Import Competition, Labour Regulations and Outsourcing*

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Abstract

Using a novel dataset on outsourcing of manufacturing jobs by Indian firms and exploiting rising imports from China after 2001, we explore the relationship between import competition and firm outsourcing. We find that greater import competition is associated with a significant increase in outsourcing of manufacturing jobs by Indian firms. This increase comes from firms located in states with inflexible labour regulations, highlighting that firms operating in the formal sector in rigid labour regimes seek to cut costs by outsourcing to smaller, informal firms. Indeed, we see a corresponding increase in the likelihood of sub-contracting among firms in the informal sector. Outsourcing formal firms have lower costs, charge lower prices and expand in response to greater import competition. Additionally, we find that the increase in outsourcing activity is driven by firms across the size distribution, firms producing final goods, non-exporters, and multi-product firms. Overall, our study highlights the role of international trade and its interaction with labour market institutions in determining the fragmentation of production.

JEL classifications: F1, F12, F14, F16, J46

Keywords: Chinese Import Competition, Outsourcing of Manufacturing Jobs, States with Inflexible Labour Laws, Firm Organization

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1 Introduction

"We live in an age of outsourcing" (Grossman and Helpman, 2005).

Fragmentation of production activity has received extensive attention in the literature in recent years. Studies have examined trade (Fennestra, 1998; Grossman and Helpman, 2005; Stiebale and Vencappa, 2018), potential for holdup problems (Grossman and Helpman, 2002), competition (Aghion et al., 2006), prices (Legros and Newman, 2013; Alfaro et al., 2016), offshoring (Bernard et al., 2018) and contractibility (Alfaro et al., 2019) as determinants of vertical integration by firms. More recently, Fort (2017) shows that a firm's investment in communication technology can be associated with greater fragmentation of production and more domestic, relative to foreign outsourcing by U.S. firms.

In this paper, we use new and unique data on actual expenditure on outsourcing of manufacturing jobs by Indian firms to analyze outsourcing as a function of (i) international trade; particularly, import competition in the domestic market, and (ii) the interaction between import competition and labour market regulation. We find strong and robust evidence that in response to the surge in import competition from China post accession to the WTO in 2001, Indian firms engage in greater outsourcing of manufacturing jobs. A 10 percentage point increase in Chinese import penetration is associated with a 0.24–0.50 percentage point increase in the share of outsourcing expenditure in total expenses. Importantly, this increase in outsourcing is concentrated among firms located in states with inflexible labour regulation that raises the implicit cost of employing labour in the formal sector. We find supportive evidence from the informal sector, where labour laws do not apply. An increase in Chinese import penetration is assocaited with an increase in the likelihood that enterprises in the informal manufacturing sector sell their final product to another firm or sub-contractor.

A key contribution of our work is to utilize unique data on a variable at the firm level which, we believe, appropriately captures outsourcing activity. Previous studies analyzing the organization of firms capture vertical integration using industry level input-output tables to calculate the proportion of inputs into production produced within the firm. Such industry level information is subject to caveats. First, the international trade literature has documented substantial heterogeneity across firms within industries on the composition and quality of inputs used in production. Industry level input-output tables may fail to capture (DeLoecker et al., 2016) this heterogeneity. Second, firms may both produce and outsource input production, as noted by Bernard et al. (2018).

We argue that our measure of firm outsourcing activity overcomes these concerns by directly exploiting data on outsourcing expenditure by firms explicitly on manufacturing jobs. Our variable,

defined as total expenses on outsourcing of manufacturing jobs, captures any expenses incurred by firms to have their manufacturing requirements fulfilled from outside parties. In particular, it includes labour, fabrication, processing, machining, fettling and conversion charges, contracted production and sub-contracted production. Hence, our measure includes diverse aspects of outsourcing expenditure related to manufacturing. We use this variable as a share of total firm expenses as our outcome of interest. [1] Our definition of outsourcing is closest in spirit to outsourcing as defined by Grossman and Helpman (2005): it is more than just the purchase of raw materials and intermediate goods and indicates a bilateral relationship(s), where the partner makes a relationship-specific investment to produce goods that fit the firm's particular needs. For example, firms may sub-contract a range of activities from product design to production.

Figure 1 presents the percentage of firms involved in outsourcing of manufacturing jobs for the years 1995-2007. The panel on the left plots aggregate outsourcing, while the panel on the right divides states into those with flexible versus inflexible labour regulation according to Besley and Burgess (2004), Gupta et al. (2008). Overall, we see a steady and significant increase in the percentage of firms outsourcing manufacturing jobs over the period 1995 through 2007. In 1995, the percentage of firms involved in outsourcing was around 3 percent, which increased to 28 percent in 2007; a nine-fold jump. Interestingly, the right panel shows that the percentage of firms involved in outsourcing is not homogenous across the two types of states categorized according to flexibility of labour regulation. The percentage of firms involved in outsourcing of manufacturing jobs in states with inflexible labour regulation is always greater, and the difference grows significantly over time, especially after 2000/2001. For example, the difference was about 1-2 percentage points between 1995 and 2000, and this increased to 7 percentage points in 2007; around 32 percent (less than 25 percent) of firms in states with inflexible (flexible) labour regulation report outsourcing manufacturing jobs.

To study the role of international trade in driving this observed significant change in the way firms organize production, we exploit the increase in import competition faced by Indian firms from China post China's accession to the WTO as a quasi-natural experiment.[2] China's membership to the WTO in 2001 was one of the most important episodes of world trade in the last two decades. China's export performance post-1990, and more so since 2001, has been spectacular. Its exports grew from US$ 62 billion to US$ 1.2 trillion between 1990 and 2007; an average of around 20%

[1] We also use (i) outsourcing expenses on manufacturing activity as a share of GVA of a firm, (ii) percentage of firms involved in outsourcing, and (iii) a binary indicator for whether a firm outsources or not. Results remain qualitatively robust to the type of outcome.

[2] There is precedence in the literature to treat the sharp rise in China's share in total imports of countries (both developed and developing) due to its accession to the WTO in 2001 as a quasi-natural experiment (see, Lu and Yu, 2015; Bloom et al., 2016).

per year (Iacovone et al., 2013). In the same period, China's share of GDP more than doubled, from 15.9 to 34.9%. Building upon this very strong export performance, China became the world's largest exporter in 2009, and the second largest economy in 2010 (Iacovone et al., 2013). Naturally, this meteoric rise of China to the status of a global exporting giant, particularly in terms of manufactured goods, has prompted economists to examine the effects of import competition from low-wage countries, specifically China, on various firm-, industry- and worker-level outcomes in developed countries (Bernard et al., 2006; Liu, 2010; Autor et al., 2013; Mion and Zhu, 2013; Martin and Meajean, 2014; Bloom et al., 2016), but to a far lesser extent in developing countries (see for example, Iacavone et al., 2013 and Utar and Ruiz, 2013 for Mexico and Medina, 2017 for Peru).

We argue that using Chinese competition as a proxy for an exogenous increase in product market competition is valid for the following reasons. First, China is currently India's largest trading partner. **Figure 2** plots Indian imports from China between 1995 and 2007. The share of manufacturing imports from China as a share of total manufacturing imports skyrocketed from less than 5 percent in 1995 to almost 25 percent in 2007 - an increase of 400 percent. The figure shows that this steep acceleration is particularly visible after China's accession to the WTO in 2001. A similar pattern is observed for the import penetration ratio, which increased from less than 1 percent to almost 8 percent in the same time period (a 700 percent increase).[3]

Table 1 compares India's trade with China and other large trading partners at three different points in time: 1992, 2001 and 2007. It shows that China accounted for the largest increase in India's imports relative to other countries and major regions of the world. India's share of Chinese imports grew by around 9000% between 1992 and 2007.[4] In comparison, imports from ASEAN (another large trading partner), the US and the EU increased by 888%, 230% and 132%, respectively. Compared to Mexico[5], where the Chinese share of manufacturing imports increased by a factor of 8, in the case of India it increased by a factor greater than 90 over the same time period (1992–2007).[6] Though there has been a significant improvement in India's exports to China, the rate of increase is far lower - close to one-third of imports. In the process, China became India's

[3] The Chinese import penetration ratio is calculated as the share of Chinese imports in an industry in total domestic production, including imports and exports. See **Appendix A** for a definition of key variables.

[4] Note that the percentage increase in Chinese imports in the case of India is almost 9 times higher when compared to the US during the same time period; the percentage increase for the US was 1156 during 1991–2007 (Autor et al., 2013).

[5] A large number of studies exploring the impact of Chinese import competition on developing countries focus on Mexico (Iacovone et al., 2013; Utar and Torres-Ruiz, 2013).

[6] We present Chinese imports by India as a share of Indian imports from the world across manufacturing industries in **Table 17** (**Appendix B**). Imports from China are largest in labor-intensive industries like textiles and wood and in machinery and transport equipment.

largest trading partner, with a total trade of US$ 84.44 billion in 2014-15. India's trade deficit with China also ballooned nine-fold over the past decade to US$ 52.7 billion in 2015-16 (Export-Import Bank of India, 2016).[7]

Second, the growth in Chinese exports to India as a result of accession to the WTO is a result of China's internal reforms to a market-oriented economy. This transition to a market economy from a centrally planned economy resulted in significant productivity growth for Chinese firms, which was further bolstered due to a reduction in trade costs as a result of its accession to the WTO. We treat this as a unilateral trade shock and not a mutual trade expansion. [8]

We conceptualize a framework where a monopolistically competitive firm producing a differentiated product can produce its inputs either in-house using labour at an exogenous wage, or incur the fixed cost of outsourcing the production of its inputs at a lower marginal cost. An increase in import competition increases the elasticity of demand for individual varieties as more substitutes are now available to the consumer. This induces a firm to lower its price and expand output, which can increase its gains from lowering the marginal cost by outsourcing input production. An increase in import competition thereby incentivizes firms to incur the fixed cost of outsourcing and outsource a greater share of production. We further posit that the gain to firms from outsourcing are particularly large when rigid labour laws act as a tax on employing labour in-house in the formal sector. Greater import competition is therefore associated with more outsourcing in regimes with rigid labour laws, relative to more flexible labour regimes. Focusing on a federal democracy like India as a case also allows us to delve into the role played by labour regulation in determining the relationship between trade and outsourcing. We are able to exploit the variation in labour regimes that yields differential labour costs across Indian states, while keeping other institutional factors constant (Besley and Burgess, 2004).

We have three sets of results: first, an increase in Chinese import penetration significantly increases the likelihood of outsourcing by manufacturing firms. Our benchmark finding is consistent with the idea that import competition, by increasing the elasticity of demand that firms face, induces them to lower price and expand output, thereby increasing the gains from reducing marginal cost

[7] A recently released research document from the Office of the Economic Advisor, Ministry of Commerce and Industry, Government of India highlights a significant surge in the growth of the Chinese import share, especially in the post-Chinese WTO membership period. The study uses 268 items for the period of 2004-05 to 2010-11 to find that while the import index from all countries for these 268 items grew by 1773.1%, in case of imports from China, the index increased by 4618.4%. Additionally, the share of imports of these 268 items from China in total imports jumped to 41.3% in 2010-11 from 25.3% in 2005-06 (Singh, 2012).

[8] This approach requires that the import demand shock to India, especially after 2001, was not the primary cause of China's export surge. While it seems plausible that China's export growth to India during the 2000s was a result of China's internal supply shocks, we use imports from China by other developing countries (Brazil, Mexico, Indonesia and Malaysia) as an instrument for Chinese imports to India. All approaches yield similar results.

by outsourcing. Indeed, we find empirical support for these mechanisms.

Second, this increase in outsourcing jobs is mitigated in Indian states with flexible (pro-employer) labour laws, suggesting that import competition increases outsourcing relatively more in states with rigid labour regulation. Our finding is consistent with the idea that inflexible labour laws magnify the positive relationship between import competition and outsourcing activity by acting as a tax on labour use in the formal sector. This result presents a new channel through which trade can have a differential affect on the outsourcing activities of firms. We conduct a placebo test, where we examine outsourcing of profession jobs (where labour regulations do not apply) as our outcome of interest. We find no evidence for a moderating role of labour regulation in determining the relationship between import competition and outsourcing of professional jobs. All results are robust to controlling for a battery of firm characteristics, industry level import tariffs, availability of cheaper intermediate inputs from China and export market competition.

Third, we employ data on outsourcing activity by manufacturing enterprises in the Indian informal sector. Like many developing economies, India has a large informal sector consisting of enterprises employing less than ten workers. Firms in the informal sector face lower labour costs because labour laws are not enforced. We find that greater import competition is associated with an increase in the likelihood of informal enterprises selling their final output to other enterprises directly, or through a contractor. This finding is consistent with formal manufacturing firms outsourcing production activity to informal firms to cut marginal production costs in response to greater import competition. Likewise, we find that the relationship between import competition and outsourcing activity among informal enterprises is mitigated in states with relatively flexible labour regulation.

Finally, we explore heterogeneous effects of import competition on outsourcing. We find that the relationship between import competition and outsourcing is driven by (a) firms across the size distribution (b) firms in industries producing final as opposed to intermediate goods, (c) non-exporters relative to exporters; and (d) domestic firms relative to foreign multinationals. A potential explanation for heterogeneous effects across firms with a domestic, relative to an international orientation is that the latter have to conform to international norms and standards related to technique of production, scale and adherence to labour standards (Sundaram et al., 2017). We find that the relationship between import competition and outsourcing exists mainly for multi-product firms.

