



Private Enterprise Development in Low-Income Countries

The Allocative Efficiency of Land in India

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This study of misallocation of inputs and output in Indian manufacturing reveals that, although more productive establishments in India tend to produce more output, factors of production are grossly misallocated.

Introduction

A significant development in economic research on growth is the acknowledgement that the misallocation of resources plays an important role in explaining productivity and income differences across countries¹. Misallocation refers to the fact that resources – capital, labour or other inputs – are not allocated to where they would yield the highest economic return. At the level of a country, misallocation means that for any given amount of capital and labour, the aggregate output is not maximised. This effect could be very large, and it has been estimated that misallocation could explain 40% of the income difference between India and the US, for instance².

In this context, this project takes a closer look at misallocation in India. Using plant level data from 1989 to 2010, we seek to quantify the extent, the consequences and the determinants of misallocation. Our work first distils a number of stylised facts about misallocation in India, and then quantifies the implications and determinants of factor and output misallocation. Misallocation of land plays a particularly important role in India, and we show how it is linked to the growing evidence on credit constraints for Indian manufacturing.

Measuring Misallocation

Firm heterogeneity is a well-documented fact in economic literature, and is especially prevalent in developing countries. The productivity of the firm at the top decile, for instance, can be five times as high as that of the firm at the bottom decile in countries such as India or China. This distribution of firm productivity within a given industry, even when narrowly defined, is not necessarily inefficient. What matters most for efficiency at the industry level is the distribution of factors across firms of varying productivity, that is, more productive firms should use more factors and produce more. Otherwise, the overall output could potentially be enhanced by some reallocation of the factors of production from a less productive to a more productive firm.

Thus, the ranking of firms by factor usage should reflect their relative productivity ranking, and, under an optimal³ allocation of factors, these should be perfectly correlated. Conversely, a less-than-perfect correlation between productivity and factor usage indicates a misallocation of factors across firms. The lower this correlation between productivity and factor usage, the greater is the extent of misallocation of factors of production. Building on this idea, we construct a measure of misallocation along the lines developed by Olley and Pakes (1996) to document the extent, determinants and consequences of misallocation in this study.

¹ Charles Jones, 2011.

² Hsieh and Klenow, 2009.

³ Optimality, in economics, refers to a state of allocation of resources in which it is impossible to make any one individual better off without making at least one individual worse off.



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Some facts about misallocation in Indian manufacturing

Misallocation in Output and Value Added: There are large misallocations in Indian manufacturing. Misallocation is most prominent when considering the organised and unorganised sectors independently and less so when the two sectors are combined. This is not surprising given the high concentration of output in the organised sector and its more productive establishments, which means that there is overall little misallocation in output between the organised and unorganised sectors.

Spatial Variation in Misallocation: There is considerable variation of misallocation across districts. The standard deviations for the indices of misallocation for output and value added are two-thirds of their levels for the full manufacturing sector. The differences in misallocation within India are even larger than the differences across countries, a fact not previously documented in the literature.

Misallocation in Inputs and Output: There is extreme misallocation of individual factors of production, especially for land, buildings, and labour. These input misallocations are worse than the levels of misallocation of output and value added. While more productive establishments in India manage to produce more than less productive ones, allocations of some factors of production are barely better than random. Given the large variation in factor misallocation across districts, this actually indicates that there are many districts in India where factor allocation is worse than random.

Decomposing Misallocation on gender and informality dimensions

Do Female-Owned Enterprises Suffer from Higher Misallocation? There is more output misallocation between groups of male- vs. female-owned establishments than within groups. The misallocation of output comes from the fact that female-owned establishments have extremely low productivity compared to their male-owned counterparts and, yet, manage to have access to more inputs. Given their much lower productivity, we would expect a set of representative female-owned establishments to produce only about 6.5% of total output. However, female-owned establishments produce 8% of total output because there is less misallocation among them relative to male-owned establishments. Overall, the effect of female ownership on misallocation is ambiguous. On the one hand, they receive more inputs for their level of productivity and thus contribute to higher misallocation, but on the other hand, misallocation within female-owned establishments is lower, which contributes to lower extent of misallocation.

Is Misallocation Higher in the Informal sector? Although output misallocation between formal and informal sectors is indicative of more misallocation vis-à-vis within each sector, they both are of roughly similar magnitude. For misallocation in factors of production, a different set of patterns holds as within-sector misallocation, and it is much worse than between-sector misallocation. Overall, the misallocation indices for factors are close to zero. This indicates a complete lack of correlation between factor use and productivity. On the other hand, factors are allocated much more efficiently between sectors. Establishments in the organised sector, which are immensely more productive than those in the unorganised sector, have access to a much larger quantity of factors of production.

