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Product Scope and Productivity: Evidence from India's Product Reservation Policy

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Protections for small enterprises are commonplace in developing countries. How do these policies affect overall industrial performance? Using exogenous variation in the timing of an Indian policy dismantling laws that "reserved" certain products for exclusive manufacture by small firms, we identify the effect of the dereservation policy on size, productivity, product churning, and other industry dynamics. Following the change, we find that firms significantly altered their product lines, leading to the reallocation of productive factors, increasing exits, and increasing total factor productivity. These effects were driven by new entrants moving into the formerly restricted product space, and in particular by multiproduct firms. Our findings underscore the importance of intrafirm heterogeneity on the impact of size-contingent regulations, as firms' product line dynamics can be an important dimension of productivity growth.

JEL Classification: O1, O25, O4, L5

1. Introduction

Policies and institutions favoring small firms are pervasive throughout the developing world. Support like subsidized credit, tax breaks, or favorable regulatory requirements are often put in place to enhance aggregate growth, based on the idea that small firms can be engines of growth if barriers to accessing resources are removed. However, as a mounting body of theoretical and empirical work shows, these types of programs may be potentially distortionary and actually lower overall productivity and output (Restuccia and Rogerson 2008; Guner, Ventura, and Yi 2008; Garcia-Santana and Pijoan-Mas 2014; Garicano, Lelarge, and Van Reenen 2016; Rotemberg 2017). An important feature in this literature is firm heterogeneity: unlike the standard neoclassical model where identical firms use a constant returns to scale aggregate production function, recent work shows that in the presence of heterogeneous firms, size-dependent policies—like the one discussed in this article—can lead to a misallocation of resources, dampening economic growth.

Further, heterogeneity may be present not just *across* firms but *within* firms as well, such as through heterogeneity in the mix of products a firm produces. A growing body of literature shows that changes in the product mix contribute substantially to overall output growth. For example, Bernard, Redding, and Schott (2010) find that product churning accounts for a third of U.S. output growth between 1972 and 1997. Goldberg et al. (2010)—in a study on Indian multiproduct firms—find that changes in product mix contribute 25% of the increase in manufacturing output between 1989 and 2003. In the presence of this product-level heterogeneity, responses to policy changes manifest

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themselves not just at the interfirm but also at the intrafirm margin. The most commonly studied policy in this context are trade liberalizations, where scholars have found that in the face of increased competition, multiproduct firms reduce their product scope by dropping their least efficient products and focus production on their "core competence" (Baldwin and Gu 2009; Eckel and Neary 2010; Iacovone and Javorcik 2010; Bernard, Redding, and Schott 2011; Mayer, Melitz, and Ottaviano 2014).

Outside the trade literature, little is known about whether product scope dynamics are an important margin of adjustment following domestic policy reforms. Further, a challenge facing any empirical analysis studying the relationship between changes in product lines and firm performance is that unobserved firm characteristics may be driving both higher productivity and probability of product switching. For example, if certain firms have an unobserved shock to the cost of switching into and producing certain products, this would manifest in both higher measured productivity and a change in product lines. This would confound a causal link between product scope and productivity.

In this article, we investigate the intrafirm reallocation channel underlying productivity growth. Our focus is on product scope changes as a driver of productivity during the unraveling of an important domestic Indian regulation—product reservation. For decades, the Indian government mandated that certain products, ranging from food items to chemicals, would be reserved for exclusive manufacture by small-scale enterprises. These items numbered over 800 and constituted almost 25% of manufacturing output. Starting in 1997, this regulation has been dismantled gradually, with different products being taken off the reserved list or being "dereserved" at different times. Dereservation was part of the troika of major Indian industrial policies—along with trade tariffs and industrial licensing—and played an important role in shaping Indian manufacturing during the postcolonial period. Dereservation heavily influenced the evolution of the small-scale sector (Little 1987; Mohan 2002). While the impact of other policies like tariffs, licensing, and FDI reform on growth and productivity has been studied extensively in the growth and development literature, this article is among the first to rigorously study product reservations.[1] Moreover, this study is the first to support product line dynamics as a margin of intrafirm reallocative activity in the aftermath of Indian industrial reform.

Leveraging plausibly exogenous variation generated by this policy change, we attempt to identify a causal connection between product scope dynamics and increases in productivity. Our empirical strategy relies on exploiting the timing and intensity of changes in the fraction of output produced in unreserved goods[2] across different industries. Using this approach, we assess whether this policy—which changed the profitability of producing certain products and led to changes in product scope dynamics—was an important margin of productivity growth following the dereservation policy. Using a difference-in-differences framework, we document the overall reduced-form impact of the policy on firm[3] size, productivity, changes in product lines, and exits, as well as the heterogeneous impacts by firm type.

We find that dereservation of products increased the size and productivity of firms in the range of 1–4% from 2000 to 2010. The changes were largest for multiproduct producers, and especially

[1] Other articles contemporaneous to ours are García-Santana and Pijoan-Mas (2014) and Martin, Nataraj, and Harrison (2017).

[2] We will use the term "unreserved" throughout the article to indicate the set of products that were never subject to the policy plus products that went from being reserved to dereserved.

[3] We will be using "firm" synonymously with an establishment that refers to the physical location of production. The dereservation policy applied at the level of the establishment.

for those who were never previously in the reserved product space. As an industry's fraction of unreserved output increases, the average number of previously reserved products increases but the average number of "regular" or never-reserved products decreases. The propensity to drop never-reserved products is larger than the addition of previously reserved products for these firms, leading to a decrease in overall product scope. This switching and reduction of products by multiproducer firms is accompanied by increases in productivity. This evidence suggests that product reservation constrained the ability of multiproduct firms to achieve their optimal product mix, and once the policy was removed, these firms were able boost productivity through product switching. Our findings also support the "core competency" firm models such as Eckel and Neary (2010) who find a reduction in product scope in the aftermath of policy reform. Also, consistent with the theoretical model of Mayer, Melitz, and Ottiviano (2014), changes in product mix spurred by competition have important implications for firm productivity.

The article is organized as follows: section 3 provides a brief background on product reservation, section 4 describes the empirical approach, data, and descriptive data patterns, section 5 presents the results and explores some robustness checks, and section 6 concludes.

2. Literature Review

The findings in this article complement and augment existing work in development, macroeconomics, and trade. First, as we discussed above, there is a growing theoretical and empirical literature which stresses the importance of incorporating within-firm activity into traditional theories of firm productivity and industry dynamics. Goldberg et al. (2010) find that Indian multiproduct firms are very similar to U.S. multiproduct firms (as studied in Bernard, Redding, and Schott 2010) in that they are larger and more productive than their single-product counterparts. However, unlike the United States, product additions are far more prevalent in India than traditional product churning, that is, product addition and dropping or creative destruction. The authors also try to link trade policy to the intrafirm channel, but are unable to find a connection. In contrast, we find strong evidence for product switching in the aftermath of this separate, domestic policy change. Alvarez, Bravo-Ortega, and Navarro (2016) conduct a similar analysis for Chilean plants, also finding that three-quarters of plants were involved in product churning and had a large role in aggregate sales growth. Navarro (2012) estimates the causal impact of product mix changes on plant outcomes using matching techniques. They, like us, find that product mix changes have a positive and significant effect on plants' total factor productivity (TFP) and size.

