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FROM PROTECTION TO COMPETITION: ASSESSING THE IMPACT OF DE-RESERVATION ON INDIA'S MSMEs AND EXPORTING ENTERPRISES

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Abstract

India's policy of reserving certain products exclusively for small-scale industries (SSI) aimed to promote the labour-intensive sector and promote employment. However, this policy was criticised for hindering growth and technological advancement of the overall manufacturing sector. The present paper focuses on the impact of India's de-reservation policy on micro, small, and medium enterprises (MSMEs), based on unit level panel data, published by Annual survey of Industries. Utilising a staggered Difference-in-Difference method and fixed effect model, the study evaluates establishment-level outcomes such as sales, output, capital, employment, wages, and labour productivity. Results highlight that MSMEs exposed to de-reservation experienced growth in these outcomes. Further the study observed that the performance of exporting MSMEs contracted after de-reservation. While the growth performance of incumbent exporters shown a positive trend after de-reservation, new large sized firms that entered after de-reservation shown a declining trend. The findings suggested that de-reservation ultimately enhanced productivity, output, and employment within India's manufacturing sector by improving incumbent firms' access to input and resources. This study contributes to the understanding of size-dependent policies and resource allocation in developing countries, highlighting firms' dynamic responses to regulatory changes. The paper concludes by discussing the broader impacts on MSMEs, the specific effects on exporting firms, and implications for future policy and research.

Keywords: De-reservation policies; MSMEs; Export performance; Regulatory Changes: Developing economies

JEL Codes: L52, L60, O25, F14, L25

1. Introduction

Governments all over the world often support small firms through tax incentives, subsidised credit, and other regulatory requirements based on the belief that small firms are the engine of the country's growth and are expected to create long-term sustainable growth. However, a large body of literature often suggests that such policies are distortionary and lowering aggregate productivity and output (Guner et al., 2008). Moreover, policies that limit the size of firms have been identified as a major driver of productivity loss among industries in developing countries (Hsieh & Klenow, 2009). Such distortions reduce establishment size, consistent with the evidence of smaller firms in developing countries (Bento & Restuccia, 2017). Against this background, understanding the dynamics of removing size restrictions is crucial, especially in economies where such policies have historically shaped industrial structure.

Theories on trade liberalization suggest that deregulation reallocate resources from less productive firms to more productive ones to enabling later to access the international market (Melitz, 2003). However, empirical evidence on whether de-reservation improved MSME exports or pushed small firms into greater competition is inconclusive. Some studies find that de-reservation improved overall manufacturing productivity and employment, while others show that small firms are adversely affected by competition from larger firms. This study contributes by examining the net impact of product de-reservation on MSMEs and exporting enterprises.

Critics argued that the reservation policy deleteriously affected manufacturing employment and exports (Mohan, 2002). Fast-growing East Asian countries experienced strong growth in manufacturing exports and employment, a trend India largely missed. East Asian exporters were largely labour-intensive, while in India many of these commodities were reserved for small firms. The removal of this policy was expected to boost labour-intensive exports and manufacturing employment. Although Several scholars have examined the impact of de-reservation policy on India’s manufacturing

sector[1] limited attention is given to understand the export pattern and its growth strategies of MSMEs[2].

Given this context, this study analyses the net effect of de-reservation on MSMEs, with a particular focus on exporting enterprises. The study employs a staggered difference-in-differences (DID) techniques to test whether de-reservation policy improved MSME outcomes through greater capacity utilisation. At the establishment level, the elimination of the reservation represented a policy shock, as many firm's production structure included reserved items. The study evaluates enterprise performance across outcomes including sales, output, capital, employment, wages, and labour productivity. The results show that incumbent MSMEs more exposed to de-reservation experienced higher sales and output, while employment and labour productivity remained stagnant.

The study also examines the net effects of de-reservation on exporting MSMEs using establishment-level outcomes including, output, capital, employment, wages, and labour productivity. The results indicate that de-reservation adversely affected the performance of exporting MSMEs. Enterprises are classified as establishments incumbents (firms established before the de-reservation policy and producing a reserved product) and entrants (firms established after the de-reservation policy and producing a reserved product). The results show that incumbent exporters experienced substantial growth in establishment-level outcomes, while new entrant exporters were adversely affected. This study addressed potential endogeneity by examining event-time trends and found no evidence of pre-treatment effects before de-reservation[3]. This result is consistent with the fact that industrial delicensing and other prominent trade reforms were completed well before the study period.

This paper adds to the existing literature in two ways. First, unlike Martin et al. (2017) and who Boehm et al. (2022) focus on aggregate productivity and incumbents/entrants, this study isolates exporting MSMEs and examines how they responded differently to de-reservation. Second, by distinguishing between incumbent and new exporting firms,

[1] The notable studies are Panagaria 2011; Bollard et al., 2013; Felipe et al., 2013; García-Santana & Pijoan-Mas, 2014; Martin et al., 2017; Tewari & Wilde, 2019; Boehm et al., 2019; Galle, 2020.

[2] Interestingly, various studies have argued that India's reforms have been unable to significantly boost labour-intensive sectors, and exports from these sectors have not proliferated (Veeramani, 2012; Barik, 2018).

[3] Various tests conducted by Martin et al. (2017) and Tewari & Wilde (2019) in Indian context found no endogeneity issues with the de-reservation policy reforms.

the paper shows that export outcomes were driven primarily by more productive incumbents rather than by new entrants.

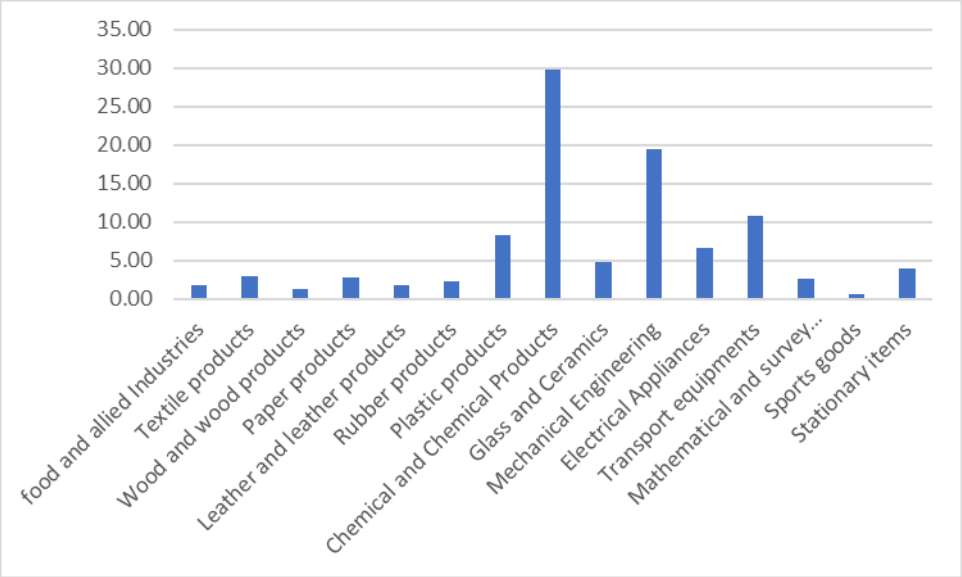
The remainder of the paper is organised as follows: The next section reviews the institutional background of the reservation and de-reservation policies in India. Section 3 examines the theoretical framework and literature review of the current paper. Section 4 explains the data sources used in this study. Section 5 discusses the effects of de-reservation policies on exporting incumbent small firms and new entrants. Finally, Section 6 presents the conclusion and policy implication of the paper.

2. Removal of small-scale reservation policies

India has a long history of protecting its small-scale industries (Bhattacharjea, 2022; Bala Subrahmanya, 2005, 2008). Historically, its policies have been both protective and promotional. Among the myriad policies promoting small-scale industries, the reservation policy (which reserves selected items exclusively for manufacture by the small-scale sector) was India's strongest commitment to supporting small-scale industries. The policy was motivated by the belief that employment generation is critical in a labour-surplus economy. It was argued that small scale manufacturing industries could absorb surplus labour. The reservation policy formally introduced in 1967 during the Third Five-Year Plan, with an initial list of 47 items. By 1996, this list had expanded to more than 1,000 products. This expansion reflected the government's belief in mass employment generation and the need to protect small firms from large-scale competition (Hussain, 1997; Mohan, 2002; Subrahmanya, 1995). Figure 1 shows the distribution of reserved products across industries. Reservation applied to almost all sectors except tobacco products with chemical and chemical products forming the largest category (30%), followed by mechanical engineering and transport equipment.

Mohan (2002) argued that the only selection criterion for product reservation was the ability of Small-Scale Industries (SSI) to produce such items. Critics noted that no evidence on production techniques was collected to demonstrate the small-scale sector's ability to manufacture these items. The policy focused on protecting SSIs in individual industries, without considering whether they were more efficient than larger firms. Moreover, the policy constrained the growth of the SSIs and negatively affected employment, output, and export growth in the manufacturing sector as a whole (Hussain, 1997; Mohan, 2002).