Explaining Misallocation: Some Policy Aspects

Evaluating the impact of policies provides a further validation of the measures of misallocation that we developed in this project. Also, this gives support to the idea that policies can have large effects on misallocation, and that some policies may take very long to show their impact. Below we discuss some of the policy evaluations covered in this project.

Repeal of Urban Land Ceiling Regulation Act (ULCRA): The ULCRA was originally enacted in 1976 with the objective to impose limits on the size of vacant land held by any individual. However, there is



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little empirical evidence that such objectives were fulfilled. To the contrary, the law artificially restricted the supply of urban land, for instance, by freezing large areas of land in legal dispute, bidding up land prices, and encouraging corruption. States that repealed ULCRA early on are associated with a stronger decline in land and building misallocation during 2000 to 2010, equivalent to an increase in output per worker of about 3.7%, compared to states that were slow to repeal ULCRA. Additionally, we also find that ULCRA is associated with reduced misallocation in value added.

Changes in Stamp Duties: High stamp duties impose greater compliance costs on taxpayers and lead to widespread tax avoidance through under-reporting. Our results show that an increase in stamp duties at the state level is associated with rising misallocation for land and buildings as well as value added during the period of study. To provide a sense of magnitude, a one standard-deviation increase in the change in stamp duties is associated with a one-tenth of a standard-deviation increase in misallocation of land and buildings.

Land and Labour Reforms: Land reforms seemed to have reduced misallocation in overall manufacturing. On the contrary, our work suggests that stricter pro-worker regulations led to a worse misallocation for overall manufacturing, mostly by distorting choices for sectors. When we distinguish between the organised and the unorganised sector, the effect of labour reforms, for instance, becomes insignificant. This is consistent with the view that labour reforms pushed many establishments into the unorganised (informal) sector and have been generally harmful to industrial development in India.

Trade and Industrial Policy: When looking at changes in misallocation over a longer time horizon (1989-2005), we find that FDI liberalisation is associated with a strong decline in misallocation while the impact of tariff liberalisation is, at best, insignificant. Finally, our results suggest that delicensing is associated with a modest and insignificant negative effect on misallocation.

Consequences of Misallocation

Do factor misallocations breed output and value added misallocation? In general, all forms of factor misallocation contribute to the misallocation of value added. Land and building misallocation is particularly important, with a one standard-deviation (SD) increase in that factor's misallocation corresponding to a 0.6 SD increase in value-added misallocation, compared to 0.4 for labour misallocation. The result that the misallocation in land and buildings matters more (for misallocation in value added) compared to labour or capital is very striking because the land and buildings account for a small fraction of final output and value added, yet they play a disproportionate role in explaining the misallocation of final output. Our findings regarding the dynamic implication of factor misallocation suggest that misallocation in inputs today may worsen the misallocation of output or value added in the future.

Does misallocation impede labour productivity? For overall manufacturing, the impact of land and building misallocation on output per worker is very large; one SD increase in the misallocation of land and buildings represents about a 25% reduction in output per worker. By contrast, there is no connection to the misallocation of employment, and the impact of the misallocation of other fixed assets is negative and statistically significant, but extremely small.

Does misallocation in land markets constrain allocative efficiency in financial market? Our study is the first to examine the impact of misallocation in land and buildings and labour markets on several outcomes in financial access. We focus attention on the hypothesis that land misallocation might be an important determinant of financial misallocation, for instance due to its role as collateral against loans. Using district-industry variations, we find evidence to support this hypothesis (although we do not observe a total reduction in the intensity of financial loans or for those being given to new entrants). This conclusion is robust to different empirical approaches, to using alternative measures of financial misallocation, and to modelling the combined sectoral misallocation in land and buildings. By contrast,



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our study finds that misallocation in labour inputs does not significantly impact the allocative efficiency of financial loans in the organised sector.

Is input misallocation higher in manufacturing or services? Although the relative importance of factors differs in services relative to manufacturing, we find strong evidence that the misallocation of factors has a large effect on the misallocation of output and output per worker in the services sector. However, the misallocation of land and buildings plays at best a minor role in services. On the other hand, in services it is the misallocation of employment that appears to be the main determinant of output misallocation. Thus, the functioning of the land market is fundamental for manufacturing and, perhaps, secondary for services. In light of this, we find that policies that were found to increase misallocation in manufacturing had, if anything, the opposite effect on services.

Moving Forward.....

Studying misallocation in factors of production and output offers insights into the policies that could be used to enhance productivity. It also offers an opportunity to study how such misallocations spill over to other markets. An upcoming project will consider linkages between the extent of misallocation in land markets and access to finance in the unorganised sector and that in the services sector.