A second line of related work is the body of literature linking manufacturing productivity and growth to industrial policies in general, and in particular to policies that restrict the size of firms. Recent work by Guner, Ventura, and Yi (2008), Restuccia and Rogerson (2008), Hsieh and Klenow (2009), Garcia-Santana and Pijoan-Mas (2014), and Garicano, Lelarge, and Van Reenen (2016) measures the aggregate productivity cost of distortions from the misallocation of capital, labor, and managerial talent. Quantitative results show a large impact of size-dependent policies, accounting for up to 50% of the productivity gap between some developing economies and the United States. Garcia-Santana and Pijoan-Mas (2014) specifically examine dereservation in a Lucas span-of-control type model, where the Indian product reservation policy results in a misallocation of talent. Calibration results show dereservation boosts output by 6.8% in manufacturing and 2% in the overall economy, and TFP by 2% and 0.75%, respectively—quantitatively similar to our findings. Bollard, Klenow, and Sharma (2013) do not find evidence of increases in productivity after

dereservation.[4] In recent work, Martin, Nataraj, and Harrison (2017) find a positive impact of dereservation on firm and district output growth. While all of these articles either feature no heterogeneity—or heterogeneity at the firm level only—we underscore the importance of another dimension—heterogeneity at the product-firm level—in assessing the impact of size-contingent regulation.

We are also motivated by empirical and theoretical work that assesses the impact of globalization on the nature of product scope dynamics and its relation to firm productivity and size. Many of these models predict changes in product mix and reduction in product scope when competition pushes firms toward their "core competencies"—inducing them to shed their least productive products (Eckel and Neary 2010; Bernard, Redding, and Schott 2011; Mayer, Melitz, and Ottaviano 2014). Iacovone and Javorcik (2010) find firms drop their fringe varieties in the aftermath of NAFTA. Similarly, Baldwin and Gu (2009) find bilateral trade liberalization reduces the number of products supplied by Canadian plants, and the rate of decline is smaller for larger and exporting plants.

3. Institutional Details on India's Product Reservation Policy

The Indian government has a long history of promoting small-scale industries (SSIs). Post-independence, policymakers viewed small industry as a means of generating employment and achieving social equity. Conceived in the Industries (Development and Regulation) Act in 1951, the industrial agenda emphasized the need to encourage new ventures by individuals from socioeconomics classes, castes, and communities that had historically contributed less to the nation's entrepreneurial activity.[5] SSIs have historically formed a large component of the Indian manufacturing sector, accounting for 40% of industrial production and 35% of total employment over the last three decades, with an overall contribution to GDP of approximately 6%.

SSI enterprises were beneficiaries of substantial institutional and financial assistance. Among the myriad protectionist measures benefiting SSIs, arguably the most extreme was product reservation, which was introduced in the Third Five Year Plan (1961–1966). Hundreds of products across the manufacturing sector were only allowed to be produced by small-scale firms, insulating them from competition.[6] A firm was defined to be "small" if the (historical) value of plants and machinery was less than ₹10 million.[7] The types of products on the reserved list were varied, spanning many industrial sectors such as food, chemicals, electronics, and textiles. Within the small-scale sector, the output share of reserved products was approximately 30% in 1987. Overall, reserved products constituted about 12% of Indian manufacturing output. There is considerable heterogeneity within industry sectors, with reserved products forming 80% of output in hosiery and garments, 57% in certain wood products, and a negligible fraction in textiles.

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[4] Some of this may be in part due to their measure of dereservation that is not based on product-level information.

[5] The Indian government decided to undo the regulations in this act and undertook other liberalization measures in 1991. However, importantly for us, these reforms were not concurrent with the dereservation policy, but several years before it. Removal of licensing and loosening of FDI requirements were industry-specific, so there may be concern that this could correlate with our product-specific policy; however, our controls for industry fixed effects and also industry-time trend effects should absorb any industry-specific factors like the older reforms.

[6] Existing large enterprises that had been producing the products were allowed to continue production without being allowed to expand. If they wanted to expand, 75% of the output had to be exported (Mohan 2002).

[7] Prior to the current 1999 definition, the investment ceiling has changed over time: http://www.dcmsme.gov.in/publications/circulars/circularmay1994.html#icoty

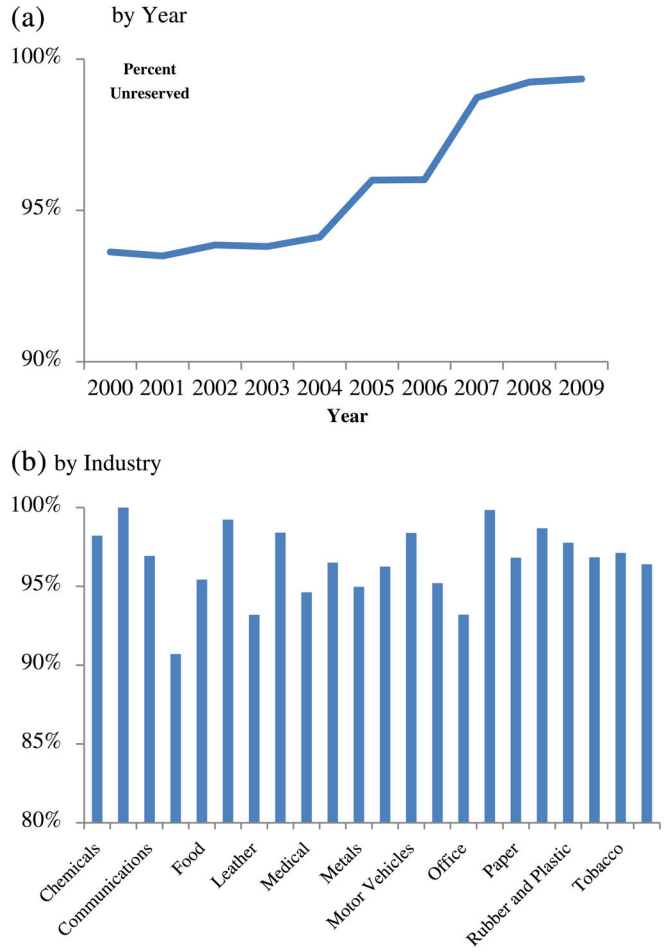

Figure 1. Fraction of Output Unreserved. (a) By Year. (b) By Industry.
Notes: The vertical axis in both figures measures the share of output constituted of products that were never under reservation or products that became dereserved across years. [Color figure can be viewed at wileyonlinelibrary.com]

There is no official documentation that describes how the reservation policy was formulated. An expert committee constituted in 1997 to review SSIs in India's postliberalization period states, "the choice of products for reservation was necessarily arbitrary." Some observers think that the government's goal in the early decades following independence was to create a labor intensive sector that would absorb abundant labor. However, there is no technical criterion for reserving specific goods say, based on optimal capital to labor ratios (which are difficult to ascertain in the first place). Since 1967, the "reserved" list has evolved, with a few more items being mostly added prior to 1997, at which point there were 821 products on the list.

Starting in 1997, products began to be gradually removed from the reserved list. Figure 1(a) shows the change in the reservation policy over the sample period. We plot the proportion of products in the economy that are unreserved by year from 2000 to 2010. We see that the policy started off gradually and accelerated greatly in the mid-2000s. Our sample ends in 2010 when 20 items remained on the dereserved list (Figure A1). As of this writing, the last dereservation episode took place in April 2014 with 20 of the remaining items being dereserved.[8] The change varied

not only across time but also across industries. Figure 1(b) gives a cross-sectional snapshot of the average proportion of products unreserved in 2000–2010. Reserved products are present in all two-digit sectors with the exception of tobacco products. Around 20% of products in apparel manufacturing are reserved while less than 5% in food and beverages.