Our study makes several contributions. First, we provide strong evidence on trade as a determinant of outsourcing activity by firms using new and unique data on outsourcing activity (McLaren, 2000; Buehler and Burghardt, 2015; Stiebale and Vencappa, 2018). We hence highlight the role of

international trade in shaping the organization of firms. Second, our study relates to the literature on the role played by labour market rigidity in spurring firms to outsource production activity in response to trade liberalization (Goldberg and Pavcnik, 2003). This is specially relevant in case of developing countries. Rigid labour laws, by increasing the cost to firms of employing workers in a formal setting in the face of greater foreign competition, may incentivize firms to outsource activity to the informal sector, where labour laws are harder to enforce. By studying the role of labour regulation in this context, we highlight the labour market implications of international trade and the fragmentation of production (Hummels et al., 2014).

Third, our study broadly relates to the literature on the impact of import competition on the domestic market. Whereas trade theory identifies low-wage countries as a likely source of disruption to high-wage countries' manufacturing firms, Krugman (2008) points out that free trade with countries of any income level may affect the dynamics of the domestic market. A large body of empirical evidence on the impacts of import competition in manufacturing, especially from China, concentrate on developed countries. Our focus is different in that we investigate the effect of the rise in Chinese imports on outsourcing activities of firms from a developing country. Ex ante, it is not unreasonable to expect different effects from Chinese import competition for developing countries, given the technological similarity between them and China (Giovanni et al. (2014)). [9]

The rest of our paper is organized as follows. Section 2 outlines a conceptual framework to study the relationship between import competition and outsourcing. Section 3 details our empirical specification and identification strategy. Section 4 presents the data, Section 5 discusses results and Section 6 concludes.

2 Conceptual framework

In this section, we provide a conceptual framework to examine the impact of import competition on outsourcing following Lommerud et al. (2009). Consider a firm i operating in a monopolistically competitive environment producing a variety of a differentiated good, which it produces by using a continuum of inputs indexed by $j \in [0, 1]$. One unit of the final good requires γ_i^{-1} units of each input for firm i. Each input can either be produced in-house or outsourced. In-house, the firm can produce one unit of j using one unit of labor at an exogenous wage rate w. Alternatively, the firm can outsource production at the cost of c per unit of input, where we assume $w > c$ to capture the idea that the wage rate is higher than the marginal cost of outsourcing to smaller (informal

[9] Giovanni et al. (2014), in examining the global welfare impact of China's trade integration and technological change rank ten developing countries in terms of technological similarity to China. Among this group of countries, India is ranked as the country with the closest technological proximity to China; India's technological similarity index being 0.928 to that of China.

sector) firms. For instance, since it operates in the formal sector, the firm has to ensure adherence to safety standards, offer benefits, including overtime and abide by hiring and firing regulations. As pointed out by Besley and Burgess (2004), these provisions of the Indian Factor's Act do not apply to firms hiring fewer than 10 workers operating in the unorganized or unregistered (informal) manufacturing sector.

An important ingredient of our framework is that outsourcing incurs fixed costs, which depend on the input j. Specifically, ordering the inputs on $[0,1]$ so that $g(j) < g(l)$ for $j < l$, the cost of outsourcing k inputs is given by

$$G(k) = \int_0^k g(j)dj \tag{1}$$

Assume that $G'(k) > 0$ and $G''(k) > 0, G'(0) = 0$ and $G'(1) \to \infty$, where the last assumption means that it is not economical to outsource all production. A motivation for outsourcing costs increasing exponentially is the co-ordination costs involved in dealing with multiple small firms or contractors.

Demand for the final good is given by $y_i = \Gamma p_i^{-\sigma}$, where p_i is the price of variety i and $\Gamma > 0, \sigma > 1$. Suppose that the firm outsource the production of k_i inputs, its profits are given by

$$\pi_i = [(p_i - \gamma_i^{-1}(k_i c + (1-k_i)w)]y_i - G(k_i) \tag{2}$$

Substituting for output, we get

$$\pi_i = [(p_i - \gamma_i^{-1}(k_i c + (1-k_i)w)]\Gamma p_i^{-\sigma} - G(k_i) \tag{3}$$

The first order condition with respect to price is given by

$$\frac{\delta \pi_i}{\delta p_i} = \Gamma[(1-\sigma)p_i^{-\sigma} + \sigma\gamma_i^{-1}(k_i c + (1-k_i)w)p_i^{-\sigma-1}] = 0 \tag{4}$$

$$p_i^* = \frac{\sigma}{\sigma - 1}\gamma_i^{-1}(k_i c + (1-k_i)w) \tag{5}$$

The first order condition with respect to outsourcing at optimal p_i^* is given by

$$\frac{\delta \pi_i}{\delta k_i} = -\Gamma p_i^{*-\sigma}\gamma_i^{-1}(c-w) - G'(k_i) = 0 \tag{6}$$

and the second order condition at the optimal outsourcing intensity k_i^* by

$$\frac{\delta^2 \pi_i}{\delta k_i^2} = \sigma\Gamma p_i^{*-\sigma-1}\gamma_i^{-1}(c-w)\frac{\delta p_i^*}{\delta k_i^*} - G^{"}(k_i^*) < 0 \tag{7}$$

Given this framework, we can present the following proposition:

Proposition 1 $\frac{\delta k_i^*}{\delta \sigma} > 0$ *as long as firm productivity* γ_i *is above a certain threshold* γ_i^*.

A proof of this proposition is presented in **Appendix C**. The intuition here is that an increase in the elasticity of demand is associated with a decrease in price charged and an increase in quantity produced by firms. This increase in quantity makes the lower marginal cost from outsourcing more attractive, inducing the firm to outsource more by incurring the higher fixed costs of outsourcing.

In **Figure 3A**, we provide a numerical example of the relationship between increasing σ and optimal outsourcing intensity for firms with low, medium and high productivity respectively (γ_i = 3, 12 and 15). We set w=5, c=4 and Γ normalized to one.[10] **Figure 3B** shows a similar graph for the relationship between σ and optimal price p_i^* and shows how the price charged declines with greater import competition.

We now consider the differential relationship between import competition and outsourcing in states with inflexible and flexible labour regulation. **Figure 4A** graphs the relationship between σ and outsourcing intensity when w=4.5 and 5.5 respectively. The idea is that in states with inflexible labor regulation, the cost of hiring labor in the formal sector is higher than in more flexible labor regimes. **Figure 4A** shows that an increase in σ is associated with a much larger increase in outsourcing when the formal wage is higher at 5.5 (equivalently, when the firm is in an inflexible state). **Figure 4B** presents a similar figure for the differential relationship between trade and prices for firms in states with inflexible versus flexible labor regimes. While the price decline is initially sharper in stats with flexible labor laws, for higher values of σ, the decline is sharper in states with inflexible labor laws.

In the next section, we examine this proposition empirically, using data on Indian manufacturing firms between 1995 - 2007 and exploiting the surge in Chinese exports to India in the wake of China's accession to the WTO as a natural experiment.

3 Empirical Specification

Our goal is to study the impact of increased import competition from China on outsourcing intensity among Indian manufacturing firms. This section lays out the strategy we use to investigate the effect of China's rising share of exports in the Indian market on outsourcing expenses as a share of total expenses in Indian manufacturing firms. To establish causality between greater Chinese

[10] Data for 2009 from the Annual Survey of Industries, Central Statistical Organization, India, suggests that average output per worker (in logs) in the formal sector equals 12 and the average production wage (in logs) equals 5.

import competition and outsourcing by Indian manufacturing firms, we use China's entry to the WTO on December 2001 as a quasi-natural experiment.

China's accession to the WTO was significantly driven by its movement towards a more market-oriented economy. This transition is a result of the following internal factors: (a) significant rural-to-urban migration of workers, (b) firms/industries gaining access to foreign technologies, capital and intermediate goods that boosted productivity growth and (c) allowing multinationals to operate in the country Autor et al. (2013). These internal reforms had significant positive effects on China's trade, which eventually led to the country's accession to the WTO. We use China's accession to the WTO to evaluate the impact of intensified competition faced by Indian firms in their domestic market on outsourcing.

The economic reforms undertaken by China in the post-1990 period in anticipation of becoming a member of the WTO and integrating into the global economy is an important element of our empirical strategy. Since China's membership to the WTO in 2001 was influenced by factors not related to the activities of Indian firms in their domestic or export markets, it can be interpreted as an exogenous shock from the standpoint of India. Furthermore, there were no trade agreements between India and China in the period prior to accession. It is hence unlikely that Chinese integration into world trade could be confounded with other factors related to the activities of Indian manufacturing firms.

Notwithstanding the assumptions underlying our empirical strategy, there is one important concern that needs to be addressed: whether the demand for Chinese goods by India, especially after 2001, was due to a change in China's export-supply capability (due to a rise in average productivity) or import demand shocks across industries in India.[11] We treat the rise in export-supply capability of Chinese firms/industries as exogenous, as it is a function of changes in labor costs, trade costs, and the number of product varieties made in China. Failure to address this concern may result in biased coefficient estimates and therefore lead to incorrect inferences drawn from our findings. In order to tackle this issue, we use an empirical strategy similar to Autor et al. (2013) among others.

We estimate the following OLS fixed effects equation as our baseline:

$$outsourcing_{ijt} = \beta_1 DComp^{China}_{IN,jt-1} + \beta_2 FComp^{China}_{IN,jt-1} + X_{jt-1} + firmcontrols_{t-1} + \mu_i + \gamma_t + \theta^t_j + \varepsilon_{ijt} \tag{8}$$

[11] In case of the US (which we use as a proxy for an alternate export destination), Autor et al. (2013) show that the rise in Chinese share of imports was not due to import demand shocks in the US, but because of an increase in comparative advantage of Chinese goods. Moreover, this increased significantly after 2001.

$outsourcing_{ijt}$ is expenditure on outsourcing as a share of total expenses by firm i in sector j at time t.[12] We define $DComp^{China}_{IN,jt-1}$ as a measure of Chinese competition that an Indian (IN) industry (j) faces in its domestic market because of the unilateral liberalization policies pursued by China ($China$). To create the $DComp^{China}_{IN,jt-1}$ index, we match the Indian firm-level data with HS six-digit product-level destination-specific data (for China) on import flows, to create a ratio that reflects the amount of competition faced by a firm i belonging to industry j. We create this index at the NIC 2004 4-digit level using the concordance table by Debroy and Santhanam (1993). It is defined as the share of Chinese imports by India in industry j at time t divided by total domestic production, imports and exports for industry j in 1994 for India. For example, let us consider the Automobile sector (j). Then, $DComp^{China}_{IN,jt-1}$ can be written as:

$$DComp^{China}_{IN,j=Automobile,t-1} = \frac{M^{China}_{IN,j=Automobile,t-1}}{(Y_{j=Automobile,95} + M_{j=Automobile,95} - X_{j=Automobile,95})} \tag{9}$$

Therefore, $DComp^{China}_{IN,j=Automobile,t-1}$ is the total amount of Automobile imports from China at any period, relative to the total production ($Y_{j=Automobile,95}$), total imports ($M_{j=Automobile,95}$), total exports ($X_{j=Automobile,95}$) of autombiles in the base year 1995. $FComp^{China}_{IN,jt-1}$ is a measure of import competition from China faced by Indian firms in an export destination, in our case the US.[13] We follow the same method as outlined above in constructing the index of competition that Indian firms face in the US from Chinese imports.[14] Our hypothesis is that $\beta_1 > 0$ if the competition induces firms to cut marginal cost by outsourcing, as long as firm productivity is not too low.

$firmcontrols_{t-1}$ is a vector of variables that includes firm size, age, age squared, and a proxy for the extent of a firm's technology adoption. We use total sales of a firm as its size indicator. The extent of technology adoption is measured as the share of R&D expenditure plus royalty payments for technical know-how in gross value-added (GVA) of a firm. This variable captures technology differences between firms, which can potentially affect outsourcing activities of a firm. All the variables are lagged at $(t-1)$.

X_{jt-1} is a set of control variables at the industry-level to account for industry specific factors

[12] Given that our key dependent variable is fractional in nature with a large proportion of zeroes, we present results from (a) Poisson and fractional logit models, and (b) various other specifications.

[13] Autor et al. (2013) show that Chinese imports in the US increased significantly after China became a member of the WTO. We also combine US, EU and ASEAN to construct a different version of the export market competition index.

[14] We use UN-COMTRADE for data on imports by US industries from the world and China at the 4-digit level. We then match the US industries along with Indian industries using the International Standard Industrial Classification (ISIC) of all economic activities by the UN.

that are related to Chinese import competition and outsourcing intensity jointly. In various specifications, these include the import tariff on the final good produced in sector j, the import tariff on inputs used in sector j, captured by a weighted average of the output tariffs across sectors that supply inputs to j with input shares as weights, and the share of Indian imports from other low-wage countries. μ_i, γ_t are firm and year fixed effects that account for unobserved firm specific time-invariant and year shocks. θ_j^t are either the interactions between industry fixed effects and year trends or indsutry-year fixed effects. These account for other potential unobserved factors, such as any policy changes that may affect outsourcing activities. Standard errors are clustered at the industry level.

