Opening the Floodgates: India's Small Scale Dereservation Reform and Informal Enterprises

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DRAFT – PLEASE DO NOT CITE

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February 2017

Abstract

The extent to which policies promoting the growth of small enterprises benefit the wider economy has long been a subject of debate for development economists. This paper examines the impact of a post-1996 policy reform (SSI dereservation) in India, which opened up product markets that had long been reserved for small scale industry manufacturing, on employment in informal manufacturing enterprises. The baseline results indicate that on average and *ceteris paribus*, dereservation is associated with increased employment in larger informal enterprises (establishments), but not in tiny household enterprises (1995-2006). This result is potentially linked to increased product market competition driven by large formal firms in the post-reform period. Further analysis suggests that the results may also be partially driven by backward linkages in establishments, with no significance attaching to forward linkages. The results highlight the continuing relevance of policy impact assessment for informal enterprises in developing economies.

[1] I wish to thank my PhD supervisors, Professor Andrew Newell and Dr. Dimitra Petropoulou for their invaluable advice and support. Funding received from the Department of Economics of the University of Sussex for purchasing survey data from the Government of India is gratefully acknowledged. In addition, I am obliged to Shanthi Nataraj for providing guidance and clarification on a number of issues of relevance to this study. Any errors or omissions in this paper are my own.

1 Introduction

Should small enterprises benefit from public sector protection and promotion, relative to larger competitors? This question has provoked much debate among development economists. The informal sector, typically characterised by small enterprises and accounting for a lion's share of economic activity in much of Asia and Africa (see for instance La Porta and Schleifer, 2008; Osei-Boateng and Ampratwum, 2011; Heintz, 2012) merits special attention in this context. By definition, informal employment and output are outside the purview of government regulation. However, regulation targeting the formal sector often has important implications for the informal sector, as the forces of competition and collaboration often shape outcomes for entities in the two sectors (Mukim, 2013 and Ghani *et al*, 2013). As such, policies targeted at promoting the growth of smaller enterprises in the formal sector could affect outcomes in the informal sector. This is of particular relevance for India, where informal enterprises have long accounted for 99 per cent of firms and 80 per cent of employment in the manufacturing sector.

India offers unique territory for an examination of the effectiveness of small scale protection laws. Since the 1960s, the Government of India progressively reserved a number of manufacturing industry products for production by small enterprises. In 1996, over 1000 products, amounting to approximately 20 per cent of the universe of manufactured goods, had been reserved for small enterprises. However, concerns had emerged as regards the effectiveness of this policy and the extent to which it had helped small enterprises. Eventually, the Government of India decided to 'dereserve' the hitherto reserved products. Crucially, this dereservation was undertaken in phases over a fourteen year period (1997-2010), and there is no evidence that products were systematically dereserved on the basis of pre-existing industry characteristics or trends. The dereservation reform therefore serves as an opening for an analysis of the effectiveness of the reservation policy. The fact that India's much heralded economic reforms of the early 1990s, primarily relating to customs tariff liberalisation and the dismantling of stifling domestic licensing requirements, had largely been completed by 1998, is an additional advantage in this regard.

In this chapter, I assess the implications of the dereservation reform for informal manufacturing enterprises in India in the 1995-2011 period, with an emphasis on employment outcomes. To my knowledge, this is the first study focusing on the informal sector in the context of this reform. Table 26 provides the proportion of products that were never reserved in each broad industry category (as defined under India's two digit national industrial classification of 2004),

along with the proportions that were reserved in 1995 and that had been dereserved by 1999, 2003, 2007 and 2010. The figures show that reserved products existed in every industry category with the exception of tobacco manufacturing. The share of reserved products varied considerably across categories in 1995, with 60 per cent of products in the wearing apparel industry group being reserved in that year, as opposed to only 3 per cent of products in the basis metals industry group.

Importantly, all informal enterprises in India qualify as 'small' enterprises on the basis of the thresholds employed for the reservation policy. As a result, I seek to identify whether outcomes for informal enterprises in product spaces that had been dereserved by a given point in time differ relative to those for informal enterprises in product spaces that were never reserved, as well as relative to those for informal enterprises manufacturing products that were reserved (or, in other words, were yet to be dereserved) at the same point in time.

Martin *et al* (2016) explore the impact of the dereservation reform on formal manufacturing enterprises. They conclude that while the reform led to reduced employment in smaller enterprises that had previously benefited from being in reserved product markets, this effect was outweighed by increased employment in larger enterprises that were able to enter the dereserved product spaces, with a positive net productivity effect. Their findings also suggest that the reservation policy had imposed growth constraints on a subset of formal enterprises. This is in line with the results of a simulation exercise undertaken by Garcia-Santana and Pijoan-Mas (2014), which suggests that the removal of the reservation policy would yield output and productivity increases in the manufacturing sector. Further, Tewari and Wilde (2014) find that the dereservation reform is associated with increased product scope and productivity in the formal sector, particularly for multi-product enterprises. The current study, which focuses on informal enterprises, complements this body of existing research on the dereservation reform and formal enterprises. Its analysis is founded upon data compiled by India's Ministry of Statistics and Programme Implementation (MOSPI) in its periodic surveys of unorganised enterprises in India, almost all of which can be categorised as 'informal' enterprises.

Overall, at the enterprise level, there is no statistically significant shift in informal enterprise employment attaching to dereservation in the 1995-2006 period, although enterprises in 'still reserved' product markets are consistently significantly larger than other enterprises. However, I find that larger informal manufacturers ('establishments') producing dereserved products employ on average 7 per cent more people relative to establishments manufacturing items that

were never reserved, with no corresponding significance visible for OAMEs. This result appears to be driven by competition between establishments and formal firms, and is possibly linked to some extent with backward linkages (input sourcing) in establishments (but not forward linkages, in terms of output sales).