In 1997, a special panel comprised of academics, bankers, politicians, and bureaucrats recommended dereservation of all products as they felt the small-scale sector would be better benefitted by financial assistance, tax breaks, and technological transfer rather than protection. These recommendations were not immediately accepted given the strength of the SSI lobby, but eventually phasing out of reservation in a gradual manner was accepted.[9] The process of determining the products chosen for dereservation at any given time consisted of several lengthy and circuitous steps. First, a product was identified as a dereservation candidate by ministry or industry players—including manufacturers of reserved products themselves who find the investment ceiling constraining. Reasons could range from competition from imports, technology requirements, needs to comply with regulation, no benefit to small producers, or availability of unreserved substitute products. Once identified, a series of meetings between stakeholders such as trade associations or small firm groups and officials would take place. After review up a chain of bureaucrats, the dereservation of a product is signed into law by the central government minister. Qualitative support for the quasi-random nature of reservation and dereservation is reflected in the extent of reservation or dereservation both across and within product categories. Figure A2 shows how even within a relatively narrowly defined industry like "vegetable oils and fats," there are many oils that were never reserved, and several (like sesame oil, mustard oil, and rapeseed oil) which were. Among the latter, there is even variation regarding when they were dereserved. As we discuss later, plausibly exogenous timing and coverage of the reforms across industries is important to our identification strategy. In the Endogeneity Concerns section of section 4, we provide some empirical tests arguing against potential endogeneity of the policy.

Efforts to promote SSI enterprises may have impeded overall manufacturing growth. Between 1980 and 1998, the small-scale sector grew at a slower pace than the large sector (a 6% annual growth rate as compared with 9%, Mohan 2002). The limit on capital accumulation may have forced firms to underinvest in machinery or technology. For example, a shirt producer's minimum efficient scale has been estimated as 500 sewing machines, and factories of this size are common in countries like China and Sri Lanka. However, in India, the average nonexporting factory has only 20 machines (Garcia-Santana and Pijoan-Mas 2014). Our goal in this article is to forge a causal connection between dereservation and industry outcomes by exploiting the pseudoexperimental features of this policy change.

4. Methodology, Data, and Descriptive Statistics

Methodology: Difference-in-Differences Specification

To estimate the reduced-form, causal link between the dereservation policy and firm productivity, size, and product churning, we use a difference-in-differences specification that exploits the plausibly exogenous changes to the reserved product output over time. Specifically, we estimate β in the following regression:

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[9] Newspaper articles discussing these topics: http://www.business-standard.com/article/specials/house-committees-divided-over-ssi-dereservation-list-197050501007_1.html
http://www.business-standard.com/article/specials/abid-hussain-panel-report-on-ssis-favours-dereservation-of-ssi-197010701089_1.html

$$Y_{\text{ist}} = \alpha_i + \gamma_t + \beta D_{s,t-1} + \varepsilon_{\text{ist}} \quad (1)$$

Y_{ist} is the economic outcome of interest: (log) gross value-added, employment, capital, and firm productivity, and three measures of product scope (the overall number of products produced, as well as the number of unreserved products and the number of reserved products produced) of firm i of industry s in year t. The main independent variable, $D_{s,t-1}$, is the percentage of output within the three-digit industry that is accounted for by unreserved products (newly dereserved or never reserved).[10] We include firm fixed effects, α_i, to control for any firm-specific time-invariant characteristics, and a year fixed effect, γ_t, to control for any year-specific shocks common to all firms. In an augmented specification, we also interact $D_{s,t-1}$ with dummy variables for whether a firm is multiproduct producer or not or a dummy for whether a firm has ever produced reserved products to test for heterogeneous effects by firm type.

Data and Variables

The main data set we use is the Annual Survey of Industries (ASI), the principal source of industrial statistics in India for the years 2000–2010. The ASI is an annual census of all registered manufacturing plants in India with more than 100 workers, and a random sample of firms registered with less.[11] Only the census firms appear in the sample for all 11 years, while other firms rotate in and out depending on the sample design (their sampling probability depends on the state and industry). In the past few years, panel identifiers for factories have become available to researchers, enabling tracking changes in factories over time. The data are collected for the financial year, which runs from April 1 to March 31. In our analysis, we assign each plant-year observation the year that corresponds to the end of the financial year. For example, data for ASI 2007–2008 are given a year value of 2008. Sampling weights are used to provide a nationally representative picture of industrial activity in India. The ASI contains information on a variety of plant characteristics, such as industrial sector, items produced, total output, wages, workers, investment, and value added, among others. Industries are classified using the Indian National Industry Classification (NIC) system. This classification system has been modified periodically, and so we use an official concordance to convert all industry codes to the NIC-2004 version. We assume a firm in our analysis is equivalent to an observation in our data. The observations in the data are at the factory or plant level (the dereservation policy defined the capital threshold at the plant level). While it is possible for a firm to have multiple factories, 95% of the observations represent single-factory firms.

Our main variables of interest from the ASI are those related to a firm's size, productivity, and product scope. For size, we use output (gross value-added),[12] employment, and capital.

[10] Our data classify establishments into a three-digit industry based on the principal product that it manufactures, and it does not record any potentially different industry affiliation of any other products. Thus, in our analysis, we assume that the coded industry is the main one in which the establishment operates and by which it will most likely be affected by the policy change. Based on our calculations, the principal product, on average, accounts for 86% of the establishment's total output. The median is 100%, which suggests that for the majority of firms in the sample, their principal product (on the basis of which their industry is determined) is the essentially the only product.

[11] The definition has changed slightly over time with large firms being defined as those with 200+ workers before the 2003–2004 wave. More details are at http://www.mospi.nic.in/stat_act_t3.htm

[12] Gross output is defined to include the ex-factory value (i.e., exclusive of taxes, duties, etc. on sale and inclusive of subsidies etc., if any) of products and by-products manufactured during the accounting year, and the net value of the semifinished goods, work-in-process (represents the excess/deficit of value of semifinished goods or work-in-process at the end of the accounting year over that of the beginning of the year plus net balance of semifinished fixed assets on a factory's capital account), and also the receipts for industrial and nonindustrial services rendered to others, value of semifinished goods of last year sold in the current year, and sale value of goods sold in the same condition as purchased. Gross value added is gross output minus material inputs.

Output is deflated by creating an index using the wholesale price index (WPI) from the Handbook of Industrial Statistics. Labor is defined as the total number of employees, while capital is measured by deflating the book value of capital by the WPI for machinery. We drop closed firms and firms with missing, negative, or zero values for any of the main variables of interest. In addition, we drop firms in three-digit industries that are not present for the entire duration of the sample. Productivity is constructed using the TFP method as in Levinsohn and Petrin (2003) where unobserved productivity is proxied using the firm's material inputs (at the three-digit level). Central to our analysis are the variables measuring a firm's product scope. Product scope is measured as the total number of products produced. We also identify the products that are reserved and unreserved.

To construct our main independent variable of interest—the percentage of output unreserved in an industry—we use information on the reserved list and timing of dereservations since 1997 from the Ministry of Small Scale Industries. Whenever dereservation occurs, an official government notification is issued providing the description and nine-digit ASICC product code of the item. Since the ASI also provides ASICC information on what items a plant produces, we can link the government dereservation order to the ASI to calculate which plants produce reserved items in each year.[13] Since the ASI data collection ends on March 31 of a given year, any product dereserved after this date is treated as reserved for the ASI financial year but dereserved for the following. We exclude observations where all product codes are missing or all of them are lumped in uninformative categories such as "other" that do not give any information about the reservation status of the product.

