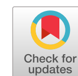
Journal of International Economics 111 (2018) 159–176

Contents lists available at ScienceDirect

Journal of International Economics

journal homepage: www.elsevier.com/locate/jie

Input-trade liberalization and the demand for managers: Evidence from India☆



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ARTICLE INFO

Article history:
Received 21 April 2017
Received in revised form 8 January 2018
Accepted 10 January 2018
Available online xxxx

JEL classification:
F66
F14
M12

Keywords:
Input-trade liberalization
Input tariffs
Demand for managers
Firm organization

ABSTRACT

Can input-trade liberalization increase the demand for managers? Imported inputs are an important source of technology inflows. Previous research on the implications of imported inputs overlooked their potential effect on the demand for managing the new incoming knowledge. Adopting the case of India, this paper presents a first empirical attempt to fill this gap. Using detailed firm-level data that uniquely distinguishes between the compensations of managers and non-managers, and exploiting the exogenous nature of India's Eight-Plan trade reform, we investigate the potential causal link between input-trade liberalization and the demand for managers relative to non-managers. We find that a decrease in input tariffs increases the relative demand for managers, primarily in domestic firms that use the imported inputs to produce intermediate goods. Specifically, a 10% drop in input tariffs induces, on average, a 1–1.5% increase in the compensation share of managers, manifested via increases in both their number as well as average wages and bonuses. These patterns are: (i) observed across the firms' size distribution; (ii) applicable for both exporting and non-exporting firms; (iii) stronger in family-run firms that operate under flexible labor market regulations; (iv) relatively more dominant in the short-run. In addition, we show that unlike changes in input tariffs, import competition does not affect the relative demand for managers.

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1. Introduction

Can input-trade liberalization increase the demand for managers? Imported inputs make an important source of technology inflows, especially in developing economies which import significant portions of their equipment.[1] These, in turn, may lead to changes in firms' production technologies, requiring labor adjustments in terms of training, and problem solving. Previous research show that access to cheaper and previously unavailable inputs has important implications for productivity and output.[2] This literature, however, overlooked the potential effects of the imported inputs on the demand for managing the new incoming knowledge. This may be especially prominent in light of the recently emerging theoretical literature on the effects of trade liberalization on firm managerial practices, quality, and hierarchical structure,[3] and its importance to

☆ We thank Himanshu, Richard Baldwin, Subhayu Bandyopadhyay, Nicholas Bloom, Dave Donaldson, Carsten Eckel, Joseph Flavian Gomes, Beata Javorcik, Amit Khandelwal, Krisztina Kis-Katos, Dirk Krueger, Manoj Pant, Saikat Sinha Roy, and Anthony Venables, for their detailed and insightful comments. We also thank the seminar participants at BI Norwegian Business School, Geneva Trade and Development Workshop, Hebrew University of Jerusalem, Indira Gandhi Institute of Development Research at Mumbai, Jadavpur University Kolkata, Jawaharlal Nehru University, National Council of Applied Economic Research at New Delhi, Norwegian School of Economics and Business Administration at Bergen, South Asian University, University of Gottingen, University of Oxford, World Bank – Trade and Competitiveness Department, the 2015 European Trade Study Group Conference, the 2015 Nordic Conference on Development Economics, and the 2016 XXVIth Annual Conference on Contemporary issues in Development, for the helpful discussions. We are greatly indebted to Reshad Ahsan, Hunt Allcott, and Sangeeta Ghosh for their generously sharing data on various measures of the Indian manufacturing sector.

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[1] These patterns are documented in various studies including Caselli and Wilson (2004), Eaton and Kortum (2001), and Raveh and Reshef (2016). This was especially prominent during the 1990s, a period relevant to our study, during which several developing economies imported the vast majority of their capital equipment. Importantly, these imports were made from a small number of industrialized economies.

[2] See Amiti and Konings (2007), Bas (2012), Bas et al. (2016), Bas and Strauss-Kahn (2014), Bas and Strauss-Kahn (2015), Goldberg et al. (2010), Halpern et al. (2015), Kasahara and Lapham (2013), and Topalova and Khandelwal (2011), among others.

[3] Models that present associations between trade liberalization and firm organization include Caliendo and Rossi-Hansberg (2012), Ma (2015), Marin and Verdier (2003), Marin and Verdier (2008), and Marin and Verdier (2014).

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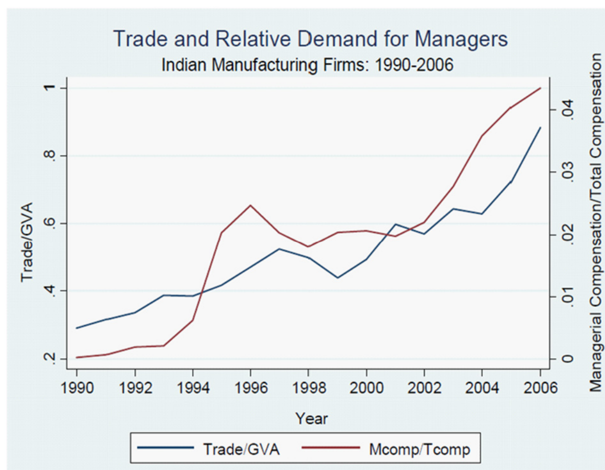

Fig. 1. Trade and the relative demand for managers.
Notes: Figure presents the average GVA share of trade (exports plus imports) and the average compensation share of managers, 1990–2006 ($\rho = 0.85$).