4 Data and Preliminary Analysis

4.1 Firm level Data

The sample of firms is drawn from the PROWESS database, constructed by the Centre for Monitoring the Indian Economy (CMIE), a private agency. The database contains information on approximately 27,400 publicly listed companies, all within the organized sector, of which almost 9000+ are in the manufacturing sector. We use data for around 5,500+ firms, for which there is consolidated data on outsourcing activities. The dataset is classified according to 5-digit 2008 National Industrial Classification (NIC) level. We re-classify it to 4-digit NIC 2004 to facilitate matching with other important industry-level variables; hence, all categorizations made throughout the paper are based on the 2004 NIC classification. The dataset spans across 108 (4-digit 2004 NIC) disaggregated manufacturing industries that belong to 22 (2-digit 2004 NIC) larger ones.

The data is captured from annual income statements and balance sheets of all publicly listed companies. Majority of the firms in the data set are either private Indian firms or affiliated to some private business groups, whereas a small percentage of firms are either government or foreign-owned. The database covers large companies, companies listed on the major stock exchanges and many small enterprises. Data for big companies are worked out from balance sheets while CMIE periodically surveys smaller companies for their data. However, the database does not cover the unorganized sector. The dataset accounts for more than 70% of the economic activity in the organized industrial sector, and 75% (95%) of corporate (excise duty) taxes collected by the Indian Government (Goldberg et al., 2010). We use data on all manufacturing firms from 1995 through 2007.

Most importantly, the PROWESS database collects data on outsourcing expenditure incurred by firms. We exploit this unique data source in our empirical analysis. Specifically, we utilize:

(1) information on outsourcing of manufacturing jobs. The dataset reports expenses incurred by the firms for getting their manufacturing tasks done from outside parties. It includes labor charges, fabrication charges, processing charges, machining charges, fettling charges, conversion charges, contracted production and sub-contracted production. This is direct information on outsourcing activity by firms at the most disaggregated level.

(2) information on outsourcing activity of professional jobs. These are the expenses incurred by firms for engaging external professional services. The services include: (i) Software development fees, (ii) IT enabled service charges, (iii) Cost audit fees, (iv) Legal charges, (v) Miscellaneous professional services, (vi) Auditors fees, and (vii) Consultancy fees. We use this measure as a placebo to our main variable of interest.

To our knowledge, our study is the first to utilize such direct information on outsourcing activity by firms at such a disaggregated level. Without such information, existing studies rely on industry-level input-output tables to develop indirect measures of vertical integration and outsourcing. Such indirect measures not only ignore heterogeneity across firms but may also fail to account for firms simultaneously outsourcing and producing their own inputs or outsourcing a part of their production process across the range of products they produce. Detailed information on variables used in our analysis is presented in **Appendix A**.

In addition to this, the dataset rolls out information on a vast array of firm-level characteristics regarding the total sales, imports, cost, compensation (wages plus incentives), production factors employed, other kinds of expenditure, gross value added, assets and other important firm and industry characteristics. The variables are measured in Indian Rupees (INR) million, deflated to 2005 using the industry-specific Wholesale Price Index. CMIE uses an internal product classification that is based on the HS (Harmonized System) and NIC schedules. Around 20% of the firms in the data set belong to the chemical industries followed by food products and beverages (12.81%), textiles (10.81%) and basic metals (10.46%).

4.2 Stylized Facts: Outsourcing of Manufacturing Activity

In this section, we present a few crucial stylized facts about the outsourcing of manufacturing jobs by Indian firms. First, we look at how outsourcing activities have changed over time. In **Figure 5**, we plot two measures of outsourcing activity for the period 1995 and 2007. The panel on the left (right) plots outsourcing expenditure in rupee millions (outsourcing expenditure as a share of total expenses). Both of them rise steadily over time, reinforcing patterns in **Figure 1**. An average Indian manufacturing firm spends more than four times on outsourcing of manufacturing jobs in 2007 when compared to 1995. On the other hand, as a share of total expenses, outsourcing of

manufacturing jobs jumps from 0.1 percent in 1995 to 1% in 2007; a ten fold increase in a decade.

Table 2 shows key firm characteristics by outsourcing status. We compare summary statistics on sales, total assets, gross value added, total factor productivity, export and import volume, R&D intensity of firms involved in outsourcing of manufacturing jobs with firms not involved in outsourcing. Firm involved in outsourcing earn significantly more from sales, are bigger, have larger value-addition, do more trade, adopt more technology, employ more capital and managerial or skilled workers.

Next, in **Table 3**, we present total outsourcing expenditure, share of outsourcing expenditure and percentage of firms involved in outsourcing by industries at the NIC 2-digit level. The table shows substantial heterogeneity in outsourcing activity across industries. Total expenditure on outsourcing in column (1) shows that the expenditure is highest for the automobile industry and lowest for office, accounting and computing machinery. In column (2), we focus on share of outsourcing expense in total expenses by a firm; share of outsourcing expenditure is highest in case of labor-intensive industries, such as apparel and tobacco products where it is over 1 percent, while accounting and computing machinery shows the lowest at 0.02 percent. Broadly, more labor-intensive industries show a larger share of outsourcing as a share of total expenses. This is consistent with the idea presented in our conceptual framework, where outsourcing is motivated by lower labor costs outside of formal manufacturing. Lastly, in column (3), the percentage of firms outsourcing ranges from 21 and 20 percent of firms in fabricated metal products and machinery and equipment to a mere 3 percent in office, accounting and computing machinery.

Table 4 presents outsourcing expenditure, its share in total expenses and percentage of firms outsourcing, both in the aggregate and split by state group based on flexibility of labor laws averaged over the time period. The findings echo that outsourcing activity is more prominent in states with less flexible labor regulation.

Table 5 looks at outsourcing expenditure, share in total expenses and the percentage of firms outsourcing by type of industry (final good versus intermediate good) and state group. The table suggests that outsourcing activity is more prevalent in the case of final good-producing industries relative to intermediate good-producing industries, particularly in states with relatively inflexible labor regulation [15].

Finally, **Table 6** demonstrates the change in distribution of mean outsourcing share in total expenditure in industries between 1992 - 2001 and 2002 - 2007, before and after Chinese accession to the WTO. Relative to 1992 - 2007, a far greater number of Indian manufacturing industries have

[15] Table 18 of Appendix B shows a more detailed breakdown of outsourcing activity across industries producing basic goods, intermediates, capital goods, consumer durables and non-durables. Outsourcing activity is greatest for consumer durables and non-durables.

firms reporting outsourcing shares greater than 0.5 percent on average in 2002 - 2007, confirming the increase in outsourcing activity in Indian manufacturing post 2002. Overall, our findings in this section support the idea that increased Chinese import competition is associated with greater outsourcing activity in Indian manufacturing firms. We examine this relationship more rigorously in our empirical analysis.

5 Results: Import Competition and Outsourcing

5.1 Baseline

Table 7 presents our baseline results by estimating equation 8 using combinations of industry-year trends, 2-digit industry by year fixed effects, 3-digit industry by year fixed effects and state by year fixed effects. We use outsourcing expenditure as a share of total expenses as the dependent variable. Column (1) regresses lagged import penetration ratio from China controlling for firm age, age squared, size, technology adoption of a firm and interaction of industry fixed effects and year trends. Both size and technology adoption are also at $(t-1)$ period and in real terms. Our coefficient of interest is positive and significant; a 10 percentage point increase in import competition from China increases the outsourcing share of manufacturing jobs in total expenses by 0.17 percentage points. Columns (2) - (6) include input and output tariffs to account for trade liberalization undertaken by India in the 1990s, Chinese import competition faced by Indian firms in a third country (the US) ($FComp^{China}_{IN,jt-1}$)and import competition from other low-wage countries.[16]

The impact of Chinese import competition continues to be robust even after controlling for import tariffs (both input and output tariffs), suggesting that import competition from a similar low-wage, labor-abundant country like China dominates potential import competition effects from any unilateral decrease in import tariffs. Our coefficient of interest remains stable - a 10 percentage point increase in import competition from China is associated with a 0.07-0.17 percentage point increase in the outsourcing share. We do not find any evidence of foreign competition faced by Indian firms affecting outsourcing intensity.

Column (7) restricts the sample to years 1995 - 2001, i.e., before Chinese accession to the WTO. We do this as a placebo test, to show that the effect of Chinese import competition on outsourcing comes entirely from the significant increase in Chinese imports that India witnessed after China joined WTO in 2001.[17] In other words, we should not find any effect of Chinese import

[16] In **Table 19** (**Appendix B**), we regress input and output tariffs on the share of outsourcing expenditure for different periods of time. We do not find any effect of either the input or output tariff on outsourcing expenditure by Indian manufacturing firms. These results nullify the hypothesis that the effect of Chinese import competition is a spillover effect from the trade reforms of the 1990s undertaken as a result of a balance-of-payments shock.

[17] The growth in Chinese exports to India as a result of accession to the WTO was a result of China's internal

competition on the outsourcing share of manufacturing jobs for Indian firms in the 1990s, as the competition did not intensify then. Our conjecture turns out to be true; our coefficient of interest is not significant. In column (8), we use an alternate measure of outsourcing given by the share of outsourcing expenditure in gross value added. We find that our result is qulitatively robust - a 10 percentage point increase in import competition from China increases the outsourcing share of manufacturing jobs in total expenses by 0.82 percentage points.

Since the outsourcing share in total expenses equals zero for a large number of firms, we replace our dependent variable with a binary outsourcing indicator that equals one if the firm reports a positive amount of outsourcing expenses and zero otherwise. Also, such a binary variable might be less vulnerable to measurement error compared to the ones that we use. The change of dependent variable does not alter our benchmark finding. Columns (9) and (10) presents results where the dependent variable takes a value 1 if the share of outsourcing expenditure in total expenses is greater than zero. Our coefficient of interest is still positive and statistically significant.

We undertake a battery of further checks to our baseline specifications in **Table 21 of Appendix B**. In column (1) we control for the lagged dependent variable, outsourcing. In column (2), we run a first-differenced equation. In both cases, the outcome remains the same. Another issue that might affect our results is that there is correlation over time in key variables for a given firm. We counter this by running a long difference specification in column (3). We use 1995 as the base year and compare the outcome with 2007. We find a significant positive effect of Chinese import competition in the domestic market on the outsourcing activity of Indian manufacturing firms with no effect for export market competition. In other words, a rise in Chinese import competition in the Indian domestic market significantly induces Indian firms to outsource more manufacturing jobs in 2007 compared to 1995.

Looking solely at Chinese imports by the U.S. as a proxy for export market competition may not reveal the true competitive effects faced by Indian firms in export market(s). To address this possible shortcoming, we construct an index that aggregates the shares of Chinese imports in two other primary export markets for Indian firms, namely the EU and ASEAN, with that of the US. We then substitute the original foreign competition index with the composite index based on these three export market destinations in column (4). In other words,

$$FComp^{China}_{IN,jt-1} = \frac{M^{China}_{US,jt-1} + M^{China}_{EU,jt-1} + M^{China}_{ASEAN,jt-1}}{(M^{World}_{US,jt-1} + M^{World}_{EU,jt-1} + M^{World}_{ASEAN,jt-1})} \tag{10}$$

reforms to a market-oriented economy. This transition to a market (from central planning) economy resulted in significant productivity growth for Chinese firms, which was further bolstered by a reduction in trade costs as a result of its accession to the WTO.

As the coefficients demonstrate, our benchmark results remain the same - we find strong evidence of outsourcing in response to Chinese competition in the domestic market. We find one additional result – weak evidence of competitive effects from export markets on outsourcing of Indian firms. In column (5), we change our independent variable following Liu and Rosell (2013). Our variable of interest now becomes:

$$DComp^{China}_{IN,jt-1} = \sum_j s_{ijt} \frac{M^{China}_{IN,jt-1}}{(Y_{j,95} + M_{j,95} - X_{j,95})} \tag{11}$$

s_{ijt} is the share of firm i's sales share in industry j at time t. $Y_{j,95}$, $M_{j,95}$, and $X_{j,95}$ continues to be the same as defined before. Multiplying the import penetration ratio with the sales share of an individual firm transforms the ratio to the firm-level. As the estimate of interest demonstrates, changing the independent variable does not induce any change in our finding. We continue to find strong effects of import competition from China. Since our dependent variable is a ratio, estimating zero-valued variables with OLS may produce biased estimates. So, we use the PPML (Poisson Pseudo Maximum Likelihood) and fractional logit specifications in columns (6) - (7) respectively to tackle this concern. This method estimates coefficients in terms of percentage changes and the dependent variable does not need to follow a Poisson distribution or be integer-valued (it can be continuous).[18] As the point estimate demonstrates, the Chinese import penetration ratio continues to significantly increase the share of outsourcing expenses of manufacturing activities in total expenses.

Put together, our results show a strong positive relationship between Chinese import competition and outsourcing of manufacturing activity by Indian manufacturing firms. This is consistent with our argument that import competition, by incentivizing firms to expand while reducing their markup raises the return to decreasing marginal costs by outsourcing.

5.2 IV Analysis

The main measure for Chinese import competition is the import penetration ratio for an industry j at time t and is computed as:

$$DComp^{China}_{IN,jt-1} = \frac{M^{China}_{IN,jt-1}}{(Y_{j,95} + M_{j,95} - X_{j,95})} \tag{12}$$

[18] We estimate standard errors using the Eicker-White robust covariance matrix estimator.