The simplest way to calculate the percentage of output unreserved in an industry would be to calculate the fraction of output produced by all firms in a given industry and year that was never reserved or has been dereserved since the last period. However, since product dereservation itself may affect the composition of products firms produce, this method may introduce endogeneity between our variables of interest and the fraction of unreserved output. Optimally, our independent variable would capture only the changes in reservation status, not changes in industry-product composition induced by dereservation. To solve this, we choose a base year to fix the distribution of output across products in a given firm, and hold this fixed over time. As products are dereserved, we then take the portion of output corresponding to production by that firm in the base year, and count it as unreserved. As a result, our measure only changes over time due to the dereservation policy. We use the first year in our sample (2000) as the base year, but the results are robust to using different base years.

Summary and Descriptive Statistics

Summary statistics are shown in Table 1. In addition to the overall mean and standard deviation of the key variables in the sample, we show these statistics for single-product firms, multiproduct firms, firms that have produced products from the reserved list, and firms that have never produced reserved list products. Multiproduct firms, about 43% of the sample, are larger in terms of Gross Value Added (GVA), capital, and employment and are also more productive. This is consistent with empirical

[13] Making this link was not immediately straightforward, since product codes used by the ASI and the government are not always the same. A key challenge was to make the full and correct concordance between ASI and government notification product codes, which we have been able to do with detailed scrutiny of each product and helpful input from the MSME ministry. We are happy to share the concordance on request.

evidence from India (Goldberg et al. 2010) as well as other countries. Reserved sector firms (or those that produce reserved products) are also smaller, which is unsurprising, since size is a criterion for qualifying to produce reserved list products. Further, they are also less productive and produced fewer products. These summary statistics give us some initial evidence that there may be a positive correlation between dereservation and productivity. To probe this further, the scatter plots of Figure 2 depict the correlation of average industry-year productivity, employment capital, GVA, and the share of output, which is not reserved (unreserved or dereserved). There is a strong and positive correlation (p-values <0.01) suggesting that in industries with less output subject to the manufacturing constraints, firms tend to be more productive and larger on average. However, these are simply correlations and do not imply causality—we cannot conclude that producing reserved products causes a firm to be less productive, or that an industry with more unreserved output is more productive. It could be the case that other observed or unobserved factors cause a factory to both produce a certain type of good as well as affect its performance. For example, low ability entrepreneurs may decide to produce a reserved good to avoid competition, in addition to being more likely to produce it less efficiently. To establish causality, we test the relationship using the difference-in-differences methodology described previously and discuss the results in section 5.

Endogeneity Concerns

One potential concern for our analysis is the endogeneity of the reforms. If certain products were systematically chosen for dereservation based on industry characteristics such as export potential, employment, or productivity, this could bias our estimates. Luckily for our analysis, the fact that essentially all products (except for 20) were dereserved by 2008 implies that products were, for the most part, not systematically excluded from dereservation based on industry characteristics—because virtually all products were dereserved. In addition, since our baseline specification includes firm fixed effects, any fixed industrywide differences in observed or unobserved characteristics are being controlled for, since a firm fixed effect controls for the industry effect. However, it may still be the case that the timing of dereservation at the industry level was endogenous. Any time-variant change in industry characteristics could have prompted dereservation to happen sooner or later for that industry, which would not be time-invariant to the firm, and therefore not controlled by the firm fixed effect. For example, if industries that had slowly growing productivity lobbied harder to keep the reservation policy for their products in place, then our difference-in-differences specification would inaccurately estimate that dereservation had a positive effect on productivity. In other words, for our differences-in-differences specification to be valid, the trends in our dependent variables must be parallel before dereservation. To check whether certain observable characteristics related to our dependent variables predict the timing of changes in a firm's unreserved status, we regress unreserved status on lagged (two periods) values of size and productivity. As we see in Table 2, the lack of consistent statistical significance in our lagged outcomes of interest suggests that reverse causality is unlikely to be an issue, in that changes in the dependent variable did not predict the timing of dereservation. In Panel B, we include an interaction between the firm's lagged characteristic and reserved production status. The coefficient on this interaction is not significant for any of our outcomes of interest, implying that the lagged size and productivity of this particular subset of firms—nonreserved good producers—do not predict dereservation either. In Appendix Table A1, we repeat this exercise at the industry level as opposed to the firm level and fail to find consistent

Table 1. Summary Statistics

	All	Product Scope		Reserved Good Production	
		Single	Multi	Yes	No
N	331,194	189,737	141,457	50,664	280,530
%	100	57.3	42.7	15.3	84.7
Gross value added (millions)	84.9 (1111.4)	50.2 (435.2)	131.4 (1622.2)	35.8 (158.2)	93.5 (1203.2)
Employment	78.3 (437.6)	64.1 (401.6)	97.3 (481.0)	55.1 (145.7)	82.4 (470.5)
Fixed capital (millions)	39.1 (787.7)	19.8 (272.4)	64.9 (1162.2)	12.3 (94.2)	43.8 (853.2)
Gross value added per worker (thousands)	788 (8961)	691 (11,680)	917 (2257)	535 (1197)	832 (9704)
Fixed capital per worker (thousands)	221 (853)	200 (672)	250 (1046)	147 (472)	234 (903)
Productivity (Levinsohn and Petrin [2003] method)	11.83 (1.58)	11.56 (1.58)	12.24 (1.53)	11.47 (1.47)	11.92 (1.61)
Number of products	1.74 (1.23)	1.00 (0.00)	2.92 (1.29)	1.22 (0.65)	1.83 (1.29)

Notes: Standard deviation in parentheses. All means weighted using ASI weights. Fixed Capital and Gross Value added measured in Rupees. Productivity refers to TFP constructed as in Levinsohn and Petrin (2003).