Figure 1: The distribution of reserved products among Industries



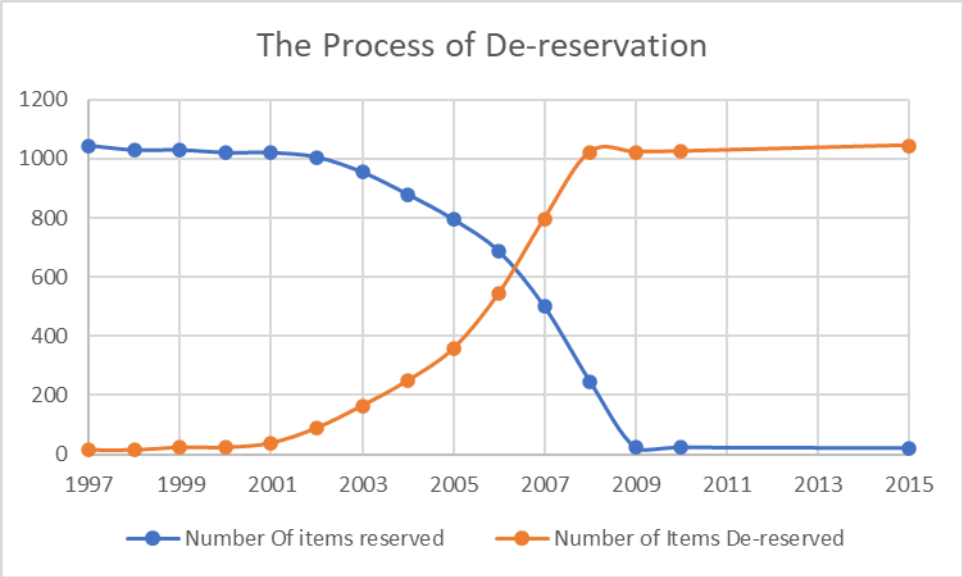
Source: Authors' calculation based on the list of reserved items for the Small-scale sector

India began liberalising various industrial and trade policies in the late 1980s and early 1990s. However, the reservation policy continued unchanged until 1996. In 1995, An advisory committee highlighted concerns about the SSI sector's ability to compete with large-scale industries that used imported inputs and produced high-quality products to meet rising consumer demand (Hussain 1997). The committee argued that reservation had become a barrier to growth, as firms producing reserved products lacked incentives to scale up. Maintaining quality and efficiency in some reserved products required investment in plant and machinery beyond the prescribed SSI limit (Hussain, 1997). Other challenges included rising import competition, the availability of unreserved substitutes, technological change, and regulatory compliance. Although the SSI lobby initially blocked these recommendations, the gradual phasing out of reservations was eventually approved. Finally, the de-reservation process formally began in 1997.

Figure 2 illustrates the time line of de-reservation after reforms. Although a few items de-reserved before 1997, large-scale de-reservation began only in 2002 with 15 products. Initial reductions were modest due to resistance of the SSI lobby, but later phases show a sharp acceleration. Between 2002 to 2008, de-reservation peaked, with about 984 products removed from the list. The highest number of products was de-reserved in 2007 (253 products). The remaining 20 products were removed in 2015. This shift

demonstrates the recognition of policy makers that reservations constrained rather than promoted MSME growth.

Figure 2



Source: Same as Figure 1

3. Theoretical framework and Review of Literature

Trade theory debates whether more productive firms self-select into export markets (self-selection hypothesis) or whether exporting itself raises productivity (learning-by-exporting). The learning by exporting hypothesis suggests that exporters face tougher competition and improve faster than their domestic firms (Clerides et al., 1998). In contrast, the self-selection hypothesis explains that only the more productive firms enter export markets, given the higher sunk of international trade (Melitz, 2003). The Melitz model, or heterogeneous-firm model, provides a framework for understanding how trade liberalization reallocates resources to more productive firms. This framework is relevant for India's de-reservation policy, where removing size restrictions introduced greater competition, similar to global trade liberalization. If self-selection holds, only more productive small firms will scale up and enter export markets, while others struggle in a liberalized environment.

While the Melitz (2003) model acts as a useful benchmark for explaining how deregulation reallocates resources from less productive to more productive firms, its assumptions of full employment and frictionless factor markets are not fully consistent with the Indian context. The nature of underemployment, high informality, and limited

credit access in Indian economy suggest that reallocation may be slower or partial. Extensions of Melitz model therefore incorporate such frictions explicitly. The model of Helpman, et. al (2010) incorporates unemployment, Hsieh & Klenow (2009) and García-Santana & Pijoan-Mas (2014) emphasize the misallocation effects of size-dependent policies. Further, Tewari & Wilde (2019) show how deregulation reshapes product scope, as firms drop less efficient lines and concentrate on core competencies. In this context, de-reservation in India operates as a domestic liberalisation shock, through the extent of reallocation is mediated by labour and credit market frictions. Despite its limitations, the Melitz model, remains relevant because it captures the core idea of reallocation toward more productive firms under greater competition.

The theoretical model suggests that only the highly productive firms can sustain in the post-liberalization period, whereas empirical studies provide mixed evidence on whether policy distortions affect firm performance[4]. These studies highlight how size-dependent policies distort incentives, causing firms to remain small to retain policy benefits rather than growing according to productivity. Beyond India, studies in developed countries also examine the outcomes of size-dependent policies[5]. In the Indian context, two earlier papers-Aghion et al. (2008) and Besley and Burgess (2004)- examined regulatory costs, such as delicensing and labour market regulations, created significant heterogeneous effects on the growth and productivity of the Indian manufacturing.

A growing body of empirical work has examined the impact of de-reservation on India's manufacturing sector, presenting mixed findings on productivity and firm size. More recently, Boehm et al. (2022) found that after the removal of the reservation policy, firms gained better access to inputs, which conferred advantages on firms with a higher use of reserved products. Tewari & Wilde (2019) used a difference-in-differences model with data from 2000 to 2010, after de-reservation had been completed. They found that the largest changes in size and productivity occurred among multi-product producers- firms that had never been part of the reserved product space. Additionally, Galle (2020) calibrated the potential impact of de-reservation on incumbent firms' mark-ups and the

[4] Relevant studies include Besley & Burgess (2004); Banerjee (2006); Aghion et al. (2008); Goldberg et al. (2010); Nataraj (2011); Alfaro & Chari (2014, 2009); Hsieh & Olken (2014) McCaig & Pavcnik (2018) and Dabla-Norris et al. (2018).

[5] These include Guner et al. (2008); Sánchez-Vela and Valero-Gil (2011); Garicano et al. (2016); Kaoru et al. (2017); Bento and Restuccia (2017) and Bils et al. (2020).

capital growth of young plants. He found that the de-reservation reforms reduced incumbent firms' markup and slowed capital growth of young plants.

Martin et al. (2017) using a difference-in-differences model, showed that de-reservation increased employment, output, and investment in Indian manufacturing. The growth was driven by entrants and incumbents that were previously constrained by capital limits, while small firms contracted. Similarly, García-Santana and Pijoan-Mas (2014) employed a span-of-control model using Indian data from 2001, where most products were still reserved. They predicted that removing the policy would raise manufacturing output about 7 percent. Against this background, this paper examines the impact of dismantling product reservations on the economic performance MSMEs, with a focus on exports.

Despite the substantial literature on India's de-reservation policies, important gaps remain in understanding their effects on exporting MSMEs. Prior studies mainly emphasise aggregate productivity, output, and employment growth through reallocation and product-scope adjustments. However, these studies treat organised manufacturing as a whole and largely neglect exporters. This leaves an unanswered question: did de-reservation improve the international competitiveness of MSMEs or increase their vulnerability to larger enterprises? Moreover, there is no systematic study on the characteristics of incumbent exporters or new entrants attempting to export in the post-reform period. This paper addresses these questions by examining the heterogenous outcomes of MSMEs under de-reservation. It advances the literature by linking aggregate efficiency gains from domestic deregulation with global market participation. The next section discusses the data and methods.

4. Data and Methods

4.1 Data

The primary data source is the Annual Survey of Industries (ASI), which provides comprehensive industrial statistics for India during 2001-2020. The ASI is an annual survey of registered firms, with large establishments covered every year and smaller ones sampled. Census establishments appear in all years, while sampled establishments rotate depending on the sampling methodology. Data are collected for each financial year, from April 1st to March 31st. This study assigns year-plant observations to the end of the financial year (For example, the ASI 2001-02 is recorded as 2002). Sampling weights are

applied to obtain nationally representative estimates of industrial activity. The ASI contains information on various plant-level characteristics, such as gross value added, output, fixed assets, items produced, and imported inputs. Industries in the ASI are classified using the Indian National Industrial Classification (NIC) system, which has been periodically updated. For consistency, industries are converted to the NIC-1998 version, using an official concordance, aligning with the classification in place at the start of the study period. Each observation in the ASI represents a factory (Establishment), which this study treats as equivalent to a firm. Observations in the data represent factories or establishments, as the de-reservation policy defined the capital threshold at the establishment level. Although firms may operate multiple factories; this study focuses on single-factory firms, which make up 95% of the dataset.

The ASI provides annual information on the original value of each plant and machinery. This study uses this information to identify MSMEs within registered manufacturing. MSMEs are classified using the 2006 Ministry of MSMEs definition, separating small firms from the broader ASI dataset. Table 1 presents the size distribution of manufacturing from the ASI, 2001 to 2020. The data are presented after the complete cleaning procedure[6]. Despite extensive de-reservation, small firms continue to account for a large share Indian industry. Based on plant and machinery values, micro firms (less than 25 lakhs), dominate the registered manufacturing sector, accounting for over 50 percent, followed by small firms. Table 1 shows that medium and large enterprises account for only a minimal share, consistent with Kapoor (2018). However, the share of large establishments increased from 11.27 percent in 2000-01 to 25.35 percent in 2019-20.

The distribution of the organised manufacturing sector is based on different definitions (Plant and machinery, employment, and annual turnover)[7] given in the appendix (figure A1). Interestingly, regardless of the definition used to classify firm size, MSME establishments dominate the ASI sample in all cases. Using the ministry's plant and

[6] See appendix (A) for the detailed cleaning procedure of the ASI data.

[7] The ASI exhibits a similar firm size distribution to that provided by the Ministry of Corporate Affairs (MCA) (Parida et al., 2021). The study used different definitions given by the Ministry of MSMEs and the World Bank to define the MSME sector. Any firm with less than or equal to 10 crores is a small firm based on plant and machinery. In the employment definition of the World Bank, any firm with less than 250 workers is small, and any firm with an annual turnover of less than 250 crores is also considered a small firm as per the latest definition given by the ministry.

machinery definition, micro firms dominated the sample in 2000-01, accounting for over 60 percent of establishments, followed by small and large firms. In 2019-20, the size distribution remained similar: Micro firms still accounted for over 50 percent, followed by large and then small firms.