The remainder of this paper is organised as follows. Section 2 outlines the Indian dereservation reform and offers a brief discussion of the related literature. Section 3 describes the data and the empirical strategy. Section 4 presents the results, and Section 5 concludes.[2]

2 Context

While large business houses have long tended to dominate press coverage of India's manufacturing sector, most manufacturing enterprises in India are small entities. In recognition of this fact, beginning in the 1960s, the Government of India sought to encourage the growth of small enterprises by reserving a number of products for small scale industry (SSI) manufacturing. Initially, a small enterprise was defined as one employing up to 50 workers and having fixed assets valued at up to Rs. 500,000 (Martin *et al*, 2016). With the passage of time, only the fixed asset threshold was retained and increased in tandem with rising historical cost indices.

The number of SSI reserved products grew steadily up to the mid-1990s. This proved to be the 'high water mark' of SSI reservation, with the list of reserved products accounting for approximately 20 per cent of all manufacturing products in 1996. Large business houses already operating in the newly reserved product markets were permitted to continue doing so, with the proviso that any increases in production or entry into reserved product spaces would require them to export 75% or more of their output (Mohan, 2002). In light of India's highly restrictive export licensing regime of the time, this is likely to have ensured the effectiveness or 'bite' of the new reservation regime.

By the mid-1990s, it was felt that SSI reservation, while well intended, had become somewhat redundant. With the liberalisation of India's trade policies and domestic licensing regime in the early part of the decade, it was argued that large enterprises could obviate the SSI reservation policy by importing reserved products or by introducing fair substitutes that were unreserved. Tewari and Wilde (2014) document how the idea of dereservation gradually gained favour in government and academic circles. Eventually, beginning in 1997, the hitherto reserved products were dereserved over time, with small groups being dereserved in 1997 and 1999 and larger

[2] This is work in progress. Please do not cite this draft without the author's permission.

numbers being dereserved in 2001 and the following years through to 2010, when only 20 products remained on the reserved list (these were dereserved in 2015).

Importantly, Tewari and Wilde (2014) provide evidence that the timing of dereservation was quasi-random across industries and that endogeneity is unlikely to be an issue for analysts of this reform episode. Table 1 provides the proportion of products that were never reserved in each broad industry category (as defined under India's two digit national industrial classification of 2004), along with the proportions that were reserved in 1995 and that had been dereserved by 1999, 2003, 2007 and 2010. The figures show that reserved products existed in every industry category with the exception of tobacco manufacturing. The share of reserved products varied considerably across categories in 1995, with 60 per cent of products in the wearing apparel industry group being reserved in that year, as opposed to only 3 per cent of products in the basis metals industry group. By 2007, the share of reserved products had declined considerably across industry groups, and had touched zero in 2010 for most two digit industry categories.

In the context of the current study, all informal enterprises in India, defined as proprietary or partnership enterprises that employ less than ten workers (or less than twenty workers without using electricity), qualify as 'small' enterprises. I will explore the implications of the dismantling of the SSI reservation policy for a segment of the economy that comprises entirely of small enterprises. Any effects that I observe may operate through the channels of increased competition (with larger enterprises entering hitherto reserved product markets after dereservation) or linkages between informal enterprises and the formal sector (by way of supply side linkages or agglomeration effects, as proposed by Munro, 2011). As emphasised above, endogeneity is unlikely to pose a threat to my results, more so given that the timing of dereservation is very unlikely to have been based on trends in the informal sector, as opposed to shifts in formal industries, for which data are compiled on a more regular (annual) basis.

3 Data and Method

3.1 Data

I use enterprise level data primarily for the 1995-2006 period, compiled by India's National Sample Survey Office (NSSO) in its periodic surveys of unorganised enterprises. The surveys were undertaken in the financial years 1994-1995, 2000-2001 and 2005-06. In robustness analysis, I also use enterprise level survey data for 1989-1990 and 2010-2011. I do not use the

1989-1990 and 2010-2011 data in my baseline analysis, as the former do not provide district codes and the latter do not record product level information. As discussed in Section 3.2, district and product codes are vital for my baseline identification strategy.

For simplicity, I will refer to each survey using only the second year in question (for instance, I will refer to the 1994-1995 survey as the '1995' survey). The surveys cover all manufacturing enterprises that employ less than ten workers (or less than twenty workers without using electricity). Each survey employs a stratified sampling design, with the primary sampling units ('first stage units') being villages or urban blocks and the final stage units being enterprises. The 2006 survey departed somewhat from the usual procedure by introducing a 'list frame', through which all relatively large urban enterprises were surveyed, with a separate 'area frame' focusing on the usual sampling for smaller urban enterprises and for all rural enterprises. While the enterprises surveyed in each period account for a small fraction (approximately 1 to 5 per cent) of the population (with the exception of the list frame in 2006), each survey provides economic census based weights that facilitate aggregation and analysis applicable to the population of informal manufacturers.

At the district level, I use these weights to construct a panel dataset. To explore potential linkages between the informal and formal sectors, I also use data from the Annual Survey of Industries (ASI), which records outcomes for formal firms and provides weights that are similar to the informal enterprise survey weights provided by the NSSO. At the enterprise level, while I do not have panel data, I benefit from having repeated cross-sections that represent the universe of informal and formal manufacturers. I use the weights provided in my regressions to obtain results that apply to the population of manufacturers.

The NSSO distinguishes between 'own account enterprises' (OAEs), which are run purely by household labour, and 'establishments', which employ at least one hired worker on a 'fairly regular basis'. Over 80 per cent of informal manufacturing enterprises tend to be OAEs. OAEs account for higher proportions of the rural informal manufacturing sector relative to establishments. On average, an informal manufacturing enterprise employs two to three workers. The average OAE employs 2.1 workers, whereas the average establishment employs 4.4 workers.

As illustrated in Table 2, approximately 82 per cent of informal enterprises are classified as operating in 'never reserved' product markets. Establishments are somewhat more likely to report producing hitherto reserved products relative to OAEs. Average OAE employment in the

1995-2006 period appears to have declined slightly. On the other hand, employment in the average establishment increased in the same period, in particular in dereserved and still reserved product markets.

On the whole, OAEs appear to be less likely to expand relative to establishments. The 2006 survey reveals that over 70 per cent of manufacturing OAEs experienced stagnation or decline over the preceding three years, while only 18 per cent expanded. On the other hand, 55-60 per cent of establishments reported perceptions of stagnation or decline over the same period, while over 23 per cent expanded. The share of establishments that report being relatively young (12 per cent report having operated for less than three years) exceeds that of OAEs (6 per cent).