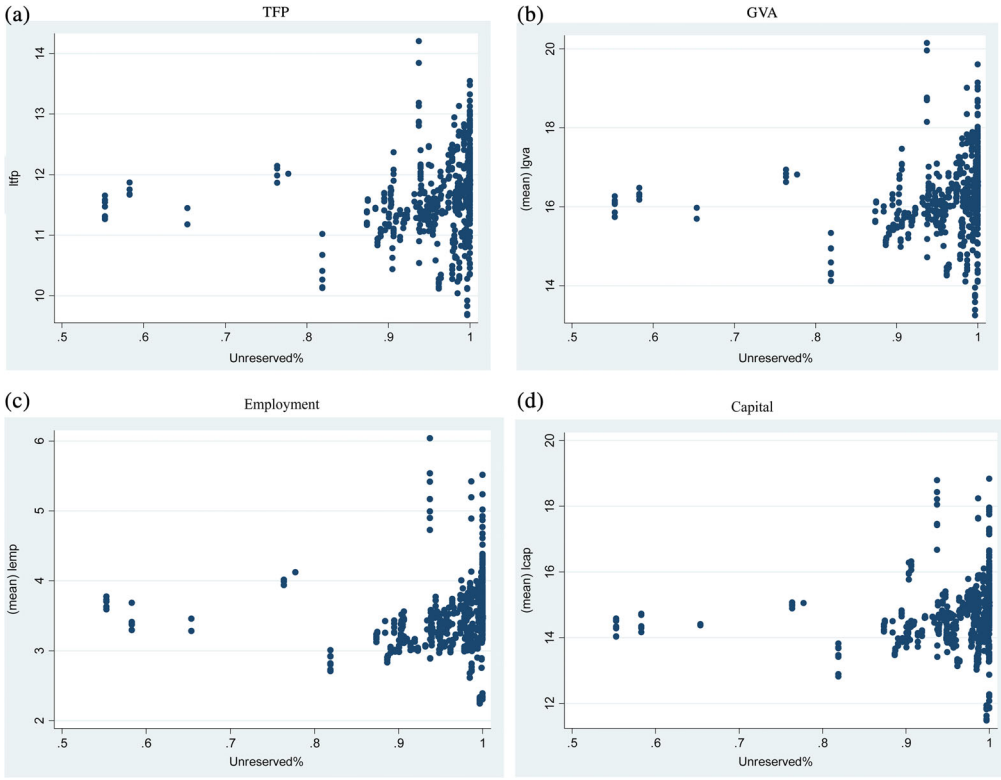

Figure 2. Correlation: Industry Characteristics and Unreserved Share. (a) TFP. (b) GVA. (c) Employment. (d) Capital. Notes: The scatter plots show the correlation between an industry's unreserved output share and average firm logs of productivity, gross value added, employment, and capital across the sample period. The correlations are 0.147, 145, 0.126, and 0.09, respectively, and significant at the <1% level. [Color figure can be viewed at wileyonlinelibrary.com]

evidence of positive reverse causation. In Appendix Table A2, we further investigate three year lags, and do find significant and negative effects on three of the four variables. This implies that—if anything—more productive and larger industries were more likely to dereserve later rather than sooner, implying that our estimate may actually be underestimated.[14]

However, unobservable time-varying trends are still a concern. We control for these in two ways. First, we include results using a variation on our benchmark regression specification, which includes a set of time-specific linear trends based on quartiles of labor intensity, which are explained in section 5 and reported in Appendix Tables A3 and A4. Second, we run a falsification or placebo test to further address the concern as to whether some unobservable factors correlated with dereservation could drive the effect. Our test strategy is as follows: (i) randomize the percentage dereserved variable assigned to an industry and (ii) run the same regression as before, and if the policy effects continue to remain significant, then some other unobserved factor other than dereservation must drive the effect. We randomized the policy variable and ran the regression specification 100 times. The distribution of the *t*-statistic for the coefficients from the 100 regressions is plotted in Figure 3. The mean of the *t*-statistic is centered around zero with a mean around 0.5. The

[14] Note that since these regressions are at the industry level instead of the firm level, we substitute 3-digit industry fixed effects for the firm fixed effects in our regression equation.

Table 2. Dereservation and Prereform Characteristics

Panel A: All Firms				
DV: Unreserved %	(1)	(2)	(3)	(4)
(log) GVA_{t-2}	0.000061 (0.000044)			
(log) Emp_{t-2}		0.000225*** (0.000071)		
(log) Cap_{t-2}			0.000028 (0.000039)	
(log) TFP_{t-2}				0.000079 (0.000064)
Observations	114,245	114,245	114,245	114,245
Panel B: Interaction with Unreserved Good Production Status				
DV: Unreserved %	(1)	(2)	(3)	(4)
(log) GVA_{t-2}* Unres. Firm	0.000097 (0.000170)			
(log) Emp_{t-2}* Unres. Firm		−0.000291 (0.000277)		
(log) Cap_{t-2}* Unres. Firm			0.000158 (0.000149)	
(log) TFP_{t-2}* Unres. Firm				0.000103 (0.000246)
Observations	114,245	114,245	114,245	114,245

Notes: The dependent variable Unreserved % is the fraction of output that is unreserved in a three-digit industry-year. The independent variables are lagged two periods. Productivity refers to a measure of productivity as in Levinsohn and Petrin (2003). All regressions include year and three-digit industry fixed effects. Robust standard errors in parentheses.

***$p < 0.01$.

**$p < 0.05$.

*$p < 0.1$.

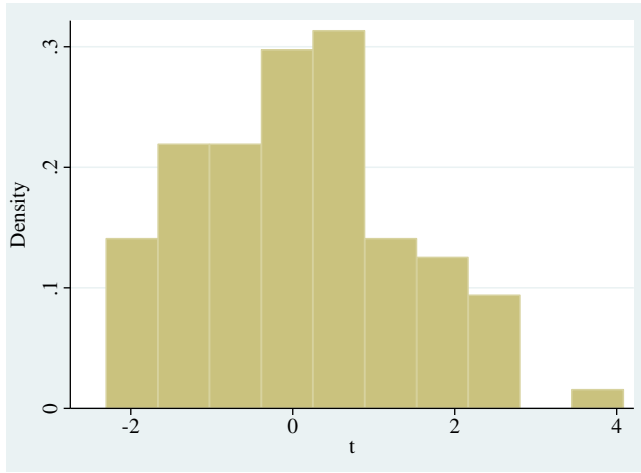

Figure 3. Distribution of t-Statistics from "Fake" Placebo Regressions.
Notes: The above figure plots the t-statistics obtained from assigning a random dereservation measure to an industry-year and running our benchmark specification. We repeat this 100 times. [Color figure can be viewed at wileyonlinelibrary.com]

lack of significance in these falsification runs lends confidence that it is unlikely that the results are driven by other unobserved factors.

Finally, it should also be noted that Martin, Nataraj, and Harrison (2017), who analyze the effect of dereservation on employment, firm size, and exit behavior, also provide evidence for the exogeneity of the dereservation policy, finding similar results to ours.

5. Results

In Table 3, we estimate our difference-in-differences Equation 1 to find the causal effect of dereservation on a series of size, productivity, and product churning measures. We find that the dereservation policy generally led to increases in size: Gross value added increases (but only marginally significantly), while inputs such as employment and capital rose very significantly. For example, given that from 2000 to 2010 the fraction of unreserved output in our overall sample rose from 93.6 to 99.3%, we estimate from the regression in panel A, column 1 that dereservation increased firm-level gross value added by 5.7%*0.270, or 1.5%, across the entire Indian manufacturing sector. Similarly, we find that the policy increased firm-level employment by 2.5% and capital by 1.9% over the sample period. We do not find that dereservation led to significant increases in productivity in the overall sample. However, as we will see in later results, it does for multiproduct firms that did not previously produce a reserved product.

In panel B of Table 3, we repeat the same exercise for measures of product scope. In column 1, we find that the dereservation policy led to a reduction in the number of product lines produced. This is consistent with the literature on competition and product choice, where when competition increases, firms reduce their product lines in order to focus on core competencies (Baldwin and Gu 2009; Eckel and Neary 2010; Iacovone and Javorcik 2010; Bernard, Redding, and Schott 2011; Mayer, Melitz, and Ottaviano 2014). In columns 2 and 3, we find that this product churning generally takes the form of firms adding products that they were unable to produce because of the old restrictions (reserved products) and shedding currently produced unreserved

Table 3. Effect of Dereservation on Size, Productivity, and Product Churning

Panel A: Size and Productivity

DV	(1) (log) GVA	(2) (log) Emp	(3) (log) Cap	(4) (log) TFP
Unreserved %	0.270* (0.156)	0.439*** (0.078)	0.331*** (0.102)	0.121 (0.144)
Observations	326,295	326,295	326,295	326,295

Panel B: Product Churning

DV	(1) # Products	(2) # Unres. Products	(3) # Res. Products
Unres. %	−0.312*** (0.120)	−1.435*** (0.220)	1.132*** (0.165)
Observations	314,921	326,295	326,295

Notes: Unreserved % refers to the fraction of output that is unreserved in a three-digit industry-year. All specifications also contain main effects for both dummies, in addition to year and firm fixed effects. Productivity refers to a measure of TFP as in Levinsohn and Petrin (2003). ASI sampling weights are used. Standard errors are in parentheses, and are clustered at the three-digit industry-year.