Table 1: The distribution of ASI manufacturing Industries by Size based on the Original Value of Plant and Machinery

Year	Micro	Small	Medium	Large	Total
2000-01	17,944	7,100	1,396	3,357	29,797
	(60.22)	(23.83)	(4.69)	(11.27)	(100)
2001-02	18,231	8,341	1,653	3,599	31,824
	(57.29)	(26.21)	(5.19)	(11.31)	(100)
2002-03	18213	8415	1669	3812	32109
	(56.72)	(26.21)	(5.20)	(11.87)	(100)
2003-04	26376	10730	1927	4212	43245
	(60.99)	(24.81)	(4.46)	(9.74)	(100)
2004-05	23495	8246	1719	4129	37589
	(62.50)	(21.94)	(4.57)	(10.98)	(100)
2005-06	25611	9002	1832	4700	41145
	(62.25)	(21.88)	(4.45)	(11.42)	(100)
2006-07	24746	9107	2016	5072	40941
	(60.44)	(22.24)	(4.92)	(12.39)	(100)
2007-08	20336	8081	2060	5503	35980
	(56.52)	(22.46)	(5.73)	(15.29)	(100)
2008-09	19529	7680	2151	6153	35513
	(54.99)	(21.63)	(6.06)	(17.33)	(100)
2009-10	22033	8157	2289	6736	39215
	(56.19)	(20.80)	(5.84)	(17.18)	(100)
2010-11	21388	8834	2495	7490	40207
	(53.19)	(21.97)	(6.21)	(18.63)	(100)
2011-12	21516	8459	2701	8237	40913
	(52.59)	(20.68)	(6.60)	(20.13)	(100)
2012-13	23642	9558	2946	9204	45350
	(52.13)	(21.08)	(6.50)	(20.30)	(100)
2013-14	24663	9572	3076	9834	47145
	(52.31)	(20.30)	(6.52)	(20.86)	(100)
2014-15	26162	9826	3212	10523	49723
	(52.62)	(19.76)	(6.46)	(21.16)	(100)
2015-16	25651	9186	3255	11122	49214
	(52.12)	(18.67)	(6.61)	(22.60)	(100)
2016-17	29780	9288	3389	11653	54110
	(55.04)	(17.17)	(6.26)	(21.54)	(100)
2017-18	28357	9126	3463	12294	53240
	(53.26)	(17.14)	(6.50)	(23.09)	(100)
2018-19	27224	8945	3504	12938	52611
	(51.75)	(17.00)	(6.66)	(24.59)	(100)
2019-20	26922	8869	3554	13362	52707
	(51.08)	(16.83)	(6.74)	(25.35)	(100)

Notes: Authors' estimation using the ASI unit-level panel data. No sampling multipliers were applied.

The present study uses ASI panel data, made possible by the recent release of panel identifiers that enable tracking factories over time[8]. The panel covers the period 2000-01 to 2019-20. Due to the sampling techniques adopted by the ASI, the data form an unbalanced panel, with some plants appearing repeatedly and others intermittently. Figure 3 shows the number of units covered in the ASI panel. Only 5.8 percent of the units have data for all 20 years (balanced panel), while about 32 percent were surveyed only once, twice, or thrice, highlighting ASI's limitations and the challenges of constructing a balanced panel. This pattern arises mainly from the survey design: large establishments are covered annually on a census basis, whereas smaller units are included through random sampling. Since actual firm exit cannot be distinguished from non-sampling, this study employs an unbalanced panel, restricting the sample to units surveyed at least four times between 2001 and 2020. In addition, the classification of firms follows the MSME definition based on the original value of plant and machinery, which provides a consistent measure of firm size and reduces potential bias from intermittent survey coverage.

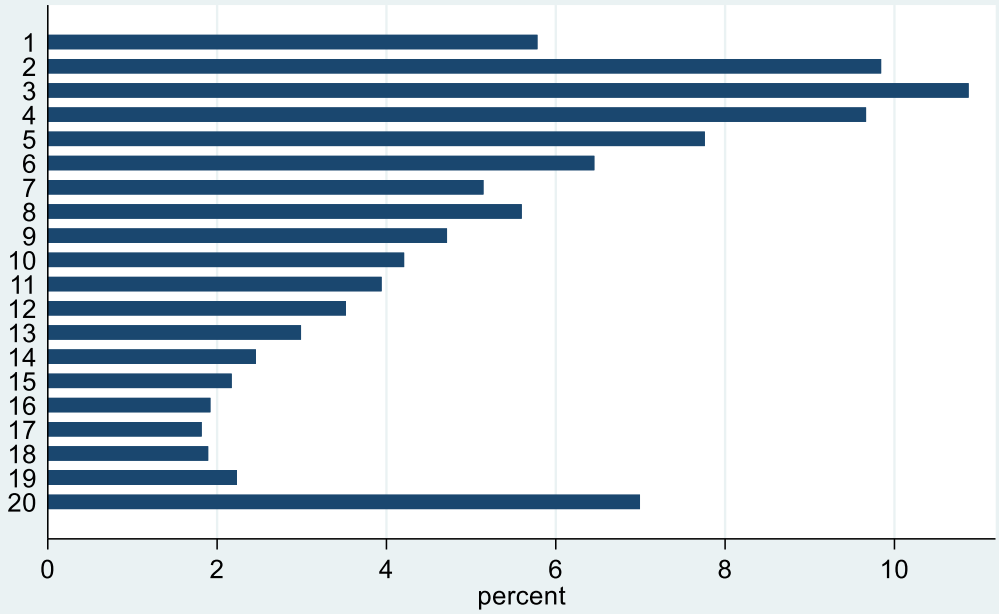
The paper examines the impact of de-reservation on the exporting MSME sector. Therefore, the first step is to map the SSI products within the ASI panel of manufacturing establishments from 2000-2001 to 2019-20. Reservation status is identified using the reserved list and de-reservation timeline issued by the Ministry of Micro, Small, and Medium Enterprises (MSME) since 1997. Whenever the de-reservation occurs, the ministry issues an official notification of the product de-reserved with the Annual Survey of Industries Commodity Classification (ASICC) code of the product[9]. The ASI reports ASICC codes for the items each establishment produces. Hence, the study uses the concordance between SSI product codes and ASICC product codes, provided by Martin et al. (2017). Because of some ASICC codes are broad, reserved products are matched using both ASICC and NIC-5-digit codes. The remaining products are simple matches between ASICC and SSI codes.

[8] The ASI started to give panel identification in 1997 onwards. The analysis starts from 2000-01 because of underreporting of products.

[9] The ASI has changed the Annual Survey of Industries Commodity Classification (ASICC) code to the National Product Classification of Manufacturing Sector (NPCMS) from 2011 onwards. The study converted NPCMS to ASICC for analysis using the official concordance tables.

Figure 3

ASI Panel by Number of Visits



Source: Authors' estimation using Annual Survey of Industries unit-level panel data (2001-2020)

Several scholars have used the Prowess database, maintained by the Centre for Monitoring Indian Economy (CMIE), to analyse India's organised manufacturing sector. The Prowess database is particularly useful for studying large firms in areas such as growth, imported inputs, FDI liberalisation, privatisation, pricing[10]. However, the Prowess database is not appropriate for analysing the MSME performance, as its coverage of small firms is minimal[11].

ASI unit-level data provide the most comprehensive panel for analysing MSME export performance, although they cover only the organised manufacturing sector[12]. In 2009, the Prowess database reported capital, output, sales, and wages for over 6000 firms, but export data for only 1,364 firms and employment data for 532 firms. In contrast, ASI covered 4,050 firms with export data and 36,240 with employment data. By the end of the study period, Prowess had improved its coverage of employment and exports but

[10] see more on, Gupta, 2005; Chari & Gupta, 2008; Alfaro & Chari, 2014; Goldberg et al., 2010b; De Loecker et al., 2016; Mathew, 2017.

[11] A year-by-year comparison of ASI and Prowess based on enterprise outcome variables is given in the appendix (Table A1)

[12] The study could not consider the export performance of the unorganised sector as such data was not published by Unincorporated Non-agriculture Enterprises Survey.

continued to lag behind ASI[13]. In summary, ASI remains the most comprehensive dataset for this analysis, and it appears to have reasonable data quality.

4.2 Methods

The estimation begins by classifying establishments based on whether they produced reserved or de-reserved products. Every product produced by an establishment is considered to capture the full impact of de-reservation at the unit level and avoid underestimating treatment effects. The study checks whether each establishment has ever produced a product on the reserved list, referred to here as an MSME product. Among MSME establishments, 22.27 percent produced at least one reserved product, while 77.73 percent never produced a reserved product over the 20-year sample period.

The de-reservation of MSME products was staggered, beginning in 1997 and ending in 2015. To identify the impact of de-reservation, the study exploits cross-product differences in the policy's timing and differential exposure across cohorts. The study adopts a staggered difference-in-differences (DID) approach (Callaway & Sant'Anna, 2021), which accounts for time variation in de-reservation and identifies heterogeneous effects by treatment period. This method differentiates early and late adopters, which ensuring estimates are not biased by treatment at different times. The study does not use the conventional DID method, as it only differentiates between treatment and control groups and produces biased estimates when treatment occurs over multiple periods (Sun & Abraham, 2021). The estimation relies on the parallel trends assumption, which posits that in the absence of policy change, de-reserved and reserved products would have follow similar trends. To validate this, the study also conducted a pre-trend analysis, which confirmed that before de-reservation, treatment and control groups followed similar trends in key outcomes. It is also assumed that no group-specific unobserved shocks correlated with outcomes occurred during de-reservation.

The study begins with an event study model to analyse the effects of the de-reservation policy. This approach examines how establishments responded over time in their

[13] The advantage of using ASI instead of Prowess is its broad coverage of the MSME sector. As per the definition of the original value of plant and machinery given by the Ministry of MSMEs, the ASI had 39,395 MSME establishments at the end of our sample period, while the Prowess database covered 3,202 establishments.

performance indicators, allowing us to track both short-run and long-run effects of de-reservation,

$$y_{it} = \alpha_t + \lambda_i + \sum_{e=-z}^{-4} \delta_e . 1(e = e_{it}) + \sum_{e=0}^{L} \beta_e . 1(e = e_{it}) + \varepsilon_{it} \text{----------(1)}$$

The dependent variable, y_{it}, is defined as the (log of) Sales, output, capital, employees, labour productivity, and wage-per-employee of establishment i at time t. Throughout this study, gross sales value, capital, output, and wage rate are defined in real terms. Specifically, sales and output are deflated using the wholesale price index (WPI), capital is deflated by WPI for plant and machinery, and wages are deflated by the Consumer Price Index (CPI)[14]. Labour productivity is measured as output per employee, and wage per employee as the total wage bill divided by total employees.