While in principle it is useful to use a lagged value of the import penetration ratio as a proxy for the contemporaneous import competition index, this could still be endogenous. For example, consider a scenario where there is an increase in the demand for particular kinds of products in India after China joined the WTO in 2001, which triggers a disproportionate increase in Chinese imports in those categories, such as labor-intensive products. Such a demand shock is likely to have the same effect on Indian firms. This could be also true for unobserved technology shocks, say innovations in labor cost saving technology, common to both countries (Utar and Torres-Ruiz, 2013). Our estimates will then capture the effect of this technology shock and erroneously attribute it to Chinese import competition. Unobservable shocks of this nature can render the effect of Chinese competition on outsourcing activity of Indian firms endogenous. To overcome possible endogeneity concern(s), we follow Autor et al. (2013), Autor et al. (2014), and Acemoglu et al. (2016) in instrumenting for Chinese imports in India by Chinese imports to other similar developing countries. The instrument for (10) is computed as:

$$IVDComp_{IN,jt-1}^{China} = \frac{M_{jt-1}^{IC,Others}}{(Y_{j,95} + M_{j,95} - X_{j,95})} \tag{13}$$

where $M_{jt-1}^{IC,Others}$ is the lagged value of Chinese imports to an industry in Brazil, Indonesia, Malaysia and Mexico. This approach assumes that the rise in Chinese manufacturing exports to other developing countries was primarily driven by internal supply shocks and reduced trade costs but not by unobserved import demand shocks in developing countries (Autor et al., 2013). The Chinese share of imports by Brazil, Indonesia, Malaysia and Mexico must be exogenous from the perspective of Indian firms as it is expected to be driven by China. In other words, Chinese exports to these countries are likely to be correlated with Chinese exports to India but not with Indian conditions driving Indian imports.

We regress the lagged (by one year) value of the Chinese share of imports by Brazil, Indonesia, Malaysia and Mexico on the share of outsourcing expenses of Indian firms. Results from the IV estimations along with their first-stages are presented in **Table 8**. Our IV results qualitatively mirror results in **Table 7**, though the magnitudes of the coefficient of interest across columns are larger. This is possible if unobserved factors driving outsourcing activity by Indian firms and imports from China simultaneously lead to inconsistent estimates of the impact of Chinese import penetration on outsourcing. From columns (1) through (4), our IV results for our main measure of outsourcing suggest that a 10 percentage point increase in Chinese import penetration ratio increases the share of outsourcing in total expenses by 0.24-0.50 percentage points. As expected,

columns (5) and (10) show that the coefficient on Chinese import penetration is not statistically significant for the time-period 1995-2001.

5.3 Robustness

Controlling for Competitive Pressures from Other Regions So far, we do not per se establish that the impact on outsourcing by Indian manufacturing firms is due to import competition from China in the domestic market and not due to import competition in general or from other destinations. The effect from China could very well pick up general competitive effects or effects from other similar countries. In order to delve into this, we calculate a general import competition index – World and for all the possible regions – high-income countries ($High - Income$), North America (NA), European Union (EU), Latin American countries (LA), least-developed countries (LDC), Middle-east and North African countries ($MENA$), and South Asian countries (SA). Results are presented in **Table 9**. We start by using a general import competition index - $DComp^{World}_{IN,jt-1}$ along with $DComp^{China}_{IN,,jt-1}$ in column (1). The coefficient on Chinese import penetration is statistically significant and positive, suggesting that it is not import competition per se, but China, which is associated with more outsourcing of manufacturing jobs by Indian firms.

Across columns (2) through (5), we show that this positive and significant relationship is robust to controlling for import competition from $High - Income$ (column (2)), NA and EU (column (3)), LA, LDC, $MENA$, and SA (column (4)) countries and all of these put together (column (5)). The positive relationship is reproduced in Column (6), which replicates column (5) with our alternate outsourcing measure.

Controlling for Industry- and Firm-level Channels **Table 10** introduces control variables for industry- and firm-level measures that may be correlated with outsourcing expenditure of a firm. For instance, it is likely that higher number of skilled labor or opening up of new factories might increase/decrease outsourcing activities. Column (1) uses skill-intensity as an additional control at the industry-level. We define skill-intensity as the ratio of the number of non-production workers to total employees of an industry. We do not find any evidence of correlation between skill-intensity and outsourcing activities of firms. We use number of factories at the industry-level as a control in column (2). We find no effect of this additional control. Our coefficient of interest remains robustly significantly.

Column (3) checks whether highly productive firms outsource more. We calculate total factor productivity of a firm using the Levinshon-Petrin (2003) methodology. Our estimate shows our conjecture to be true – productivity of a firm is strongly correlated with outsourcing activity. This

is consistent with Grossman and Helpman (2004) and with our conceptual framework, that suggests that import competition should be associated with more outsourcing for more productive firms.

Columns (4) - (8) test another proposition put forward by Grossman and Helpman (2004) - managerial incentives is positively correlated with outsourcing. In the age of rapid globalization, when firms want to expand their activities as a result of competitive pressures, they tend to outsource various production and assembly activities. Managers who oversee these production and assembly activities are offered high-powered incentives in order to facilitate outsourcing in an efficient manner.

We start by looking at managerial compensation in column (4). Compensation is defined as wages plus incentives. We do not find any evidence of outsourcing activity being correlated with managerial compensation. Column (5) looks at the former component of compensation - wages; managerial wages does not seem to be correlated with outsourcing activities. In column (6), we use managerial incentives as a control variable. Our estimate shows a positive relationship between managerial incentives and outsourcing. Lastly, we divide the managerial incentives variable into two management levels - top management (executives) and non-executives (directors). Results are presented in columns (7) - (8).[19] We find the incentives of executives to be positively correlated with outsourcing share of firms. Across all columns, our key variable of interest, Chinese import competition is robust in sign, significance and magnitude.

The Case of Intermediate Inputs One other factor that might be affecting our findings is the way we look at total imports: in other words, we include imports of intermediate inputs by Indian firms (Iacovone et al., 2013). For example, imported intermediate inputs may be cheaper and of higher quality than locally sourced inputs thus lowering production costs of the firm, making it possible to outsource more. To account for this possibility, we generate a measure of the share of imported inputs from China by Indian firms using Indian input-output (I-O) tables.[20] We weight the I–O coefficient of each sector (at NIC 4-digit level) as an input by its import share, and then by the Chinese share in imports for that sector. By summing these measures, we arrive at a measure, *InpDComp*, that gives the average weighted sum of intermediate goods imported from China at a sectoral level, where the weights are given by the coefficients of the I-O table.

In **Table 11**, we report results where we control for imported intermediate goods from China. If Chinese import competition in upstream industries is correlated with import penetration in the final goods sector, then our coefficient of interest might be inconsistently estimated. Estimates show

[19] The former set of managers have executive powers in a firm.

[20] We use the 1999 I-O table to choose input coefficients for each of the 2004 NIC 4-digit sectors. We additionally test for robustness by substituting with the 1993 I-O table and find that the results remain.

that our main result remains robust to the addition of this control variable. We do not find any effect of imported intermediate goods, $InpDComp$, from China. It is product market competition that induces firms to outsource a part of their manufacturing activities in order to compete with Chinese products.

5.4 The Role of Labor Market Regulation

In this paper, we argue that greater import competition induces firms to lower marginal production cost. A large set of literature emphasizes the role played by rigid labor markets and stringent labor market regulation in pushing up implicit labor costs in developing countries (Besley and Burgess, 2004), particularly in the formal sector, where labor laws are enforced. To explore the role of labor market regulation in incentivizing firms to outsource manufacturing jobs, we use the following equation:

$$\begin{aligned} outsourcing_{ijt} &= \beta_1 DComp^{China}_{IN,jt-1} + \beta_2 (DComp^{China}_{IN,jt-1} * LMktR_s) \\ &\quad + X_{jt-1} + \beta_4 (X_{jt-1} * LMktR_s) + Z_{ijt-1} + \mu_i + \gamma_t + \varepsilon_{ijt} \end{aligned} \tag{14}$$

$LMktR_s$ is a dummy variable that equals one if labor laws in a state in which firms' are registered are flexible (pro-employer). $LMktR_s = 1$, when $s =$ Andhra Pradesh, Karnataka, Rajastha, Tamil Nadu, and Uttar Pradesh. On the other hand, $LMktR_s = 0$, when $s =$ Assam, Bihar, Gujarat, Haryana, Kerela, Madhya Pradesh, Maharastra, Orissa, Punjab, and West Bengal.

The interaction between $LMktR_s$ and $DComp^{China}_{IN,jt-1}$ given by β_2 captures the differential effect of Chinese import competition on firms in states with more flexible labor laws relative to other states. We employ the labor law classification in Gupta et al. (2008). We hypothesize that $\beta_2 < 0$, or, greater import competition from China is associated with less outsourcing in states with more flexible labor laws that impose a much lower tax on employing labor in-house by formal manufacturing firms. In other words, if costs imposed by labor regulation spur firms to outsource manufacturing activity, we expect the interaction term between Chinese import penetration and the indicator for states with flexible labor regulation to be negative.

Table 12 presents our results. Columns (1) – (7) show that this is indeed the case. While Chinese import competition is associated with greater outsourcing, this relationship is attenuated in states with relatively flexible labor regulation. This is supportive of our proposition that rigid labor laws, by increasing the cost of employing labor, may increase firm incentives to cut marginal costs by outsourcing more with increased import competition. A 10 percentage point change in the

import penetration ratio increases outsourcing by 0.16–0.24 percentage points less in states with flexible labor regulation. Columns (8) - (9) use the alternate outsourcing indicator as a dependent variable. Results remain qualitatively robust across all columns of **Table 12**. To bolster our argument, we undertake the following two estimations.

Placebo First, we estimate a placebo regression following 14 for outsourcing of professional jobs. Note that labor laws under the Indian Factories Act do not apply to professional workers, who perform skilled tasks. If the mechanism we have in mind explains the differential relationship between import competition and outsourcing in states with more flexible labor regulation, we would not expect to find it for outsourcing of professional jobs[21].

Indeed, results in **Table 13**, which focuses on outsourcing of professional jobs, show that there is no differential relationship between Chinese import competition and outsourcing of professional jobs in states with relatively flexible labor regulation. These results provide further support to our idea that greater import competition is associated with greater outsourcing, particularly under stringer labor enforcement regimes that drive up the relative cost of operating in the formal sector in developing countries.

5.5 Unorganized Sector

Second, we incorporate a new dataset that contains information on unorganized (informal) sector manufacturing enterprises from the National Sample Survey Organization (NSSO), India. Note that formal sector firms in our data are most likely to outsource manufacturing tasks to firms in the informal sector if their primary motivation is to cut marginal labor cost. If this is true, we should see a corresponding increase in informal firms selling their output to formal firms with greater Chinese import competition.

Our data come from two rounds of a nationally representative survey of informal enterprises that employ fewer than ten workers for the years 2000 and 2005. The survey asks these enterprises two relevant questions. First, if they are mainly on contract to sell their product to another enterprise or to a middleman/contractor. Second, the destination of their final product. We construct three alternate indicators of outsourcing activity among informal sector firms. The first is an indicator variable that equals one for enterprises that are mainly on contract to sell their product to another firm or a middleman/contractor. The second indicator variable equals one for enterprises that report selling most of their output to other enterprises or middlemen (as opposed to the government or

[21] **Table 21 (Appendix B**) presenst results for estimation of our baseline equation 8 on outsourcing of professional jobs. We do not find any relationship between import competition and outsourcing of professional jobs by Indian manufacturing firms

private households). The third indicator is a combination of the first two and equals one if either the first or second indicator equals one. We use the third as our preferred indicator and examine its relationship to Chinese import competition.

Table 14 presents our results exploring this relationship. Columns (1) - (3) using a linear probability, probit and logit model show that there is a strong, statistically significant and positive relationship between Chinese import competition and the likelihood of outsourcing to informal firms. Exactly like in the case of the formal sector, column (4) shows that the relationship between import competition and outsourcing is mitigated in states with relative flexible labor regulation, consistent with our hypothesis that costs imposed by stringent labor regulation may induce formal sector firms to outsource manufacturing tasks to the informal sector. Columns (5) and (6) show that while import competition effects exist both in urban and rural areas, they are dominant in rural areas. This suggests that outsourcing of manufacturing jobs to informal firms occurs more so in rural areas.

Columns (7) and (8) show that this result is robust to measuring outsourcing using alternate indicators available in the data. Finally, from columsn (9) and (10), we see that import competition is associated with an increase in the size of firms and labour productivity (captured by output per worker), though the latter effect is statistically insignificant. Moreover, these effects are attentuated in states with flexible labour regulation. To summarize, our results offer considerable support for the role played by rigid labor regulation in increasing outsourcing of manufacturing activity between the formal and informal sectors in response to increased import competition from China. This is consistent with the idea that trade is associated with an increase in activity in the informal sector through outsourcing between the formal and informal sectors - a potential explanation for the rise of the informal sector with globalization observed in developing countries.

