firms. Newly eligible firms borrow more but, on average, do not introduce new or more complex products or expand product scope. Many firms appear to operate below efficient scale and use credit to expand existing product lines rather than innovate. Moreover, most firms face several additional barriers that weaken the impact of credit on innovation. Among firms that do not face these additional barriers, credit access boosts innovation, as in advanced economies.

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1 Introduction

Innovation is a key driver of economic growth (Romer, 1990; Aghion & Howitt, 1992) and a policy goal for many governments. Financing is an important input, since innovation activities like research, patenting, and product development often require substantial upfront investment. Many policy initiatives to promote innovation thus aim to improve firms' access to credit. Prior research, largely focused on advanced economies, shows that access to bank credit enables innovation (e.g., Babina, Bernstein, & Mezzanotti, 2023; Granja & Moreira, 2023; Mezzanotti & Simcoe, 2023). However, bank credit may have different effects in developing countries, where firms face tighter financial constraints and other barriers to innovation (Verhoogen, 2023). These additional barriers may shape how firms use credit, since innovation usually involves multiple, complementary inputs (Kremer, 1993).

In this paper, we study how access to bank credit affects product innovation in emerging markets. The introduction of new, complex products is an important dimension of innovation (e.g., Akcigit & Kerr, 2018; Argente, Lee, & Moreira, 2018; Braguinsky, Ohyama, Okazaki, & Syverson, 2021), particularly in developing countries where innovation typically involves less R&D, patenting, or invention of novel technologies (Verhoogen, 2023). Using rich data on Indian manufacturing firms, we examine how improved credit access affected product innovation. The firms we study operate in a very different environment from advanced economies: they are much smaller and face multiple frictions in input and output markets. These frictions lead to a nuanced relationship between credit and innovation. Among firms that face few barriers, credit access fosters innovation, as in advanced economies (Granja & Moreira, 2023). However, for the average firm, additional barriers hinder their ability to translate credit into new and better products, diluting the effect of credit on innovation. Instead, these firms use credit to scale their existing operations and more fully utilize current capacity.

To identify the role of credit, we evaluate a policy change that improved credit access for many Indian firms. India has a long history of supporting credit access for micro, small and medium enterprises (MSMEs) through a variety of schemes. Most notably, starting in 1974, the Reserve Bank of India's Priority Sector Lending (PSL) scheme has required all banks to allocate a sizable share of lending to firms below a size threshold. In 2006, the government expanded eligibility criteria for these schemes, raising the size threshold from Rs 10 million to Rs 50 million. Firms with capital stock between Rs 10-50 million thus became newly eligible for the PSL and other credit access programs.[1] We examine the impact of this change using a standard difference-in-differences design, comparing (i) newly eligible firms to firms whose eligibility status did not change, (ii) before and after 2006.

Rich, firm-level data on product-wise sales for the near-universe of Indian manufacturing firms enables us to track when firms change their product mix. We construct three complementary innovation measures that capture (i) *product scope*, the number of unique products sold (Goldberg et al., 2010); (ii) *product innovation*, the introduction of new products (Granja & Moreira, 2023); and (iii) *product complexity*, the introduction of more sophisticated products (Hidalgo & Hausmann, 2009). On average, firms introduce a new product in 47% of years and a more complex product than prior offerings in 12% of years. MSMEs play an important role in the product innovation landscape, accounting for about 50% of all new product introductions during our sample period. Our data allow us to consider a significantly wider set of products than studies based on scanner data (e.g., Jaravel, 2019; Dubois, Griffith, & O'Connell, 2022; Granja & Moreira, 2023), including many intermediate products.

We first confirm that the reform boosted newly eligible firms' access to credit. Treated firms borrow 12-22% more per year, depending on the measure of credit used. This highlights the importance of these schemes and echoes the findings of prior work, which documents that eligibility expansions were effective at raising credit access (Banerjee & Duflo, 2014; Rotemberg, 2019).

We find that, on average, increased access to bank credit has little impact on product innovation. Newly eligible firms do not expand product scope and are no more likely to introduce new or more complex products. These null effects are precisely estimated: the point estimate is close to zero and with 95% confidence, we can reject that product scope grew by more than 0.05 products (0.04 standard deviations, SD) or that product innovation increased by more than 2 percentage points (0.04 SD).

[1] As discussed in Section 2, the reform also changed the eligibility for other MSME programs which on top of credit provided other type of support for MSMEs (e.g., management training, help with ISO certification and product design, etc). However, since most of the budget for these schemes was allocated to facilitating credit access, we view this reform as reducing MSMEs' financial constraints.

These findings differ significantly from prior research on advanced economies, which has tended to find that credit access increases product innovation (Granja & Moreira, 2023), R&D and patenting (Babina, Bernstein, & Mezzanotti, 2023; Mezzanotti & Simcoe, 2023). We explore two explanations for why increased credit access has little overall impact on product innovation in a developing country context.

First, firms may find it more profitable to expand existing production (De Mel, McKenzie, & Woodruff, 2008; Ottonello & Winberry, 2024). Firms in developing countries generally face tighter credit constraints than in rich countries (Banerjee & Duflo, 2014), and indivisibility in inputs leads constrained firms to often operate with slack (Walker et al., 2024). In this environment, firms may derive high returns from scaling their existing operations. Consistent with this hypothesis, newly eligible firms increase sales by 28% and net income by 24%—despite not changing their product mix or introducing new or more complex products. Newly eligible firms use additional credit to better exploit existing capacity: they spend 26% more on materials, use 28% more worker days, and pay workers 18% higher wages, but do not increase physical investment.

The second explanation we consider is that firms in developing countries face additional barriers, which may limit their ability to translate increased credit into product innovation. In his review paper, Verhoogen (2023) discusses several input and output market frictions common in developing countries that act as barriers to innovation. We identify and measure ten such barriers in our context. These include small and concentrated local output markets; frictions to accessing inputs such as electricity, labor, and land; and low quality of transportation infrastructure and legal institutions. Barriers appear highly relevant in this setting: the median firm faces five non-financial barriers, but there is significant variation, with some firms facing few barriers.

Among firms that face no barriers, credit access significantly increases product innovation. Newly eligible firms that face no barriers increase product scope by 0.17 products (0.14 SD), are 12.7 percentage points (0.25 SD) more likely to introduce a new product, and almost 8 percentage points (0.24 SD) more likely to introduce a more complex product. These effects are if anything, slightly larger in magnitude than those seen in advanced economies (Granja & Moreira, 2023). Put differently, among firms that operate in environments with fewer frictions, credit has a similar impact on innovation as in advanced economies.

Market barriers significantly dilute the impact of credit on product innovation. For each additional barrier, credit access has a 0.03 product weaker effect on scope (0.03 SD), a 2.5 percentage points (0.05 SD) weaker effect on product innovation rates, and a 1.8 percentage point (0.05 SD) weaker effect on the odds that firms introduce a more complex product. We observe similar patterns across different measures of product innovation and for both input and output market barriers. For the median firm, which faces five barriers, credit has a net null effect on innovation, consistent with our baseline results. No single barrier drives these patterns. Rather, most firms face multiple, overlapping non-financial barriers which collectively make it harder for firms to translate credit into new and more complex products.

These barriers also weaken the impact of credit on firm growth. Among firms that face no barriers, credit access increases sales (profits) by 98% (72%), but each additional barrier reduces the impact of credit by 13% (8%). While substantial, this dilution effect is less severe than for product innovation: the median firm, which faces five barriers, still experiences a significant 20-30% increase in sales and profits. Dilution effects are stronger for investment: newly eligible firms facing no barriers raise investment by 62%, but each additional barrier reduces the impact of credit by 10%. Thus, for the median firm, credit increases sales and profits but not investment.

Taken together, our findings highlight the nuanced relationship between bank credit and product innovation. Firms that face few non-financial barriers to innovation are well-positioned to use credit to invest and introduce new products. However, many firms face multiple barriers that make it difficult to translate credit into innovation. For such firms, expanding existing production may be a higher-return use of credit than innovation, especially if they are operating below efficient scale. The average impacts of credit depend on the shares of both types of firms in the economy.

Firms in developing countries are both significantly smaller than their advanced economy counterparts (Hsieh & Olken, 2014) and likely face more non-financial market barriers. These two features of emerging markets may explain why our results differ from existing research on advanced economies. Our findings also illustrate why big-push policies—that unlock several frictions at once—might be required to foster product innovation in emerging markets (Murphy, Shleifer, & Vishny, 1989; Kremer, 1993).

Contribution to literature. Our paper relates to two areas of research. First, we add to a large literature on the effects of credit in developing countries. Access to external finance has been shown to improve firm performance (Banerjee & Duflo, 2014; Rotemberg, 2019) and stimulate economic growth (Rajan & Zingales, 1998; Levine, 2005), with particularly strong effects for small firms in developing countries (De Mel, McKenzie, & Woodruff, 2008; Khwaja & Mian, 2008). Our paper shows that, in developing countries, the impact of credit depends on which non-financial barriers firms face.

A growing body of work documents that bank credit promotes innovation (see Kerr and Nanda (2015) and Lin, Liu, and Wei (2023) for reviews), increasing patenting (Amore, Schneider, & Žaldokas, 2013; Nanda & Nicholas, 2014; Babina, Bernstein, & Mezzanotti, 2023), R&D expenditure (Acharya & Xu, 2017; Giebel & Kraft, 2019; Krieger, Li, & Papanikolaou, 2022; Mezzanotti & Simcoe, 2023), and product innovation (Granja & Moreira, 2023). However, most of this research is on advanced economies, where firms are larger and face fewer non-financial barriers to innovation. By contrast, there is less evidence from developing countries. While several studies use cross-country firm surveys to examine the relationship between financial constraints and innovation in emerging markets (Ayyagari, Demirgüç-Kunt, & Maksimovic, 2011; Gorodnichenko & Schnitzer, 2013; Ongena & Qi, 2020), they do not leverage exogenous policy shocks to credit access.[2] Our results show that for firms that face few non-financial barriers, access to credit increases both innovation and sales, as in advanced economies. However, for the average firm, non-financial barriers significantly dampen the effects of credit, especially on innovation. Most firms thus use additional credit to scale up existing product lines rather than introduce new or more complex products. Our findings echo recent evidence that many firms in developing countries operate with slack (Walker et al., 2024) and may use credit to reach efficient scale (as in Ottonello and Winberry (2024) and Cui, Xie, and Zhang (2024)).

In addition, while prior studies exploit variation in financial constraints due to aggregate shocks like the Global Financial Crisis (Duval, Hong, & Timmer, 2020;

[2] Jain, Singh, and Subramanian (2022) show that debt recovery tribunals affect innovation in India, but the mechanisms go beyond increasing access to credit.

Giebel & Kraft, 2020; Contreras, Ghosh, & Kong, 2021) or banking sector deregulation (Chava et al., 2013; Cornaggia et al., 2015; Hombert & Matray, 2017), we evaluate a major credit access policy for Indian MSMEs. Such programs are common industrial policies (Rotemberg, 2019; Matray et al., 2024), and our results shed light on how they affect innovation.

Second, we contribute to research on the drivers of firm upgrading and innovation. In his influential review paper, Verhoogen (2023) argues that firms in developing countries face a range of barriers to innovation, including export restrictions (Ayyagari, Demirgüç-Kunt, & Maksimovic, 2011), limited foreign competition (Stiebale & Vencappa, 2022), constrained access to imported inputs (Goldberg et al., 2010), small and uncompetitive domestic markets (Lileeva & Trefler, 2010; Jaravel, 2019; Zhang & Nie, 2021), weak local spillovers (Matray, 2021), and ineffective management practices (Bloom et al., 2013). However, there is surprisingly little causal evidence on the role of credit constraints (Verhoogen, 2023) — and, to our knowledge, no prior work systematically examines how credit constraints interact with other barriers to innovation. We show that easing financing constraints has a large impact on innovation when firms face few other barriers but a diluted impact when firms face multiple non-financial barriers. These findings align with Kremer (1993) and Buera and Shin (2013), who emphasize the complementary inputs required to make complex products.[3]

Arguably, the paper closest to ours is Granja and Moreira (2023), which finds that US firms more exposed to liquidity shocks during the Global Financial Crisis reduced product innovation. Our work complements theirs by showing that the impacts of credit depends on firms' non-financial barriers and may thus vary across contexts. In addition, our data cover all products sold by Indian manufacturing firms, going beyond the consumer products available in the scanner data used in Granja and Moreira (2023).

The rest of the paper is organized as follows. Section 2 describes the institutional context. Section 3 describes the data, Section 4 explains the empirical strategy, and Section 5 presents the results. Section 6 concludes.

[3]Interestingly, development economists have reached similar conclusions about barriers to upgrading in agriculture—credit access must be combined with other interventions to support technology adoption by farmers in developing countries (Bridle et al., 2020; Suri & Udry, 2022).

2 Institutional Background

As in many developing countries, MSMEs play a crucial role in India's economy. In 2005, just before policy reform we study, MSMEs accounted for nearly 35% of manufacturing employment. India has a long history of supporting MSMEs, dating back to the 1951 Industries (Development and Regulation) Act and the establishment of the Ministry of Small Scale Industries in 1954. Over time, a wide array of schemes have been introduced to promote MSME growth.[4]

Credit access programs are by far the largest and most important of these MSME support schemes. In 2005, over 60% of the MSME Ministry's overall budget was allocated to credit access programs, dwarfing all other program categories. Moreover, since 1974, under the Priority Sector Lending (PSL) program, the Reserve Bank of India has required all banks to set aside a significant portion of their total lending for priority sectors, including agriculture, social sectors (e.g, housing, education, etc), and MSMEs. By 2005, domestic (foreign) commercial banks needed to allocate 40% (32%) of their total loans to priority sectors.[5]

Eligibility for the PSL and other credit access schemes changed in 2006. The Indian government passed the MSME Development Act, which revised the size threshold to be an MSME.[6] Prior to 2006 (i.e. in 2001, the year our sample starts, manufacturing firms with under 10 million rupees in nominal investment in plants and machinery were classified as MSMEs and were eligible for credit access programs like the PSL.[7] The MSME Development Act raised the size cutoff to 50 million rupees.

Firms with assets between 10-50 million rupees became newly eligible for Pri-

[4]See MSME Annual Report 2008-09. These programs were intended to facilitate: (i) access to credit; (ii) technology modernization; (iii) infrastructure facilities; (iv) modern testing facilities and quality certification; (v) access to modern management practices; (vi) entrepreneurship development and skill upgradation through appropriate training facilities; (vii) support for product development, design intervention and packaging; (viii) welfare of artisans and workers; (ix) assistance for better access to domestic and export markets; and (x) capacity-building and empowerment of the units and their collectives.

[5]See RBI MASTER CIRCULAR 07/03/2006.

[6]The act also established specific programs to enhance the competitiveness of these enterprises, gave preference in government procurements to products and services of MSMEs, established more effective mechanisms for mitigating the problems of delayed payments to micro and small enterprises and offered assurance of a scheme for easing the closure of business by these enterprises.

[7]The cutoff varied over time: from 500,000 in 1960, to 6.5 million in 1997, and then to 30 million in 1998. The threshold was lowered to 10 million in 1999, where it remained until October 2006.

ority Sector Lending and other credit access programs from the MSME Ministry. As a result, 10% of all Indian manufacturing firms, which collectively account for 15% of manufacturing output, became newly eligible for credit access programs. Appendix Figure A.1 shows that both the absolute volume of credit and the share of lending flowing to MSMEs increased following the reform.

3 Data

Our empirical analysis draws on the Annual Survey of Industries (ASI), a nationally representative survey of manufacturing firms that covers all registered manufacturing establishments in India.[8,9] Larger firms (>100 workers) are surveyed every year while the remainder are sampled at least once every five years.[10,11] The ASI provides associated sampling weights, allowing us to draw conclusions representative of the entire population of registered manufacturing firms in India.

Crucially, the ASI contains information on product-wise sales. Products are partitioned into 9 sections, 64 product divisions, and 5,400 unique products. We exploit this granular data to construct three measures of innovation:

Product Scope. The number of unique products a firm sells in a given year. This definition mirrors Goldberg et al. (2010).