The term $1(e = e_{it})$ represents the event-time periods relative to treatment (De-reservation). Where possible, all establishments are included, even those do not directly identify β, as these establishments are unaffected by the reservation policy. This inclusion allows us to check secular year trends in establishment performance. The model includes year (α_t) fixed effects to account for aggregate shocks varying over time, and establishment fixed effects (λ_i) to capture time-invariant characteristics that may influence product selection for De-reservation. The coefficient of interest, β, measures the long-run impact of the De-reservation policy. The parameter z defines the number of pre-treatment periods (negative leads), and L defines the number of post-treatment periods (positive lags), with period 0 marking the year of de-reservation for product i. This aligns with the standard event study notation where leads < 0 and lags > 0 relative to the treatment year. De-reservation status is determined at the product level; hence, the standard errors are clustered at this level. This accounts for within-product correlation and ensures robustness to policy shocks affecting firms producing similar products. Clustering at the product level is appropriate because de-reservation applies to products rather than establishment.

The event study has used an unbalanced panel of MSME plants observed for at least three years before and after their products were de-reserved. Accordingly, the analysis uses ASI plant-level data from 2001 to 2020, which covers the entire de-reservation period.

[14] The data for Wholesale Price Index (WPI) and Consumer Price Index (CPI) have been extracted from EPWRF times series data. The study uses the base shifting method to convert WPI and CPI to the latest base year (2011-12).

Other major reforms had already taken place following India's earlier liberalisation. These reforms were completed before the study period. The analysis focuses exclusively on the MSME sector. Products de-reserved before 2001 are excluded, as these plants provide only post-de-reservation information. After the cleaning, the final sample includes 603,501 MSME plants over 20 years.

The de-reservation process occurred gradually, creating a staggered event timeline. The CSDID method reframes this into relative event time, which identifies $ATTg_t$ for each period. This allows assessment of MSME performance before and after de-reservation. An important implication of this method is that it identifies the Average Treatment Effects on the Treated (ATT), rather than the Average Treatment Effect (ATE). Since this study examines only establishments producing previously reserved products, the estimates capture the casual impact of de-reservation on this group. Firms producing non-reserved products never receive treatment and serve as the control group; hence, the parameters are interpreted as ATT. Evidence suggests that de-reservation primarily benefitted large firms and firms producing non-reserved products by enhancing their capacity utilisation. It also increased productivity, employment, investment, and output for these firms (García-Santana & Pijoan-Mas, 2014; Martin et al., 2017). In contrast, small firms experienced decline in overall performance. In this context, the following analysis focuses on the effects of the de-reservation on the MSME sector.

The study further examines the impact of de-reservation on MSME exports. The focus is on the effects of de-reservation on exporting MSMEs. Exporting establishments may respond differently due to enhanced competition, improved raw-material access, or resource reallocation toward more productive firms. Understanding these effects is crucial for evaluating the trade implications of de-reservation. The analysis is therefore restricted to 2008-09 to 2019-20[15]. By 2008, about 98 percent of MSME products had been de-reserved. To address potential endogeneity, the analysis excludes 20 products de-reserved in 2010 and 2015, focusing only on those de-reserved on or before 2008.

The analysis begins with the following panel model,

$$Y_{it} = \gamma_t + \delta_s + \lambda_p + \alpha\, Deres_{pt} + \theta\, Export_{it} + \beta\, (Deres_{pt} * Export_{it}) + \mu_{it} \text{--------(2)}$$

[15] The ASI provides export data only from 2008 onwards; therefore, this section focuses on the post-2008 period to examine the effects of the de-reservation policy.

The model focuses on identifying the impact of de-reservation on MSME exports. It includes year (γ_t), state (δ_s), and product (λ_p) fixed effects. In this specification, α measures the causal effect of de-reservation on non-exporting MSMEs, while β captures the incremental effect for exporters relative to non-exporters, specifically those producing previously reserved products. The total effect of de-reservation on exporters is therefore given by α + β. Standard errors are clustered at the establishment level.

The study next examines the impact of de-reservation on incumbent MSMEs and new entrants in previously reserved categories. An incumbent is defined as a firm established before the de-reservation that produced at least one previously reserved product. Similarly, an entrant is defined as a firm established after de-reservation that produced at least one previously reserved product. This classification is crucial: incumbents may face cost adjustments, while entrants benefit from an open competitive environment. The panel analysis of new entrants includes both MSMEs and large firms. This is because the reservation policy did not restrict small firms from entering reserved product markets. Hence, restricting the sample to MSMEs alone would bias the analysis. To estimate establishment-level effects of de-reservation on incumbents and entrants, the study employs the following panel models.

$$Y_{it} = \gamma_t + \delta_s + \lambda_p + \theta\ Export_{it} + \phi\ Incumbent_{it} + \psi\ (Incumbent_{it} \times Export_{it}) + \mu_{it} \text{----------} (3)$$

$$Y_{it} = \gamma_t + \delta_s + \lambda_p + \alpha_1\ Deres_{it} + \alpha_2\ Export_{it} + \beta_1\ (Deres_{it} \times Export_{it}) + \phi_1\ Entrant_{it} + \phi_2\ (Entrant_{it} \times Export_{it}) + \mu_{it} \text{----------} (4)$$

In addition to year, state, and product fixed effects, the study controls for firm age to capture life-cycle effects that may influence the performance outcomes in models (3) and (4). This control accounts for any time-invariant factors that might affect the firm's age. The next section presents results on the impact of de-reservation for overall MSMEs, as well as exporting incumbents and entrants.

5. Results and Discussion

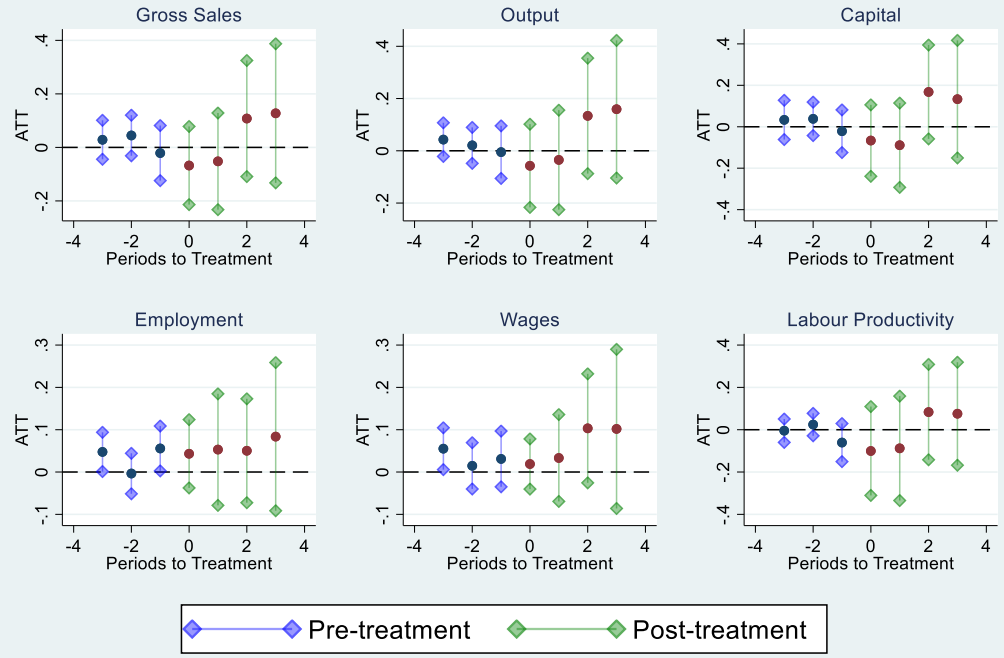
5.1 Impact of De-reservation on Small Firms

This section presents the establishment-level effects of the de-reservation policy in India. The analysis begins by examining the impact of the de-reservation policy on the MSME sector in India. While the study is particularly focused on the impact on exports, it also

examines the subsequent effects on gross sales value, output, capital, number of employees, labour productivity, and wage per employee.

The immediate effect of de-reservation is the removal of size constraints on products and a substantial increase in competition. The increase in competition is driven by incumbent plants being allowed to expand their capital stock and the entry of larger firms into the previously reserved product market. However, the removal of size restriction has improved the allocative efficiency of the economy (Guner et al., 2008). The results show considerable entry of large firms into product markets, providing strong evidence of increased competition. For example, the number of large firms in reserved markets rose from 385 in 2001 to 1,412 in 2020[16]. This pattern consistent with market Boehm et al. (2022), who found that de-reservation improved input access and productivity for non-reserved firms, encouraging their entry into the previously reserved markets.

Figure 4: Event Plots of the Impact of Dereservation Policy On MSME Establishment-Level Outcomes



Source:-Authors' estimation using Annual Survey of Industries unit-level panel data (2001-2020)

Figure 4 presents event study plots of the impact of de-reservation on selected establishment-level outcomes. It reports Average Treatment effects on the Treated (ATT) for MSME outcomes following de-reservation[17]. The blue and green diamonds represent

[16] See the Appendix (Table B3) for details on the participation of ASI manufacturing establishments in the Reserved Product market by size.

[17] The study further examines the impact of de-reservation on firms of different sizes, and most of the results are found to be insignificant. The results are provided in Appendix C.

the pre-treatment periods and post-treatment periods, respectively. The study also tests the parallel trends assumption, which requires that treated and untreated firms would have followed similar trends in the absence of policy intervention. The results show that the pre-treatment effects are centered around zero with confidence intervals overlapping zero, confirming the absence of pre-treatment trends[18].