5.6 Mechanisms

In **Table 15**, we explore the mechanisms through which import competition impacts outsourcing of manufacturing activity. Our conceptual framework and results so far presented suggest that import competition induces firms to lower prices and expand output, thereby incentivizing them to incur the fixed costs of outsourcing production to avail of lower marginal costs. Hence, for firms that outsource, greater import competition should be associated with a decrease in costs and price and an increase in firm size (sales). Also, if the driving factor behind cost gains is labour regulation, we should see these impacts magnified in states with more stringent labour regulation (attentuated in states with flexible labour regulation).

Columns (1) - (4) present results for firms in states with inflexible and flexible labour regimes

that outsource and do not outsource, respectively. Columns (5) - (8) present results for the price charged by firms as the dependent variable. Columns (9) - (12) focus on firm sales. Results are remarkably in line with our conceptual framework. From the first four columns, Chinese import penetration is negatively associated with firm costs for firms that outsource and this effect is magnified for firms in states with inflexible labour regulation. From Columns (5) - (8), the same applies for the prices that firms charge. Columns (9) - (12) show that greater import competition is associated with larger firm size for outsourcing firms, particularly in states with inflexible labour regulation.

Taken together, our results drive home key findings - import competition is associated with greater outsourcing of production activity as firms exploit labour cost gains, lower prices and expand output.

5.7 Extensions

In this section, we extend our analysis by delving into the relationship between import competition and outsourcing further. **Table 16** introduces more lags of the import competition variable with a view to unpacking the dynamics of the relationship. From columns (1) through (4), we see that the coefficients on import penetration are larger when the variable is lagged two or three years. In other words, the impact of import competition on outsourcing is stronger two and three years in the future. Results in columns (5) through (8) echo these findings using the alternate way of measuring outsourcing as an indicator variable. Put together, results in this table point to a lagged effect of import competition on outsourcing.

Finally, in **Table 17**, we explore heterogeneous effects of import competition on outsourcing across firm types. We interact our main Chinese import penetration variable with indicator variables for size categories in Column (1), whether the firm is in a final good or intermediate good industry in column (2), if the firm is an exporter or not in column (3), whether the firm is a foreign or domestic firm in column (4).

From column (1), we find strong evidence of the impact of import competition on outsourcing across the size distribution of firms. However, the effect is about 30% higher for big firms. In addition, we find that the impact of import competition on outsourcing is concentrated among firms in final good industries, firms who are non-exporters and domestic firms. This is likely to be the case if firms that are oriented internationally have to conform to international norms and standards in their technique of production (capital-labor ratios), scale or have to demonstrate adherence to labor standards and are subject to more labor inspections from state officials (Sundaram et al., 2017).

Finally, in columns (5) - (8), we look at single and multi-product firms separately. We find that the impacts of import competition are concentrated among multi-product firms. We do not find significant impacts for single-product firms. However, **Appendix B, Table 23** probes these results further to show that among single-product firms, import competition is positively associated with outsourcing among final good producers and exporters.

6 Conclusion

In this study, we explore the relationship between import competition and outsourcing. Employing unique data from India and exploiting China's accession to the WTO in 2001 as a natural experiment, we show that greater import competition is associated with more outsourcing of manufacturing activity by Indian firms, particularly in the presence of stringent labor regulation regimes that increases the cost of employing labor for firms. We provide evidence that firms that outsource face lower costs, charge lower prices and expand output in the face of import competition. We thereby highlight international trade as an important driver of the organization of firms and fragmentation of production. We also propose that labor market institutions moderate the relationship between import competition and outsourcing to the informal sector, where labor laws are not enforced, particularly in developing countries.

References

Alfaro, L., Antras, P., Chor, D., Conconi. P., 2019. Internalizing Global Value Chains: A Firm-Level Analysis. Journal of Political Economy 127 (2): 508-559

Alfaro, L., Conconi, P., Fadinger, H., Newman. A., 2016. Do Prices Determine Vertical Integration? The Review of Economic Studies 83: 1-35

Bernard, A., Fort, T., Smeets, V., Warzynski. F., 2018. Heterogeneous Globalization: Offshoring and Reorganization. Mimeo

Besley T., Burgess, R., 2004. Can Labor Regulation Hinder Economic Performance? Evidence from India. The Quarterly Journal of Economics 119 (1): 91-134

Buehler, S., Burghardt, D., 2015. Globalization and Vertical Firm Structure: An Empirical Investigation. Mimeo, University of St. Gallen

De Loecker, J. , Goldberg, P. K., Khandelwal, A. K., Pavcnik, N., 2016. Prices, Markups, and Trade Reform. Econometrica 84: 445-510

Fort, T., 2017. Technology and Production Fragmentation: Domestic versus Foreign Sourcing. The Review of Economic Studies 84 (2): 650-687

Goldberg P., Pavcnik, N., 2003. The Response of the Informal Sector to Trade Liberalization. Journal of Development Economics 72: 463-496

Grossman, G. M., Helpman, E., 2002. Integration versus Outsourcing in Industry Equilibrium. The Quarterly Journal of Economics 117 (1): 85-120.

Grossman, G. M., Helpman, E., 2004. Managerial Incentives and the International Organization of Production. Journal of International Economics 63: 237-262

Grossman, G. M., Helpman, E., 2005. Outsourcing in a Global Economy. The Review of Economic Studies (2005) 72, 135–159

Gupta, P., Hasan R., Kumar, U., 2008. Big Reforms but Small Payoffs: Explaining the Weak Record of Growth in Indian Manufacturing. in Bery, S, B Bosworth and A Panagariya (eds.), India Policy Forum, Vol. 5, Sage, Delhi.

Hummels, D., Jorgensen, R., Munch, J., Xiang, C., 2014. The Wage Effects of Offshoring: Evidence from Danish Matched Worker-Firm Data. The American Economic Review 104 (6): 1597-1629

Lommerud K. E., Meland F., Straume, O. R., 2009. Can Deunionization Lead to International Outsourcing? Journal of International Economics 77: 109-119

McLaren, J., 2000. Globalization and Vertical Structure. American Economic Review 90 (5): 1239-1254

Stiebale, J., Vencappa, D., 2018. Import Competition and Vertical Integration: Evidence from

India. DICE Discussion Papers 293, University of Dusseldorf

Sundaram A., Mehta A., Hasan, R., 2017. The Effects of Labor Regulation on Firms and Exports: Theory and Evidence from Indian Apparel. SSRN Working Paper 3077251

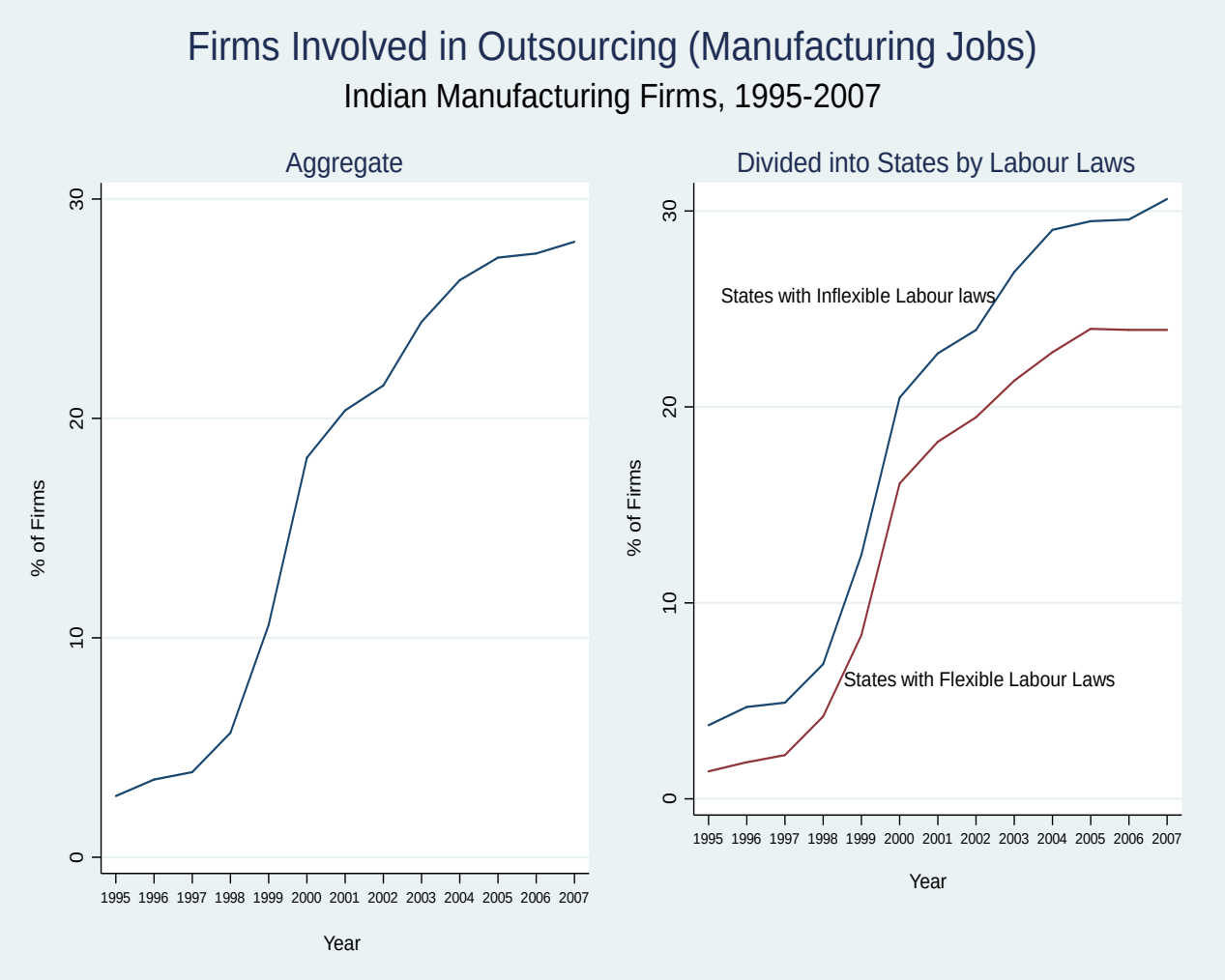

Figure 1: Percentage of Firms Involved in Outsourcing – Aggregate and Divided into States by Labour Laws (Inflexible and Flexible): Indian Manufacturing Firms, 1995-2007

Notes: In Panel B, Blue Line represents the percentage of firms outsourcing in states with 'Inflexible Labour Laws'; Red Line represents the percentage of firms outsourcing in states with 'Flexible Labour Laws'. States with Flexbile Labour Laws' are: Andhra Pradesh, Karnataka, Rajasthan, Tamil Nadu and Uttar Pradesh. 'States with Inflexible Labour Laws' are: Assam, Bihar, Gujarat, Haryana, Kerela, Madhya Pradesh, Maharastra, Orissa, Punjab, and West Bengal..

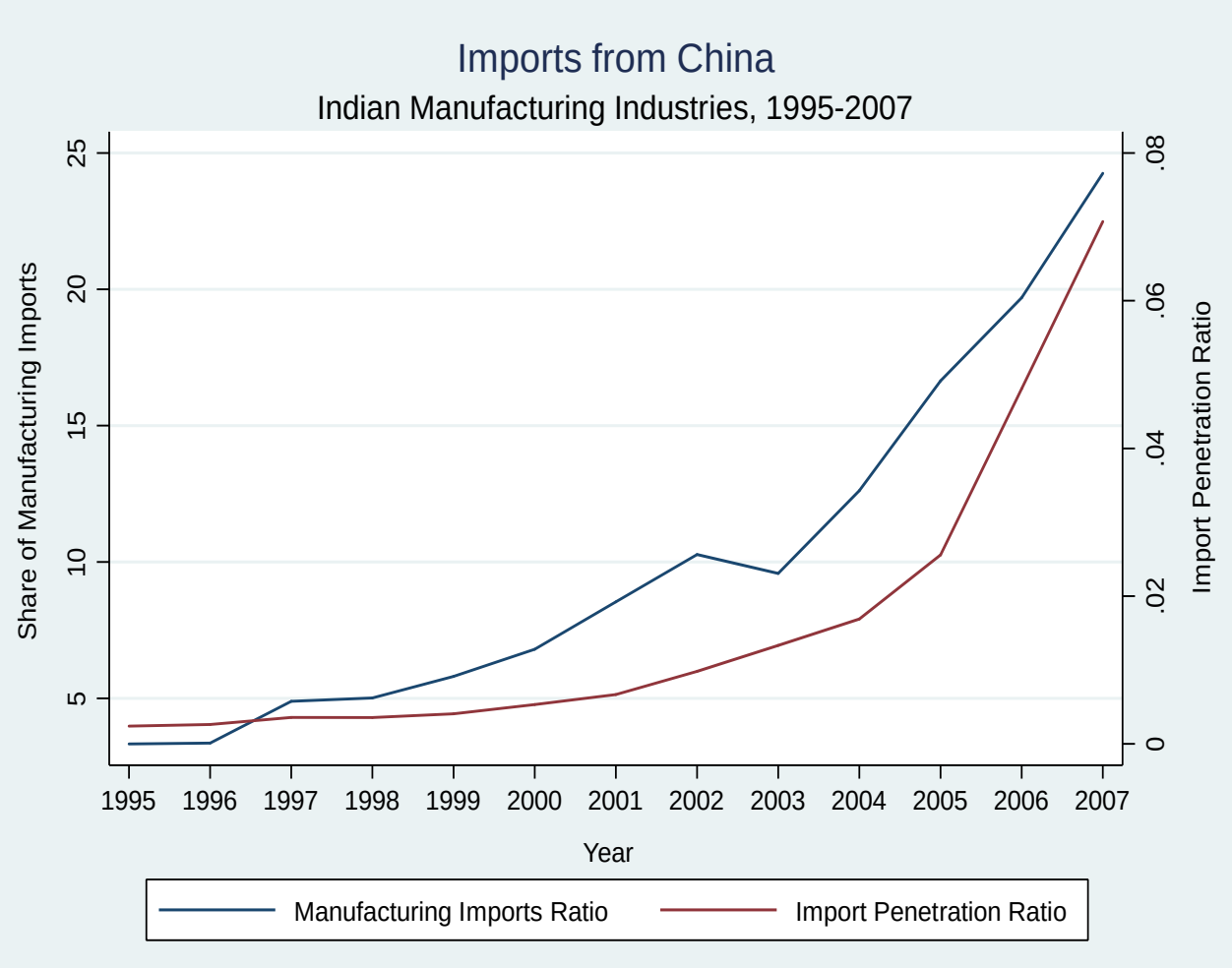

Figure 2: Share of Manufacturing Imports and Import Penetration Ratio for India from China, Indian Manufacturing Industries, 1995-2007

Notes: The line to the left represents the average manufacturing imports from China as a share of total manufacturing imports. The line to the right represents the average of the import penetration ratio.