Product Innovation. An indicator for whether a firm, in a given year, introduces a product it has not previously sold. Firms occasionally remove existing product lines or reintroduce previously sold products (Argente, Lee, & Moreira, 2018), so increases in product scope do not necessarily reflect product innovation. Figure 1 and Appendix Table A.1 (panel B) showcase examples of product innovation in our data.

[8] We use the terms establishment and firm interchangeably, as 92% of entities report no other plants in the country.

[9] The firms eligible for inclusion are all formal establishments with 10 or more workers if the plant uses power, or 20 or more workers in the absence of power use.

[10] Firms in the five least industrially developed states, Manipur, Meghalaya, Nagaland, Tripura, Andaman & Nicobar Islands (and in some years Sikkim), are included in the "Census Sector" irrespective of size.

[11] The sampling fraction by stratum was revised from 12% to 20% in 2003.

Product Complexity. An indicator for whether a firm sells a more complex product than its previous offerings. Following Hidalgo and Hausmann (2009), we measure product complexity using an index based on the structure of the country-product export network. A product is considered more complex when it is specialised (i.e. exported by few countries) and exported by countries that export many other specialised products. The measure is strongly correlated with income per capita and captures the idea that products that are primarily exported by richer, industrialised countries tend to be more complex (Kremer, 1993).

Figure 2 describes an example of an increase in *Product Complexity*, which also illustrates the granularity of our data. The firm in question previously sold unwrought aluminum and then introduced aluminum foil as a product line. Appendix Table A.1 (panel A) presents more examples of firms introducing more complex products.

Innovation Sales Shares. In addition to these discrete measures, we also consider sales from new and more complex products as shares of total sales. Specifically, we construct (i) *Innovation Sales Share*: the fraction of total sales from new products; and (ii) *Complex-Innovation Sales Share*: the fraction of sales from new and more complex products. These continuous measures allow us to capture how important these changes in product mix are to a firm's overall sales.

Comparison with Scanner Data. Scanner data is increasingly used in many advanced economy contexts to measure and study innovation (Jaravel, 2019; Dubois, Griffith, & O'Connell, 2022). Our data complements scanner data in several ways. First, we observe a wider set of products. Matching ASI codes to products that typically appear in scanner data, we find that scanner products account for only 34% of products and 52% of sales (Appendix Figure A.2). Moreover, while scanner data also tends to focus on RFID-tagged products sold by retailers, our data also includes intermediate goods. RFID-tagged products may also be less common in developing countries, where many retailers are in the informal sector.

Firm Borrowing, Inputs, Revenue. The ASI also contains rich data on firms' borrowing, revenues, materials, wages, investment, value-added, net income, and detailed coverage of fixed assets. As described in Section 2, firms' eligibility for government credit support programs is determined by gross fixed assets in plant and machinery. Following Rotemberg (2019), we use the last reported value before 2006 to identify whether firms became *Newly Eligible* (i.e. gained eligibility after the 2006 reform) or not (eligibility unchanged by 2006 reform).[12]

Sample Restrictions. We restrict the sample in several ways. First, we limit our analysis to years 2001-2010 due to changes in ASI product classifications: product codes became more granular in 2001 and were fully revised in 2011. These changes mean that we can only accurately map changes in a firm's product offerings between 2001-2010. Second, we restrict the sample to firms observed at least twice prior to and once after the 2006 reform. We need to observe innovation outcomes before and after the reform to estimate our difference-in-differences specification, and require at least two observations to measure whether a firm's product mix changed. We also impose additional filters, such as dropping firms with more than 9 products (since the ASI only lists a firm's top 10 products). Appendix Table A.2 describes all the sampling restrictions in more detail.

Non-Financial Barriers to Innovation. We compile data on ten frictions in input and output markets that are widely regarded as barriers to product innovation (Verhoogen, 2023). All measures are constructed using pre-treatment data.

1. *Market Concentration*: Herfindahl-Hirschman Index for each state $\times$ year $\times$ product market

2. *Market Size*: total sales across all firms, defined at state $\times$ year $\times$ product level

3. *Import Reliant*: an indicator for whether the firm imports inputs

4. *Electricity*: a measure of electricity shortage at state $\times$ industry level, following and using data from Allcott, Collard-Wexler, and O'Connell (2016)

5. *Raod Infrastructure*: fraction of villages in state with paved roads, from last pre-reform census

[12] Because not all firms are surveyed every year, and firms occasionally submit incomplete surveys, we use the last available gross accumulated investment in plant and machinery in the pre-reform period to determine treatment. We drop firms for which no such value is available.

6. *Labor Regulation*: a measure of the strictness of each state's labor regulation, following and using data from Besley and Burgess (2004)

7. *Land Access*: a proxy for the efficiency of land markets, based on each state's prior land reforms, following and using data from Besley and Burgess (2000)

8. *Legal Contract Enforcement*: a proxy for the strength of contract enforcement based on how congested each state's courts are, following Boehm and Oberfield (2020) using pre-treatment data from Daksh

9. *Education*: the share of children meeting reading and math proficiency standards, using data from the Annual Status of Education Report (ASER)

10. *Rural*: whether a firm is located in a rural area

All ten barriers are constructed as binary measures (see Appendix Table A.3 for details).[13] While there is significant variation, the median firm faces five of these barriers (Figure 3).

3.1 Stylised Facts on Innovation

Table 1 presents summary statistics and Appendix Table A.5 contains detailed variable definitions. Using our data, we describe three facts about innovation in our developing country context.

#1: Firms regularly introduce new products. The average firm sells 1.8 products in a given year. Although most firms have limited scope, product innovation is not rare: the probability of introducing a new product in any given year is 47%. Over the 2001-10 period, we observe more than 66,000 instances of firms introducing new products. Product innovation by individual firms expands the variety of products in the economy at large: over the 2002-10 period, the number of distinct products in the Indian economy grew from 3,499 to 3,813, an 8.9% increase. Expanding product variety is a key ingredient of economic growth in some canonical models (Romer, 1990), so it is valuable to understand its microeconomic drivers. These introductions are also economically meaningful for individual firms: on average, new products account for 33% of a firm's annual sales (Table 1).

[13] We validate the relevance of the latter six barriers constructed outside of ASI using data from ASI in Appendix Figure C.1. Pairwise correlations among the ten barrier indicators are reported in Appendix Table A.4.

#2: MSMEs account for a significant fraction of product innovation. Contrary to the perception that large firms drive innovation in developing countries, we find that nearly 50% of new product introductions come from MSMEs. Moreover, 13% of all new products are sold exclusively by MSMEs and never by larger firms. Since MSMEs play an important role in shaping aggregate innovation dynamics in emerging economies, understanding what constrains MSME innovation is crucial.

#3: A meaningful share of innovations raise product complexity. Approximately 11% of innovations involve firms introducing more complex products than they have previously sold. Moving up the product complexity ladder is associated with industrial development and productivity growth (Hausmann, Hwang, & Rodrik, 2007; Hidalgo et al., 2007) . Indeed, over our sample period, we observe that the sales-weighted complexity of Indian manufacturing products rose, with the magnitude comparable to moving from Cuba's export basket in 2002 to Russia's export basket in 2010.

Product Innovation in Advanced vs Emerging Economies. Several noteworthy points emerge when comparing our context with that of Granja and Moreira (2023), which examines product innovation in the US consumer goods sector. First, product innovation rates are similar: in our sample, firms have a 47% probability of introducing a new product each year, versus 34% in Granja and Moreira (2023). However, the Indian MSMEs in our sample are much smaller, with average annual revenue of INR 96 million (USD 2.2 million in 2005)—less than one-third that of firms studied by Granja and Moreira (2023).[14] Indian MSMEs also have narrower product scope: the average firm in our sample sells 1.8 products per year, compared to 25.7 in Granja and Moreira (2023), though this may also reflect features of firms selling RFID-tagged consumer goods. The fact that Indian firms operate at much smaller scale may shape how they use additional capital. For instance, firms may choose to expand existing product lines rather than introduce new products (Ottonello & Winberry, 2024).

[14]In fact, this calculation is likely to significantly underestimate the size disparity, since Granja and Moreira (2023) only observe sales and products in stores covered by the Nielsen scanner data.

4 Empirical Framework

To evaluate how firms use additional credit, we exploit the 2006 policy change and estimate a standard difference-in-difference specification, following Rotemberg (2019):

$$y_{i,t} = \beta_1 \text{Post}_t \times \text{Newly Eligible}_i + a_{s,t} + b_{j,t} + c_i + \epsilon_{i,t} \tag{1}$$

where $y_{i,t}$ represents firm outcomes such as innovation, sales, profits, investment and inputs like materials and workers' wages.[15] Post_t is a dummy equal to one for years after the 2006 reform, and Newly Eligible_i is a dummy indicating whether the firm gained eligibility due to the reform.

Our specification includes a rich set of fixed effects to account for potential confounding factors: firm FEs (c_i) control for unobserved time-invariant firm-specific traits (e.g., managerial quality); state $\times$ year FEs ($a_{s,t}$) account for time-varying shocks or policy changes at the subnational level (e.g., changes in local economic conditions) that could affect firm outcomes; and industry $\times$ year FEs ($b_{j,t}$) absorb any industry-specific shocks or trends (e.g. demand shifts).

Thus, our specification compares newly eligible firms to a control group of similar firms that were unaffected by the reform, within the same state, industry, and year. Figure 4 shows that we see no differential pre-trends between these two groups of firms. Standard errors are clustered at the firm level and observations are weighted by inverse sampling probability.

Pre-treatment characteristics of input and output markets—such as market concentration, availability of electricity, or infrastructure quality—may impact firms' ability to leverage the reform to innovate. To empirically explore how barriers influence the effects of credit, we build on Equation 1 and estimate:

$$\begin{aligned} \ln(y_{i,t}) =& \beta_1(\text{Post}_t \times \text{Newly Eligible}_i) + \beta_2(\text{Post}_t \times \text{Barriers}_i) + \\ & \beta_3(\text{Post}_t \times \text{Newly Eligible}_i \times \text{Barriers}_i) + \delta_{s,t} + \delta_{j,t} + \delta_i + \epsilon_{i,t} \end{aligned} \tag{2}$$

where Barriers_i refers to the number of market barriers firm i faced prior to the reform. Specifically, we use a count—ranging from zero to ten—of how many

[15] We do not apply the log-transformation for our measures of innovation.

barriers each firm faced. The coefficient β_1 shows the effect of credit access on firms who faced zero barriers, while β_3, captures how an additional barrier influences the impact of credit on firms. All barriers are detailed in Section 3.

5 Results

We begin by showing that the 2006 reform significantly improved access to credit for newly eligible firms. However, for the average firm in our context, this did not increase product innovation. We propose two explanations for this. First, we show that the average firm expands existing production rather than innovate. Second, the average firm faces several non-financial barriers to innovation, and these dilute the effects of credit.

5.1 Impact on Credit Access

Did the 2006 reform meaningfully expand credit access for newly eligible firms? Table 2 presents results for three measures of credit: i) outstanding loans, ii) overdraft facilities, and iii) a total measure combining both.

The reform significantly improved newly eligible firms' ability to access credit.[16] Column (1) shows that long-term loan balances increased by 12% for newly-eligible firms relative to firms with no shift in eligibility.[17] This is an economically large improvement in access to long-term financing. Columns (2) and (3) indicate that short-term and total borrowing also expanded by more than 20%. These findings show that the reform meaningfully boosted access to credit, consistent with prior work on priority sector lending targeting MSMEs (Banerjee & Duflo, 2014; Rotemberg, 2019).

5.2 Impact on Product Innovation

Next, we examine how this expanded credit access impacted product innovation. Column 1-3 of Table 3 consider our three primary measures of innovation. Column

[16] Appendix Table C.1 shows that these (and other log-transformed) estimates are robust to the concern about log-transformations raised in Chen and Roth (2024).

[17] On average, these loans represented 51% of borrowing for newly-eligible firms in the post-reform period.

(1) indicates that credit access did not affect product scope: the coefficient on *Post* × *Newly Eligible* is small and not statistically different from zero. Newly eligible firms are also no more likely to introduce a new product (column 2), or to introduce more complex products (column 3). The difference-in-difference plot also shows no visible effect (Figure 4).

These null results are precisely estimated: the point estimates are all close to zero and we can rule out even modest effects. Specifically, at the 95% confidence level, we can rule out that newly eligible firms expand product scope by more than 0.05 products (0.04 SD), increase product innovation rates by more than 2 percentage points (0.04 SD), or raise their odds of introducing more complex products by more than 0.7 percentage points (0.02 SD).

We obtain similar results when using a more intensive margin measure of innovation—the share of sales from new or more complex products. As before, credit access has no average effect, and the difference-in-difference estimates are small, precisely estimated, and statistically insignificant (Table 3, columns 4-5). Thus, across a range of innovation measures, we find little evidence that newly eligible firms adjust their product mix.[18]

Two additional exercises support the robustness of our findings. First, we compare newly eligible firms to a narrower range of firms that are more comparable in size. Specifically, we re-estimate our baseline difference-in-difference specification from Table 3 for sub-samples restricted by firm size. Appendix Table B.1 presents results across four bands: 0–100mm, 0–50mm, 0–30mm, and 0–20mm. Across all size bands and innovation measures, the estimated treatment effects are very similar and remain statistically insignificant. Second, we probe whether our results are driven by changes to regulations that reserved certain products for small firms (Martin, Nataraj, & Harrison, 2017).[19] Appendix Table B.2 estimates our baseline specification for firms that never produce such reserved products in the sample period. Again, we find no evidence that credit access boosts innovation.

Collectively, our evidence suggests that expanded credit access had little aver-

[18]This expansion in scale does not appear to be accompanied by significant improvements in productivity (see Appendix Table C.2).

[19]India's Small-Scale Industry policy limited the manufacturing of designated products to firms whose plant-and-machinery value lay below a limit. A staggered reform removed products from the list beginning in 1997, and virtually the entire list had been de-reserved by 2008. The size ceiling itself was relaxed in 2006 under the MSME Act.

age impact on product innovation in our developing country context. These findings stand in contrast to evidence from the US, where firms reduced product innovation during periods of credit market disruption (Granja & Moreira, 2023).

5.3 Why Does Credit Access Fail to Spur Product Innovation?

We consider two explanations for why improving credit access did not increase product innovation among Indian MSMEs. First, firms may be highly credit constrained and find it more profitable to expand existing production lines rather than innovate (we consider this explanation in Section 5.4). Second, firms in developing countries may face many additional non-financial barriers that hinder their ability to translate credit into innovation (we consider this explanation in Section 5.5).

5.4 Do Firms Expand Existing Production?

Table 4 examines whether the improved credit access enabled firms to expand the scale of production. We estimate our baseline DiD specification with four measures of firm performance: i) sales, ii) gross value added (GVA), iii) net income, and iv) managerial wages.

Newly eligible firms channeled additional credit into profitably expanding the scale of output. Column (1) shows that newly eligible firms increased sales by 28%. Column (2) shows that GVA grew by 24%, confirming that higher revenue reflects real output, not merely higher prices. Similarly, columns (3) and (4) indicate that profits rose as net income increased by 24%, and managerial wages—a proxy for payments to owners—rose by 14%.

How did firms achieve this profitable expansion? To explore this question, we examine how newly eligible firms used key inputs: i) materials, ii) labor, iii) wages, and iv) fixed capital investments. Table 5 presents the findings.

Newly eligible firms grew largely by scaling up variable inputs rather than making additional capital investments. Newly eligible firms increased raw materials by 26% (column 1), worker days by 28% (column 2), and wage expenditure by 18% (column 3). All of these estimates are statistically significant at the 99% confidence level. By contrast, we see limited evidence that credit access raised capital investment: the point estimate in column 4 is positive but statistically insignificant and smaller in magnitude than the coefficients on the variable inputs.[20]

Taken together, the results in Table 4 and Table 5 are consistent with recent evidence on slack in developing countries.[21] On average, newly eligible firms did not use credit to introduce new or more complex products, or even increase investment. Rather, they used variable inputs like materials and labor more intensively, significantly increasing sales and profits. Moreover, given the null effects on innovation, this expansion in production scale occurred in existing product lines.