Furthermore, some coefficients in the event-study plots display wide confidence intervals and cross the zero line, which is a common feature of staggered DID settings. Because different cohorts are treated at different times, the number of observations in both lead and lag periods is often small, resulting in imprecise estimates in certain periods. Even so, the event study remains central, as it demonstrates parallel trends and the dynamic adjustment paths of firms around the policy change. Overall, while the dynamic effects appear noisy in some periods, the average treatment effects remain statistically significant and robust. This difference arises because the event study estimates each period separately, where small sample sizes reduce precision, whereas the staggered DID estimator pools information across all cohorts and periods. As a result, the average treatment effects are estimated with greater precision, even if some individual event-time coefficients appear imprecise.

The study finds significant improvements MSME performance, especially in sales and output, reflected in the clear upward trend in the post-treatment ATT. This likely reflects the policy enabling small firms to expand operations and increase production. Capital investment shows an upward trend, though with greater variability, suggesting that some firms expanded quickly while others responded more cautiously. The widening confidence intervals for capital investment reflect divergent responses, shaped by firm strategies, sectoral differences, or the financial constraints faced by small firms in India. This aligns with Galle (2020), who found that incumbents faced lower markups under competition, while young firms experienced slower capital growth. Overall, the results suggests that financial constraints remained a key barrier for small firms despite the policy change.

[18] The study also conducted a placebo test with a one-year lag from the policy year to check the pre-treatment trends and validate the parallel trend assumption. The result indicates that the absence of pre-treatment trends, where the estimates were statistically insignificant, satisfying that there are no systematic differences before treatment. Further details are provided in Appendix D.

In contrast, the estimates for employment and wages are close to zero, indicating that the labour market remained unchanged despite increased firm performance. This suggests that firms pursued capital-intensive expansion rather than hiring more workers. The neutral effect on wages indicates that employees did not directly benefit from the policy. Similarly, labour productivity shows no clear upward trend, with estimates near zero and wide confidence intervals. This indicates that firms expanded in scale without significant efficiency gains. The slow employment growth despite firm expansion aligns with Besley and Burgess (2004). Moreover, deregulation often pushed workers into the informal sector rather than expanding formal employment.

The limited expansion of employment and wages under de-reservation can be explained by India's institutional environment. Decades of industrial policies-including licensing, small scale reservation, and expansion of capital-intensive public sector-led firms to expanded through machinery rather than labour (Bhattacharjea, 2022). Further, trade liberalisation reinforced this pattern by lowering the price of capital goods, encouraging capital deepening, and reducing the labour intensity even in traditionally labour-intensive sectors (Raj & Sen, 2016). Similarly, rigid employment protection and high-dispute resolution costs discouraged firms from expanding their permanent workforce (Ahsan & Pagés, 2008). As a result, many firms relied more on contractual employment. This practice allowed larger firms to expand, but many MSMEs struggled to manage a dual workforce effectively (Kapoor & Krishnapriya, 2019; Singh et al., 2019). These institutional constraints help explain why de-reservation generated competition, output, and capital, but failed to translate into higher employment and wages.

Overall, the findings suggest that de-reservation increased competition, improved productivity, and enhanced allocative efficiency, while employment and wages in the formal sector showed little change.

5.2 Impact of De-reservation Policy on the MSME Export

The previous section showed that de-reservation policy reshaped MSMEs, leading to increased competition and resource reallocation. While some MSMEs expanded after the policy change, many struggled to adapt to the more competitive environment. This dynamism is particularly relevant for understanding how the policy affected exporting MSMEs, as the global market poses even greater market competition than the domestic one.

A key finding is that, unlike the domestic small firms, exporting firms experienced a sharp decline in performance after the policy change. Exporting MSMEs experienced significant declines in sales, output, capital, employment, wage and labour productivity. This suggests that de-reservation disproportionately affected internationally active firms, possibly due to increased competition from larger counterparts or difficulties maintaining stability in global markets. The following analysis explores these trends in greater detail.

Table 2: The Impact of De-reservation on Exporting MSMEs Based on the Establishment-Level Outcomes

VARIABLES	(1) log(Sales)	(2) log(Output)	(3) log(capital)	(4) log(Employment)	(5) log(Wage)	(6) log(LP)
Deres×Export	-0.126***	-0.112***	-0.0959**	-0.0572*	-0.102***	-0.0552**
	(0.0402)	(0.0388)	(0.0425)	(0.0323)	(0.0375)	(0.0223)
Observations	207,836	207,850	207,724	207,850	207,662	207,850
Establishments	46,062	46,063	46,042	46,063	46,030	44,063
R-squared	0.372	0.375	0.340	0.349	0.357	0.480
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
state FE	Yes	Yes	Yes	Yes	Yes	Yes
Product FE	Yes	Yes	Yes	Yes	Yes	Yes

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Notes: Results from establishment-level regression outcomes. Dependent variables are shown in the column headings. 'Deres' is a dummy variable that takes the value '1' if the establishment product has de-reserved and zero otherwise. We control year, state, and product fixed effects. Errors are clustered at the establishment level.

To evaluate the impact of de-reservation on exporting MSMEs, Table 2 reports establishment level regressions of key performance indicators, including sales, output, capital, employment, wages, and labour productivity. The estimates indicate that de-reservation had a statistically significant negative impact on sales, output, capital, employment, wages, and labour productivity among MSME exporters. Specifically, de-reservation was associated with declines of 12 percent in sales, an 11 percent in output, 9 percent in capital, 5 percent in employment, 10 percent in wages, and 5 percent in labour productivity among MSME exporters. This likely reflects the increased competition from the entry of large firms into the previously reserved product categories. These findings align with Tewari and Wilde (2019), who showed that de-reservation allowed entry of multi-product firms, intensifying competition and reducing MSMEs'

market share. Similarly, de-reservation input access of large firms, strengthening their dominance at the expense of smaller firms (Boehm et al., 2022).

The study next examines the impact of de-reservation on exporting incumbents, defined as firms established before the policy change. Table 3 reports estimate from model (3). In the regressions, 'Incumbent' refers to firms established before de-reservation that produced at least one previously reserved product. The estimates indicates that de-reservation negatively affected the performance of incumbent exporting MSMEs in India. Specifically, de-reservation is associated with declines of 8 percent in sales, 9 percent in output, 34 percent in capital, 5 percent in employment, and 5 percent in labour productivity. These results are consistent with earlier studies on de-reservation and incumbent performance in India (Bollard et al., 2013; Martin et al., 2017; Tewari & Wilde, 2019).

Table 3: The Impact of De-reservation on Exporting Incumbent MSMEs Based on the Establishment-Level Outcomes

	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	log(Sales)	log(Output)	log(Capital)	log(Employment)	log(Wage)	log(LP)
Incumbent	-0.0818**	-0.0962***	-0.349***	-0.0483**	-0.0316	-0.0473**
	(0.0326)	(0.0337)	(0.0347)	(0.0241)	(0.0294)	(0.0206)
Incumbent×Export	0.113***	0.119***	0.160***	0.0915***	0.0608	0.0274
	(0.0424)	(0.0414)	(0.0442)	(0.0348)	(0.0398)	(0.0240)
Observations	207,836	207,850	207,724	207,850	207,662	207,850
Establishments	46,062	46,063	46,042	46,063	46,030	46,063
R-squared	0.373	0.375	0.345	0.350	0.357	0.482
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
state FE	Yes	Yes	Yes	Yes	Yes	Yes
Product FE	Yes	Yes	Yes	Yes	Yes	Yes

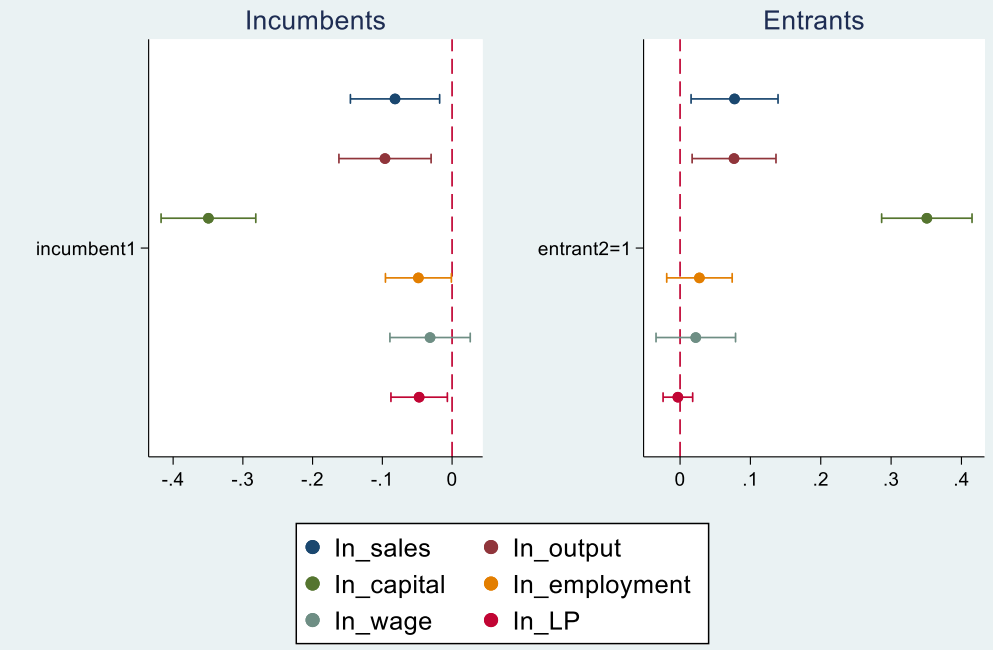
Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Notes: Results from establishment-level regression outcomes. Dependent variables are shown in the column headings. 'Deres' is a dummy variable that takes the value '1' if the establishment product has de-reserved and '0' otherwise. Incumbent is a firm established before the de-reservation policy and produces at least one previously reserved product. We control year, state and product-fixed effects. Errors are clustered at the establishment level.

Similarly, the term "$Incumbent \times Export$" captures incumbent exporting MSMEs that produced at least one previously reserved product. The estimates indicate that de-reservation positively affected these exporting firms. Specifically, De-reservation is associated with 11

percent higher sales, 12 percent higher output, 16 percent higher capital, and 9 percent higher employment. wages and labour productivity also increased, but the estimates are not statistically significant. This suggests that exporting MSMEs previously constrained by the reservation policy became more productive once it was removed. This finding is consistent with García-Santana and Pijoan-Mas (2014), who showed that removing size restrictions enhanced productivity through resource reallocation toward more productive incumbents. Moreover, the policy change enabled firms to optimise production, with productivity growth driven more by resource reallocation than by within-firm efficiency improvements.