***$p < 0.01$.

**$p < 0.05$.

*$p < 0.1$.

Table 4. Heterogeneous Effect of Dereservation on Firm Size and Productivity by Firm Multiproduct and Reservation Status

	(1)	(2)	(3)	(4)
DV	(log) GVA	(log) Emp	(log) Cap	(log) TFP
Unreserved %	0.043 (0.186)	0.386*** (0.115)	0.163 (0.117)	−0.052 (0.169)
Unreserved %* Unres. Firm	0.258 (0.194)	−0.039 (0.114)	0.062 (0.161)	0.245 (0.164)
Multiproduct dummy	0.146 (0.219)	0.000 (0.095)	−0.222 (0.147)	0.210 (0.206)
Unreserved %* MP	−0.038 (0.230)	0.050 (0.101)	0.295* (0.154)	−0.128 (0.216)
MP* Unres. Firm	−0.394* (0.221)	−0.220* (0.115)	−0.101 (0.188)	−0.337* (0.202)
MP* Unres. Firm* Unres %	0.413* (0.232)	0.217* (0.122)	0.093 (0.197)	0.359* (0.213)
Observations	326,295	326,295	326,295	326,295
Overall Effect of Dereservation by Firm Type				
Reserved single product	0.043 (0.186)	0.386*** (0.115)	0.163 (0.117)	−0.052 (0.169)
Unreserved single product	0.301 (0.194)	0.347*** (0.081)	0.225* (0.128)	0.193 (0.177)
Reserved multiproduct	0.00544 (0.172)	0.435*** (0.129)	0.458*** (0.162)	−0.18 (0.176)
Unreserved multiproduct	0.676*** (0.213)	0.614*** (0.095)	0.613*** (0.175)	0.425** (0.184)

Notes: Unreserved % refers to the fraction of output that is unreserved in a three-digit industry-year. Multiproduct Dummy (MP) is a dichotomous variable that takes a value of 0 if the firm produces a single product and 1 if the firm produces multiple products. Unres. Firm is a dummy variable that takes a value of 1 if the firm did not previously produce a reserved product or previously reserved product, and 0 otherwise. All specifications also contain main effects for all dummies, in addition to year and firm fixed effects. Productivity refers to a measure of TFP as in Levinsohn and Petrin (2003). ASI sampling weights are used. Standard errors are in parentheses, and are clustered at the three-digit industry-year.

***$p < 0.01$.

**$p < 0.05$.

*$p < 0.1$.

Table 5. Heterogeneous Effect of Dereservation on Product Churning by Firm Multiproduct and Reservation Status

DV	(1) # Prdcts	(2) # Unres. Prdcts	(3) # Res. Prdcts
Unreserved %	−0.057 (0.072)	−1.817*** (0.294)	1.358*** (0.225)
Unreserved %* Unres. Firm	−0.006 (0.087)	0.983*** (0.256)	−1.073*** (0.197)
Multiproduct dummy	1.372*** (0.234)	0.523 (0.339)	−0.396*** (0.101)
Unreserved %* MP	0.072 (0.241)	0.419 (0.347)	0.530*** (0.110)
MP* Unres. Firm	0.907*** (0.282)	0.856** (0.400)	−0.645*** (0.137)
MP* Unres. Firm* Unres %	−0.776*** (0.293)	−0.620 (0.414)	0.609*** (0.145)
Observations	314,923	326,297	326,297
Overall Effect of Dereservation by Firm Type			
Reserved single product	−0.0573 (0.072)	−1.817*** (0.294)	1.358*** (0.225)
Unreserved single product	−0.0632 (0.096)	−0.833*** (0.242)	0.285* (0.147)
Reserved multiproduct	0.0145 (0.223)	−1.398*** (0.291)	1.888*** (0.242)
Unreserved multiproduct	−0.767*** (0.206)	−1.035*** (0.322)	1.425*** (0.177)

Notes: Unreserved % refers to the fraction of output that is unreserved in a three-digit industry-year. Multiproduct Dummy (MP) is a dichotomous variable that takes a value of 0 if the firm produces a single product and 1 if the firm produces multiple products. Unres. Firm is a dummy variable that takes a value of 1 if the firm did not previously produce a reserved product or previously reserved product, and 0 otherwise. All specifications also contain main effects for all dummies, in addition to year and firm fixed effects. Productivity refers to a measure of TFP as in Levinsohn and Petrin (2003). ASI sampling weights are used. Standard errors are in parentheses, and are clustered at the three-digit industry-year.
***$p < 0.01$.
**$p < 0.05$.
*$p < 0.1$.

products that are now relatively less profitable. The net effect is a reduction in overall product scope.

Tables 4 and 5 repeat the exercise in Table 3, but with additional interaction terms to analyze how the effects of the dereservation policy was heterogeneous for different types of firms. Specifically, Table 4 analyzes the effect of dereservation on firm size and productivity, and corresponds to panel A of Table 3, while Table 5 does the same for product churning and corresponds to panel B of Table 3. Each of the regression models now include triple interactions between the fraction of unreserved products, a dummy whether the firm is an "unreserved firm"—defined as never having previously produced a reserved product—and a dummy for being a multiproduct firm—defined as currently producing more than one product. Each regression also includes the cross product of interactions for all of these variables as well as their level effects. The top portion of each table reports the results of each regression, while the bottom portion interprets these coefficients to report the overall net effect for four different types of firms: reserved single product firms, unreserved single product firms, reserved multiproduct firms, and unreserved multiproduct firms.

In Table 4, we see that unreserved multiproduct firms are the only firm type for which the dereservation policy increases overall productivity. The policy change had no effect on all other firm types. In addition, unreserved multiproduct firms are the only firm type for which every measure of firm size increases. For example, while all firm types experience an increase in employment as a result of the product dereservation, only unreserved multiproduct firms show an increase in production in the form of log GVA. Capital increases significantly for both types of multiproduct firms (reserved and unreserved), while does not increase or only marginally so for both types of single product firms.

Not only does the product dereservation increase size and productivity in a statistically significant manner for unreserved multiproduct firms, it also does so in an economically significant way. For example, by interpreting the coefficients, we find that log GVA rose by 3.8% as a result of the product

Table 6. Firm Exit

	All Firms (1)	Reserved (2)	Never Reserved (3)	Multiproduct (4)	Single Product (5)
Unreserved %	0.303** (0.121)	0.733*** (0.225)	0.148 (0.122)	0.00645 (0.0165)	0.368*** (0.134)
Observations	478,292	105,585	372,707	160,070	318,222

Notes: All the above specifications are linear probability models where the dependent variable is exit, which is equal to 0 if the firm's status was open and 1 otherwise. Unreserved % refers to the fraction of output that is unreserved in a three-digit industry-year. Column 1 is the sample of all firms, Column 2 of firms who have produced reserved products, Column 3 is firms who have never produced a reserved product, Column 4 is single-product producers, and Column 5 is multiproduct producers. ASI sampling weights are used. Standard errors are in parentheses, and are clustered at the three-digit industry-year.