5.5 Do Market Barriers Dilute the Impacts of Credit?

5.5.1 Impacts on Innovation

A second reason why improved credit access did not increase product innovation is that firms in developing countries face significant non-financial barriers to innovation. Indeed, Verhoogen (2023) identifies several frictions in input and output markets in developing countries that may hinder innovation. Intuitively, input market frictions may constrain firms' ability to innovate, while output market frictions may reduce the returns from doing so. We examine how the impact of credit on product innovation varies with firms' exposure to such barriers.

As discussed in Section 3, we consider ten barriers, including unreliable electricity supply, uncompetitive or small output markets, poor infrastructure, and legal congestion. Importantly, these barriers tend to overlap: as shown in Figure 3, the median firm faces five barriers. We evaluate whether the effect of credit on product innovation varies with the total number of barriers a firm faces (a count ranging from 0 to 10).

Table 6 presents results. Among firms that face no non-financial barriers, credit access enables product innovation. Across our three primary innovation measures, we observe a positive and statistically significant coefficient on *Post* × *Newly Eligible*

[20] Appendix Table C.3 disaggregates investment by type and shows that newly eligible firms did not meaningfully raise long-term capital expenditure after the reform. Estimated effects for machinery, buildings, and transport equipment—the three largest asset categories of the firms in our sample—are all economically small and statistically indistinguishable from zero, although we do see a small treatment response for land acquisitions.

[21] Walker et al. (2024) emphasize that indivisible inputs generate slack for small firms. Drawing on experimental evidence for Kenyan firms, they find that indivisibility in labor is important for very small firms. For the Indian MSMEs we study, indivisibility appears more binding for capital than for labor.

(columns 1-3). Moreover, the magnitudes are economically meaningful: improved credit access increases scope by 0.17 products (0.14 SD), product innovation rates by 12.7 percentage points (0.25 SD), and odds of introducing more complex products by 7.9 percentage points (0.23 SD). These effect sizes are comparable to (and, if anything, slightly larger than) estimates from advanced economies: in Granja and Moreira (2023), for instance, credit shocks reduce product innovation by 0.11 SD. Thus, for firms that operate in environments more similar to advanced economies, we find that credit boosts product innovation, consistent with prior work from advanced economies (Granja & Moreira, 2023).[22]

However, each additional barrier a firm faces dilutes the effect of credit access on innovation. We see that the triple interaction term *Post* × *Newly Eligible* × *Pre-Treatment Barrier Count* is negative and statistically significant for all three innovation measures. Consider column (2) to better understand magnitudes. Newly eligible firms that face no barrier increase product innovation rates by 12.7 percentage points (0.25 SD). Each additional barrier attenuates this effect by 2.5 percentage points (0.05 SD). For the typical firm,which faces five barriers, this translates to a net null effect of credit on product innovation (Appendix Figure C.2). We observe a very similar pattern for all our innovation measures: product scope (column 1) and complexity (column 3), and the share of sales from new products (column 4) and more complex products (column 5). Our results indicate that non-financial barriers attenuate the effects of credit on product innovation.

Our results in Table 6 are robust to several additional tests. First, we re-estimate our main specifications for samples restricted by pre-treatment size. Panels A-E of Appendix Table B.3 show that the interaction *Post* × *Newly Eligible* remains positive and statistically significant across all specifications, Similarly, *Post* × *Newly Eligible x Barrier Count* remains negative and statistically significant. Second, we assess whether our findings are driven by concurrent policy changes, such as the de-reservation of specific products. In Appendix Table B.4, we exclude firms that ever produced products subject to de-reservation during the sample period. Again, our main findings remain similar.

In Appendix Table B.5, we show that no single barrier drives our findings. Ex-

[22] Our measure of the introduction of new products corresponds to what Granja and Moreira (2023) describe as entry into new product lines. ASI also defines a small set of product divisions. It is much less common for firms to enter new product divisions—which are very different from their existing product mix—and we have little statistical power to study such entry (Appendix Table C.4).

cluding any individual barrier from our count does not change the results. Rather, the fact that many barriers overlap makes it difficult to isolate the effect of any one barrier.[23]

Collectively, these results offer a second explanation for why credit had a limited effect on product innovation for the average Indian MSME, and why our findings might differ from studies in advanced economies.

5.5.2 Impacts on Firm Growth

Do input and output market barriers also constrain firms' ability to translate credit into growth? To test this, we estimate equation (2) using measures of firm growth as the outcome. Table 7 presents results: Panel A contains results for sales, gross value added, net income, and managerial wages, while Panel B examines materials, labor, wage expenditures, and investment.

Among firms that face no barriers, credit has a large, positive effect on growth. In both panels of Table 7, the coefficient on *Post* × *Newly Eligible* is positive and statistically significant for all outcomes. Moreover, the magnitudes are large: for these firms, credit access increases sales by 98% and profits by 72%.

We also see that non-financial barriers weaken the effects of credit on firm growth. The triple interaction term, *Post* × *Newly Eligible* × *Pre-Treatment Barrier Count*, is negative and statistically significant across all outcomes. Each additional barrier reduces the impact of credit on sales and profits by 13% and 8% respectively. However, this dilution effect is less severe than for product innovation (Figure 5). The median newly eligible firm, which faces five barriers, still experiences a substantial increase in sales and profits of 20-30%, and increases use of raw materials and labor. Thus, the median firm still uses additional credit to expand operations, though less than firms that face no barriers. By contrast, due to stronger dilution effects, credit access has no treatment effect on innovation (Figure 5) and investment (Table 7, column 4) for the median firm.

These results bridge our two explanations for why credit has a limited effect on product innovation in a developing country setting. Firms that face few or no non-financial barriers are well-positioned to use credit to invest and introduce new products. For such firms, credit access facilitates product innovation—and these

[23] Accordingly, we place less weight on specifications that focus exclusively on a single barrier, as reported in Appendix Table B.6.

new and more complex products comprise a growing share of sales.[24] However, most firms face multiple non-financial barriers that make it difficult to translate credit into innovation. Yet these firms are still financially constrained, and credit allows them to profitably expand by increasing input use and better utilise existing capacity.

The average impact of credit depends on the shares of both types of firms in the economy. In advanced economies, a higher share of firms may face few non-financial barriers to innovation, while in developing countries most firms likely face many such barriers. Because both groups of firms use the marginal dollar of credit in different ways, credit expansions may have different reduced form effects in advanced and emerging economies.

6 Conclusion

Fostering innovation is an important policy goal in countries across the income spectrum. Credit access programs are a popular policy instrument, since financing is considered a key constraint to innovation. Indeed, prior work, largely set in advanced economies, has shown that improved access to credit enables innovation.

We examine how bank credit affects product innovation in a developing country context. Firms in developing countries do not operate in the same environment as their advanced economy counterparts. They are much smaller, and many face significant input and output market barriers to innovation besides financing constraints.

We find that improved access to credit has nuanced effects on innovation for developing country firms. Many firms appear to operate below efficient scale and use additional access to credit to expand existing production. Moreover, many—but not all—firms face market barriers that dilute the impact of credit on product innovation. Firms that face no other barriers to innovation use additional credit to innovate, with effect sizes larger than those seen in advanced economies.

These findings highlight the need for policymakers to unlock firms' multiple, overlapping constraints to innovation. A coordinated big-push strategy of this kind can foster innovation and, increase the effectiveness of credit support programs.

[24] Appendix Table C.5 shows that firms that face no barriers make investments in both buildings and plant & equipment.

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Figure 1: *Product Innovation—Example*

Notes: This figure presents an illustrative example of product innovation from our sample. A firm initially engaged in the production of *Ingot, Iron/Steel* introduces *Bars Rods & Rounds, Iron/Steel* as a new product.

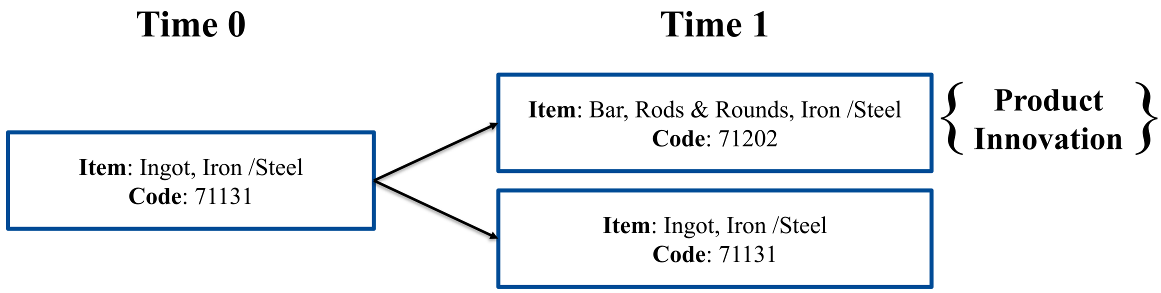
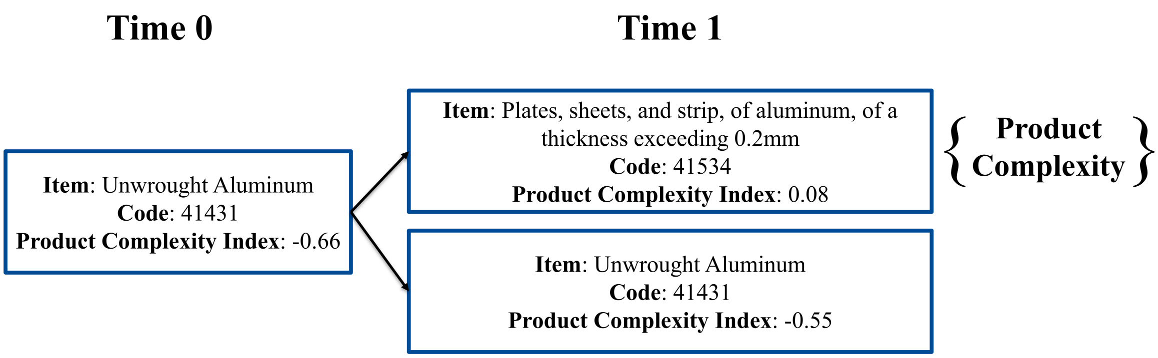


Figure 2: *Product Complexity—Example*

Notes: **Panel A** shows an example to illustrate how our measure of complex innovations is defined. A firm originally manufacturing *Unwrought aluminum* introduces *Plates, sheets, and strip of aluminum...* as a new product. The new product is assigned a Product Complexity Index (PCI) of 0.08, surpassing the PCI of historical production. The new production is therefore classified as a Product Complexity Innovation. **Panel B** offers insight into the PCI measure by listing five of the products with the highest and lowest PCI values observed in the dataset.

Panel A: *Product complexity process*



Panel B: *High and low complexity products in the Annual Survey of Industries*

Code	Description
	Top Product Complexity
38942	Photographic plates and film, exposed and developed, other than cinematographic film
48315	Liquid crystal devices n.e.c.; lasers, except laser diodes; other optical appliances and instruments n.e.c.
43123	Compression-ignition internal combustion piston engines, of a kind used for the propulsion of vehicles other than railway or tramway rolling stock
44213	Lathes for removing metal
41234	Flat-rolled products of high-speed steel of a width of less than 600 mm, not further worked than hot or cold-rolled
	Bottom Product Complexity
26170	Jute and other textile bast fibres (except flax, true hemp and ramie), processed but not spun; tow and waste of these fibres
01922	Jute, kenaf, and other textile bast fibres, raw or retted, except flax, true hemp and ramie
01950	Natural rubber in primary forms or in plates, sheets or strip
01141	Sorghum/Jowar, seed
01142	Sorghum/Jowar, other

Figure 3: *Distribution of Market Barriers*

Notes: This figure shows the distribution of barriers faced by each firm. We consider ten non-financial barriers to innovation. Each barrier is explained in more detail in Table A.3. The median firm faces five barriers.

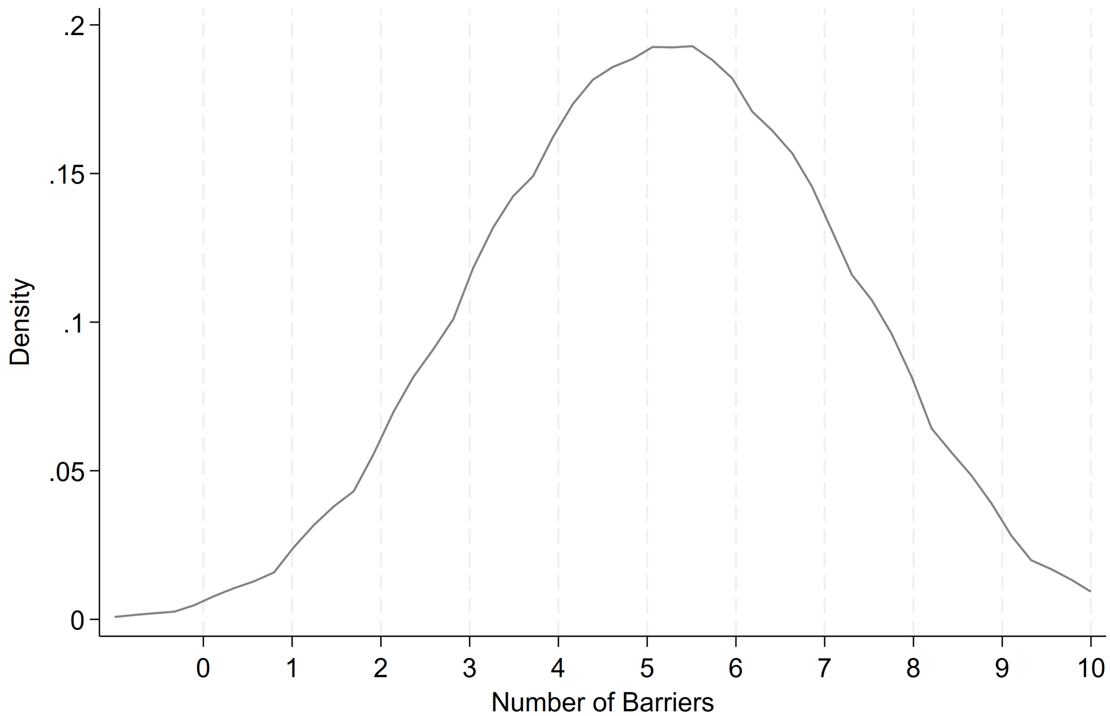
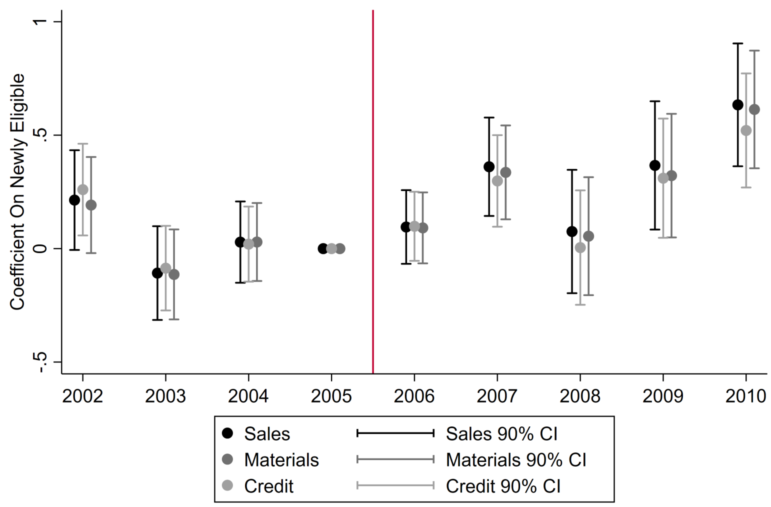


Figure 4: *Difference in Difference coefficient plot*

Notes: This figure displays difference-in-difference plots from estimating the dynamic version of equation (1). **Panel A** presents estimates of the treatment's impact on the natural log of sales, materials, and credit. **Panel B** illustrates the treatment effect on Product Scope/Innovation/Complexity. The specification includes controls for firm, state × year, and industry × year fixed effects. The plots show 90 percent confidence intervals, with standard errors clustered at the firm level. The year 2005 is omitted from the regression, and the vertical line between 2005 and 2006 marks the policy change. Outcomes are winsorized at the 1st and 99th percentiles.