Figure 5: Firm-Level Outcomes after Dereservation: Incumbents vs Entrants



Source: Authors' estimation using Annual Survey of Industries unit level-panel data (2001-2020)

Table 4 reports estimate of the impact of de-reservation on new entrants to previously reserved product categories. The sample includes both large and small establishment after de-reservation policy. The analysis is also re-estimated for exporting firms within this adjusted sample. The results indicate that de-reservation significantly affected establishments in previously reserved product categories. Specifically, sales, output, capital, employment, and wages increased significantly for exporting establishments producing previously reserved products. Sales increased by 13 percent, output by 14 percent, capital by 15 percent, employment by 14 percent, and wages by 14 percent.

In the regressions, 'Entrant' refers to firms established after the de-reservation policy that produced at least one previously reserved product. Entrants into previously reserved product spaces experienced substantial increases in sales, output, capital. Specifically, Sales and output rose by 8 percent, while capital increased by 4 percent. All effects are statistically significant at the 5 percent level. These results suggest that de-reservation enabled entrant establishments to expand. These findings are consistent with Galle (2020), who showed that de-reservation increased competition, lowering incumbent firms' markups while creating growth opportunities for new entrants. These differences between incumbents and entrants are further illustrated in Figure 5, which compares their relative performance across key establishment-level outcomes.

Table 4: The Impact of De-reservation on Exporting Entrants Based on the Establishment-Level Outcomes

VARIABLES	(1) log(Sales)	(2) log(Output)	(3) log(Capital)	(4) log(Employment)	(5) log(Wage)	(6) log(LP)
Deres×Export	0.135***	0.140***	0.147***	0.138***	0.145***	0.00704
	(0.0308)	(0.0298)	(0.0326)	(0.0245)	(0.0286)	(0.0100)
Entrant	0.0775**	0.0768**	0.351***	0.0276	0.0224	-0.00308
	(0.0315)	(0.0304)	(0.0328)	(0.0237)	(0.0288)	(0.0107)
Entrant×Export	-0.249***	-0.249***	-0.415***	-0.121**	-0.148**	-0.0277
	(0.0606)	(0.0585)	(0.0641)	(0.0505)	(0.0590)	(0.0199)
Observations	302,962	302,828	302,833	302,962	302,750	302,750
Establishments	55,252	55,246	55,235	55,252	55,219	55,219
R-squared	0.588	0.603	0.639	0.556	0.584	0.513
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
state FE	Yes	Yes	Yes	Yes	Yes	Yes
Product FE	Yes	Yes	Yes	Yes	Yes	Yes

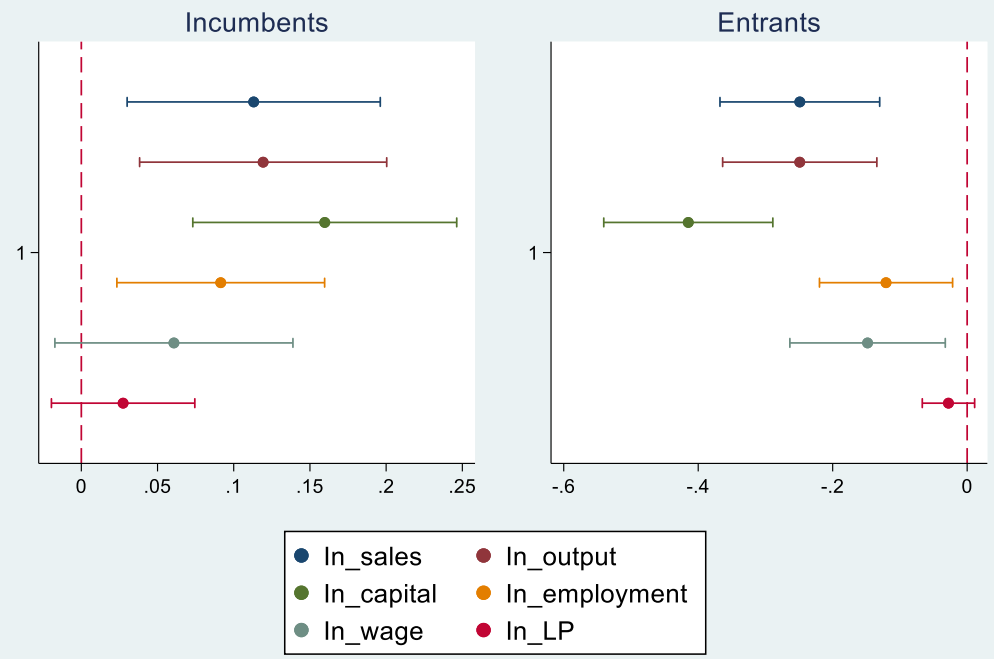
Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Notes: Results from establishment-level regression outcomes. Dependent variables are shown in the column headings. 'Deres' is a dummy variable that takes the value '1' if the establishment product has de-reserved and zero otherwise. An entrant is a firm established after the de-reservation policy and producing at least one previously reserved product. We control establishment, year, and age-fixed effects. Errors are clustered at the product level.

Table 4 further examines exporting entrant ($Entrant \times Export$). The estimates indicate that product de-reservation significantly reduced the performance of entrant exporters. Specifically, sales and output fell by 25 percent, capital by 41 percent, employment by 12 percent, and wages by 15 percent. These findings align with Bollard et al. (2013), who showed that industries exposed to trade liberalisation did not achieve higher TFP growth, suggesting that new entrant exporters faced severe constraints when competing

internationally. Figure 6 illustrates this divergence, showing the contrasting effects of de-reservation on exporting incumbents compared to exporting entrants.

Figure 6: Firm-level Outcomes of Exporting Incumbents and Entrants Compared to Non-exporters



Source: Authors' estimation using Annual Survey of Industries unit-level panel data (2008-2020)

The counterintuitive finding that incumbent exporters benefitted more than new entrant exporters after the policy change reflects the persistent obstacles that the policy itself could not remove. While the de-reservation policy removed the entry barriers for larger firms to enter reserved product market, entry into the export market still required overcoming substantial sunk cost (Sasidharan & Rajesh Raj, 2014; Tripathy & Kumar, 2019). These sunk entry costs were particularly burdensome for new entrants, who faced strict credit constraints that limited their entry into export market (Ranjan & Raychaudhuri, 2011). Moreover, successful entry into the export markets depends not just on firm scale, but also on marketing capacity and prior international experience (Kathuria et al., 2010; Tripathy & Kumar, 2019). Therefore, de-reservation primarily benefitted incumbents, who had previously been handicapped by capacity constraints, but it did not ease the structural barriers that continued to hold back new entrants.

The contrasting outcomes of incumbents and entrants created by the de-reservation policy suggests that the mechanism operated more through self-selection than through learning-by-exporting. The results indicate that more productive incumbents benefitted disproportionately compared to new entrants, supporting this interpretation. Moreover,

only productive incumbents with prior international experience were able to absorb sunk costs, whereas new entrants, often constrained by limited credit and marketing access, struggled in the export market. Therefore, the policy mimicked a domestic liberalisation shock that improved allocative efficiency by reallocating resources to already productive firms, but did not generate the expected dynamic efficiency gains from the policy change.

An important question is whether these adjustments are temporary or whether MSME incumbents gradually converge toward higher productivity, as suggested by Melitz (2003). The results of this study suggest that such convergence is limited. The gains among incumbent exporters stem from the relaxation of capacity constraints following the policy change. In contrast, new entrants faced severe disadvantages, reflected in declines in sales, output, and capital during the study period. At the aggregate level, employment and labour productivity remained stagnant, implying that efficiency gains were concentrated among highly productive firms rather than broadly shared across the sector. Persistent labour and credit market frictions in the Indian market likely slowed the reallocation process and prevented new entrants from catching up.

Taken together, the results suggest several broad effects of MSME product de-reservation on Indian manufacturing sector. First, product de-reservation led to the reallocation of productive factors, with many firms producing reserved products exiting once protections were removed. Second, among overall establishments, the policy favoured new entrants over incumbents. Incumbents generally shrank across establishment-level outcomes, while entrants expanded. Third, in the export market, the policy had a stronger impact on incumbents than on new entrants. Thus, it can be argued that the productivity incumbent small exporters increased once restrictions on scale and scope were lifted.

6. Conclusion and Policy Implication

5.1 Conclusion

This paper examined the impact of the de-reservation policy on small-scale industries in India, with particular focus on exporting firms. It sought to assess whether eliminating product reservations improved the performance of the small-scale sector overall, and whether exporting firms in particular benefitted. The results suggest that eliminating product reservation improved the overall performance of MSMEs in India. Specifically,

significant improvements in MSME sales, output, and capital between 2001 to 2020 following the de-reservation policy. However, it remains unclear whether these gains genuine productivity improvements within firms reallocation of resources from less productive to higher-productive small firms.

The study also examined whether small incumbents that previously produced reserved products benefitted from the de-reservation policy. It compared the effects of de-reservation on incumbents and new entrants in previously reserved markets across key performance indicators. The analysis found significant adverse effects on incumbent MSME in terms of sales, output, capital, employment, and labour productivity while new entrants expanded. This finding is consistent with the heterogeneous firms literature (Melitz, 2003). De-reservation increased market competition, with more productive firms expanding their market shares at the expense of less productive establishments.

To examine the impact of de-reservation on export growth, the study classified establishments into exporting incumbent and exporting entrants. The results show that eliminating the reservation policy enhanced the performance of incumbent exporting establishments in terms of sales, output, capital, employment, and wages, while, the new exporting entrants exhibited a declining trend. In sum, eliminating the reservation policy did not expand the growth of labour-intensive exporting MSMEs, as the gains were concentrated among incumbent exporters rather than new entrants.