3.2 Methodology

3.2.1 District level

As discussed in Section 3.1, I construct a district level panel dataset using the district codes and survey weights attached to enterprise level observations in the 1995, 2001 and 2006 surveys. To explore the implications of dereservation for informal sector employment at the district level, I employ the strategy adopted by Martin *et al* (2016). This approach involves the use of long differencing, with exposure to dereservation captured by a variable termed '*FrDeres*':

$$FrDeres_{dt} = \frac{\sum_p (Employment, 1995_{dp} * Deres_{pt})}{Overall\ employment, 1995_d}$$

In other words, exposure to dereservation in district *d* at time *t* is measured by aggregating, over all products, employment associated with every product *p* manufactured in a given district in 1995, multiplied by a dummy variable equalling one if product *p* had been dereserved by time *t* ('$Deres_{pt}$'), divided by total employment in district *d* in 1995. The baseline district level regressions take the form

$$\Delta \ln y_{dt} = \alpha + \beta\ \Delta FrDeres_{dt} + \delta X_{d2001} + \varepsilon_{dt} \qquad (1)$$

where ln(y_{dt}) is the natural logarithm of district level employment or enterprise numbers, $FrDeres_{dt}$ is as defined above, and X_{d2001} denotes a set of district level controls for 2001, obtained from the 2001 census and, as regards state level labour market flexibility, from Besley and Burgess (2004) and Hasan *et al* (2012). Following Martin *et al* (2016), I use district level employment in 1995 to weight this regression. This ensures that the variance-covariance matrix of the regression is adjusted to account for variation in initial district size. In an alternative

specification, I incorporate the '*FrDeres*' measure for neighbouring districts to account for potential spatial spillovers.

The identification strategy is underpinned by the argument that, notwithstanding the apparent randomness in the timing of dereservation across product lines, cross-district variation in the exposure to dereservation in the pre-reform period (1995) is likely to circumvent endogeneity concerns. In addition, as Martin *et al* (2016) suggest, the dereservation reform may be thought of as having been an exogenous shift at the district level, which renders such an analysis more robust to endogeneity concerns.

3.2.2 Enterprise level

The 1995, 2001 and 2006 surveys provide product level data on informal manufacturers. The 1995 survey uses the Common Product Nomenclature (CPN) of 1988, while the 2001 and 2006 surveys provide Annual Survey of Industries (ASI) Commodity Codes, or ASICC codes. The product codes used by the Government of India in its notifications on dereservation are distinct from both the CPN and the ASICC codes. I therefore set up a concordance between the CPN codes and the dereservation codes on the one hand, and the ASICC codes and the dereservation codes on the other. In the latter instance, I compare my concordance with the concordance set up by Martin *et al* (2016) to ensure consistency[3]. In this manner, I obtain a firm level dataset with information on reservation status for each product produced by every firm in 1995, 2001 and 2006. This facilitates an enterprise level baseline analysis, with the estimated equation being

$$lnemp_{ijkmt} = \alpha_0 + \alpha_1 DERES_{jkt-1} + \delta_t + \delta_k + \delta_m + \varepsilon_{ijkmt} \quad (2)$$

where $lnemp_{ijkmt}$ is the natural logarithm of the total number of persons engaged in enterprise *i* producing product *j* in three digit industry *k* and district *m* at time *t*; $DERES_{jkt-1}$ is a categorical variable capturing whether enterprise *i* operates in a reserved, dereserved or never reserved product space (for product *j* in industry *k* at the point *t-1*); and δ_t, δ_k and δ_m are year, industry and district fixed effects (in an alternative specification for enterprises that produce only one product, I use product fixed effects, δ_j instead of industry fixed effects). Standard errors are clustered at the district-industry level. The reference category for $DERES_{jkt-1}$ is that of enterprises

[3] As discussed in Section 2, the list of reserved products accounted for approximately 20 per cent of all manufacturing products in 1996 if the dereservation product codes are used. Using the ASICC codes, which are slightly more aggregated than the dereservation codes (a total of 5,200 ASICC codes may be mapped to 6,475 dereservation codes), this figure declines to 12 per cent, as shown in Table 2.

manufacturing products that were never reserved. The other categories are defined by whether enterprises reporting manufacturing products that were reserved or dereserved at the time of survey. Alternative specifications introduce separate categories demarcating whether the dereservation had occurred in the 1997-1999 period or in the 2001-2005 period.[4] As the employment data fit a Poisson distribution well, I also use a count dependent variable (the total number of persons engaged) in an alternative specification that uses a Poisson (count) regression.

Over two-thirds of the enterprises in my dataset produce only one product. For the remainder, which are multi-product enterprises, I assign every enterprise to the relevant (de)reservation category if it reports manufacturing at least one (de)reserved product and to the relevant 'never reserved' category otherwise. Further, I follow Tewari and Wilde (2014) in considering an enterprise to operate in a 'never reserved' space if it reports having operated for less than three years and being a manufacturer of a product that was dereserved at least three years prior to the survey period. The justification for this is that from the perspective of such an enterprise, the product in question would effectively never have been reserved.

4 Results

4.1 Baseline district level findings

Table 3 presents the results yielded by the most basic form of equation (1). I find that increased exposure to dereservation (captured by the '*FrDeres*' variable) is not associated with statistically significant changes in employment in, and the number of, informal enterprises at the district level. This applies to OAMEs as well as establishments. Throughout, I obtain coefficients that are positive but statistically insignificant.

In Table 4, I incorporate exposure to dereservation in neighbouring districts. This has little effect on the results presented in Table 3. The only slight change appears for establishments, the number of which now bears a weakly significant (as opposed to insignificant) positive association with increased exposure to dereservation. The coefficient on the '*FrDeres*' variable for neighbouring districts is negative but insignificant throughout, which suggests that any effect

[4] In total, the $DERES_{jkt-1}$ variable comprises up to four categories from the following set: never reserved (the reference group), dereserved, still reserved, dereserved in the 1997-1999 period, and dereserved in the 2001-2005 period.

that the reform may have had on informal manufacturers is likely to have been restricted and highly localised.