Panel A*: Credit, inputs, and sales*



Panel B*: Innovation measures*

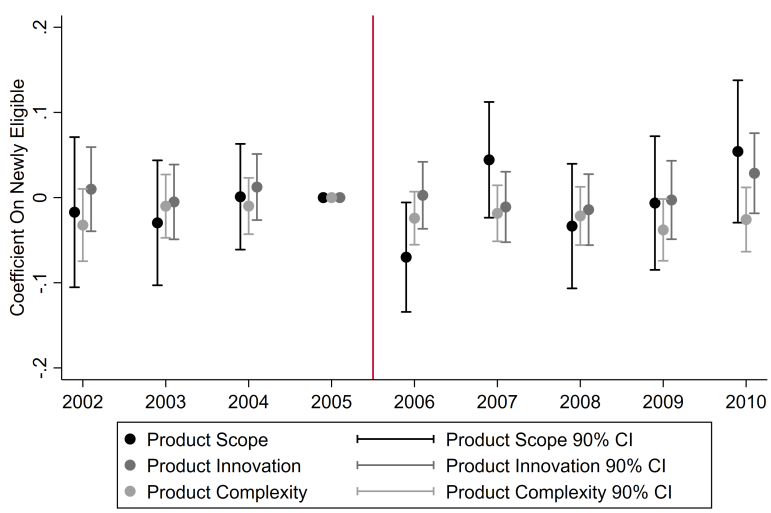
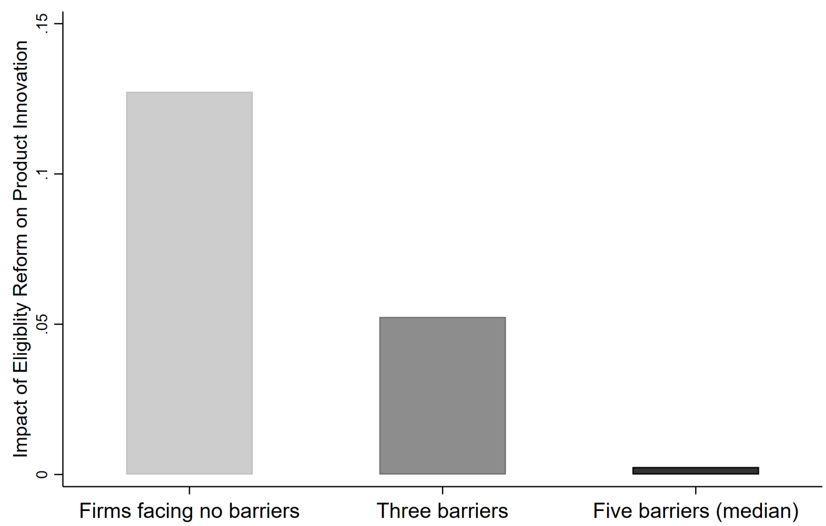


Figure 5: *Impact of eligibility reform on product innovation and sales by barrier count*

Notes: **Panel A** shows the estimated treatment effects on product innovation for firms facing zero, three, and median (five) pre-treatment market barriers; **Panel B** shows the analogous estimates for sales (log). Estimates plotted are the sum of the baseline reform effect (Post × Newly Eligible) and its interaction with the barrier count (Post × Newly Eligible × Barrier Count), evaluated at barrier counts of 0, 3, and the sample median (5). "Newly Eligible" firms are those that received eligibility under the 2006 reform, and "Post" is an indicator for reform-active years. All specifications are linear regressions including state × year, industry × year, and firm fixed effects; inverse sampling-probability weights; clustered standard errors at the firm level; and winsorized outcomes at the 1st and 99th percentiles. Bars represent point estimates only. Barrier counts range from 0–10. Shading corresponds to barrier category: light gray =0 barriers, medium gray = 3 barriers, black = 5 barriers. See Appendix Table A.3 for detailed barrier definitions.

***Panel A**: Product innovation*



***Panel B**: sales*

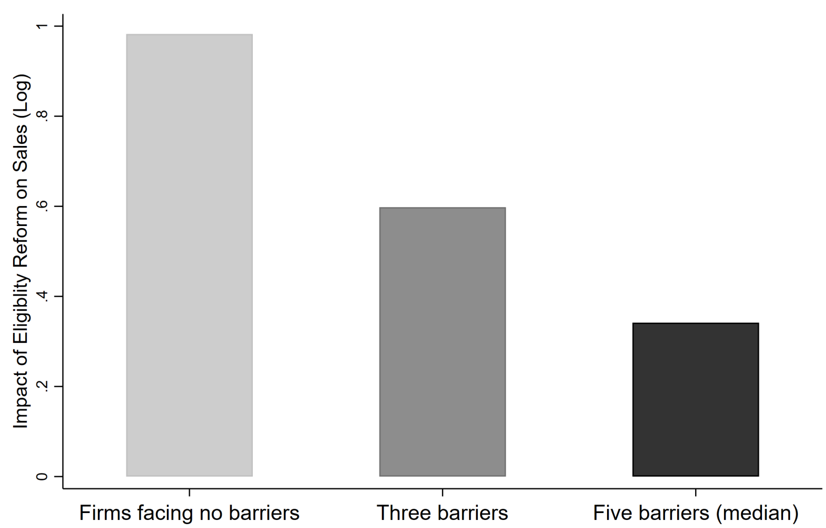


Table 1: *Summary statistics*

Notes: Panel A presents summary statistics for all dependent variables, expressed in real 2005 Rupees. These variables are winsorized at the 1st and 99th percentiles, with observations weighted by their respective sampling weights. The reported survey weight is the inverse of the sampling probability. $NewlyEligible$ is a binary indicator set to one for firms that became eligible for PSL and MSME programs through the 2006 reform. Panel B provides summary statistics for the market barriers to innovation examined in the paper. Detailed definitions of all dependent variables and market barriers can be found in Appendix Table A.5 and Table A.3.

***Panel A**: Dependent variables*

	Mean	**P25**	**P50**	**P75**	**SD**	**N**
Innovation Measures						
Product Scope	1.64	1.00	1.00	2.00	1.18	48,829
Product Innovation (in %)	47%	0%	0%	100%	50%	48,829
Innovation Sales Share (in %)	33%	0%	0%	100%	45%	48,829
Product Complexity (in %)	12%	0%	0%	0%	33%	44,577
Complex-Innovation Sales Share (in %)	8%	0%	0%	0%	33%	44,577
Other Dependent Variables						
Outstanding Loans (in millions)	13.02	0.75	3.27	11.83	28.79	48,829
Overdraft (in millions)	12.48	0.58	2.70	10.64	28.49	48,829
Credit (in millions)	26.01	2.13	7.64	25.54	52.15	48,829
Materials Consumed (in millions)	66.67	4.41	18.57	66.42	131.26	48,677
Days Worked (in 000s)	27.78	4.01	10.86	32.99	45.30	48,783
Workers' Wages (in millions)	2.82	0.27	0.84	2.87	5.46	48,608
Investment (in millions)	2.35	0.16	0.66	2.59	4.15	48,801
Sales (in millions)	96.89	7.01	27.66	100.62	181.05	48,739
Gross Value Added (in millions)	14.49	1.06	3.86	14.26	30.47	48,749
Net Income (in millions)	9.97	0.43	2.04	8.78	25.50	48,724
Managerial Wages (in millions)	1.50	0.12	0.39	1.33	3.30	44,516
Miscellaneous						
Survey Weight	4.45	1.00	4.20	5.44	4.66	48,829
Newly Eligible	24%					48,829

***Panel B**: Market barriers*

	Mean	**P25**	**P50**	**P75**	**SD**	**N**
Education (in %)	66%	57%	66%	76%	15%	43,230
Electricity Shortage (in %)	10%	3%	9%	19%	7%	48,829
Import Reliance (in %)	18%	0%	0%	0%	39%	48,829
Infrastructure (in %)	75%	55%	82%	94%	22%	48,829
Labor Regulation	1.40	0.00	0.00	2.00	4.18	43,242
Land Access	3.26	2.00	3.00	4.00	2.33	43,242
Legal Congestion (Days)	779.44	567.97	791.78	833.71	230.57	36,988
Market Concentration (HHI)	2420.61	712.10	1663.99	3525.64	2230.34	48,829
Market Size (Percentile)	73.45	59.09	76.26	91.38	19.89	48,829
Rural (in %)	66%	0%	100%	100%	47%	48,829
Barrier Count	**5.17**	**4.00**	**5.00**	**6.00**	**1.70**	**33,094**

Table 2: *Impact of Credit Access Reform on Firm Borrowing*

Notes: This table presents difference-in-difference estimates from (1) with three measures of credit as the outcome variable. In column (1), the dependent variable is total outstanding loans, in column (2) it is total overdrafts, and in column (3) it is the (log of the) sum of both credit measures. Each measure is defined in detail in Appendix Table A.5. $NewlyEligible$ firms are those that became eligible through the 2006 reform, while $Post$ is a binary indicator set to one for years after the reform. The specification incorporates state×year, industry×year, and firm fixed effects. Outcomes are winsorized at the 1st and 99th percentiles, and observations are weighted by their inverse sampling probability. Standard errors, clustered at the firm level, are reported in parentheses. Statistical significance is denoted by *, **, and *** at the 10 percent, 5 percent, and 1 percent levels, respectively.

	Outstanding Loans (Log)	**Overdraft (Log)**	**Credit (Log)**
Post x Newly Eligible	0.12*	0.21***	0.22***
	(0.07)	(0.07)	(0.07)
Factory FE	Y	Y	Y
State × Year FE	Y	Y	Y
Industry × Year FE	Y	Y	Y
SE clustered by	F	F	F
R^2	0.69	0.70	0.73
Firm-years	48,799	48,799	48,799
Firms	10,939	10,939	10,939

Table 3: *Impact of Credit Access Reform on Innovation*

Notes: This table presents difference-in-difference estimates from equation (1) with various innovation measures as the dependent variable. Each outcome is defined in detail in Appendix Table A.5. $NewlyEligible$ firms are those that became eligible following the 2006 reform, while $Post$ is a binary indicator set to one for years after the reform. The specification incorporates state×year, industry×year, and firm fixed effects. Outcomes are winsorized at the 1st and 99th percentiles, and observations are weighted by their inverse sampling probability. Standard errors, clustered at the firm level, are reported in parentheses. Statistical significance is denoted by *, **, and *** at the 10 percent, 5 percent, and 1 percent levels, respectively.

	Product Scope	**Product Innovation**	**Product Complexity**	**Innovation Sales Share**	**Complex Innovation Sales Share**
Post x Newly Eligible	0.003	-0.005	-0.015	0.017	0.003
	(0.024)	(0.013)	(0.011)	(0.012)	(0.008)
Factory FE	Y	Y	Y	Y	Y
State × Year FE	Y	Y	Y	Y	Y
Industry × Year FE	Y	Y	Y	Y	Y
SE clustered by	F	F	F	F	F
Mean	1.71	0.44	0.11	0.30	0.07
R^2	0.77	0.49	0.43	0.49	0.45
Firm-years	48,799	48,799	44,544	48,799	44,544
Firms	10,939	10,939	10,149	10,939	10,149

Table 4: *Impact of Credit Access Reform on Sales and Profits*

Notes: This table presents difference-in-difference coefficient estimates from equation (1) with different measures of sales and profitability as the dependent variable. All outcomes are defined in detail in Appendix Table A.5. $NewlyEligible$ firms are those that received eligibility through the 2006 reform, while $Post$ is a binary indicator set to one for years during which the reform was active. The specification incorporates state×year, industry×year, and firm fixed effects. Outcomes are winsorized at the 1st and 99th percentiles, and observations are weighted by their inverse sampling probability. Standard errors, clustered at the firm level, are reported in parentheses. Statistical significance is denoted by *, **, and *** at the 10 percent, 5 percent, and 1 percent levels, respectively.

	Sales (Log)	**Gross Value Added (Log)**	**Net Income (Log)**	**Managerial Wages (Log)**
Post x Newly Eligible	0.28***	0.24***	0.24***	0.14***
	(0.08)	(0.07)	(0.07)	(0.05)
Factory FE	Y	Y	Y	Y
State × Year FE	Y	Y	Y	Y
Industry × Year FE	Y	Y	Y	Y
SE clustered by	F	F	F	F
R^2	0.74	0.75	0.75	0.76
Firm-years	48,709	46,256	42,667	44,475
Firms	10,926	10,504	9,829	9,845

Table 5: *Impact of Credit Access Reform on Input Use and Investment*

Notes: This table presents difference-in-difference estimates from equation (1) with various inputs and investment as the dependent variable. All outcomes are defined in detail in Appendix Table A.5. $NewlyEligible$ firms are those that received eligibility through the 2006 reform, while $Post$ is a binary indicator set to one for years after the reform. The specification incorporates state×year, industry×year, and firm fixed effects. Outcomes are winsorized at the 1st and 99th percentiles, and observations are weighted by their inverse sampling probability. Standard errors, clustered at the firm level, are reported in parentheses. Statistical significance is denoted by *, **, and *** at the 10 percent, 5 percent, and 1 percent levels, respectively.

	Materials Consumed (Log)	**Days Worked (Log)**	**Workers' Wages (Log)**	**Investment (Log)**
Post x Newly Eligible	0.26***	0.28***	0.18***	0.08
	(0.08)	(0.07)	(0.05)	(0.06)
Factory FE	Y	Y	Y	Y
State × Year FE	Y	Y	Y	Y
Industry × Year FE	Y	Y	Y	Y
SE clustered by	F	F	F	F
R^2	0.75	0.73	0.77	0.79
Firm-years	48,647	48,753	48,578	48,771
Firms	10,912	10,933	10,897	10,935

Table 6: *Heterogeneous Impact of Credit Access Reform on Product Innovation by Firms' Non-Financial Barriers*

Notes: This table presents triple difference estimates from equation (2) with various innovation measures as the dependent variable. All outcomes are defined in detail in Appendix Table A.5. $NewlyEligible$ firms are those that received eligibility through the 2006 reform, while "Post" is a binary indicator set to one for years after the reform. $BarrierCount$ refers to the count of non-financial barriers faced by each firm before the reform, and ranges from 0-10. Detailed barriers definitions are in Appendix Table A.3. The specification includes state×year, industry×year, and firm fixed effects. Outcomes are winsorized at the 1st and 99th percentiles, and observations are weighted by their inverse sampling probability. Standard errors, clustered at the firm level, are reported in parentheses. Statistical significance is denoted by *, **, and *** at the 10 percent, 5 percent, and 1 percent levels, respectively.

	Product Scope	**Product Innovation**	**Product Complexity**	**Innovation Sales Share**	**Complex-Innovation Sales Share**
Post x Newly Eligible	0.174**	0.127***	0.079**	0.132***	0.058**
	(0.085)	(0.047)	(0.038)	(0.042)	(0.029)
Post x Barrier Count	-0.017	-0.015**	-0.004	-0.011*	-0.007*
	(0.014)	(0.008)	(0.006)	(0.007)	(0.004)
Post x Newly Eligible x Barrier Count	-0.032*	-0.025***	-0.018**	-0.020**	-0.010*
	(0.017)	(0.009)	(0.007)	(0.008)	(0.005)
Factory FE	Y	Y	Y	Y	Y
State × Year FE	Y	Y	Y	Y	Y
Industry × Year FE	Y	Y	Y	Y	Y
SE clustered by	F	F	F	F	F
Mean	1.70	0.44	0.11	0.30	0.07
R^2	0.77	0.51	0.46	0.50	0.47
Median Effect	-0.068	-0.073	-0.030	-0.024	-0.028
Firm-years	33,057	33,057	30,047	33,057	30,047
Firms	7,454	7,454	6,886	7,454	6,886

Table 7: *Heterogeneous Impact of Credit Access Reform on Firm Growth by Non-Financial Barriers*

Notes: This table presents triple difference estimates from equation (2) with various measures of firm performance, including sales, profits, input use and investment, as the dependent variable. All outcomes are defined in detail in Appendix Table A.5. $NewlyEligible$ firms are those that received eligibility through the 2006 reform, while "Post" is a binary indicator set to one for post-reform years. $BarrierCount$ is the number of non-financial barriers faced by each firm before the reform, and ranges from 0-10. **Panel A** presents regression estimates for four measures of sales & profitability, whereas **Panel B** provides estimates for four input measures. The specification includes state×year, industry×year, and firm fixed effects. Outcomes are winsorized at the 1st and 99th percentiles, and observations are weighted by their inverse sampling probability. Standard errors, clustered at the firm level, are reported in parentheses. Statistical significance is denoted by *, **, and *** at the 10 percent, 5 percent, and 1 percent levels, respectively.