6.2 Policy Implications

The major findings of this study indicate that while the de-reservation policy improved sales, output, and capital among small enterprises, it failed to generate corresponding gains in employment, wages, and labour productivity. Additionally, the policy's impact on exporting MSMEs was heterogenous. Incumbent exporters benefited from the policy, whereas new entrants experienced weaker performance. These findings call for an optimal policy mix that not only preserves efficiency gains but also addresses the structural barriers constraining employment generation and internationalisation of new entrants. The calls for complementary measures such as improving access to credit, export financing, and marketing support, promoting advanced technology, and enhancing skill development for employment generation. Similarly, further labour market reforms are needed to enable MSMEs to expand their workforce without prohibitive rigidities, aligning firm growth with better employment generation.

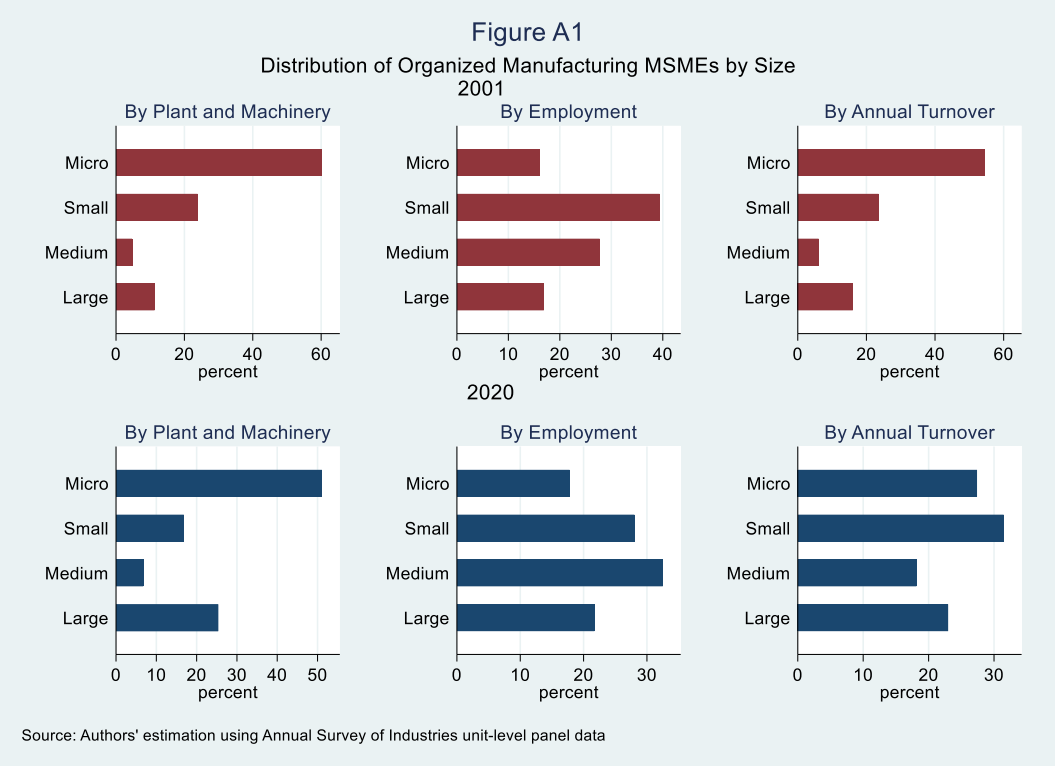
In addition, a differentiated approach with sector specific policies such as cluster-based export promotion, capacity building to meet international standards, and performance linked-incentives can help scale-up MSMEs. Therefore, a balanced policy mix that combines horizontal reforms with targeted interventions can ensure that the benefits of de-reservation are more sustainable and inclusive. Furthermore, such measures would allow small firms to play a stronger role in industrial expansion and employment growth, while aligning with India's dynamic export performance.

Appendix A

ASI Data Cleaning procedure

The study uses establishment-level panel data from the Annual Survey of Industries (ASI) from 2001 to 2020. The ASI covers all the formally registered manufacturing sectors in India. The survey provides sampling multipliers, allowing us to construct nationally representative samples across industries in India.

The data has many limitations in covering all samples for the analysis in each round. The study is particularly interested in the manufacturing sector; hence, all service and mining establishments were eliminated from the samples. The data contains many misleading years when calculating the age of a firm. Therefore, establishments that started operations before 1500 or after the respective ASI round were excluded from the sample. Apart from this, the study strictly focuses on currently operating firms and eliminates all firms flagged as closed. Firms with a large number of missing values in the establishment-level outcomes selected for this study were also excluded from the samples.



Note: The definitions used for the size distribution are as follows:
By plant and Machinery: - Micro: ≤25 L; Small: >25L to ≤5 Cr; Medium: >5 Cr to ≤10 Cr; Large: >10 Cr
By Employment: - Micro: ≤9 employees; Small: >9 to ≤49 employees; Medium: >49 to ≤250 employees: Large: >250 employees
By Annual Turnover: - Micro: ≤5 Cr; Small: >5 Cr to ≤50 Cr; Medium: >50 Cr to ≤100 Cr; Large: >100 Cr

Appendix B

Table B1: The distribution of Prowess listed Manufacturing Industries by size using the original value of plant and machinery

Year	Micro	Small	Medium	Large	Total
2000-01	115	1,152	626	1,999	3892
2001-02	137	1,203	634	2,115	4089
2002-03	228	1,530	742	2,288	4788
2003-04	296	1,734	754	2,340	5124
2004-05	366	1,968	811	2,555	5700
2005-06	357	1,932	849	2,815	5953
2006-07	352	1,876	862	3,058	6148
2007-08	343	1,783	863	3,331	6320
2008-09	368	1,849	862	3,577	6656
2009-10	345	1,864	878	3,769	6856
2010-11	407	1,865	823	3,890	6985
2011-12	398	1,811	870	4,351	7430
2012-13	301	1,675	855	4,690	7521
2013-14	336	1,855	921	5,347	8459
2014-15	446	2,067	966	5,681	9160
2015-16	468	2,176	1,040	5,903	9587
2016-17	480	2,159	1,046	5,955	9640
2017-18	456	2,094	1,064	6,175	9789
2018-19	426	1,978	1,027	6,147	9578
2019-20	394	1,825	983	6,120	9322

Source: Author's estimation using Prowess unit-level database

Table B2: Comparison of ASI and Prowess Database based on the key Industrial Performance variables

Year	Exporters		Labour		Capital		Sales		Output		Wage	
	ASI	Prowess	ASI	Prowess	ASI	Prowess	ASI	Prowess	ASI	Prowess	ASI	Prowess
2008-09	4,050	1,364	36,240	532	35,351	6,320	31,322	6,382	35,943	6,452	35,931	6,594
2009-10	3,839	1,362	40,040	563	39,032	6,856	34,454	6,568	39,662	6,719	39,844	6,780
2010-11	4,262	1,377	41,096	563	40,056	6,985	35,980	6,446	41,092	6,886	41,349	6,637
2011-12	4,973	1,443	41,818	553	40,706	7,430	36,719	6,335	41,725	7,411	42,018	6,543
2012-13	4,367	1,511	45,060	556	45,064	7,521	39,502	6,322	44,320	7,558	45,173	6,506
2013-14	4,615	1,827	47,101	581	46,813	8,459	41,210	8,385	46,246	8,570	47,005	8,538
2014-15	4,950	1,954	49,948	1,240	49,180	9,160	43,098	9,306	48,560	9,350	49,397	9,473
2015-16	5,439	2,011	49,710	1,38 1	48,803	9,587	42,489	9,721	48,285	9,776	49,291	9,902
2016-17	5,386	2,020	52,956	1,441	54,110	9,640	44,815	9,928	50,660	9,866	52,956	9,987
2017-18	5,280	2,063	51,834	1,529	52,801	9,789	44,143	10,364	49,743	10,031	51,834	10,099
2018-19	5,125	2,148	51,282	1,579	52,151	9,578	43,975	10,340	49,211	9,877	51,282	9,904
2019-20	2,572	2,218	51,626	1,604	52,225	9,322	44,307	10,155	49,440	9,660	51,626	9,646

Source: Authors' estimation using the the ASI and Prowess unit-level database

Table B3: The participation of ASI manufacturing establishments In the Reserved Product market by size

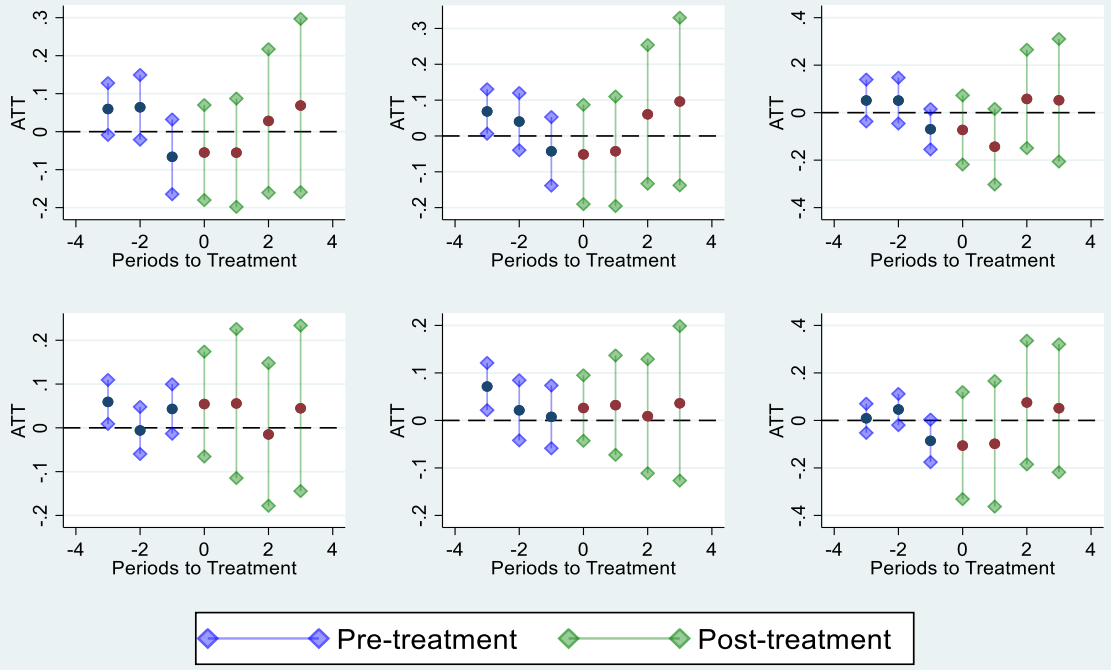
Year	MSME			Large		
	De-reserved	Ever Reserved	Percentage	De-reserved	Ever Reserved	Percentage
2001	6,964	14,343	32.68%	385	2885	11.77%
2002	7,895	15,573	33.64%	426	3,062	12.21%
2003	8,899	19,048	34.73%	483	3,230	13.01%
2004	11,381	21,534	34.58%	545	3,534	13.36%
2005	10,276	17,697	36.74%	568	3,438	14.18%
2006	11,290	19,122	37.12%	720	3,805	15.91%
2007	11,369	19,051	37.37%	801	4,095	16.36%
2008	9,307	16,666	35.83%	915	4,374	17.30%
2009	5,907	18,812	23.90%	576	5,368	9.69%
2010	6,674	20,484	24.57%	624	5,855	9.63%
2011	5,717	22,365	20.36%	775	6,449	10.73%
2012	5,705	22,405	20.30%	813	7,148	10.21%
2013	6,042	24,238	19.95%	960	7,895	10.84%
2014	5,525	25,927	17.57%	937	8,460	9.97%
2015	5,513	27,175	16.87%	1,022	8,998	10.20%
2016	5,292	26,202	16.80%	1,110	9,488	10.47%
2017	5,408	28,318	16.04%	1,075	10,008	9.70%
2018	5,651	27,114	17.25%	1,311	10,388	11.21%
2019	5,585	26,383	17.47%	1,404	10,946	11.37%
2020	5,628	26,322	17.62%	1,412	11,307	11.10%