***$p < 0.01$.

**$p < 0.05$.

*$p < 0.1$.

dereservation, labor and capital both rise by 3.5%, and productivity rises by 2.4%. While these estimates are 25–50% smaller than the estimate of García-Santana and Pijoan-Mas (2014), they are quantitatively similar and still represent a significant effect on the overall Indian manufacturing sector.

Table 5 reports our estimation results regarding the heterogeneous effect of product dereservation on product churning by firm type. We find that all firm types drop unreserved products and add reserved products. However, similar to our results on productivity in Table 4, the only firm type for which there is a net change in products is unreserved multiproduct firms. On average, these firms reduce their product scope, consistent with the story of these firms shedding products to focus on core competencies. Overall, the average unreserved multiproduct firm dropped 0.044 products as a result of the dereservation policy, which is approximately a 1.5% reduction in product scope. Since the only firm type that reduces product scope is also the only firm type whose productivity increases, this suggests a possible link between productivity and product scope.

These results also suggest that the drivers of the overall size and productivity increases were not the incumbent firms (i.e., those that were previously producing reserved goods), but rather new entrants into the product space in the form of multiproduct firms producing unreserved products. Thus, it appears that the removal of these restrictions intended to protect workers actually led to even more employment. And if factors of production are complementary, increases in allowable capital would also lead to increases in labor as the industry becomes larger and more capital intensive.

The above findings lead us to explore industry dynamics further. That is, does dereservation affect the incidence of exits? And if so, which type of firms are most likely to leave? We repeat our benchmark difference-in-differences specification with exits as the dependent variable. This measure is based on the ASI's information on the status of the firm—an "open" response by the firm is coded as the firm still being in operation, and "closed" is regarded as an exit.[15] Table 6 shows the policy's effect on exits for different subsamples of firms—all firms, multiproduct producers, single-product producers, those producing reserved goods, and those who have never been in the reserved good manufacturing space. Overall, the probability of a firm exit for a 1% increase in dereserved output is around 30%. This is driven mainly by firms who have produced reserved goods as well as single-product producers—their exit probability is 70% and 40%, respectively. This consistent with our previous findings. Establishments who were protected by the policy were the ones who were least likely to expand and become more productive once the policy was removed. Thus, they exit as new and larger firms expand.

Taken together, all of these results suggest several broad effects of the product dereservation on the Indian manufacturing sector. First, the product dereservation generally led to a realignment of products and the reallocation of productive factors. Firms that produced reserved products—and were thereby protected by the reservation policy—exited at higher rates after these protections were removed. As a result, all four firm types who remained shed currently produced unreserved products and moved into the formerly reserved product space, leading to an increase in employment (and sometimes capital) among all firm types that survived the reallocation. However, the only firm types that increased their productivity and output as a result of the product dereservation were the multiproduct firms that were previously prevented from producing reserved products. After dereservation, these firms moved into the new product space like the other firms, but shed their

[15] Measuring exits exactly in the ASI is not possible as it is only a rotating (not true) panel for a subset of establishments. Thus, if an establishment exits while it is not rotating into the sample, it will not be surveyed in the following period and this exit will not be captured. However, we are able to capture some information based on the "status" variable, which is open, closed, deleted, or nonresponsive.

previously produced unreserved products at an even higher rate, choosing instead to focus on core competencies and increasing their overall productivity and output.

As discussed in the Endogeneity Concerns subsection in section 4, one reasonable robustness check would be to include linear trends at the industry level as part of the main specifications to absorb any unobserved characteristics of an industry that evolve in a linear fashion over time. However, if these time-invariant characteristics were themselves dependent on industry characteristics, a simple linear tread for the entire sample may not be sufficient. As mentioned in section 3, the reservation policy was—at least in part—an attempt to increase national employment. Therefore, products may have originally been chosen for the reservation list in part based on their labor intensity. This raises a concern that the industry-specific changes over time might be correlated with other factors such as a change in Indian trade policy, technological changes, and so on that disproportionately affected labor intensive industries.

To control for this possibility, in Tables A3 and A4, we reestimate Tables 4 and 5, but include time trends interacted with four dummies—one for each quartile of industry labor intensity. This measure of industry labor intensity is created by taking the ratio of the total wage bill to gross output across each three-digit industry. We then divide the industries into four quartiles based on this labor intensity measure, create four dummy variables for whether the firm lies in the respective quartile, and interact them with a linear time trend to get quartile-specific time trends. As we see in Tables A3 and A4, these results are qualitatively similar to our main results. In fact, this change generally makes our results about 20% larger and statistically more significant.

6. Conclusion

In this article, we assessed the relationship between product scope, size, and productivity following an Indian domestic policy reform. To do so, we exploited a potentially exogenous policy change that removed the restrictions on the production of certain products solely to small-scale enterprises—known as Indian product dereservation. Using data from the ASI to estimate a difference-in-differences model, we found that the dereservation policy increased firm-level output and productivity by 1–4% over 10 years—particularly for multiproduct firms and newcomers into the formerly reserved product space. On average, dereservation decreases the overall number of unreserved products a firm produces, but increases the number of previously reserved products in firms' product mix, and particularly so for multiproduct producers that never before produced a reserved product.

Our evidence that dereservation increased product churning by multiproduct firms supports the idea that adding and dropping products is an important margin of within-firm reallocative activity following policy reform. Much of the current literature focuses on this mechanism in the context of globalization, but we provide novel evidence for product churning outside this typical trade setting in the aftermath of a policy that increased competitive dynamics. We hope this empirical evidence leads to incorporation of product scope dynamics in analyses of size-dependent policies that are widespread throughout the developed and developing world, and have sizable effects on productivity and growth.

LIST OF ITEMS RESERVED FOR EXCLUSIVE MANUFACTURE BY MICRO AND SMALL ENTERPRISE SECTOR
(As on 30 July 2010)

S.No.	S.No. (As per Gazette Notification)	Product Code	Name of the Product
		20-21	**FOOD AND ALLIED INDUSTRIES**
1.	3	202501	Pickles & chutneys
2.	7	205101	Bread
3.	11	21100102	Mustard Oil (except solvent extracted)
4.	13	21100104	Ground nut oil (except solvent extracted)
		27	**WOOD AND WOOD PRODUCTS**
5.	47	276001	Wooden furniture and fixtures
		28	**PAPER PRODUCTS**
6.	79	285002	Exercise books and registers
			OTHER CHEMICALS AND CHEMICAL PRODUCTS
7.	253	305301	Wax candles
8.	308	314201	Laundry soap
9.	313	317001	Safety matches
10.	314	318401	Fire works
11.	319	319902	Agarbatties
			GLASS AND CERAMICS
12.	335	321701	Glass bangles
		33-35	**MECHANICAL ENGG. EXCLUDING TRANSPORT EQUIPMENT**
13.	364	340101	Steel almirah
14.	394	341004	Rolling shutters
15.	402	34200602	Steel chairs-All types
16.	404	34200702	Steel tables-All other types
17.	409	342099	Steel furniture-All other types
18.	428	343302	Padlocks
19.	447A	345207	Stainless steel utensils
20.	474	345202	Domestic utensils-Aluminium

Figure A1. Currently Reserved Products.
Notes: The above official notification from the Small Scale ministry shows the list of dereserved products as of 2010 (the end of our sample).