Panel A*: Sales & profitability*

	Sales (Log)	**Gross Value Added (Log)**	**Net Income (Log)**	**Managerial Wages (Log)**
Post x Newly Eligible	0.98***	0.69***	0.72***	0.55***
	(0.26)	(0.23)	(0.23)	(0.18)
Post x Barrier Count	-0.03	-0.03	-0.02	-0.01
	(0.05)	(0.04)	(0.04)	(0.03)
Post x Newly Eligible x Barrier Count	-0.13***	-0.08*	-0.08*	-0.07**
	(0.05)	(0.04)	(0.04)	(0.03)
Factory FE	Y	Y	Y	Y
State × Year FE	Y	Y	Y	Y
Industry × Year FE	Y	Y	Y	Y
SE clustered by	F	F	F	F
R^2	0.76	0.76	0.77	0.78
Firm-years	33,007	31,308	28,764	30,305
Firms	7,447	7,143	6,653	6,755

Panel B*: Inputs*

	Materials Consumed (Log)	**Days Worked (Log)**	**Workers' Wages (Log)**	**Investment (Log)**
Post x Newly Eligible	0.91***	0.92***	0.68***	0.62***
	(0.25)	(0.23)	(0.19)	(0.19)
Post x Barrier Count	-0.02	-0.04	-0.03	-0.02
	(0.04)	(0.04)	(0.03)	(0.03)
Post x Newly Eligible x Barrier Count	-0.12**	-0.11***	-0.09**	-0.10***
	(0.05)	(0.04)	(0.03)	(0.04)
Factory FE	Y	Y	Y	Y
State × Year FE	Y	Y	Y	Y
Industry × Year FE	Y	Y	Y	Y
SE clustered by	F	F	F	F
R^2	0.77	0.75	0.78	0.80
Firm-years	32,950	33,023	32,910	33,036
Firms	7,439	7,451	7,431	7,451

Online Appendix

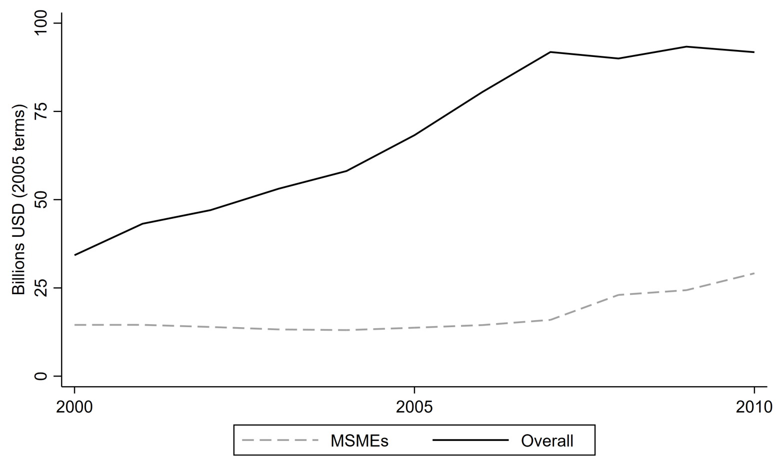
Credit and Product Innovation in Emerging Markets: Evidence from India

A Data Appendix

Figure A.1: *Evolution of priority sector lending over time*

Notes: **Panel A** shows real credit classified under the Reserve Bank of India's Priority Sector Lending (PSL), 2000–2010. Amounts are deflated to 2005 USD. The solid line is total PSL; the dashed line is PSL to micro, small, and medium enterprises (MSMEs) **Panel B** reports the corresponding shares of total bank credit.

***Panel A**: PSL amounts*



***Panel B**: PSL share of overall bank credit*

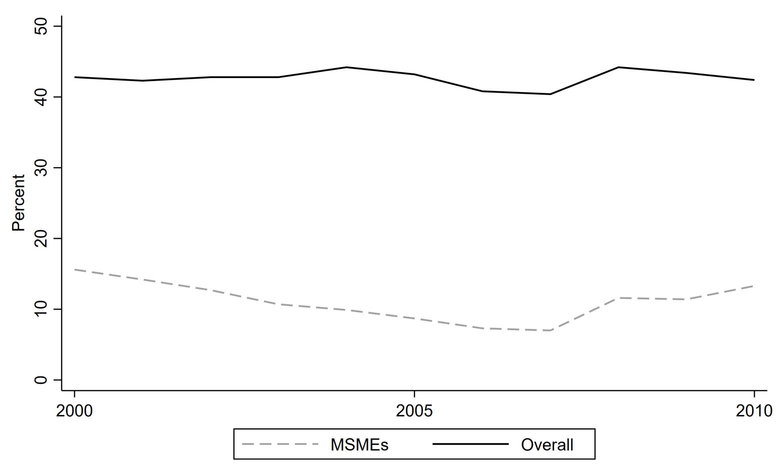


Figure A.2: *Product data coverage comparison to scanner data*

Notes: This figure plots the share of output that would be observable had the analysis relied exclusively on retail-scanner data rather than the Annual Survey of Industries (ASI). The black line (left-hand axis) shows the fraction of unique 5-digit product codes in the ASI that can be matched to barcodes appearing in retail-scanner data; the grey line (right-hand axis) shows the corresponding share of aggregate sales generated by those matched products.

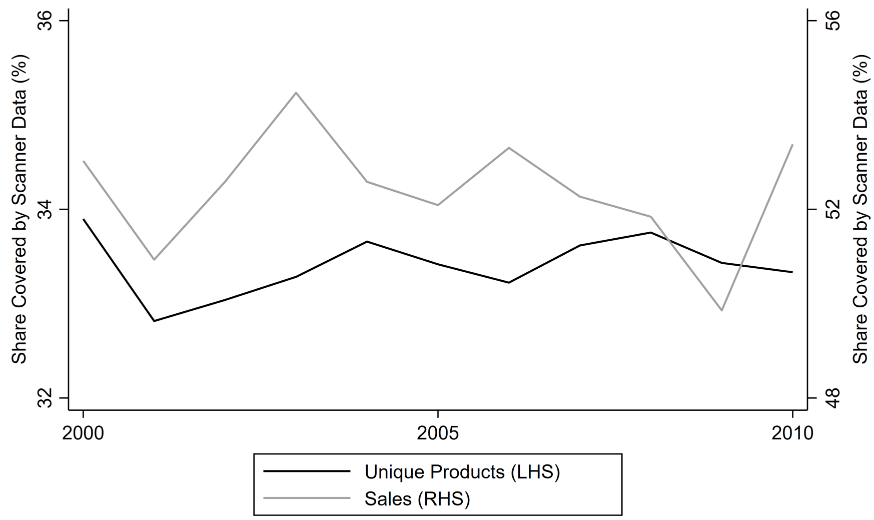


Table A.1: *Illustrative innovation examples*

Notes: **Panel A** shows examples of product innovation from the ASI. Column 1 lists the last produced product, Column 2 lists the product innovation, and Column 3 lists the year the novel product is introduced. **Panel B** similarly shows examples of Product Complexity. Column 1 lists the last produced product while Column 2 lists the product innovation with a greater Product Complexity Index than any of the firm's historical production, and Column 3 lists the year the novel complexity-enhancing product is introduced.

***Panel A**: Product Innovation*

Old Product (Code)	**New Product (Code)**	**Year**
Drums & barrels, iron & steel (71531)	Pump sets without motor (75286)	2002
Yarn dyed, synthetic (64231)	Yarn unbleached, cotton (63221)	2003
Bar, rods & rounds, iron /steel (71202)	Ingot, iron /steel (71131)	2004
Wallets, leather (44106)	Bag, leather (44101)	2005
Adhesive tape, non-medicinal (39007)	Bandage including ahdesive gauze bandage (33712)	2006
Dot pen with refill (95201)	Tips (74238)	2007
Cinematographic equipment (91141)	Projectors, lcd (91143)	2008
Cable, pvc insulated (77417)	Pipe, plastic / pvc (non-conduit) (42202)	2009
Kit-kat /fuse / fuse wire (77444)	Distribution boards (77308)	2010

***Panel B**: Product Complexity*

Old Product (Code)	**New Product (Code)**	**Year**
Bars & rods, iron/non-alloy (41242)	Flat-rolled non-alloy steel (41212)	2002
Unwrought aluminium (41431)	Aluminium plate/sheet >0.2 mm (41534)	2003
Plastic tubes/pipes & fittings (36320)	Agricultural liquid sprayers (44150)	2004
Non-alloy steel ingots (41121)	Alloy-steel ingots & semifin. (41122)	2005
Ferrous waste & scrap (39340)	Bars & rods, iron/non-alloy (41242)	2006
Floating structures n.e.c. (49390)	Sailboats (49410)	2007
Cotton woven fabrics n.e.c. (26690)	Hi-tenacity man-made fabrics (26710)	2008
Kraft paperboard, uncoated (32133)	Writing/printing paperboard (32129)	2009
Plastic articles n.e.c. (36990)	Engine piston parts (43151)	2010

Table A.2: *Sample filters*

Notes: This table details the filters applied to the ASI data to arrive at the final sample. The filters are listed in the sequence they are applied.

Filter	**Rationale**
Raw data	Our starting point is the merged version of the ASI cross section for 2001-2010.
Identifiable industries	We follow the industry classification in Rotemberg (2019) and drop factories who's NIC from the 1987 version is above or equal to 390.
Treatment Status	We need to observe factories' Gross Accumulated Investment in Plant & Machinery prior to treatment. We use the last reported value in 2001-2006 and drop factories without non-missing non-zero reported values in the pre-treatment period.
Private Status	We follow Rotemberg (2019) and drop factories which are never private prior to 2007.
Reports fewer than 10 products	ASI allows factories to report their top 10 products, where the vast majority reports far fewer than that. Since we can only define innovation when we observe all products, factories that report 10 or more products are dropped.
Exclude 1st year	Innovation is identified by comparing each firm's products to its prior observation(s); because the first record lacks a comparison, we drop it.
Non-zero non-missing number of products	Factory-years that report zero/missing products are dropped, unless this is a year a factory goes out of business where we follow Rotemberg (2019) and set all outcomes to zero.
Non-missing credit	Factory-years that report missing credit are dropped, unless this is a year a factory goes out of business where all outcomes are zero.
Appears in the pre-period	We need at least one remaining pre-reform observation remaining after preceding filters have been applied to estimate outcomes with our empirical framework.
Appears in the post-period	To estimate the effect of treatment we need to observe factories at least once after treatment.
Comparable Size	We keep factories with a pre-treatment Gross Accumulated Investment of 0-100mm.
	Firms: 10,942, **Firm-Years**: 48,835

Table A.3: *Definitions of market barriers*

Variable	Definition
Education	A dummy equal to one if the firm operates in a district with a lower fraction of 2nd graders able to read and complete subtraction than the state-average. The underlying data is from the 2005 Annual Survey of Education Report.
Electricity Shortage	We create the measure based on the definition in and data made available by Allcott, Collard-Wexler, and O'Connell (2016), (energy demand − energy supply)/energy demand. We aggregate the data, which is available at the state-year level, to the state-level by averaging the shortages in the pre-reform (2001-2005) period. We then compute a dummy equal to 1 if the factory operates in a state with a lower fraction of electricity shortage than that experienced by the within-sample median factory.
Import Reliant	A dummy equal to 1 if the firm ever reports a non-zero non-missing purchase value of total imports in the pre-period (2001-2005).
Infrastructure	This measure is a dummy defined as whether the firm operates in a state with better infrastructure than that experienced by the within-sample median firm. The infrastructure data is computed at the state-level as the fraction of villages with paved roads as of the last pre-treatment population census (Office of the Registrar General and Census Commissioner, 2001; Asher et al., 2021) .
Labor Regulation	We define this measure as a dummy based on the latest available value of the measure defined in Besley and Burgess, 2004. The authors classify all labor regulation as pro-worker (-1), neutral (0), or pro-employer (1) from the enactment of the Indian Constitution. We use the last available pre-treatment cumulative net reform count and create a dummy equal to 1 if the factory operates in a state with less pro-employer regulation than that experienced by the within-sample median firm.
Land Access	A dummy based on the latest available pre-treatment value of the measure defined in Besley and Burgess, 2000. The authors' data series classify land reforms and create a count of cumulative reforms that improve land access since the Indian Constitution was enacted, at the state-year level. We create a dummy based on the last available value, which is equal to 1 if the factory operates in a state with worse access to land than that experienced by the within-sample median firm.
Legal Congestion	A dummy equal to one if the firm operates in a state with more congested courts than that experienced by the within-sample median firm. The measure is based on Boehm and Oberfield (2020), where we define the average case age as of 2005. The underlying data is microdata on pending cases in High Courts, made available by the NGO Daksh.
Market Concentration	We define markets at the state-year-product-level. We use the full ASI sample from 2001-2005 to compute annual HHI in each market. We then calculate firm-year HHI as the firm's sales weighted HHI. We then obtain a firm-level HHI by computing the average of firm-year HHIs. In the regressions, we use this as a dummy, equal to one if the firm-HHI is above the within-sample median.

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Table A.3 – continued from previous page

Variable	Definition
Market Size	We use the full ASI sample from 2001-2005 and define markets at the state-year-product-level. We compute aggregate sales at each market, and use those values to produce each market's percentile based on market size. We aggregate these percentiles from the state-year-product market to the state-product market by taking the average. We merge these values to the firm-year level and multiply the state-product level percentiles with each firm's sales-share in that market to generate a sales-weighted firm-year level market size percentile. We aggregate this to the firm-level by taking the average of the pre-reform values, and create a dummy equal to one if that value is below the within-sample median.
Rural	A dummy equal to 1 if the firm reports its location as Rural (Block A, item 9) in the last year it appears in the data prior to treatment.

Table A.4: *Correlation matrix of market barriers*

Notes: This table shows how measures of barriers are related. The observations are weighted by their inverse sampling probability. For detailed definition of the barrier measures see Appendix Table A.3.