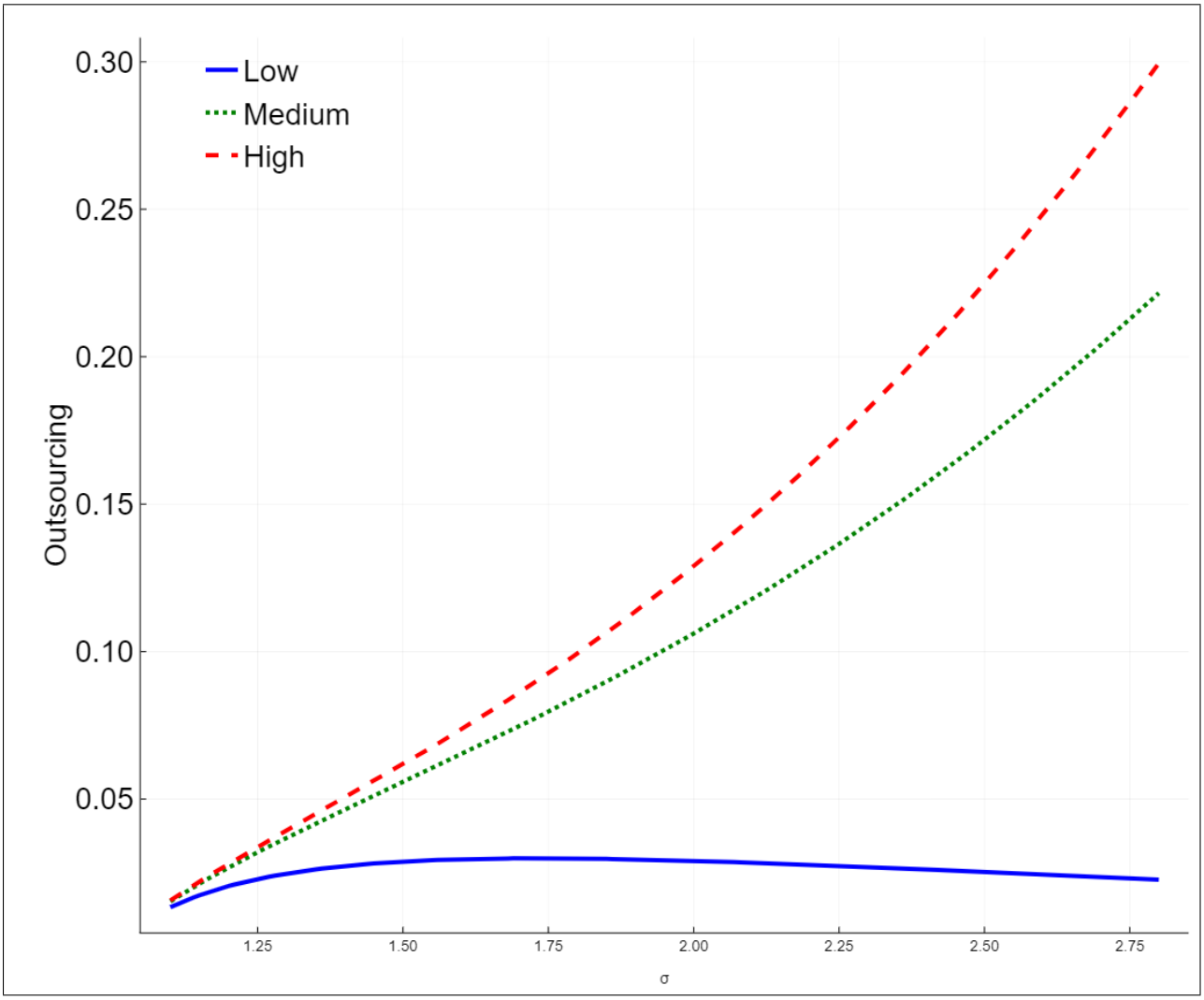

Figure 3A: Outsourcing as a function of the elasticity of demand σ by productivity

Notes: Low, Medium and High productivity indicate $\gamma = 3, 12, 15$. $\Gamma = 1; w = 5; c = 4$

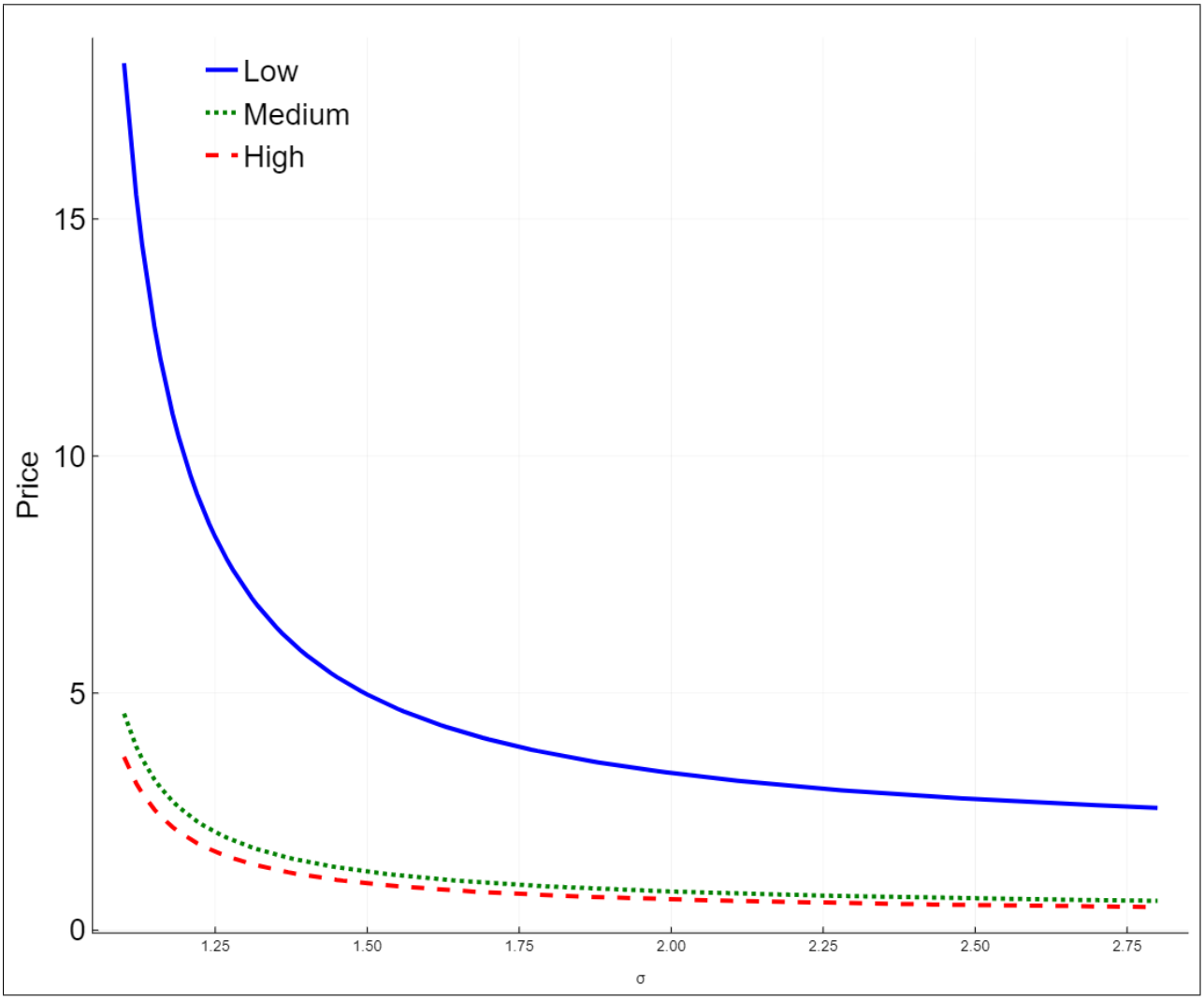

Figure 3B: Price as a function of the elasticity of demand σ by productivity

Notes: Low, Medium and High productivity indicate $\gamma = 3, 12, 15$. $\Gamma = 1; w = 5; c = 4$

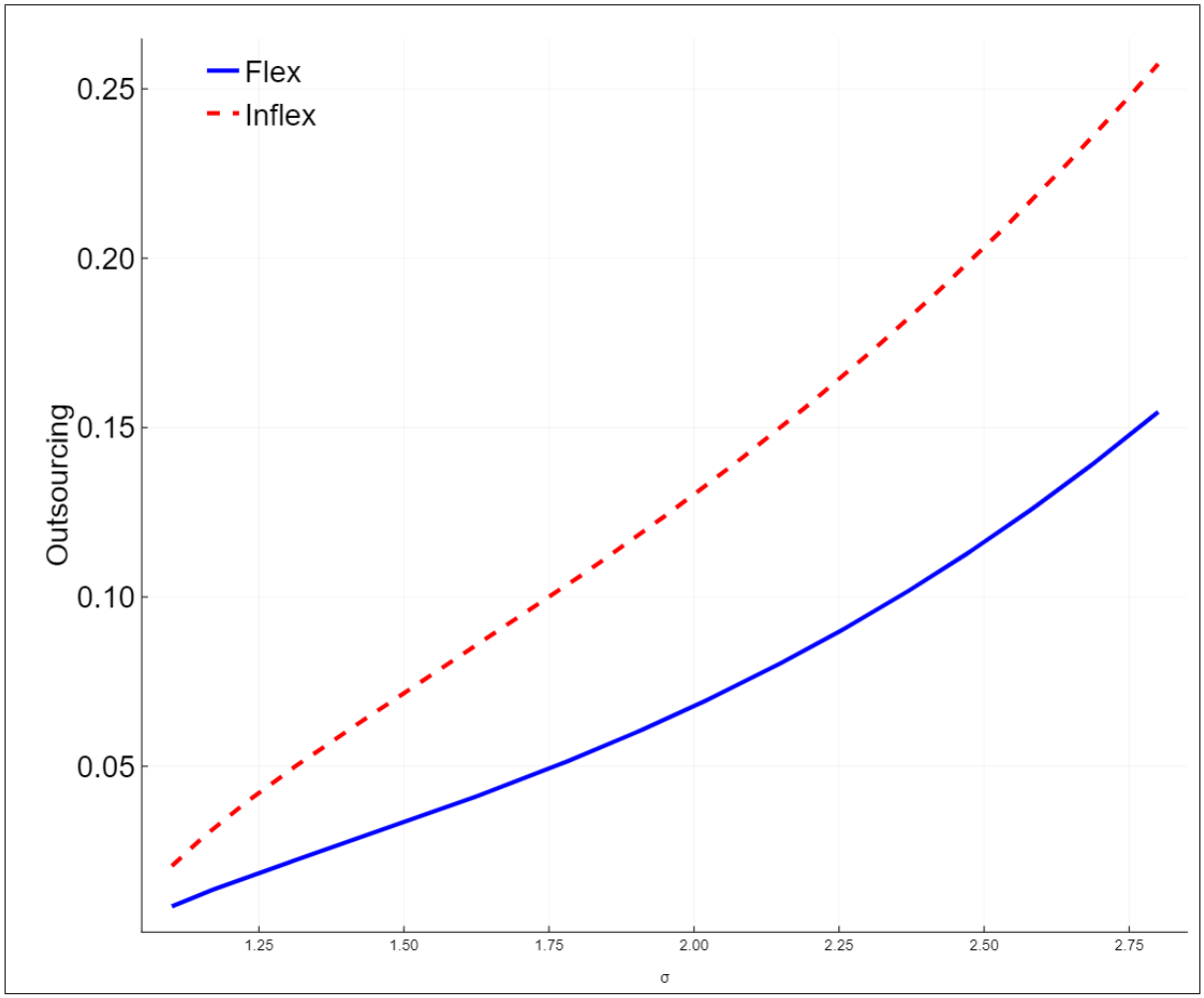

Figure 4A: Outsourcing as a function of the elasticity of demand σ by labor law

Notes: "Flex" and "Inflex" states indicate $w = 4.5, 5.5$. $\gamma = 12$; $\Gamma = 1; c = 4$