4.2 Baseline enterprise level findings

At the enterprise level, results relating the simplest specification corresponding to equation (2) are reported in Table 5. For the 1995-2006 period, relative to informal manufacturers of products that were never reserved, dereservation is not associated with statistically significant changes in average employment. However, enterprises operating in product spaces that are 'still reserved' (in other words, product spaces that had yet to be dereserved at the time of surveying) are significantly larger than their 'never reserved' counterparts, with the differential amounting to almost 12 per cent after the inclusion of year, district and industry fixed effects (Table 5, Column 4). These findings are virtually unchanged in magnitude and significance when I run an alternative Poisson (count) regression (Table 5, Column 5).

Further, in Table 6, I examine whether the timing of dereservation might matter for informal enterprise employment. Specifically, I introduce two dereservation categories to distinguish between products that were dereserved up to 1999 ('Dereserved 1997-1999') and products that were dereserved in the 2001-2005 period ('Dereserved 2001-2005'). The results are largely unchanged relative to Table 5, although weak significance attaches to the positive coefficient corresponding to the early period dereservation category (Table 6, Column 4, 'Dereserved 1997-1999').

I proceed to explore the extent to which these broad enterprise level findings differ for OAMEs and establishments (Table 7 and Table 8). Interestingly, this analysis highlights that dereservation is associated with a significant rise in employment in establishments, but not in OAMEs. In precise terms, establishments producing recently dereserved products are approximately 7 per cent larger, in employment terms, in comparison with establishments producing products that were never reserved (Table 7, Column 3). This result appears to be driven by the early period dereservation category rather than establishments operating in product spaces dereserved in 2001-2005 (Table 8, Column 3). Morever, the significant positive coefficient attaching to the 'still reserved' indicator in Table 5 and Table 6 also holds only for establishments. These findings are in line with the results obtained for the district level regressions, outlined in Section 4.1, where significance also attaches to establishments rather than OAMEs.

4.2 Potential mechanisms

The definition of 'small scale industry' (SSI) discussed in Section 2 covers the entirety of the informal manufacturing sector. On the other hand, formal (registered) manufacturing firms may be classified as having or having not been 'small' from the perspective of the initiation of dereservation. As such, it is vital to observe that any changes in informal enterprise outcomes associated with dereservation are likely to have arisen through linkages between the formal and informal sectors. Perhaps most evidently, these linkages may take the form of competition between formal and informal operators in hitherto reserved product markets, and changes therein following the initiation of dereservation. An alternative argument, following Munro (2011), favours the existence of collaboration between the two sectors, owing to supply side linkages or agglomeration externalities. I proceed to analyse the extent to which the data support either or both of these channels.

4.2.1 Competition effects

Over time, the dereservation policy promoted an increase in the presence of larger formal firms in product spaces that were hitherto reserved for smaller players (both formal and informal). As a first test of whether the district level effects might differ in this regard, I run equation (1) separately for two sets of districts, defined by whether the ratio of informal to formal sector employment in each district in 1995 falls below (above) the median, implying a higher (lower) degree of pre-reform competition.

The results of this exercise are presented in Table 9. On the whole, the lack of statistical significance that is visible in the baseline, in terms of district level employment and enterprise numbers, is reflected in both sets of districts. This result holds for OAMEs across all districts. As regards establishments, however, I find that in districts that are characterised by a lower level of pre-reform competition, increased exposure to dereservation is associated with a significant rise in the number of establishments in the 1995-2006 period. More precisely, for districts in which the 1995 informal-to-formal employment ratio exceeds the median, a one percentage point increase in the average district's 'FrDeres' measure is associated with a statistically significant 1.2 per cent increase in the number of establishments, on average and *ceteris paribus*. There is no corresponding significance in the case of districts where the same ratio falls below the median.

Viewed from the perspective of the results of Martin *et al* (2016), who conclude that dereservation led to a decrease in the number of small formal firms following increased competition due to the entry of larger operators, the estimates in Table 9 suggest that there may have been a rise in the presence of larger informal enterprises (establishments) in districts that were relatively more vulnerable to the competition effect. I arrive at very similar results, in terms of magnitude and significance, if I employ the ratio of the number of informal enterprises to that of formal firms (as opposed to employment therein). The estimates are also robust to restricting the set of formal firms in the analysis to those employing only up to 20 workers or 50 workers, assuming that informal enterprises are more likely to compete with smaller formal firms.

Further, I examine whether the result outlined above is affected by changes in the ratio of district level informal to formal employment in the 1995-2006 period, particularly in districts that had greater formal firm presence in 1995, as these appear to have been more resistant to the subsequent increase in establishment numbers. Table 10 suggests that this resistance appears to persist irrespective of whether the ratio in question moved upwards or downwards over time. In other words, districts characterised by a lower informal-to-formal employment ratio in 1995 (in other words, greater formal firm presence in 1995) did not register a significant increase in establishment numbers in association with greater dereservation exposure, irrespective of whether that ratio increased or decreased in the 1995-2006 period, unlike districts that were dominated by informal employment to a larger extent in 1995.

The results presented in Table 9 and Table 10 adopt the ratio of overall district level informal to formal sector employment as a measure of formal sector presence. There may also be an argument for considering this ratio only in product areas that were dereserved in the 1997-2005 period (or prior to the last survey round in my dataset). As a robustness check, I therefore construct this alternative ratio and rerun my regressions on its basis. The results, presented in Table 11 and Table 12, are reassuringly similar to their counterparts in Table 9 and Table 10.

At the enterprise level, the only evidence on competition effects is rooted in a question appearing in the 2001 and 2006 NSSO surveys, which queries whether 'competition from larger units' was a problem encountered by informal enterprises surveyed in the preceding year. On the whole, 16 per cent of informal enterprises cited this as having been an issue from their perspective. The proportion of firms reporting this issue increased from 13 per cent in 2001 to over 20 per cent in 2006. While establishments were somewhat more likely to report the issue

relative to OAMEs, the proportions of both types of informal enterprise raising the issue had increased in 2006, relative to 2001.