	Education (Low)	**Electricity Shortage (High)**	**Import Reliance (High)**	**Infrastructure (Low)**	**Labor Regulation (High)**	**Land Access (Low)**	**Legal Congestion (High)**	**Market Concentration (High)**	**Market Size (Low)**	**Rural**
Education (Low)	1	.11	.01	-.19	-.09	.13	-.05	-.07	-.03	-.01
Electricity Shortage (High)	.11	1	.04	.1	-.22	-.51	-.01	-.01	-.05	.07
Import Reliance (High)	.01	.04	1	.1	-.01	-.02	.1	-.14	.01	0
Infrastructure (Low)	-.19	.1	.1	1	.5	-.36	.6	.09	.08	.1
Labor Regulation (High)	-.09	-.22	-.01	.5	1	0	.46	-.03	0	.03
Land Access (Low)	.13	-.51	-.02	-.36	0	1	-.09	-.1	-.06	-.05
Legal Congestion (High)	-.05	-.01	.1	.6	.46	-.09	1	.06	.06	.06
Market Concentration (High)	-.07	-.01	-.14	.09	-.03	-.1	.06	1	.37	.11
Market Size (Low)	-.03	-.05	.01	.08	0	-.06	.06	.37	1	.11
Rural	-.01	.07	0	.1	.03	-.05	.06	.11	.11	1

Table A.5: *Definitions of dependent variables*

Variable	Definition
Outstanding Loans	Item 17 in block D of the ASI data. Includes secured loans such as loans and advances from banks on hypothecation of fixed assets, as well as unsecured loans such as loans taken from friends and directors. We leverage the fact that ASI reports opening and closing balances. If either value is missing and we observe the factory in the adjacent year, we impute the missing balance.
Overdraft	Item 13 in block D of the ASI. Includes short-term loans from banks, other financial institutions, from directors and others. Bank overdrafts, cash credit, loan taken on hypothecation of raw materials and other current assets etc for a period up to one year are also to be included here. We make the same adjustment with adjacent balances as in *Outstanding Loans*.
Credit	The sum of Outstanding Loans and Overdraft.
Sales	Reported total sales (Block J, item 12, Column 7) minus the change in the value of finished goods in inventory during the year (Block D, item 6 Column 4 minus Column 3).
Gross Value Added	The difference between total output and total input and is defined following the *Flow Chart for Tabulation Program* provided by ASI in each year (available here).
Net Income	*Gross Value Added* net of depreciation, rent, and interest paid. The measure is defined following the *Flow Chart for Tabulation Program* provided by ASI in each year (available here).
Managerial Wages	Wages/Salaries of Supervisory & Managerial staff (Block E item 7, column 8 in the 2005-06 survey). ASI defines payments to the proprietor to be recorded against the category of employment in which the proprietor engages (see instruction manual for details, available here). We therefore consider *Managerial Wages* as a proxy for profit.
Materials	The value of all items of raw materials, components, chemicals and packing materials that went into the production process. This measure is defined following the *Flow Chart for Tabulation Program* provided by ASI in each year (available here).
Days Worked	Total Man-days worked by Total Employees (Block E, item 10, column 5 in the 2005-06 survey).
Workers' Wages	Wages/Salaries (Rs) by Total Workers (Block E, item 6, column 8 in the 2005-06 survey).
Investment	Following Rotemberg, 2019 defined as the flow cost of capital: $0.15\times$ the average of the net total capital stock (Block C, item 10) at the beginning and ending of the fiscal year.
Product Scope	The number of unique reported product codes produced by factory-year. ASI implements a minor product code change between 2008 to 2009, of which we can map 5,400/5469 products across the product code change and drop the product we cannot map 1:1. This measure is defined after the concordance.
Product Innovation	A dummy equal to one if the firm produce one or more products for the first time, defined at the most granular product level. ASI classifies products according to their 5-digit ASICC structure. An introduced product with a 5-digit code never earlier produced by that firm would be defined as an innovation here.
Innovation Sales Share	The fraction of a firm's sales derived from product innovations.

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Table A.5 – continued from previous page

Variable	Definition
Product Complexity	A dummy equal to one if the firm **1**) produce one or more products for the first time, defined at the most granular product level, and **2**) the new production require more sophistication than any product the firm has ever produced. We use a product-year-level *Product Complexity Index* developed in Hidalgo and Hausmann (2009).
Complex-Innovation Sales Share	The fraction of a firm's sales derived from product complexity innovations.

B Robustness

B.1 Impact of eligibility reform on innovation

Table B.1: *Impact of eligibility reform on innovation measures: narrow samples*

Notes: This table is a version of Table 3, with Column 1 of **Panel A-E** corresponding to Column 1-5 of Table 3, respectively. Subsequent columns applies sample restrictions based on pre-treatment firm-size varying across columns. "Newly Eligible" firms are those that received eligibility through the 2006 reform, while "Post" is a binary indicator set to one for years during which the reform was active. The specification incorporates state×year, industry×year, and firm fixed effects. Outcomes are winsorized at the 1st and 99th percentiles, and observations are weighted by their inverse sampling probability. Standard errors, clustered at the firm level, are reported in parentheses. Statistical significance is denoted by *, **, and *** at the 10 percent, 5 percent, and 1 percent levels, respectively.

***Panel A**: Product scope*

	0mm - 100mm	**0mm - 50mm**	**0mm - 30mm**	**0mm - 20mm**
Post x Newly Eligible	0.003	0.014	0.017	0.025
	(0.024)	(0.026)	(0.029)	(0.034)
Factory FE	Y	Y	Y	Y
State × Year FE	Y	Y	Y	Y
Industry × Year FE	Y	Y	Y	Y
SE clustered by	F	F	F	F
Mean	1.71	1.68	1.66	1.66
R^2	0.77	0.77	0.77	0.78
Firm-years	48,799	42,418	37,346	33,960
Firms	10,939	9,849	8,906	8,219

***Panel B**: Product innovation*

	0mm - 100mm	**0mm - 50mm**	**0mm - 30mm**	**0mm - 20mm**
Post x Newly Eligible	-0.005	-0.009	-0.013	-0.022
	(0.013)	(0.014)	(0.016)	(0.019)
Factory FE	Y	Y	Y	Y
State × Year FE	Y	Y	Y	Y
Industry × Year FE	Y	Y	Y	Y
SE clustered by	F	F	F	F
Mean	0.44	0.43	0.43	0.43
R^2	0.49	0.51	0.52	0.52
Firm-years	48,799	42,418	37,346	33,960
Firms	10,939	9,849	8,906	8,219

***Panel C**: Product complexity*

	0mm - 100mm	0mm - 50mm	0mm - 30mm	0mm - 20mm
Post x Newly Eligible	-0.015	-0.017	-0.013	-0.015
	(0.011)	(0.011)	(0.013)	(0.015)
Factory FE	Y	Y	Y	Y
State × Year FE	Y	Y	Y	Y
Industry × Year FE	Y	Y	Y	Y
SE clustered by	F	F	F	F
Mean	0.11	0.11	0.11	0.11
R^2	0.43	0.45	0.46	0.47
Firm-years	44,544	38,724	34,072	31,046
Firms	10,149	9,134	8,254	7,621

***Panel D**: Product innovation sales share*

	0mm - 100mm	0mm - 50mm	0mm - 30mm	0mm - 20mm
Post x Newly Eligible	0.017	0.016	0.004	-0.011
	(0.012)	(0.013)	(0.015)	(0.017)
Factory FE	Y	Y	Y	Y
State × Year FE	Y	Y	Y	Y
Industry × Year FE	Y	Y	Y	Y
SE clustered by	F	F	F	F
Mean	0.30	0.30	0.30	0.30
R^2	0.49	0.50	0.51	0.52
Firm-years	48,799	42,418	37,346	33,960
Firms	10,939	9,849	8,906	8,219

***Panel E**: Complex-innovation sales share*

	0mm - 100mm	0mm - 50mm	0mm - 30mm	0mm - 20mm
Post x Newly Eligible	0.003	0.003	0.005	-0.005
	(0.008)	(0.009)	(0.010)	(0.012)
Factory FE	Y	Y	Y	Y
State × Year FE	Y	Y	Y	Y
Industry × Year FE	Y	Y	Y	Y
SE clustered by	F	F	F	F
Mean	0.07	0.07	0.07	0.07
R^2	0.45	0.46	0.48	0.48
Firm-years	44,544	38,724	34,072	31,046
Firms	10,149	9,134	8,254	7,621

Table B.2: *Impact of eligibility reform on innovation: excluding de-reserved products*

Notes: This table is a version of Table 3 that restricts the sample to firms that never produce products that become de-reserved during the sample period (see Martin, Nataraj, and Harrison (2017) for details). The table presents regression estimates for all innovation measures, defined in detail in Appendix Table A.5. "Newly Eligible" firms are those that received eligibility through the 2006 reform, while "Post" is a binary indicator set to one for years during which the reform was active. The specification incorporates state×year, industry×year, and firm fixed effects. Outcomes are winsorized at the 1st and 99th percentiles, and observations are weighted by their inverse sampling probability. Standard errors, clustered at the firm level, are reported in parentheses. Statistical significance is denoted by *, **, and *** at the 10 percent, 5 percent, and 1 percent levels, respectively.

	Product Scope	**Product Innovation**	**Product Complexity**	**Innovation Sales Share**	**Complex-Innovation Sales Share**
Post x Newly Eligible	0.006	-0.004	-0.014	0.017	0.003
	(0.025)	(0.014)	(0.011)	(0.013)	(0.009)
Factory FE	Y	Y	Y	Y	Y
State × Year FE	Y	Y	Y	Y	Y
Industry × Year FE	Y	Y	Y	Y	Y
SE clustered by	F	F	F	F	F
Mean	1.66	0.43	0.11	0.30	0.07
R^2	0.77	0.49	0.44	0.49	0.46
Firm-years	40,916	40,916	36,798	40,916	36,798
Firms	9,222	9,222	8,453	9,222	8,453

B.2 Market frictions and innovation response to eligibility reform

Table B.3: *Heterogeneous effects of market barriers: narrow samples*

Notes: This table is a version of Table 6, with Column 1 of **Panel A-E** corresponding to Column 1-5 of Table 6, respectively. Subsequent columns applies sample restrictions based on pre-treatment firm-size varying across columns. "Newly Eligible" firms are those that received eligibility through the 2006 reform, while "Post" is a binary indicator set to one for reform-active years. "Barrier Count" quantifies barriers faced by firms pre-treatment, ranging from 0-10. For detailed barriers definitions, see Appendix Table A.3. The specification includes state×year, industry×year, and firm fixed effects. Outcomes are winsorized at the 1st and 99th percentiles, and observations are weighted by their inverse sampling probability. Standard errors, clustered at the firm level, are reported in parentheses. Statistical significance is denoted by *, **, and *** at the 10 percent, 5 percent, and 1 percent levels, respectively.

***Panel A**: Product scope*

	0mm - 100mm	**0mm - 50mm**	**0mm - 30mm**	**0mm - 20mm**
Post x Newly Eligible	0.174**	0.209**	0.268**	0.266**
	(0.085)	(0.092)	(0.105)	(0.126)
Post x Barrier Count	-0.017	-0.009	-0.008	-0.009
	(0.014)	(0.016)	(0.016)	(0.017)
Post x Newly Eligible x Barrier Count	-0.032*	-0.036**	-0.045**	-0.045*
	(0.017)	(0.018)	(0.020)	(0.024)
Factory FE	Y	Y	Y	Y
State × Year FE	Y	Y	Y	Y
Industry × Year FE	Y	Y	Y	Y
SE clustered by	F	F	F	F
Mean	1.70	1.67	1.65	1.64
R^2	0.77	0.78	0.78	0.79
Firm-years	33,057	28,296	24,777	22,549
Firms	7,454	6,631	5,966	5,505

Panel B: *Product innovation*

	0mm - 100mm	0mm - 50mm	0mm - 30mm	0mm - 20mm
Post x Newly Eligible	0.127***	0.139***	0.129**	0.145**
	(0.047)	(0.050)	(0.059)	(0.071)
Post x Barrier Count	-0.015**	-0.009	-0.012	-0.014
	(0.008)	(0.008)	(0.009)	(0.009)
Post x Newly Eligible x Barrier Count	-0.025***	-0.028***	-0.025**	-0.030**
	(0.009)	(0.009)	(0.011)	(0.013)
Factory FE	Y	Y	Y	Y
State × Year FE	Y	Y	Y	Y
Industry × Year FE	Y	Y	Y	Y
SE clustered by	F	F	F	F
Mean	0.44	0.43	0.43	0.42
R^2	0.51	0.53	0.54	0.55
Firm-years	33,057	28,296	24,777	22,549
Firms	7,454	6,631	5,966	5,505

Panel C: *Product complexity*

	0mm - 100mm	0mm - 50mm	0mm - 30mm	0mm - 20mm
Post x Newly Eligible	0.079**	0.079*	0.096*	0.158**
	(0.038)	(0.041)	(0.050)	(0.062)
Post x Barrier Count	-0.004	-0.004	-0.005	-0.005
	(0.006)	(0.007)	(0.007)	(0.007)
Post x Newly Eligible x Barrier Count	-0.018**	-0.018**	-0.020**	-0.032***
	(0.007)	(0.007)	(0.009)	(0.011)
Factory FE	Y	Y	Y	Y
State × Year FE	Y	Y	Y	Y
Industry × Year FE	Y	Y	Y	Y
SE clustered by	F	F	F	F
Mean	0.11	0.11	0.11	0.11
R^2	0.46	0.47	0.49	0.50
Firm-years	30,047	25,746	22,536	20,554
Firms	6,886	6,128	5,508	5,085

***Panel D**: Product innovation sales share*

	0mm - 100mm	**0mm - 50mm**	**0mm - 30mm**	**0mm - 20mm**
Post x Newly Eligible	0.132***	0.143***	0.117**	0.126**
	(0.042)	(0.045)	(0.052)	(0.062)
Post x Barrier Count	-0.011*	-0.006	-0.007	-0.009
	(0.007)	(0.008)	(0.008)	(0.008)
Post x Newly Eligible x Barrier Count	-0.020**	-0.022***	-0.018*	-0.022*
	(0.008)	(0.008)	(0.010)	(0.012)
Factory FE	Y	Y	Y	Y
State × Year FE	Y	Y	Y	Y
Industry × Year FE	Y	Y	Y	Y
SE clustered by	F	F	F	F
Mean	0.30	0.30	0.30	0.30
R^2	0.50	0.52	0.53	0.54
Firm-years	33,057	28,296	24,777	22,549
Firms	7,454	6,631	5,966	5,505

***Panel E**: Complex-innovation sales share*

	0mm - 100mm	**0mm - 50mm**	**0mm - 30mm**	**0mm - 20mm**
Post x Newly Eligible	0.058**	0.064**	0.053	0.070
	(0.029)	(0.031)	(0.037)	(0.046)
Post x Barrier Count	-0.007*	-0.007	-0.007	-0.006
	(0.004)	(0.005)	(0.005)	(0.005)
Post x Newly Eligible x Barrier Count	-0.010*	-0.011*	-0.008	-0.013
	(0.005)	(0.006)	(0.007)	(0.008)
Factory FE	Y	Y	Y	Y
State × Year FE	Y	Y	Y	Y
Industry × Year FE	Y	Y	Y	Y
SE clustered by	F	F	F	F
Mean	0.07	0.07	0.07	0.07
R^2	0.47	0.49	0.51	0.52
Firm-years	30,047	25,746	22,536	20,554
Firms	6,886	6,128	5,508	5,085

Table B.4: *Heterogeneous effects of market barriers: excluding de-reserved products*

Notes: This table is a version of Table 6 that restricts the sample to firms that never produce products that become de-reserved during the sample period (see Martin, Nataraj, and Harrison (2017) for details). ”Newly Eligible” firms are those that received eligibility through the 2006 reform, while ”Post” is a binary indicator set to one for reform-active years. ”Barrier Count” quantifies barriers faced by firms pre-treatment, ranging from 0-10. For detailed barriers definitions, see Appendix Table A.3. Panel A presents regression estimates for three primary innovation measures from Equation 2, and Panel B provides estimates for five additional measures. The specification includes state×year, industry×year, and firm fixed effects. Outcomes are winsorized at the 1st and 99th percentiles, and observations are weighted by their inverse sampling probability. Standard errors, clustered at the firm level, are reported in parentheses. Statistical significance is denoted by *, **, and *** at the 10 percent, 5 percent, and 1 percent levels, respectively.

	Product Scope	**Product Innovation**	**Innovation Sales Share**	**Product Complexity**	**Complex-Innovation Sales Share**
Post x Newly Eligible	0.216**	0.143***	0.136***	0.085**	0.051
	(0.086)	(0.051)	(0.046)	(0.041)	(0.033)
Post x Barrier Count	-0.021	-0.017**	-0.015**	-0.004	-0.006
	(0.015)	(0.008)	(0.008)	(0.006)	(0.005)
Post x Newly Eligible x Barrier Count	-0.038**	-0.027***	-0.020**	-0.019**	-0.008
	(0.017)	(0.010)	(0.009)	(0.008)	(0.006)
Factory FE	Y	Y	Y	Y	Y
State × Year FE	Y	Y	Y	Y	Y
Industry × Year FE	Y	Y	Y	Y	Y
SE clustered by	F	F	F	F	F
Mean	1.66	0.44	0.30	0.11	0.07
R^2	0.77	0.51	0.50	0.46	0.48
Firm-years	27,645	27,645	27,645	24,705	24,705
Firms	6,281	6,281	6,281	5,724	5,724

B.3 Granular barrier estimates

Table B.5: *Robustness of heterogeneous effect of eligibility reform on innovation to excluding individual barriers*

Notes: This table is a version of Table 6, with **Panel A-E** corresponding to Column 1-5, respectively, and "Barrier Count" excluding an individual barrier from the count across barriers. "Newly Eligible" firms are those that received eligibility through the 2006 reform, while "Post" is a binary indicator set to one for reform-active years. For detailed barriers definitions, see Appendix Table A.3. The specification includes state×year, industry×year, and firm fixed effects. Outcomes are winsorized at the 1st and 99th percentiles, and observations are weighted by their inverse sampling probability. Standard errors, clustered at the firm level, are reported in parentheses. Statistical significance is denoted by *, **, and *** at the 10 percent, 5 percent, and 1 percent levels, respectively.