- 15: Food Products & Beverages
  - 151: Production, processing and preservation of meat, fish, fruit vegetables, oils and fats.
    - 1514: Vegetable and animal oils and fat
      - 15142: Vegetable oils and fats (excluding corn oil)
        - 12501 Oil, Chili
        - 12502 Oil, Rice bran
        - 12503 Oil, Castor
        - 12504 Oil, Coconut
        - 12505 Oil, Cotton
        - 12506 Oil, Sesame ***Dereserved 2008***
        - 12507 Oil, Ground nut (except solvent extracted)
        - 12508 Oil, Kardi
        - 12511 Oil, Linseed
        - 12512 Oil, Mahua
        - 12513 Oil, Maize
        - 12514 Oil, Mowrah
        - 12515 Oil, Mustard (except solvent extracted) ***Reserved***
        - 12516 Oil, Neem
        - 12517 Oil, Palm
        - 12518 Oil, Rapeseed (except solvent extracted) ***Dereserved 2008***
        - 12519 Palm fatty oil
        - 12521 Oil, Soyabeans
        - 12525 Oil, Cashew kernel ***Dereserved 2008***

- Hair oils dereserved 2003, essential oils dereserved in 2004

Figure A2. Dereservation of the Oil Category.
Notes: The above schematic shows the staggered nature of dereservation dates in the "Oil" category.

Table A1. Preexisting Trends at Industry Level: Two-Year Lags

DV: Unreserved %	(1)	(2)	(3)	(4)
(log) GVA_{t-2}	24 (17.86)			
(log) Emp_{t-2}		16.6 (34.92)		
(log) Cap_{t-2}			−22.2* (13.27)	
(log) TFP_{t-2}				−22.7 (22.57)
Observations	477	477	477	477

Notes: The dependent variable Unreserved % refers to the fraction of output that is unreserved in a three-digit industry-year. Productivity refers to a productivity measure as in Levinsohn and Petrin (2003). All regressions include year and three-digit industry fixed effects. Robust standard errors in parentheses.
***$p < 0.01$.
**$p < 0.05$.
*$p < 0.1$.

Table A2. Preexisting Trends at Industry Level: Three-Year Lags

DV: Unreserved %	(1)	(2)	(3)	(4)
(log) GVA_{t-3}	−38.7** (18.30)			
(log) Emp_{t-3}		−3.7 (27.55)		
(log) Cap_{t-3}			−38.4** (17.02)	
(log) TFP_{t-3}				−39.6* (20.89)
Observations	477	477	477	477

Notes: The dependent variable Unreserved % refers to the fraction of output that is unreserved in a three-digit industry-year. Productivity refers to a measure of productivity measure as in Levinsohn and Petrin (2003). All regressions include year and three-digit industry fixed effects. Robust standard errors in parentheses.
***$p < 0.01$.
**$p < 0.05$.
*$p < 0.1$.

Table A3. Heterogeneous Effect of Dereservation on Firm Size and Productivity by Firm Multiproduct and Reservation Status—With Linear Time Trends by Labor Intensity Quartiles

DV	(1) (log) GVA	(2) (log) Emp	(3) (log) Cap	(4) (log) TFP
Unreserved %	0.152 (0.195)	0.394*** (0.114)	0.100 (0.127)	0.074 (0.174)
Unreserved %* Unres. Firm	0.438** (0.192)	0.014 (0.115)	0.205 (0.165)	0.378** (0.160)
Multiproduct dummy	0.270 (0.212)	0.039 (0.097)	−0.112 (0.144)	0.297 (0.200)
Unreserved %* MP	−0.137 (0.222)	0.017 (0.103)	0.208 (0.152)	−0.199 (0.210)
MP* Unres. Firm	−0.257 (0.222)	−0.190 (0.116)	0.013 (0.184)	−0.237 (0.203)
MP* Unres. Firm* Unres %	0.263 (0.233)	0.184 (0.123)	−0.034 (0.194)	0.249 (0.214)
Observations	326,295	326,295	326,295	326,295
Overall Effect of Dereservation by Firm Type				
Reserved single product	0.152 (0.195)	0.394*** (0.114)	0.0999 (0.127)	0.0738 (0.174)
Unreserved single product	0.590*** (0.203)	0.408*** (0.081)	0.305** (0.141)	0.452** (0.176)
Reserved multiproduct	0.015 (0.182)	0.412*** (0.131)	0.308* (0.179)	−0.125 (0.180)
Unreserved multiproduct	0.715*** (0.223)	0.609*** (0.101)	0.479*** (0.184)	0.502*** (0.186)

Notes: Unreserved % refers to the fraction of output that is unreserved in a three-digit industry-year. Multiproduct Dummy (MP) is a dichotomous variable that takes a value of 0 if the firm produces a single product and 1 if the firm produces multiple products. Unres. Firm is a dummy variable that takes a value of 1 if the firm did not previously produce a reserved product or previously reserved product, and 0 otherwise. All specifications also contain main effects for all dummies, in addition to firm fixed effects. Each regression contains heterogeneous year time trends by quartile of labor intensity in the three-digit industry. Productivity refers to a measure of TFP as in Levinsohn and Petrin (2003). ASI sampling weights are used. Standard errors are in parentheses, and are clustered at the three-digit industry-year.

***$p < 0.01$.

**$p < 0.05$.

*$p < 0.1$.

Table A4. Heterogeneous Effect of Dereservation on Product Churning by Firm Multiproduct and Reservation Status—With Linear Time Trends by Labor Intensity Quartiles

DV	(1) # Prdcts	(2) # Unres. Prdcts	(3) # Res. Prdcts
Unreserved %	0.012 (0.067)	−3.079*** (0.524)	1.406*** (0.241)
Unreserved %* Unres. Firm	−0.020 (0.086)	−0.412 (0.314)	−1.055*** (0.196)
Multiproduct dummy	1.390*** (0.236)	−0.558 (0.621)	−0.392*** (0.104)
Unreserved %* MP	0.056 (0.243)	1.231* (0.643)	0.528*** (0.113)
MP* Unres. Firm	0.893*** (0.282)	−0.357 (0.623)	−0.642*** (0.135)
MP* Unres. Firm* Unres %	−0.760*** (0.293)	0.704 (0.650)	0.605*** (0.143)
Observations	314,921	326,295	326,295
Overall Effect of Dereservation by Firm Type			
Reserved single product	0.012 (0.067)	−3.079*** (0.524)	1.406*** (0.241)
Unreserved single product	−0.009 (0.087)	−3.491*** (0.540)	0.351*** (0.129)
Reserved multiproduct	0.068 (0.223)	−1.848*** (0.624)	1.933*** (0.255)
Unreserved multiproduct	−0.712*** (0.203)	−1.557** (0.676)	1.483*** (0.180)

Notes: Unreserved % refers to the fraction of output that is unreserved in a three-digit industry-year. Multiproduct (MP) Dummy is a dichotomous variable that takes a value of 0 if the firm produces a single product and 1 if the firm produces multiple products. Unres. Firm is a dummy variable that takes a value of 1 if the firm did not previously produce a reserved product or previously reserved product, and 0 otherwise. All specifications also contain main effects for all dummies, in addition to firm fixed effects. Each regression contains heterogeneous year time trends by quartile of labor intensity in the three-digit industry. Productivity refers to a measure of TFP as in Levinsohn and Petrin (2003). ASI sampling weights are used. Standard errors are in parentheses, and are clustered at the three-digit industry-year.
***$p < 0.01$.
**$p < 0.05$.
*$p < 0.1$.

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