Having rerun my enterprise level regressions separately for enterprises that do not cite competition from larger firms as having been a problem and for those that do, I obtain the results compiled in Table 13. This reveals the positive and significant baseline dereservation effect for establishments is driven by establishments that cite competition with larger operators as being a problem, which suggests that the competition effect may have resulted in smaller establishments having exited the market following the increase in competition driven by larger formal entrants in the post-dereservation period. However, in the absence of a panel, I interpret this finding with some caution.

4.2.2 Linkages between informal enterprises and the wider economy

To examine the existence of supply chain linkages between formal and informal market players and their implications for my results, I further examine the descriptives of the NSSO surveys. The 2001 and 2006 surveys included questions on whether enterprises undertook any work on a contract basis and whether they bought at least part of their input from, and sold at least part of their output to, another enterprise or a contractor. As only a little over 8 per cent of the enterprises in my dataset report working on a contract basis, there is insufficient power for a regression to tease out differential effects linked to the dereservation reform for this variable. However, 25 per cent of enterprises state that they purchased at least part of their input from another enterprise or a contractor and 43 per cent of enterprises report that at least part of their produce was sold to another enterprise or a contractor. While it is not clear that the counterparty in each case is a formal business, given that informal enterprises are unlikely to be part of sophisticated supply chains, the probability of the counterparty being formal is arguably high, particularly where enterprises report selling output to another enterprise or a contractor.

In Table 14, I present the estimates yielded by regressions underpinned by these linkage centric survey questions. As regards establishments, the baseline positive employment effect associated with dereservation is robust for the subsample that does not report selling any produce to another enterprise or a contractor, but loses significance for the subsample that does report doing so. Conversely, significance is retained for establishments that report procuring at least part of their input from another enterprise or a contractor, but is lost for other establishments. In the context of the dereservation reform, this suggests that backward

linkages might matter more in terms of the response of employment in establishments, rather than forward linkages. Interestingly, a strongly (weakly) significant positive coefficient attaches to the dereservation indicator for OAMEs that report not buying any input from (not selling any output to) another enterprise or a contractor, which is indicative of these tiny, household only informal manufacturers being less linked with the wider economy relative to establishments.

5 Discussion

This study assesses the implications of India's SSI dereservation reform of the 1997-2010 period on informal manufacturing enterprises. While the literature has made major strides in understanding the impact of this reform on formal firms, this is likely to be the first attempt that is focused on informal enterprises, which account for a great majority of firms and a smaller but still sizeable majority of employment in Indian manufacturing.

A broad district level analysis along the lines of Martin *et al* (2016) does not yield a statistically significant relationship between district level dereservation propensity in the pre-reform period and either employment in or the number of informal enterprises. When neighbouring district dereservation exposure is controlled for, a weakly significant positive coefficient attaches to larger informal enterprise (establishment) numbers.

Overall, at the enterprise level, there is no statistically significant shift in informal enterprise employment attaching to dereservation in the 1995-2006 period, although enterprises in 'still reserved' product markets are consistently significantly larger than other enterprises. However, I find that establishments producing dereserved products are approximately 7 per cent larger, in employment terms, relative to establishments manufacturing items that were never reserved, with no corresponding significance visible for OAMEs. This result appears to be driven by competition between establishments and formal firms, and is possibly linked to some extent with backward linkages (input sourcing) in establishments (but not forward linkages, in terms of output sales).

The findings of this study have a number of policy implications. They are complementary to the findings of Martin et al (2016), which highlight the positive employment effects of the dereservation reform for the formal sector. They highlight the persistence of the duality inherent in the Indian economy, with informal activity flourishing in tandem with strides made in terms of formal sector growth. Perhaps the most prominent limitation of the analysis relates to the absence of panel data for informal enterprises in India. The initiation of panel data

compilation in this regard appears to be highly desirable on a fairly regular basis, if not on an annual basis along the lines of the ASI for formal firms. Further research on the constraints faced by informal manufacturers and the extent to which they may be accentuated or alleviated by policies targeted at SSI promotion remains a priority.

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Tables

Table 1: SSI dereservation – products by industry category (two digit NIC 2004)

		Percentages:					
Industry category	**Number of products**	***Never reserved***	**Reserved (1995)**	**Reserved (1999)**	**Reserved (2003)**	**Reserved (2007)**	**Reserved (2010)**
FOOD PRODUCTS AND BEVERAGES	**386**	*86*	14	8	8	6	2
TOBACCO PRODUCTS	**17**	*100*	0	0	0	0	0
TEXTILES	**410**	*93*	6	7	1	0	0
WEARING APPAREL; DRESSING AND DYEING OF FUR	**77**	*40*	60	60	1	0	0
TANNING AND DRESSING OF LEATHER; LUGGAGE, HANDBAGS SADDLERY, HARNESS AND FOOTWEAR	**118**	*51*	49	42	7	7	0
WOOD AND OF PRODUCTS OF WOOD AND CORK, EXCEPT FURNITURE; ARTICLES OF STRAW AND PLATING MATERIALS	**107**	*88*	12	12	12	0	0
PAPER AND PAPER PRODUCTS	**123**	*78*	22	20	20	15	0
PUBLISHING, PRINTING AND REPRODUCTION OF RECORDED MEDIA	**45**	*91*	9	9	9	7	7
COKE, REFINED PETROLEUM PRODUCTS AND NUCLEAR FUEL	**59**	*95*	5	5	5	2	0
CHEMICALS AND CHEMICAL PRODUCTS	**1,257**	*92*	8	8	7	3	1
RUBBER AND PLASTIC PRODUCTS	**309**	*83*	17	17	16	5	0
OTHER NON-METALLIC MINERAL PRODUCTS	**191**	*83*	17	17	17	1	1
BASIC METALS	**297**	*97*	3	3	3	1	0
FABRICATED METAL PRODUCTS, EXCEPT MACHINERY AND EQUIPMENTS	**256**	*82*	18	18	18	4	3
MACHINERY AND EQUIPMENT N.E.C.	**548**	*93*	7	6	6	1	0
OFFICE, ACCOUNTING AND COMPUTING MACHINERY	**32**	*97*	3	3	3	0	0
ELECTRICAL MACHINERY AND APPARATUS N.E.C.	**206**	*94*	6	6	6	2	0
RADIO, TELEVISION AND COMMUNICATION EQUIPMENT AND APPARATUS	**163**	*96*	4	4	4	1	0
MEDICAL, PRECISION AND OPTICAL INSTRUMENTS, WATCHES AND CLOCKS	**192**	*92*	8	8	5	1	0
MOTOR VEHICLES, TRAILERS AND SEMI-TRAILERS	**86**	*90*	10	3	3	0	0
OTHER TRANSPORT EQUIPMENT	**130**	*88*	12	10	10	0	0
FURNITURE; MANUFACTURING N.E.C.	**191**	*79*	21	21	20	8	6
TOTAL	**5,200**	***88***	**12**	**11**	**9**	**3**	**1**