***Panel A**: Product scope*

	Barrier Count Excluding:									
	Electricity Shortage	Education	Regulation	Land Access	Import Reliant	Market Concentration	Market Size	Legal Congestion	Infrastructure	Rural
Post x Newly Eligible	0.151*	0.090	0.136*	0.181**	0.193**	0.170**	0.205**	0.139	0.181**	0.188**
	(0.077)	(0.079)	(0.080)	(0.084)	(0.079)	(0.083)	(0.087)	(0.088)	(0.083)	(0.082)
Post x Barrier Count	-0.017	-0.035**	-0.019	-0.016	-0.016	-0.011	0.003	-0.018	-0.015	-0.024
	(0.014)	(0.016)	(0.014)	(0.014)	(0.015)	(0.016)	(0.017)	(0.014)	(0.014)	(0.016)
Post x Newly Eligible x Barrier Count	-0.030*	-0.017	-0.025	-0.036**	-0.039**	-0.035*	-0.040**	-0.027	-0.038**	-0.039**
	(0.016)	(0.017)	(0.016)	(0.018)	(0.018)	(0.019)	(0.019)	(0.019)	(0.019)	(0.018)
Factory FE	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
State × Year FE	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Industry × Year FE	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
SE clustered by	F	F	F	F	F	F	F	F	F	F
Mean	1.70	1.70	1.70	1.70	1.70	1.70	1.70	1.70	1.70	1.70
R^2	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77
Firm-years	33,057	33,057	33,057	33,057	33,057	33,057	33,057	33,057	33,057	33,057
Firms	7,454	7,454	7,454	7,454	7,454	7,454	7,454	7,454	7,454	7,454

***Panel B*: Product innovation**

	Barrier Count Excluding:									
	Electricity Shortage	Education	Regulation	Land Access	Import Reliant	Market Concentration	Market Size	Legal Congestion	Infrastructure	Rural
Post x Newly Eligible	0.113***	0.119***	0.117***	0.085*	0.128***	0.135***	0.140***	0.114**	0.104**	0.122***
	(0.043)	(0.044)	(0.044)	(0.048)	(0.044)	(0.045)	(0.047)	(0.049)	(0.047)	(0.044)
Post x Barrier Count	-0.015**	-0.022***	-0.015**	-0.017**	-0.018**	-0.005	-0.012	-0.015*	-0.015**	-0.016*
	(0.008)	(0.008)	(0.007)	(0.008)	(0.008)	(0.008)	(0.009)	(0.008)	(0.008)	(0.008)
Post x Newly Eligible x Barrier Count	-0.025***	-0.026***	-0.024***	-0.018*	-0.028***	-0.030***	-0.030***	-0.025**	-0.024**	-0.027***
	(0.009)	(0.009)	(0.008)	(0.010)	(0.009)	(0.010)	(0.010)	(0.010)	(0.010)	(0.009)
Factory FE	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
State × Year FE	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Industry × Year FE	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
SE clustered by	F	F	F	F	F	F	F	F	F	F
Mean	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44
R^2	0.51	0.51	0.51	0.51	0.51	0.51	0.51	0.51	0.51	0.51
Firm-years	33,057	33,057	33,057	33,057	33,057	33,057	33,057	33,057	33,057	33,057
Firms	7,454	7,454	7,454	7,454	7,454	7,454	7,454	7,454	7,454	7,454

***Panel C*: Product complexity**

	Barrier Count Excluding:									
	Electricity Shortage	Education	Regulation	Land Access	Import Reliant	Market Concentration	Market Size	Legal Congestion	Infrastructure	Rural
Post x Newly Eligible	0.069*	0.065*	0.075**	0.059	0.074**	0.084**	0.078**	0.071*	0.077**	0.071**
	(0.036)	(0.036)	(0.035)	(0.039)	(0.035)	(0.036)	(0.038)	(0.040)	(0.038)	(0.036)
Post x Barrier Count	-0.004	-0.003	-0.004	-0.005	-0.008	0.002	-0.001	-0.004	-0.004	-0.011*
	(0.006)	(0.007)	(0.006)	(0.006)	(0.006)	(0.007)	(0.007)	(0.006)	(0.006)	(0.006)
Post x Newly Eligible x Barrier Count	-0.017**	-0.016**	-0.018***	-0.015*	-0.019**	-0.021***	-0.019**	-0.018**	-0.020**	-0.018**
	(0.007)	(0.007)	(0.007)	(0.008)	(0.007)	(0.008)	(0.008)	(0.008)	(0.008)	(0.008)
Factory FE	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
State × Year FE	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Industry × Year FE	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
SE clustered by	F	F	F	F	F	F	F	F	F	F
Mean	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11
R^2	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46
Firm-years	30,047	30,047	30,047	30,047	30,047	30,047	30,047	30,047	30,047	30,047
Firms	6,886	6,886	6,886	6,886	6,886	6,886	6,886	6,886	6,886	6,886

Panel D: *Product innovation sales share*

	Barrier Count Excluding:									
	Electricity Shortage	Education	Regulation	Land Access	Import Reliant	Market Concentration	Market Size	Legal Congestion	Infrastructure	Rural
Post x Newly Eligible	0.120***	0.137***	0.134***	0.099**	0.134***	0.121***	0.130***	0.136***	0.108***	0.121***
	(0.039)	(0.040)	(0.040)	(0.043)	(0.039)	(0.041)	(0.043)	(0.045)	(0.042)	(0.041)
Post x Barrier Count	-0.011*	-0.021***	-0.011	-0.013*	-0.012*	-0.004	-0.006	-0.011	-0.012*	-0.013*
	(0.007)	(0.008)	(0.007)	(0.007)	(0.007)	(0.008)	(0.008)	(0.007)	(0.007)	(0.008)
Post x Newly Eligible x Barrier Count	-0.019**	-0.024***	-0.021***	-0.014	-0.022***	-0.020**	-0.021**	-0.023**	-0.017*	-0.020**
	(0.008)	(0.008)	(0.008)	(0.009)	(0.008)	(0.009)	(0.009)	(0.009)	(0.009)	(0.009)
Factory FE	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
State $\times$ Year FE	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Industry $\times$ Year FE	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
SE clustered by	F	F	F	F	F	F	F	F	F	F
Mean	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30
R^2	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50
Firm-years	33,057	33,057	33,057	33,057	33,057	33,057	33,057	33,057	33,057	33,057
Firms	7,454	7,454	7,454	7,454	7,454	7,454	7,454	7,454	7,454	7,454

Panel E: *Complex-innovation sales share*

	Barrier Count Excluding:									
	Electricity Shortage	Education	Regulation	Land Access	Import Reliant	Market Concentration	Market Size	Legal Congestion	Infrastructure	Rural
Post x Newly Eligible	0.056**	0.054**	0.061**	0.045	0.053**	0.055**	0.057*	0.060**	0.052*	0.049*
	(0.027)	(0.027)	(0.026)	(0.029)	(0.027)	(0.027)	(0.029)	(0.030)	(0.028)	(0.027)
Post x Barrier Count	-0.007	-0.007	-0.007	-0.008*	-0.008*	-0.004	-0.007	-0.007	-0.007	-0.011**
	(0.004)	(0.005)	(0.004)	(0.004)	(0.005)	(0.005)	(0.005)	(0.004)	(0.004)	(0.005)
Post x Newly Eligible x Barrier Count	-0.011*	-0.010*	-0.011**	-0.008	-0.010*	-0.011*	-0.011*	-0.011*	-0.010*	-0.009
	(0.006)	(0.006)	(0.005)	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)
Factory FE	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
State $\times$ Year FE	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Industry $\times$ Year FE	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
SE clustered by	F	F	F	F	F	F	F	F	F	F
Mean	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07
R^2	0.47	0.47	0.47	0.47	0.47	0.47	0.47	0.47	0.47	0.47
Firm-years	30,047	30,047	30,047	30,047	30,047	30,047	30,047	30,047	30,047	30,047
Firms	6,886	6,886	6,886	6,886	6,886	6,886	6,886	6,886	6,886	6,886

Table B.6: *Impact of eligibility reform on product innovation, heterogeneous effects of individual market barriers*

Notes: This table is a version of Table 6, with **Panel A-E** corresponding to Column 1-5, respectively, with "Barrier Count" now replaced with individual barriers varying across barriers. "Newly Eligible" firms are those that received eligibility through the 2006 reform, while "Post" is a binary indicator set to one for reform-active years. For detailed barriers definitions, see Appendix Table A.3. The specification includes state×year, industry×year, and firm fixed effects. Outcomes are winsorized at the 1st and 99th percentiles, and observations are weighted by their inverse sampling probability. Standard errors, clustered at the firm level, are reported in parentheses. Statistical significance is denoted by *, **, and *** at the 10 percent, 5 percent, and 1 percent levels, respectively.

***Panel A**: Product scope*

	Electricity Shortage (High)	**Education** (Low)	**Labor Regulation** (High)	**Land Access** (Low)	**Import Reliant** (High)	**Market Concentration** (High)	**Market Size** (Low)	**Legal Congestion** (High)	**Infrastructure** (Low)	**Rural**
Post x Newly Eligible	0.035	0.109***	0.039	0.035	-0.036	0.044	0.006	0.089**	0.048	0.003
	(0.038)	(0.040)	(0.032)	(0.034)	(0.050)	(0.045)	(0.038)	(0.039)	(0.053)	(0.045)
Post x Barrier Count		0.069**			-0.044	-0.051	-0.122***			-0.000
		(0.033)			(0.040)	(0.037)	(0.038)			(0.034)
Post x Newly Eligible x Barrier Count	-0.025	-0.180***	-0.079	-0.035	0.084	-0.029	0.020	-0.141**	-0.037	0.034
	(0.057)	(0.057)	(0.073)	(0.062)	(0.062)	(0.058)	(0.058)	(0.058)	(0.063)	(0.057)
Factory FE	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
State × Year FE	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Industry × Year FE	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
SE clustered by	F	F	F	F	F	F	F	F	F	F
Mean	1.70	1.70	1.70	1.70	1.70	1.70	1.70	1.70	1.70	1.70
R^2	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77
Firm-years	33,057	33,057	33,057	33,057	33,057	33,057	33,057	33,057	33,057	33,057
Firms	7,454	7,454	7,454	7,454	7,454	7,454	7,454	7,454	7,454	7,454

Panel B: *Product innovation*

	Electricity Shortage (High)	Education (Low)	Labor Regulation (High)	Land Access (Low)	Import Reliant (High)	Market Concentration (High)	Market Size (Low)	Legal Congestion (High)	Infrastructure (Low)	Rural
Post x Newly Eligible	0.012	0.010	0.003	0.056***	-0.005	0.011	0.006	0.048**	0.076***	0.016
	(0.021)	(0.021)	(0.017)	(0.019)	(0.025)	(0.027)	(0.021)	(0.021)	(0.027)	(0.024)
Post x Barrier Count		0.005			-0.003	-0.072***	-0.043**			-0.012
		(0.018)			(0.021)	(0.021)	(0.020)			(0.019)
Post x Newly Eligible x Barrier Count	-0.009	-0.005	0.020	-0.132***	0.020	0.001	-0.003	-0.085***	-0.099***	-0.016
	(0.031)	(0.030)	(0.039)	(0.032)	(0.032)	(0.033)	(0.030)	(0.031)	(0.033)	(0.031)
Factory FE	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
State × Year FE	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Industry × Year FE	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
SE clustered by	F	F	F	F	F	F	F	F	F	F
Mean	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44
R^2	0.51	0.51	0.51	0.51	0.51	0.51	0.51	0.51	0.51	0.51
Firm-years	33,057	33,057	33,057	33,057	33,057	33,057	33,057	33,057	33,057	33,057
Firms	7,454	7,454	7,454	7,454	7,454	7,454	7,454	7,454	7,454	7,454

Panel C: *Product complexity*

	Electricity Shortage (High)	Education (Low)	Labor Regulation (High)	Land Access (Low)	Import Reliant (High)	Market Concentration (High)	Market Size (Low)	Legal Congestion (High)	Infrastructure (Low)	Rural
Post x Newly Eligible	-0.005	0.006	-0.014	0.019	-0.003	-0.005	0.002	0.020	0.018	0.004
	(0.017)	(0.017)	(0.014)	(0.015)	(0.021)	(0.024)	(0.017)	(0.018)	(0.023)	(0.020)
Post x Barrier Count		-0.010			0.017	-0.039**	-0.019			0.022
		(0.014)			(0.016)	(0.016)	(0.015)			(0.014)
Post x Newly Eligible x Barrier Count	-0.005	-0.029	0.029	-0.074***	-0.002	0.000	-0.024	-0.058**	-0.037	-0.018
	(0.025)	(0.025)	(0.032)	(0.026)	(0.026)	(0.028)	(0.025)	(0.025)	(0.027)	(0.025)
Factory FE	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
State × Year FE	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Industry × Year FE	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
SE clustered by	F	F	F	F	F	F	F	F	F	F
Mean	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11
R^2	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46
Firm-years	30,047	30,047	30,047	30,047	30,047	30,047	30,047	30,047	30,047	30,047
Firms	6,886	6,886	6,886	6,886	6,886	6,886	6,886	6,886	6,886	6,886

Panel D: *Product innovation sales share*

	Electricity Shortage (High)	Education (Low)	Labor Regulation (High)	Land Access (Low)	Import Reliant (High)	Market Concentration (High)	Market Size (Low)	Legal Congestion (High)	Infrastructure (Low)	Rural
Post x Newly Eligible	0.041**	0.024	0.025	0.075***	0.021	0.065***	0.047**	0.055***	0.100***	0.051**
	(0.020)	(0.020)	(0.016)	(0.018)	(0.023)	(0.025)	(0.019)	(0.020)	(0.026)	(0.023)
Post x Barrier Count		0.016			-0.013	-0.047**	-0.041**			-0.005
		(0.017)			(0.020)	(0.019)	(0.018)			(0.017)
Post x Newly Eligible x Barrier Count	-0.008	0.027	0.060*	-0.104***	0.022	-0.040	-0.030	-0.039	-0.091***	-0.026
	(0.029)	(0.028)	(0.035)	(0.030)	(0.030)	(0.030)	(0.029)	(0.029)	(0.031)	(0.029)
Factory FE	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
State × Year FE	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Industry × Year FE	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
SE clustered by	F	F	F	F	F	F	F	F	F	F
Mean	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30
R^2	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50
Firm-years	33,057	33,057	33,057	33,057	33,057	33,057	33,057	33,057	33,057	33,057
Firms	7,454	7,454	7,454	7,454	7,454	7,454	7,454	7,454	7,454	7,454

Panel E: *Complex-innovation sales share*

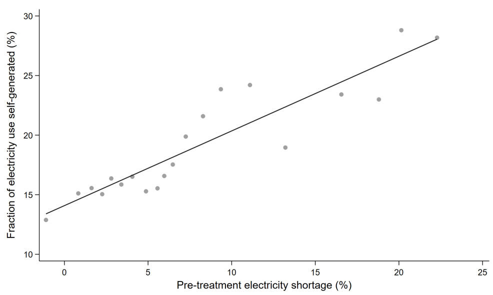
	Electricity Shortage (High)	Education (Low)	Labor Regulation (High)	Land Access (Low)	Import Reliant (High)	Market Concentration (High)	Market Size (Low)	Legal Congestion (High)	Infrastructure (Low)	Rural
Post x Newly Eligible	0.006	0.013	0.003	0.027**	0.014	0.021	0.016	0.020	0.032*	0.023
	(0.013)	(0.013)	(0.011)	(0.011)	(0.015)	(0.018)	(0.012)	(0.013)	(0.017)	(0.015)
Post x Barrier Count		-0.011			0.001	-0.025**	-0.012			0.008
		(0.010)			(0.012)	(0.012)	(0.011)			(0.010)
Post x Newly Eligible x Barrier Count	0.008	-0.007	0.036	-0.047**	-0.007	-0.014	-0.015	-0.020	-0.031	-0.021
	(0.019)	(0.019)	(0.024)	(0.020)	(0.019)	(0.021)	(0.019)	(0.019)	(0.021)	(0.019)
Factory FE	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
State × Year FE	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Industry × Year FE	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
SE clustered by	F	F	F	F	F	F	F	F	F	F
Mean	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07
R^2	0.47	0.47	0.47	0.47	0.47	0.47	0.47	0.47	0.47	0.47
Firm-years	30,047	30,047	30,047	30,047	30,047	30,047	30,047	30,047	30,047	30,047
Firms	6,886	6,886	6,886	6,886	6,886	6,886	6,886	6,886	6,886	6,886

C Additional results

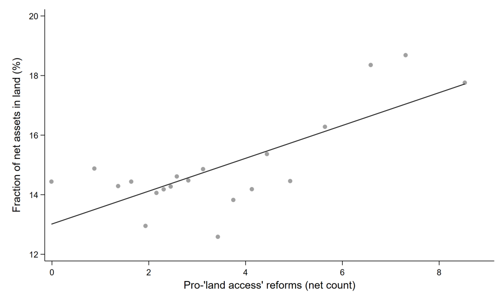
Figure C.1: *Validating measures of barriers*

Notes: Each panel plots 20-quantile binned means of a firm-level outcome against its corresponding pre-treatment barrier, with the solid line showing the OLS fit from a regression that absorbs industry-year fixed effects and applies sampling weights. All variables are winsorised at the 1st/99th percentiles.