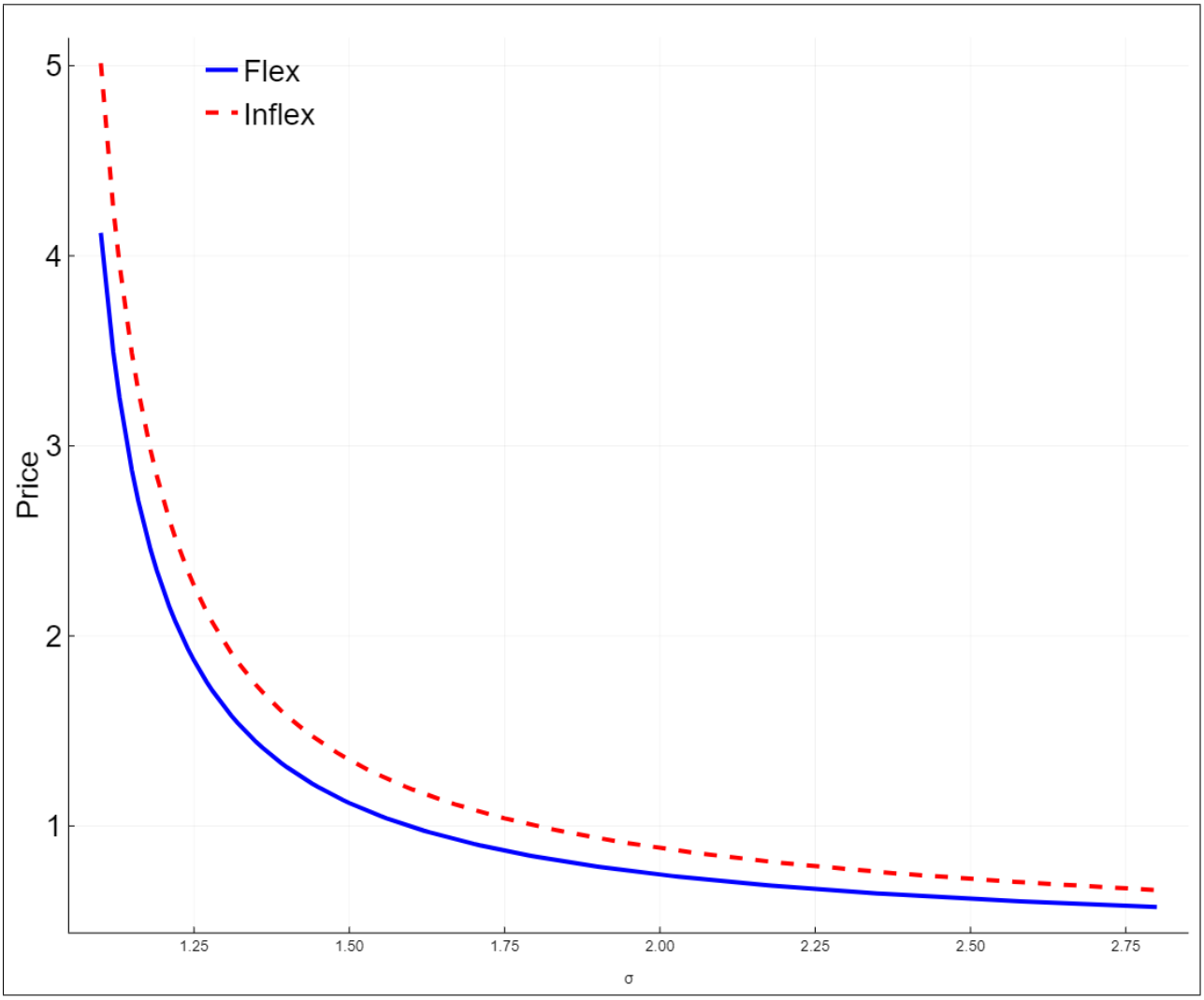

Figure 4B: Price as a function of the elasticity of demand σ by labor law

Notes: "Flex" and "Inflex" states indicate $w = 4.5, 5.5$. $\gamma = 12; \Gamma = 1; c = 4$

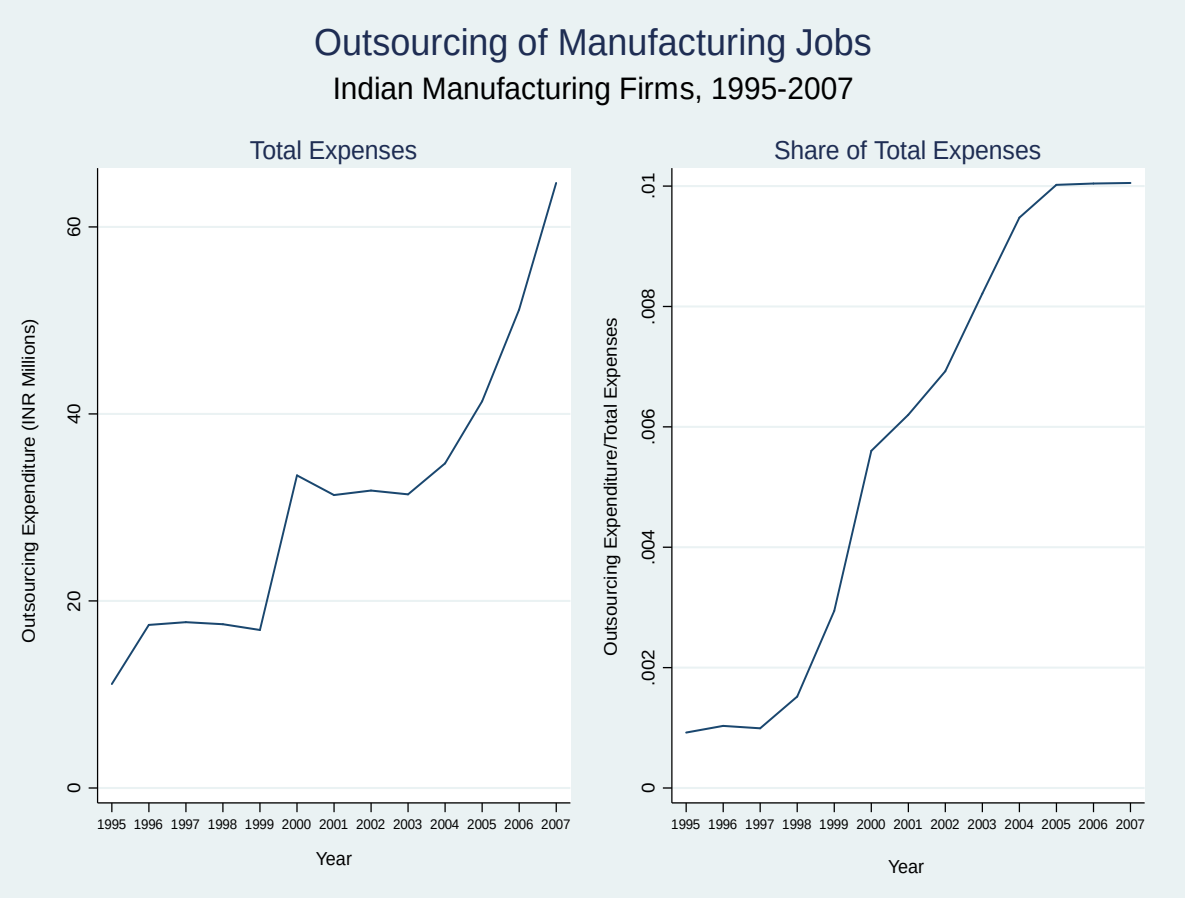

Figure 5: Outsourcing Expenditure of Manufacturing Jobs – Aggregate and Share: Indian Manufacturing Firms, 1995-2007

Notes: Figure presents the average outsourcing expenditure for an average manufacturing firm in India, 1995-2007

Table 1: India's Trade with China and Others

	Trade with China		Imports from Other Countries			
	Imports from China	Exports to China	ASEAN excluding China	US	EU27	World
1992	2.32	2.60	18.95	38.27	124.42	402.50
2001	20.51	10.35	48.88	36.21	116.11	568.70
2007	218.80	84.51	187.24	126.48	288.42	1946.65
Growth (1992-2007)	9339.34%	3150.38%	888.07%	230.49%	131.81%	383.64%

Notes: Real trade values (deflated using Wholesale Price Index of the entire manufacturing sector in India). Source: Chakraborty and Henry (2019)

Table 2: Firms Reporting Outsourcing of Manufacturing Jobs Vs. Firms Not Reporting Outsourcing of Manufacturing Jobs

	Outsourcing Manufacturing Jobs				
	Mean	Median	Std. Dev.	Min	Max
Panel A: Firms with Reported Outsourcing Expenditure					
Sales	2624.44	257.8	34441.31	0.1	2000000
Assets	2569.80	309.65	24727.86	0.2	1200000
GVA	1404.75	121.6	20711.66	0	1200000
Productivity	0.557	0.496	0.355	0.0001	5.50
Exports	406.27	4.9	5828.86	0	585313
Imports	700.46	7.3	15583.72	0	972704
R&D Intensity	0.013	0.009	0.724	0	89.86
Capital Employed/GVA	7.08	1.73	121.48	0	16789
MCom/TComp	0.062	0.032	0.085	0	1
MIncentives/TIncentives	0.049	0	0.192	0	1
Panel B: Firms with No Reported Outsourcing Expenditure					
Sales	1640.03	321.9	14519.2	0	1000000
Assets	1616.59	224	9104.12	0.1	347562
GVA	314.55	0	5671.78	0	591644
Productivity	0.533	0.475	0.348	0.0001	4.52
Exports	59.47	0	903.33	0	119211
Imports	117.48	0	3115.78	0	391216
R&D Intensity	0.002	0	0.089	0	18.73
Capital Employed/GVA	3.40	0	81.34	0	10688
MCom/TComp	0.020	0	0.080	0	1
MIncentives/TIncentives	0.010	0	0.085	0	1

Notes: Panel A (B) covers firms that reported positive (zero) expenditure on outsourcing of manufacturing jobs. 'Sales' is the total sales (exports plus domestic sales) of a firm. 'Assets' is the total assets of a firm. 'GVA' is the gross value-added defined as total sales minus total raw material expenditure. 'Productivity' is measured through Levinshon-Petrin (2003) methodology. 'Exports', 'Imports' are the total exports, imports of a firm, respectively. 'R&D intensity' is the GVA share of R&D expenditure. 'Capital Employed' is the amount of capital employed. 'MComp/TComp' is the share of managerial compensation. 'MIncentives/TIncentives' is the share of managerial incentives. For further information on variables see data **Appendix A**.

Table 3: Outsourcing of Manufacturing Jobs - Total Expenditure, Share of Expenses, Percentage of Firms: At Industry-level (NIC 2-digit)

Industry Code	Industry Name	Outsourcing Manufacturing Jobs		
NIC 2004 2-digit		Total	Share	% of Firms
15	Foods Products and Beverages	35.50	0.17	7.30
16	Tobacco Products	77.36	1.33	18.01
17	Textiles	29.70	0.73	17.91
18	Wearing Apparel	66.54	1.41	16.17
19	Leather	25.15	1.02	15.19
20	Wood and Wood Products	3.27	0.08	7.20
21	Paper and Paper Products	9.68	0.20	9.33
22	Recorded Media	10.43	1.00	6.74
23	Coke, Refined Petroleum, Nuclear Fuel	257.13	0.15	8.06
24	Chemical and Chemical Products	26.71	0.25	12.88
25	Rubber and Plastics	16.66	0.44	17.37
26	Non-metallic Mineral Products	17.28	0.25	6.68
27	Basic Metals	59.02	0.37	14.63
28	Fabricated Metal Products	35.58	0.88	21.08
29	Machinery and Equipment	35.34	0.82	19.67
30	Office, Accounting & Computing Machinery	1.84	0.02	3.12
31	Electrical Machinery and Apparatus	20.14	0.40	13.33
32	Communication Equipment	6.24	0.25	12.06
33	Medical, Precision and Optical Instruments	10.15	0.53	14.67
34	Motor vehicles, Trailers and Semi-Trailers	1370.55	0.09	6.53
35	Other transport equipment	44.76	0.94	19.54
36	Furniture; Manufacturing n.e.c	64.69	0.72	18.07

Notes: Column (1) calculates the mean outsourcing expenditure by an Indian manufacturing firm. It is expressed in INR Million. Column (2) represents the mean share of outsourcing expenditure in total expenditure of a firm multiplied by 100. Column (3) represents mean percentage of firms involved in outsourcing of manufacturing jobs.

Table 4: Outsourcing of Manufacturing Jobs - Total Expenditure, Share of Expenses, Percentage of Firms

	Outsourcing Manufacturing Jobs		
	Total	Share	% of Firms
Panel A			
Aggregate	37.00	0.47	13.86
Panel B: Dividing into States by Labour Laws			
States with Flexible Labour Laws	32.46	0.43	11.80
States with Infexible Labour Laws	41.02	0.57	15.47

Notes: Column (1) calculates the mean outsourcing expenditure by an Indian manufacturing firm. It is expressed in INR Million. Column (2) represents the mean share of outsourcing expenditure in total expenditure of a firm multiplied by 100. Column (3) represents mean percentage of firms involved in outsourcing of manufacturing jobs. 'States with Flexbile Labour Laws' are: Andhra Pradesh, Karnataka, Rajasthan, Tamil Nadu and Uttar Pradesh. 'States with Inflexible Labour Laws' are: Assam, Bihar, Gujarat, Haryana, Kerela, Madhya Pradesh, Maharastra, Orissa, Punjab, and West Bengal.

