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The reservation laws in India and the misallocation of production factors [☆]

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ABSTRACT

The Small Scale Reservation Laws (SSRL) in India are a unique case of firm-level size restrictions. We quantify their aggregate productivity costs by use of a span-of-control model extended into a multisector setting. The reallocation of top managers away from the distorted sector partly offsets the effect of the distortions. We calibrate our model using plant level data from India. Lifting the SSRL increases output by 6.8% in manufacturing and 2% in the overall economy, and TFP by 2% and 0.75% respectively. While large, the costs of this size-dependent policy cannot account for the existing gap in manufacturing TFP between the US and India.

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1. Introduction

There are large differences in GDP per capita between countries and a big part of them can be attributed to differences in Total Factor Productivity (TFP).¹ While research has traditionally focused on understanding the determinants of knowledge production and diffusion in a context of a representative firm, a recent strand of literature has started to emphasize resource misallocation between sectors or between firms as a source of differences in aggregate TFP. One proposed explanation for the misallocation of productive resources has been the presence of government policies that impose barriers on the size of large firms or promote small ones. Often quoted examples of size-dependent policies are labor market regulations like in France, Italy or Spain, or the regulation in the retailing sector as in Germany, Japan or UK. [Guner et al. \(2008\)](#) and [Restuccia and Rogerson \(2008\)](#) argue that the potential impact of size-dependent policies is large. For instance, according to [Hsieh and Klenow \(2009\)](#), plant level distortions may account for up to 50 percent of the productivity gap between some developing economies like China and India, and the US. Because of this, there is a growing interest in quantifying the aggregate impact of specific size-dependent government policies.²

A unique case of restriction on size has been present in the Indian economy since the end of the 1960s. Several products in the manufacturing sector were reserved for production by small scale industries. A small scale industry is defined

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¹ See for instance [Hall and Jones \(1999\)](#), [Banerjee and Duflo \(2005\)](#) or [Caselli \(2005\)](#) among others.

² A few recent examples are [Guner et al. \(2006\)](#), [Gallipoli and Goyette \(2011\)](#), [Braguinsky et al. \(2011\)](#), [Garicano et al. \(2012\)](#), or [Gourio and Roys \(2014\)](#).

as a plant producing with a government-set upper bound in its capital stock. This implies that reserved goods cannot be produced by large firms. These laws receive the name of Small Scale Reservation Laws (SSRL). Several authors have attributed the poor economic performance of the manufacturing sector in India to the presence of these laws.³

In this paper we want to quantify the long run effects of the SSRL on aggregate productivity, aggregate output, and aggregate consumption of the Indian economy. To this end, we extend the span-of-control model by Lucas (1978) into a multisector setting and embed it into the neo-classical growth model.⁴ The span-of-control model is a tractable framework that generates an endogenous distribution of firm sizes, and hence, it is a useful tool to think about size-dependent policies. In the Lucas (1978) model a representative household has to choose which individuals are workers and which individuals are entrepreneurs. The SSRL distort this allocation by limiting the scale of production of the best entrepreneurs and by diminishing the overall demand for labor, in which equilibrium gives rise to a larger mass of smaller and less efficient entrepreneurs. We generalize the model such that it contains three sectors: a first manufacturing sub-sector where the SSRL apply, a second manufacturing sub-sector with no distortions, and a third sector for the rest of the economy where for simplicity there is no firm size problem.

Our main theoretical contribution is to model the occupational choice within this framework: in a multisector model the representative household has to choose into which sector to send its entrepreneurs, as well as who becomes an entrepreneur and who becomes a worker. The multisector model is important for two reasons. First, reassignment of managers between sectors dampens the effect of distortions: top managers can operate in the unrestricted sector where they do not see their scale of production reduced, while worse managers operate in the restricted sector to benefit from higher prices. We show that when size-dependent distortions are not too severe and apply to a small enough sector of the economy, reassignment of managers between sectors may leave the aggregate allocations of the economy unchanged. Hence, since many size-dependent policies in different countries affect only a fraction of the economy, quantifying the productivity loss of such distortions with a one-sector model may give misleading answers.⁵ Second, as emphasized by Schmitz (2001), when economic distortions are present in a sector producing investment goods, then the whole economy is affected through a decrease in capital accumulation. Since investment goods are more intensive in manufactures than consumption goods, the SSRL have the potential to have economy-wide effects despite applying to a relatively small subset of goods.

We fully calibrate our model to data from India for 2001. To do so, we combine two different plant-level data sets to build a non-truncated distribution of firm sizes for India, which turns out to be much more tilted towards small firms than previously thought. In our calibration (a) we measure directly the severity of the distortion; (b) we measure the actual size of the distorted sector: 14% of manufacturing and 4% of total GDP; and (c) we back out the underlying distribution of managerial talent and the degree of diminishing returns to scale from the distribution of firm sizes in India.

Despite the small size of the restricted sector, the effects on productivity are substantial. We find that lifting the SSRL would increase output per worker by 2% in the whole economy, by 6.8% in manufacturing, and by 123% within the set of reserved goods. The causes of these productivity gains are multiple. First, there is the direct effect of smaller capital ratios in the production of reserved goods. Second, under the SSRL there are too many small firms in equilibrium: lifting the constraint would imply a fall in the number of establishments in manufacturing sector of 12%, with the average establishment size increasing by 10%. And third, under the SSRL there is too little capital in all sectors of the economy. This is because capital goods are intensive in manufactures, and the price of the manufactured goods is too high in the restricted economy. In particular, we measure the share of manufactures in investment goods to be 71%, while it is only 13% in consumption goods. We find that lifting the constraint would increase the steady state capital-to-labor ratio by almost 3% for the whole economy.

The productivity gains of lifting the SSRL are partly due to the better allocation of production factors and partly due to the capital deepening that arises as a response. To quantify the importance of each, we measure Total Factor Productivity (TFP) as it is typically done in development accounting exercises. We find that lifting the SSRL would increase the TFP for the overall economy by 0.75% and the TFP for manufacturing by 2%. Therefore, 71% of the productivity gains in manufacturing come from capital deepening and not from measured TFP, while for the total economy this is 62%. Hsieh and Klenow (2009) argue that, if capital and labor were reallocated efficiently, the TFP gains in India would be around 50%. Hence, we conclude that, while the SSRL are an important drag for growth in India, other distortions need to be identified to account for the small TFP in India.

The remaining of the paper is organized as follows. In Section 2 we describe the main characteristics of the SSRL. In Sections 3 we present the model economy without size restrictions, and in Section 4 we introduce the SSRL and discuss the different equilibria that may arise. Then, in Section 5 we calibrate our model economy and in Section 6 we present and discuss our quantitative results. Finally, Section 7 concludes.

³ See among others Lewis (2005), Mohan (2002), Morris et al. (2001) and Unel (2003).

⁴ We follow Erosa (2001), which is the first article to embed the span-of-control model of occupational choice into a well defined intertemporal consumption and saving problem, and Guner et al. (2008), who use it to measure the potential costs of size-dependent policies.

⁵ Allowing for managerial skills to be transferable across sectors is key. Guner et al. (2006) also model a size distortion affecting one sub-sector of the economy. However, they assume that managers cannot switch between sectors. Direct empirical evidence of the effects of SSRL shows that reallocation of managers between sectors matters. See Section 6.5 for details.

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