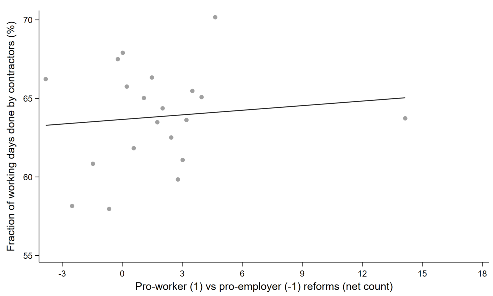
Panel A: *Electricity shortage*



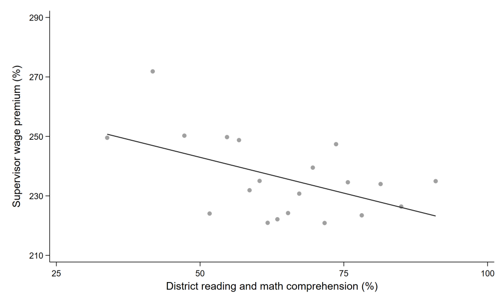
Panel B: *Inaccessibility of land*



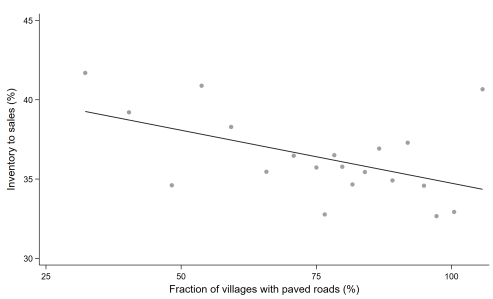
Panel C: *Pro-Worker labor regulation*



Panel D: *Poor education*



Panel E: *Poor infrastructure*



Panel F: *Legal congestion*

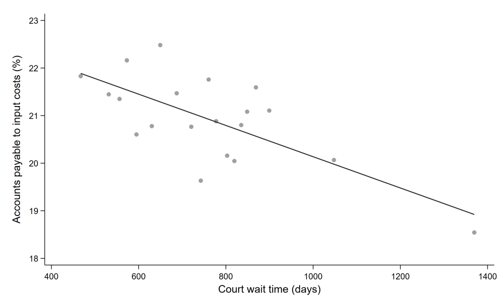


Figure C.2: *Heterogeneous impact of eligibility reform*

Notes: This table displays estimated treatment effect on product scope (black), product innovation (dark gray), and product complexity (light gray) varying firms' exposure to barriers. "Average firm" reproduces the baseline difference-in-differences specification, while "Median (five barriers) firm" and "Unconstrained (zero barriers) firm" are linear combinations that set the pre-treatment barrier counts to five and zero, respectively. Estimates weigh observations by their inverse sampling probability, and absorbing firm, industry-year and state-year fixed effects. Standard errors are clustered at the firm level, and 90 percent confidence intervals are shown as capped lines. The horizontal dashed line marks a null effect (= 0).

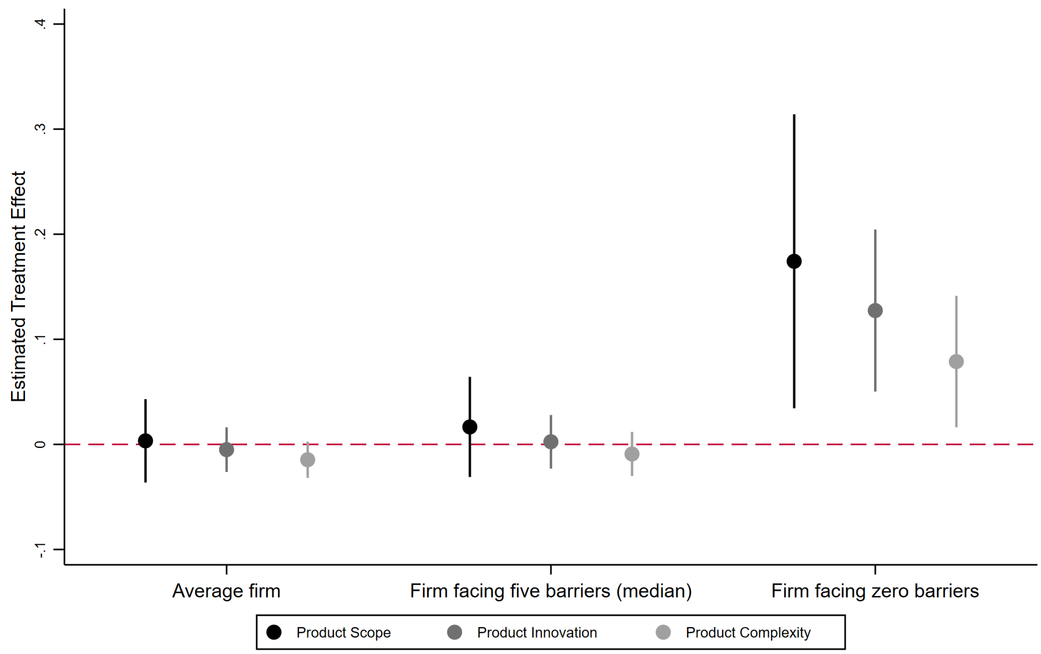


Table C.1: *Impact of eligibility reform on key outcomes: index specification*

Notes: This table validates the estimates to a potential concern about log(zero), demonstrated in Chen and Roth, 2024. The outcomes considered, credit, sales, etc., can equal zero, and this paper follows the existing literature using ASI (see Allcott, Collard-Wexler, and O'Connell, 2016) and define outcome as log(1+Y), and are thus subject to the concern. Chen & Roth propose several methods to resolve this issue. We show estimates for one proposed solution, appropriate for our setting. Here, each firm-year observation is scaled by the firm-level pre-treatment mean multiplied by 100. The interpretation thus becomes the percentage point increase relative to the pre-reform mean. Across the board the estimates aligns with the estimates from the baseline specification. The dependent variables are winsorized at the 1st and 99th percentiles. Observations are weighted by their inverse sampling probability, and standard errors clustered by firm and industry×year are reported in parentheses. *, **, and *** denote statistical significance at the 10 percent, 5 percent, and 1 percent levels, respectively.

	Credit (Index)	**Sales (Index)**	**Materials Consumed (Index)**	**Days Worked (Index)**	**Investment (Index)**	**Net Income (Index)**
Post x Newly Eligible	15.95***	12.94***	11.12***	11.30***	6.63*	28.36***
	(4.72)	(3.65)	(3.74)	(1.90)	(3.76)	(8.67)
Factory FE	Y	Y	Y	Y	Y	Y
State × Year FE	Y	Y	Y	Y	Y	Y
Industry × Year FE	Y	Y	Y	Y	Y	Y
SE clustered by	F	F	F	F	F	F
R^2	0.63	0.65	0.65	0.60	0.64	0.53
Firm-years	48,739	48,709	48,647	48,748	48,771	48,694
Firms	10,921	10,926	10,912	10,931	10,935	10,923

Table C.2: *Impact of eligibility reform on TFPQ*

Notes: This table shows estimated treatment effect on TFPQ across a range of measures, defined in Rotemberg (2019). **Panel A** presents estimates for all firms in our sample with available data, whereas **Panel B** restricts the sample to firms that have available data to define all measures of TFPQ. "Newly Eligible" firms are those that received eligibility through the 2006 reform, while "Post" is a binary indicator set to one for reform-active years. The specification includes state×year, industry×year, and firm fixed effects. Outcomes are winsorized at the 1st and 99th percentiles, and observations are weighted by their inverse sampling probability. Standard errors, clustered at the firm level, are reported in parentheses. Statistical significance is denoted by *, **, and *** at the 10 percent, 5 percent, and 1 percent levels

***Panel A**: Baseline sample*

	Cost Shares (US) - TFPQ	Cost Shares (India) - TFPQ	W-LP (Weighted) - TFPQ	W-LP - TFPQ	DGKP (Prowess) - TFPQ	DGKP (ASI) - TFPQ
Post x Newly Eligible	0.025	-0.003	-0.001	-0.005	0.045	0.029
	(0.025)	(0.016)	(0.017)	(0.018)	(0.029)	(0.018)
Factory FE	Y	Y	Y	Y	Y	Y
State × Year FE	Y	Y	Y	Y	Y	Y
Industry × Year FE	Y	Y	Y	Y	Y	Y
SE clustered by	F	F	F	F	F	F
Mean	-4.90	-4.26	-4.37	-4.40	-5.77	-4.28
R^2	0.93	0.90	0.90	0.91	0.94	0.89
Firm-years	30,433	46,094	46,094	46,094	32,942	32,942
Firms	7,939	10,240	10,240	10,240	7,804	7,804

***Panel B**: Consistent sample*

	Cost Shares (US) - TFPQ	Cost Shares (India) - TFPQ	W-LP (Weighted) - TFPQ	W-LP - TFPQ	DGKP (Prowess) - TFPQ	DGKP (ASI) - TFPQ
Post x Newly Eligible	0.033	0.012	0.013	0.019	0.036	0.008
	(0.028)	(0.019)	(0.021)	(0.022)	(0.031)	(0.020)
Factory FE	Y	Y	Y	Y	Y	Y
State × Year FE	Y	Y	Y	Y	Y	Y
Industry × Year FE	Y	Y	Y	Y	Y	Y
SE clustered by	F	F	F	F	F	F
Mean	-4.99	-4.25	-4.37	-4.40	-5.82	-4.23
R^2	0.93	0.90	0.91	0.92	0.95	0.90
Firm-years	24,476	24,476	24,476	24,476	24,476	24,476
Firms	6,502	6,502	6,502	6,502	6,502	6,502

Table C.3: *Impact of eligibility reform on investment by type*

Notes: "Newly Eligible" firms are those that received eligibility through the 2006 reform, while "Post" is a binary indicator set to one for reform-active years. The specification includes state×year, industry×year, and firm fixed effects. Outcomes are winsorized at the 1st and 99th percentiles, and observations are weighted by their inverse sampling probability. Standard errors, clustered at the firm level, are reported in parentheses. Statistical significance is denoted by *, **, and *** at the 10 percent, 5 percent, and 1 percent levels, respectively.

	Net Investment in Fixed:				
	Land (Log)	Building (Log)	Plant (Log)	Transport (Log)	Total (Log)
Post x Newly Eligible	0.12***	0.07	-0.03	0.03	0.08
	(0.04)	(0.05)	(0.05)	(0.04)	(0.06)
Factory FE	Y	Y	Y	Y	Y
State × Year FE	Y	Y	Y	Y	Y
Industry × Year FE	Y	Y	Y	Y	Y
SE clustered by	F	F	F	F	F
R^2	0.83	0.83	0.84	0.79	0.79
Firm-years	35,033	43,869	48,593	45,169	48,775
Firms	7,750	9,749	10,908	10,037	10,936

Table C.4: *Impact of eligibility reform on investment by type, heterogeneity by barrier count*

Notes: **Panel A** reports baseline estimates of the effect of the 2006 credit reform on product innovation defined at different levels of granularity. **Panel B** augments the specification by interacting treatment with the "Barrier Count", defined as the number of distinct barriers a firm faced prior to the reform (0–10; see Table A.3 for detailed definitions). "Newly Eligible" equals 1 for firms that became eligible because of the 2006 reform, and "Post" equals 1 in reform-active years. All regressions include state×year, industry×year, and firm fixed effects. Outcomes are winsorized at the 1st and 99th percentiles, and observations are weighted by their inverse sampling probability. Standard errors, clustered at the firm level, are reported in parentheses. Statistical significance is denoted by *, **, and *** for the 10%, 5%, and 1% levels, respectively.

Panel A: *Impact of eligibility reform on innovation by product distance*

	Product Innovation	
	Product Division (Old)	Product Division (New)
Post x Newly Eligible	0.005	-0.011
	(0.012)	(0.009)
Factory FE	Y	Y
State × Year FE	Y	Y
Industry × Year FE	Y	Y
SE clustered by	F	F
Mean	0.28	0.09
R^2	0.45	0.45
Firm-years	48,799	48,799
Firms	10,939	10,939

Panel B: *Impact of eligibility reform on innovation by product distance, heterogeneity by barriers*

	Product Innovation	
	Product Division (Old)	Product Division (New)
Post x Newly Eligible	0.138***	0.026
	(0.042)	(0.029)
Post x Barrier Count	0.002	-0.009*
	(0.007)	(0.005)
Post x Newly Eligible x Barrier Count	-0.025***	-0.007
	(0.008)	(0.006)
Factory FE	Y	Y
State × Year FE	Y	Y
Industry × Year FE	Y	Y
SE clustered by	F	F
Mean	0.28	0.09
R^2	0.48	0.48
Median Effect	0.025	-0.052
Firm-years	33,057	33,057
Firms	7,454	7,454

Table C.5: *Impact of eligibility reform on investment by type, heterogeneity by barriers*

Notes: "Newly Eligible" firms are those that received eligibility through the 2006 reform, while "Post" is a binary indicator set to one for reform-active years. "Barrier Count" quantifies barriers faced by firms pre-treatment, ranging from 0-10. The specification includes state×year, industry×year, and firm fixed effects. Outcomes are winsorized at the 1st and 99th percentiles, and observations are weighted by their inverse sampling probability. Standard errors, clustered at the firm level, are reported in parentheses. Statistical significance is denoted by *, **, and *** at the 10 percent, 5 percent, and 1 percent levels, respectively.

	Net Investment in Fixed:				
	Land (Log)	Building (Log)	Plant (Log)	Transport (Log)	Total (Log)
Post x Newly Eligible	0.15	0.38**	0.52***	0.12	0.62***
	(0.15)	(0.16)	(0.18)	(0.15)	(0.19)
Post x Barrier Count	-0.06**	-0.01	-0.01	-0.04	-0.02
	(0.02)	(0.03)	(0.03)	(0.02)	(0.03)
Post x Newly Eligible x Barrier Count	-0.00	-0.05*	-0.10***	-0.01	-0.10***
	(0.03)	(0.03)	(0.03)	(0.03)	(0.04)
Factory FE	Y	Y	Y	Y	Y
State × Year FE	Y	Y	Y	Y	Y
Industry × Year FE	Y	Y	Y	Y	Y
SE clustered by	F	F	F	F	F
R^2	0.84	0.84	0.84	0.81	0.80
Firm-years	24,448	30,290	32,893	30,431	33,040
Firms	5,458	6,793	7,430	6,768	7,452

PUBLICATIONS

Credit and Product Innovation in Emerging Markets: Evidence from India

Working Paper No. WP/2025/192