Source: Author's calculations based on Government of India data on SSI dereservation (available at http://www.dcmsme.gov.in/)

Table 2: Summary statistics by SSI reservation status (1995, 2001, 2006)

	Proportion of enterprises			Number of enterprises	Average employment			
	1995	**2001**	**2006**	**Total**	**1995**	**2001**	**2006**	**Overall**
All enterprises:								
Never reserved	0.83	0.81	0.82	12,034,059	2.40	2.38	2.42	2.40
Dereserved		0.07	0.08	690,594		2.38	2.33	2.36
Reserved	0.17	0.12	0.10	1,952,868	2.64	2.91	3.45	2.89
Overall				14,677,521	2.45	2.44	2.51	2.46
OAMEs:								
Never reserved	0.85	0.83	0.86	10,410,441	2.21	2.04	2.00	2.10
Dereserved		0.08	0.09	613,827		2.25	1.96	2.11
Reserved	0.15	0.09	0.06	1,295,288	2.15	1.94	2.04	2.07
Overall				12,319,556	2.21	2.05	2.00	2.10
Establishments:								
Never reserved	0.65	0.71	0.69	1,623,620	4.21	4.37	4.38	4.33
Dereserved		0.03	0.06	76,767		4.01	4.44	4.29
Reserved	0.35	0.25	0.25	657,580	4.20	4.70	4.65	4.29
Overall				2,357,967	4.21	4.44	4.45	4.38

Source: Author's calculations based on NSSO survey data for 1995, 2001 and 2006 (CPN and ASICC product codes used to determine SSI reservation status; survey weights applied to ensure that estimates are representative of the population of informal manufacturing enterprises in India)

Table 3: SSI dereservation and district level outcomes in the informal sector (long differences, 1995-2001-2006)

	All enterprises		**OAMEs**		**Establishments**	
	Δ ln(Emp)	Δ ln(Ent)	Δ ln(Emp)	Δ ln(Ent)	Δ ln(Emp)	Δ ln(Ent)
Δ FrDeres (own district)	1.050	1.099	1.061	1.103	0.450	0.705
	(0.725)	(0.710)	(0.756)	(0.732)	(0.672)	(0.625)
_cons	-0.362**	-0.358***	-0.481***	-0.419***	0.055	-0.001
	(0.145)	(0.138)	(0.147)	(0.140)	(0.098)	(0.092)
N	836	836	833	833	788	788
R^2	0.006	0.008	0.006	0.007	0.001	0.002

Dependent variable: Δ ln(Emp) = change in natural logarithm of employment or Δ ln(Ent) = change in natural logarithm of number of enterprises
Standard errors, in brackets, are robust to heteroskedasticity. ***: Significant at 1% **: Significant at 5% *: Significant at 10%

Table 4: SSI dereservation and district level outcomes in the informal sector (long differences, 1995-2001-2006)

	All enterprises		**OAMEs**		**Establishments**	
	Δ ln(Emp)	Δ ln(Ent)	Δ ln(Emp)	Δ ln(Ent)	Δ ln(Emp)	Δ ln(Ent)
Δ FrDeres (own district)	1.487	1.417	1.400	1.352	0.844	1.244*
	(1.052)	(1.005)	(1.075)	(1.026)	(0.813)	(0.754)
Δ FrDeres (neighbours)	-1.270	-0.924	-0.986	-0.724	-1.113	-1.525
	(1.574)	(1.479)	(1.590)	(1.499)	(1.149)	(1.144)
_cons	-0.322**	-0.330**	-0.451***	-0.397***	0.089	0.046
	(0.144)	(0.138)	(0.148)	(0.141)	(0.107)	(0.098)
N	834	834	831	831	786	786
R^2	0.010	0.009	0.007	0.008	0.003	0.006

Dependent variable: Δ ln(Emp) = change in natural logarithm of employment or Δ ln(Ent) = change in natural logarithm of number of enterprises
Standard errors, in brackets, are robust to heteroskedasticity. ***: Significant at 1% **: Significant at 5% *: Significant at 10%

Table 5: SSI dereservation and employment in informal enterprises (1995-2006)

	OLS	OLS	OLS	OLS	Poisson
Still reserved	0.141***	0.104***	0.121***	0.116***	0.131***
	(0.016)	(0.020)	(0.018)	(0.018)	(0.019)
Dereserved	0.015	0.043	0.059	0.065	0.053
	(0.034)	(0.045)	(0.041)	(0.042)	(0.045)
Observations	140059	140059	140059	140059	140059
R^2	0.132	0.143	0.229	0.230	
Year FE	Yes	Yes	No	Yes	Yes
District FE	Yes	No	Yes	Yes	Yes
Industry FE	No	Yes	Yes	Yes	Yes

Dependent variable: natural logarithm of total number of persons engaged (total number of persons engaged) for OLS (Poisson) regression 'FE' denotes fixed effects. Standard errors, in brackets, are clustered at the district-industry level. ***: Significant at 1% **: Significant at 5% *: Significant at 10%

Table 6: SSI dereservation and employment in informal enterprises (1995-2006)