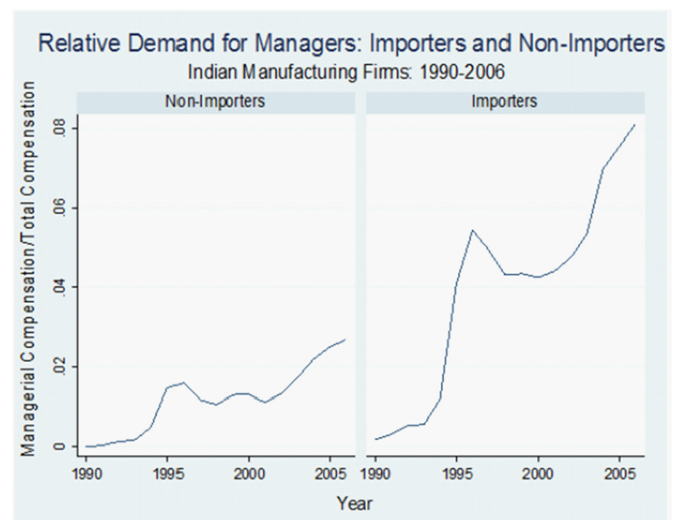

Fig. 2. Relative demand for managers, importers and non-importers, 1990–2006.
Notes: Figure presents the average compensation share of managers' for importing and non-importing firms, 1990–2006.

productivity and performance,[4] including in developing economies.[5] Examining whether imported inputs are associated with managerial incentives may, thus, shed light on first-order issues such as the impact of trade policies on firms' growth and productivity.[6] Adopting the case of India, this paper makes a first empirical attempt to fill this gap.

Using a rich data set of Indian manufacturing firms that uniquely distinguishes between the compensations of managers and non-managers,[7] we explore the impact of plausibly exogenous changes in input tariffs on the demand for managers relative to non-managers. The emphasis on the *relative* demand of managers is central in our analysis. Imported-inputs-driven changes in the production process, via the new incoming technologies, may affect the demand for both managers and non-managers. For instance, considering this along the lines of Caliendo and Rossi-Hansberg (2012) and Garicano (2000), firms that face a more complex production technology may upgrade the skills of their production workers (non-managers), yet may otherwise economize on the problem solving process by increasing the quality and number of specialist problem solvers (managers), depending on which option minimizes their costs. Hence, approaching this empirically requires examining the complementarity (or substitutability) of imported inputs and managers relative to that of imported inputs and non-managers.

We start by presenting the link between trade and the relative demand for managers in our sample of Indian firms, for the period of 1990–2006. This is plotted in Fig. 1.[8] Both measures have been increasing steadily throughout the period, exhibiting a correlation of 0.85. The surge in trade is a consequence of the Indian 1990s trade reform which we discuss further below. The increase in the compensation share of managers is what we aim to investigate.[9] We seek to understand whether there is indeed a systematic association between the two. Fig. 2 points at a possible direction. Dividing the relative demand measure to importing and non-importing firms indicates that the surge is almost an exclusive feature of the former types. This intrigues undertaking a more careful examination of the association between imports and the relative demand for managers.

To do so, we first motivate the analysis via a simple analytical framework, along the lines of Berman et al. (1994). This yields a reduced form equation that links between imports and the relative demand for managers, which we follow in the empirical analysis. In a preliminary examination, testing trade measures directly via conditional correlations, we find that consistent with Fig. 2, it is only imports – and more specifically those of intermediate inputs – that are positively associated with the relative demand for managers. This then refutes the possibility of observing a simple administrative relabeling (an option we elaborate on later), and paves the way to considering tariffs in an attempt to provide causal inferences.

To establish a causal link, we exploit a quasi-natural experiment, India's Eight-Plan trade reform. The details of this reform, and its merits in the context of our case, are outlined separately in the following section. The key point is that this reform provides plausibly exogenous changes in industry-level input and output tariffs, with ample cross-industry variation, which we use as the basis of our identification strategy.[10] We find a remarkably persistent and economically meaningful negative effect that, consistent with the findings in the initial analysis, is entirely driven by input tariffs. The relative dominance of input, over output, tariffs suggests that this effect is manifested via changes in the production side rather than through a product market (import) competition. In

[4] See e.g. Bloom et al. (2013a). We discuss this literature in more detail in a later sub-section.
[5] Bloom et al. (2013b) point at the prominence of this in the case of India.
[6] See Goldberg and Pavcnik (2016) on the need for analyses that examine the effects of trade policies on firm and individual outcomes.
[7] We define managers as any workers who manage at least one other worker (or who is the sole worker in the firm), with non-managers accounting for the remaining balance. We discuss this in further detail in the empirical part.
[8] The figure presents yearly average (over all firms), 1990–2006, of the share of total trade in gross value added and the share of managerial compensation in total labor compensation. We proxy for the relative demand for managers using the latter. We discuss both measures in more detail in the empirical part.
[9] Notably, the observed steep increase in managerial compensation over the given period is not a unique feature of the Indian economy, and is also observed elsewhere. Data from S&P Capital IQ's Compustat ExecuComp Database indicates that the median annual compensation of CEOs of firms included in the S&P 500 Index grew from approximately 3$ million in 1992 to almost 10$ million in 2006 (in 2011 prices), hence increasing by a factor of three.
[10] By which we, in effect, follow the empirical methodology, and data sources of previous studies that examined the effects of this trade reform on the Indian economy, including Ahsan (2013), Ahsan and Mitra (2014), Bas and Berthou (2017), De Loecker et al. (2016), Goldberg et al. (2010), Hasan et al. (2012), and Topalova and Khandelwal (2011).

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