Source: Author's estimation based on the Annual Survey of Industries unit-level panel data. No sampling weight were applied.

Appendix C

Figure C1

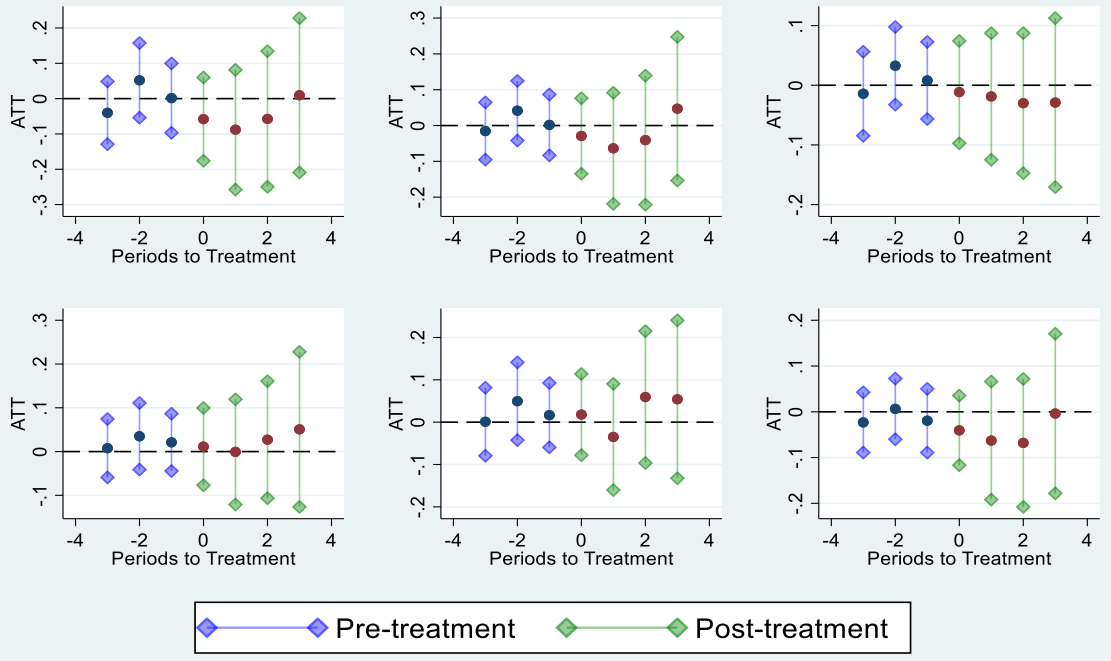
Event plots for the impact of De-reservation policy on the establishment level outcomes of micro firms



Source: Authors' estimation using Annual Survey of Industries unit-level panel data (2001-2020)

Figure C2

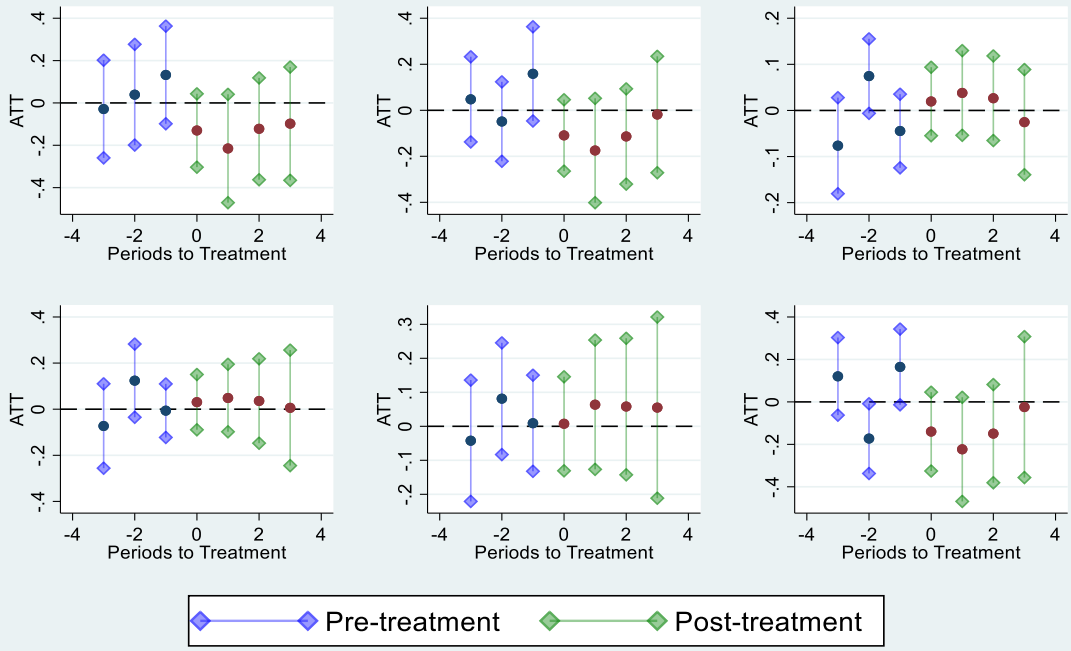
Event plots for the impact of De-reservation policy on the establishment level outcomes of small firms



Source: Authors' estimation using Annual Survey of Industries unit-level panel data (2001-2020)

Figure C3

Event plots for the impact of De-reservation policy on the establishment level outcomes of medium firms

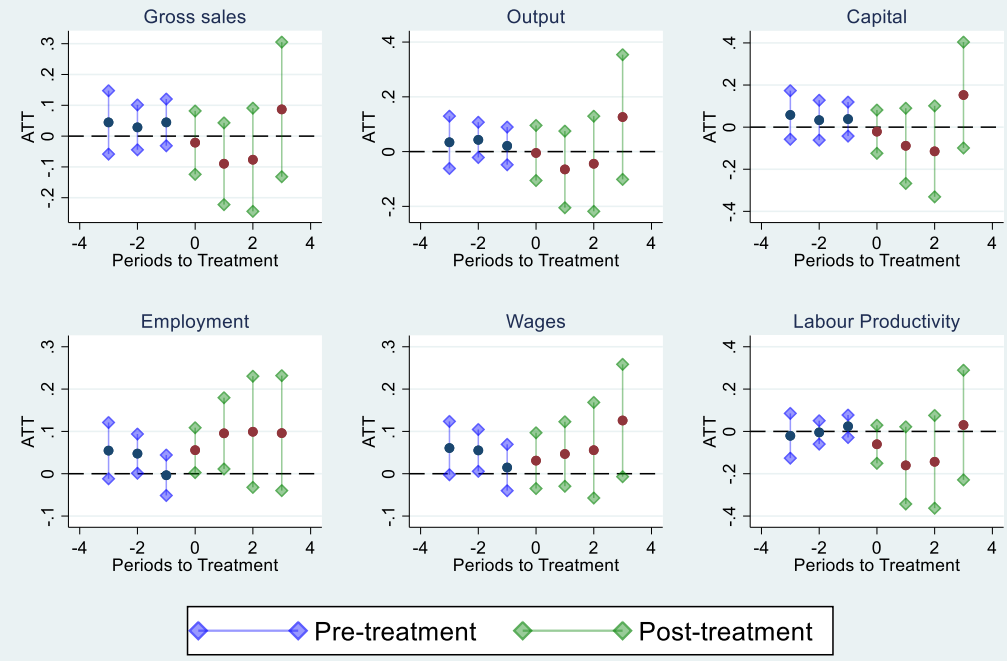


Source: Authors' estimation using Annual Survey of Industries unit level panel data (2001-2020)

Appendix D

The study also checks the validity of the difference-in-difference method. I conducted a placebo test with a one-year lag using the CSDID method. The estimation controls for year and establishment fixed effects, and the error is clustered at the product level. Figure D1 presents the event study outcomes using key outcome variables such as sales, output, capital, employment, wages, and labour productivity.

Figure D1: Event study placebo test for assessing pre-treatment trends



Source: Authors' estimation using Annual Survey of Industries unit-level panel data (2001-2020)

The figure indicates that the one-year lag pre-treatment effects (blue diamonds) are statistically insignificant and centered around zero, confirming the absence of significant trends in the pre-treatment period. This supports the assumption of parallel trends and validates the empirical results. The post-treatment effects (green diamonds) are primarily due to the actual impact of the de-reservation policy. These findings support the robustness of the main results and rule out the concerns about spurious effects.

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