	OLS	OLS	OLS	OLS	Poisson
Still reserved	0.141***	0.102***	0.120***	0.115***	0.130***
	(0.016)	(0.020)	(0.018)	(0.018)	(0.019)
Dereserved 1997-1999	0.051	0.061	0.084*	0.091*	0.073
	(0.037)	(0.052)	(0.048)	(0.048)	(0.052)
Dereserved 2001-2005	-0.156***	-0.039	-0.048	-0.047	-0.031
	(0.047)	(0.055)	(0.046)	(0.047)	(0.052)
Observations	140059	140059	140059	140059	140059
R^2	0.133	0.143	0.230	0.230	
Year FE	Yes	Yes	No	Yes	Yes
District FE	Yes	No	Yes	Yes	Yes
Industry FE	No	Yes	Yes	Yes	Yes

Dependent variable: natural logarithm of total number of persons engaged (total number of persons engaged) for OLS (Poisson) regression 'FE' denotes fixed effects. Standard errors, in brackets, are clustered at the district-industry level. ***: Significant at 1% **: Significant at 5% *: Significant at 10%

Table 7: SSI dereservation and employment in informal enterprises (1995-2006, OAMEs and establishments)

	OLS			Poisson		
	All	OAMEs	Establishments	All	OAMEs	Establishments
Still reserved	0.116***	0.033	0.106***	0.131***	0.019	0.100***
	(0.018)	(0.023)	(0.014)	(0.019)	(0.028)	(0.014)
Dereserved	0.065	0.052	0.069**	0.053	0.029	0.061**
	(0.042)	(0.047)	(0.032)	(0.045)	(0.059)	(0.030)
Observations	140059	97849	42210	140059	97849	42210
R^2	0.230	0.201	0.274			
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
District FE	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes

Dependent variable: natural logarithm of total number of persons engaged (total number of persons engaged) for OLS (Poisson) regression 'FE' denotes fixed effects. Standard errors, in brackets, are clustered at the district-industry level. ***: Significant at 1% **: Significant at 5% *: Significant at 10%

Table 8: SSI dereservation and employment in informal enterprises (1995-2006, OAMEs and establishments)

	OLS			Poisson		
	All	OAMEs	Establishments	All	OAMEs	Establishments
Still reserved	0.115***	0.032	0.106***	0.130***	0.019	0.100***
	(0.018)	(0.023)	(0.014)	(0.019)	(0.028)	(0.014)
Dereserved 1997-1999	0.091*	0.077	0.074**	0.073	0.052	0.063*
	(0.048)	(0.054)	(0.037)	(0.052)	(0.066)	(0.037)
Dereserved 2001-2005	-0.047	-0.078*	0.060	-0.031	-0.120**	0.059
	(0.047)	(0.043)	(0.056)	(0.052)	(0.047)	(0.050)
Observations	140059	97849	42210	140059	97849	42210
R^2	0.230	0.201	0.274			
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
District FE	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes

Dependent variable: natural logarithm of total number of persons engaged (total number of persons engaged) for OLS (Poisson) regression 'FE' denotes fixed effects. Standard errors, in brackets, are clustered at the district-industry level. ***: Significant at 1% **: Significant at 5% *: Significant at 10%

Table 9: SSI dereservation and employment in informal enterprises – competition with formal firms (1995-2006)

ALL INFORMAL ENTERPRISES	Δ ln(Emp)		Δ ln(Ent)	
	I-F employment ratio 1995 **below** median	I-F employment ratio 1995 **above** median	I-F employment ratio 1995 **below** median	I-F employment ratio 1995 **above** median
Δ FrDeres (own district)	-0.091	1.978	0.106	1.818
	(0.609)	(1.389)	(0.609)	(1.329)
Δ FrDeres (neighbours)	-1.413	-1.155	-1.253	-0.744
	(0.892)	(2.116)	(0.891)	(1.993)
Observations	444	390	444	390
R^2	0.010	0.015	0.007	0.015

OAMEs	Δ ln(Emp)		Δ ln(Ent)	
	I-F employment ratio 1995 **below** median	I-F employment ratio 1995 **above** median	I-F employment ratio 1995 **below** median	I-F employment ratio 1995 **above** median
Δ FrDeres (own district)	-0.463	1.999	-0.196	1.843
	(0.842)	(1.411)	(0.803)	(1.347)
Δ FrDeres (neighbours)	-0.752	-1.031	-0.665	-0.701
	(1.183)	(2.118)	(1.151)	(1.998)
Observations	441	390	441	390

R^2	0.005	0.014	0.002	0.014

ESTABLISHMENTS	Δ ln(Emp)		Δ ln(Ent)	
	I-F employment ratio 1995 **below** median	I-F employment ratio 1995 **above** median	I-F employment ratio 1995 **below** median	I-F employment ratio 1995 **above** median
Δ FrDeres (own district)	-1.136	1.570	-0.920	2.046**
	(0.719)	(1.050)	(0.764)	(0.951)
Δ FrDeres (neighbours)	-0.627	-1.377	-0.629	-1.956
	(1.140)	(1.540)	(1.196)	(1.511)
Observations	425	361	425	361
R^2	0.008	0.007	0.006	0.014

Dependent variable: Δ ln(Emp) = change in natural logarithm of employment or Δ ln(Ent) = change in natural logarithm of number of enterprises 'I-F' denotes 'informal to formal' Standard errors, in brackets, are robust to heteroskedasticity. All regressions include a constant, which is not reported here for convenience. ***: Significant at 1% **: Significant at 5% *: Significant at 10%

Table 10: SSI dereservation and employment in establishments – competition with formal firms (1995-2006)

ESTABLISHMENTS ONLY	Δ ln(Ent)		Δ ln(Ent)	
	I-F employment ratio was **below** median in 1995 and had decreased further by 2006	All other districts	I-F employment ratio was **below** median in 1995 but had increased by 2006	All other districts
Δ FrDeres (own district)	-1.900	1.741**	0.061	1.434*
	(1.279)	(0.805)	(0.705)	(0.869)
Δ FrDeres (neighbours)	-0.223	-1.694	-0.753	-1.694
	(1.833)	(1.286)	(1.121)	(1.304)
Observations	182	604	212	574
R^2	0.014	0.011	0.001	0.007

Dependent variable: Δ ln(Ent) = change in natural logarithm of number of enterprises 'I-F' denotes 'informal to formal' Standard errors, in brackets, are robust to heteroskedasticity. All regressions include a constant, which is not reported here for convenience. ***: Significant at 1% **: Significant at 5% *: Significant at 10%

Table 11: SSI dereservation and employment in establishments – competition with formal firms in product markets dereserved up to 2005 (1995-2006)

ESTABLISHMENTS ONLY	Δ ln(Emp)		Δ ln(Ent)	
	1995 I-F employment ratio in product areas dereserved in 1997-2005 **below** median	1995 I-F employment ratio in product areas dereserved in 1997-2005 **above** median	1995 I-F employment ratio in product areas dereserved in 1997-2005 **below** median	1995 I-F employment ratio in product areas dereserved in 1997-2005 **above** median
Δ FrDeres (own district)	-1.842	1.495	-1.820	2.028**
	(1.336)	(1.000)	(1.276)	(0.917)
Δ FrDeres (neighbours)	-0.188	-1.709	-0.520	-2.129
	(1.605)	(1.551)	(1.571)	(1.506)
Observations	469	317	469	317
R^2	0.005	0.012	0.006	0.023

Dependent variable: Δ ln(Ent) = change in natural logarithm of number of enterprises 'I-F' denotes 'informal to formal' Standard errors, in brackets, are robust to heteroskedasticity. All regressions include a constant, which is not reported here for convenience. ***: Significant at 1% **: Significant at 5% *: Significant at 10%

Table 12: SSI dereservation and employment in establishments – competition with formal firms in product markets dereserved up to 2005 (1995-2006)

ESTABLISHMENTS ONLY	Δ ln(Ent)		Δ ln(Ent)	
	I-F employment ratio was **below** median in product areas dereserved in 1997-2005 and had decreased further by 2006	All other districts	I-F employment ratio was **below** median in product areas dereserved in 1997-2005 but had increased by 2006	All other districts
Δ FrDeres (own district)	0.154	1.286	-1.891	1.466*
	(2.580)	(0.788)	(2.601)	(0.785)
Δ FrDeres (neighbours)	-0.015	-1.683	4.293	-1.946
	(4.019)	(1.197)	(3.922)	(1.200)
Observations	147	639	137	649
R^2	0.000	0.007	0.010	0.010

Dependent variable: Δ ln(Ent) = change in natural logarithm of number of enterprises 'I-F' denotes 'informal to formal' Standard errors, in brackets, are robust to heteroskedasticity. All regressions include a constant, which is not reported here for convenience. ***: Significant at 1% **: Significant at 5% *: Significant at 10%

Table 13: SSI dereservation and employment in informal enterprises – competition with larger firms as a problem

	All enterprises (1995-2006)	'Competition from larger units' was not cited as being a problem (2001, 2006)	'Competition from larger units' **was** cited as being a problem (2001, 2006)
ALL INFORMAL ENTERPRISES			
Still reserved	0.116***	0.130***	0.217***
	(0.018)	(0.021)	(0.034)
Dereserved	0.065	0.067	0.036
	(0.042)	(0.054)	(0.037)
Observations	140059	64011	12267
R^2	0.230	0.277	0.392
OAMEs			
Still reserved	0.033	0.009	0.098***
	(0.023)	(0.026)	(0.034)
Dereserved	0.052	0.066	-0.005
	(0.047)	(0.061)	(0.043)
Observations	97849	40413	6214
R^2	0.201	0.232	0.413
ESTABLISHMENTS			
Still reserved	0.106***	0.134***	0.115***
	(0.014)	(0.017)	(0.028)
Dereserved	0.069**	0.047	0.164***
	(0.032)	(0.036)	(0.055)
Observations	42210	23598	6053
R^2	0.274	0.311	0.417
Year FE	Yes	Yes	Yes
District FE	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes

Dependent variable: natural logarithm of total number of persons engaged 'I-F' denotes 'informal to formal' Standard errors, in brackets, are robust to heteroskedasticity. All regressions include a constant, which is not reported here for convenience. ***: Significant at 1% **: Significant at 5% *: Significant at 10%

Table 14: SSI dereservation and employment in informal enterprises – linkages with other enterprises

ALL INFORMAL ENTERPRISES	All enterprises (1995-2006)	No input purchased from another enterprise/ contractor (2001, 2006)	At least some input purchased from another enterprise/ contractor (2001, 2006)	No output sold to another enterprise/ contractor (2001, 2006)	At least some output sold to another enterprise/ contractor (2001, 2006)
ALL INFORMAL ENTERPRISES					
Still reserved	0.116***	0.151***	0.150***	0.118***	0.163***
	(0.018)	(0.035)	(0.022)	(0.023)	(0.027)
Dereserved	0.065	0.170***	0.050	0.082*	0.033
	(0.042)	(0.055)	(0.043)	(0.042)	(0.072)
Observations	140059	18810	57468	42899	33379
R^2	0.230	0.376	0.284	0.251	0.382
OAMEs					
Still reserved	0.033	0.103***	-0.009	0.023	0.017
	(0.023)	(0.037)	(0.030)	(0.024)	(0.048)
Dereserved	0.052	0.156**	0.037	0.081*	0.010
	(0.047)	(0.063)	(0.051)	(0.046)	(0.094)
Observations	97849	14903	31724	30162	16465
R^2	0.201	0.335	0.243	0.260	0.321
ESTABLISHMENTS					
Still reserved	0.106***	0.059	0.133***	0.124***	0.111***
	(0.014)	(0.041)	(0.016)	(0.024)	(0.019)
Dereserved	0.069**	0.030	0.083**	0.074**	0.066
	(0.032)	(0.063)	(0.034)	(0.034)	(0.045)
Observations	42210	3907	25744	12737	16914
R^2	0.274	0.590	0.283	0.340	0.292

Year FE	Yes	Yes	Yes	Yes	Yes
District FE	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes

Dependent variable: natural logarithm of total number of persons engaged 'I-F' denotes 'informal to formal' Standard errors, in brackets, are robust to heteroskedasticity. All regressions include a constant, which is not reported here for convenience. ***: Significant at 1% **: Significant at 5% *: Significant at 10%