Table 5: Outsourcing Expenditure and Intensity of Manufacturing Jobs: By User-based Industries and Labour Laws

Industry Name	Outsourcing Manufacturing Jobs					
	Total		Share		% of Firms	
	States with Flexible Labour Laws	States with Inflexible Labour Laws	States with Flexible Labour Laws	States with Inflexible Labour Laws	States with Flexible Labour Laws	States with Inflexible Labour Laws
	(1)	(2)	(3)	(4)	(5)	(6)
Final Goods	31.99	42.57	0.51	0.60	12.69	15.22
Intermediate Goods	33.06	39.93	0.35	0.44	10.83	15.65

Notes: Numbers represent average across manufacturing firms belonging to each user-based industries. Final Goods include Consumer Durables and Consumer Non-Durables, whereas, Intermediate Goods include Basic, Intermediate and Capital goods. Columns (1) and (2) calculate the mean outsourcing expenditure by an Indian manufacturing firm. It is expressed in INR Million. Columns (3) and (4) represents the mean share of outsourcing expenditure in total expenditure of a firm multiplied by 100. Columns (5) and (6) represent mean percentage of firms involved in outsourcing of manufacturing jobs.

Table 6: Distribution of Industries by Outsourcing Share of Manufacturing Jobs

	Outsourcing Share	Manufacturing Jobs No of Industries
	(1)	(2)
$1992-2001$	0–0.25	67
	0.26–0.5	22
	0.6–1	7
	$\rangle$ 1	4
$2002-2007$	0–0.25	22
	0.26–0.5	21
	0.6–1	19
	$\rangle$ 1	39

Notes: Column (1) represents the mean outsourcing share of an industry at NIC 4-digit level. Outsourcing Share is defined as the share of outsourcing expenditure in total expenses multiplied by 100. Column (2) count the number of industries within those ranges of outsourcing share.

Table 7: Chinese Import Competition and Outsourcing of Manufacturing Jobs: Benchmark Results

	Outsourcing Exp/ Total Expenses							Outsourcing Exp/ GVA	Outsourcing Intensity	
	Year 1995−2007						Year 1995−2001	Year 1995−2007	Year 1995−2007	Year 1995−2007
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
$DComp^{China}_{IN,jt-1}$	0.017^{a} (0.005)	0.013^{b} (0.005)	0.007^{b} (0.003)	0.010^{a} (0.002)	0.007^{a} (0.002)	0.017^{a} (0.005)	0.041 (0.051)	0.082^{b} (0.038)	0.136^{b} (0.063)	0.130^{b} (0.056)
$InpTariff_{jt-1}$		−0.005 (0.003)	−0.003 (0.002)	0.0003 (0.002)	−0.002 (0.003)	−0.004 (0.003)	−0.007 (0.006)	−0.019^{b} (0.009)	−0.091^{c} (0.049)	−0.123^{b} (0.048)
$OutTariff_{jt-1}$		0.002 (0.002)	0.003 (0.003)	0.002 (0.002)	0.002 (0.003)	0.001 (0.002)	0.004 (0.003)	0.008 (0.009)	−0.009 (0.033)	0.021 (0.038)
$FComp^{China}_{IN,jt-1}$		0.0002^{b} (0.0001)	0.00004 (0.0001)	0.0001 (0.0001)	0.0001 (0.0001)	0.0001 (0.002)	0.0003 (0.0003)	0.0005 (0.0004)	0.003 (0.002)	0.002 (0.002)
$DComp^{Other\ LWC}_{IN,jt-1}$						−0.003 (0.002)				
Firm Controls$_{t-1}$	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R-Square	0.56	0.56	0.56	0.60	0.62	0.55	0.55	0.35	0.61	0.55
N	41,821	41,515	41,515	41,515	41,515	39,466	18,136	34,950	41,515	41,515
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE (4-digit)*Year Trend	Yes	Yes	No	No	No	Yes	Yes	Yes	Yes	Yes
Industry FE (2-digit)*Year FE	No	No	Yes	No	Yes	No	No	No	No	No
Industry FE (3-digit)*Year FE	No	No	No	Yes	No	No	No	No	No	No
State FE*Year FE	No	No	No	No	Yes	No	No	No	No	No

Notes: Columns (1) – (7) and column (8) uses expenditure on outsourcing (OutExp) as a share of total expenses (Total Expenses) and outsourcing expenditure as a share of GVA (gross value-added) as the dependent variable, respectively. Columns (9) and (10) use outsourcing intensity (OutIntensity) as the dependent variable. Column (9) takes a value 1 if the share of outsourcing expenditure (OutExp) as a share of total expenses (Total Expenses) $\rangle$ 0, whereas column (10) takes a value 1 if the share of outsourcing expenditure (OutExp) as a share of GVA $\rangle$ 0. All the measures focus on manufacturing jobs. '$DComp^{China}_{IN,jt-1}$' is an index of Chinese import pentration ratio in the domestic market of India. It is calculated as the share of Chinese imports in industry j at time t by India divided by total domestic production, imports and exports for industry j in 1994 for India. '$InpTariff$' and '$OutTariff$' is the natural logarithm of input and output tariffs faced by Indian industries at 2004 NIC 4-digit. '$FComp^{China}_{IN,jt-1}$' is the measure of Chinese import competition faced by Indian firms in an export destination (US). '$DComp^{Other\ LWC}_{IN,jt-1}$' is the share of imports from all other low-wage countries. 'Firm Controls' include age, age squared of a firm, size (assets) and technology adoption (sum of R&D expenditure and Technology Transfer). Both 'Assets' and 'Technology Adoption' are used at $t-1$ period and in real terms. Numbers in the parenthesis are robust clustered standard errors at the industry-level. Intercepts are not reported. ^{c},^{b},^{a} denotes 10%, 5% and 1% level of significance, respectively.

Table 8: Chinese Import Competition and Outsourcing of Manufacturing Jobs: IV Results

	Outsourcing Exp/ Total Expenses					Outsourcing Exp/ GVA				
	Year 1995−2007				Year 1995−2001	Year 1995−2007				Year 1995−2001
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
$DComp^{China}_{IN,jt-1}$	0.024^{a} (0.006)	0.050^{b} (0.007)	0.026^{a} (0.007)	0.027^{a} (0.006)	0.371 (0.408)	0.137^{a} (0.022)	0.140^{a} (0.019)	0.143^{a} (0.022)	0.164^{a} (0.022)	0.685 (1.485)
$FComp^{China}_{IN,jt-1}$	0.0001 (0.0001)	0.0001 (0.0001)	0.0001 (0.0001)	0.0001 (0.0001)	0.00004 (0.0003)	0.0006^{c} (0.0003)	−0.0003 (0.0003)	0.0005 (0.0003)	0.0007 (0.0004)	0.0004 (0.001)
$InpTariff_{jt-1}$			−0.005^{c} (0.003)	−0.004 (0.003)	−0.010 (0.007)			−0.022^{b} (0.010)	−0.017^{c} (0.010)	−0.040 (0.025)
$OutTariff_{jt-1}$			0.002 (0.002)	0.001 (0.002)	0.006 (0.004)			0.006 (0.008)	0.003 (0.007)	0.021 (0.014)
Firm Controls$_{t-1}$	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R-Square	0.04	0.06	0.04	0.05	0.04	0.02	0.04	0.02	0.03	0.02
N	37,844	37,844	37,844	32,375	16,529	31,890	31,890	31,890	27,313	14,365
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE (4-digit)*Year Trend	Yes	No	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes
Industry FE (3-digit)*Year FE	No	Yes	No	No	No	No	Yes	No	No	No
State FE*Year FE	No	No	No	Yes	No	No	No	No	Yes	No
1st Stage										
	$DComp^{China}_{IN,,jt-1}$									
$DComp^{China}_{BIMM,jt-1}$	0.150^{a} (0.014)	0.192^{a} (0.041)	0.151^{a} (0.014)	0.151^{a} (0.013)	0.048^{a} (0.016)	0.149^{a} (0.015)	0.199^{a} (0.048)	0.151^{a} (0.015)	0.150^{a} (0.014)	0.047^{a} (0.016)
F-Stat	155.06		192.77		10.49	142.07		185.92		12.64

Notes: Columns (1) - (5) use expenditure on outsourcing (OutExp) as a share of total expenses (Total Expenses) as the dependent variable. Columns (6) - (10) use outsourcing expenditure as a share of GVA (gross value-added) as the dependent variable. '$DComp^{China}_{IN,jt-1}$' is the Chinese import pentration ratio in the domestic market of India. We use '$DComp^{China}_{BIMM,jt-1}$' as the instrument for '$DComp^{China}_{IN,jt-1}$'. We measure '$DComp^{China}_{BIMM,jt-1}$' using imports from other developing countries such as Brazil (B), Indonesia (I), Malaysia (M) and Mexico (M). '$InpTariff$' and '$OutTariff$' is the natural logarithm of input and output tariffs faced by Indian industries at 2004 NIC 4-digit. '$FComp^{China}_{IN,jt-1}$' is the measure of Chinese import competition faced by Indian firms in an export destination (US). 'Firm Controls' include age, age squared of a firm, size (assets) and technology adoption (sum of R&D expenditure and Technology Transfer). Both 'Assets' and 'Technology Adoption' are used at $t-1$ period and in real terms. Numbers in the parenthesis are robust clustered standard errors at the industry-level. Intercepts are not reported.^{c},^{b},^{a} denotes 10%, 5% and 1% level of significance, respectively.

Table 9: Chinese Import Competition and Outsourcing of Manufacturing Jobs: Controlling for Import Competition from Other Regions

	Outsourcing Exp/ Total Expenses					Outsourcing Exp/ GVA
	(1)	(2)	(3)	(4)	(5)	(6)
$DComp^{World}_{IN,jt-1}$	−0.0007					
	(0.001)					
$DComp^{China}_{IN,jt-1}$	0.013[a]	0.011[a]	0.010[a]	0.008[a]	0.009[a]	0.041[a]
	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.014)
$DComp^{High-Income}_{IN,jt-1}$		−0.0003				
		(0.001)				
$DComp^{NA}_{IN,jt-1}$			−0.041[b]		−0.040[b]	0.098
			(0.016)		(0.018)	(0.097)
$DComp^{EU}_{IN,jt-1}$			0.014		0.010	−0.027
			(0.008)		(0.019)	(0.036)
$DComp^{LA}_{IN,jt-1}$				−0.010	−0.005	−0.105
				(0.022)	(0.023)	(0.127)
$DComp^{LDC}_{IN,jt-1}$				−0.009	−0.00002	−0.216
				(0.033)	(0.040)	(0.153)
$DComp^{MENA}_{IN,jt-1}$				−0.008*	−0.005	0.027
				(0.005)	(0.005)	(0.025)
$DComp^{SA}_{IN,jt-1}$				0.032	0.033	0.199
				(0.038)	(0.033)	(0.158)
Firm Controls$_{t-1}$	Yes	Yes	Yes	Yes	Yes	Yes
R-Square	0.56	0.56	0.56	0.56	0.56	0.34
N	38,625	38,625	38,625	38,625	38,852	32,760
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE (2-digit)*Year FE	Yes	Yes	Yes	Yes	Yes	Yes

Notes: Columns (1) – (5) and column (6) uses expenditure on outsourcing (Outsourcing Exp) as a share of total expenses (Total Expenses) and outsourcing expenditure as a share of GVA (gross value-added) as the dependent variable, respectively. '$DComp^{China}_{IN,jt-1}$' is an index of Chinese import pentration ratio in the domestic market of India. It is calculated as the share of Chinese imports in industry j at time t by India divided by total domestic production, imports and exports for industry j in 1994 for India. '$DComp^{World}_{IN,jt-1}$', '$DComp^{High-Income}_{IN,jt-1}$', '$DComp^{NA}_{IN,jt-1}$', '$DComp^{EU}_{IN,jt-1}$', '$DComp^{LA}_{IN,jt-1}$', '$DComp^{LDC}_{IN,jt-1}$', '$DComp^{MENA}_{IN,jt-1}$', '$DComp^{SA}_{IN,jt-1}$' are import penetration indices in case of World ($World$), High-Income countries (OECD plus non-OECD) ($High-Income$), North America (NA), European Union (EU), Latin America (LA), Least Developed Countries (LDC), Middle East and North African countries ($MENA$), and South Asia (SA) respectively. 'Firm Controls' include age, age squared of a firm, size (assets) and technology adoption (sum of R&D expenditure and Technology Transfer). Both 'Assets' and 'Technology Adoption' are used at $t-1$ period and in real terms. Numbers in the parenthesis are robust clustered standard errors at the industry-level. Intercepts are not reported. [b],[a] denotes 5% and 1% level of significance, respectively.

Table 10: Chinese Import Competition and Outsourcing of Manufacturing Jobs: Controlling for Other Possible Channels (Firm and Industry level)

	Outsourcing Exp/ Total Expenses							
	Skill Intensity	Factories	Total Factor Productivity	Managerial Compensation	Managerial Wages	Managerial Incentives		
						Total	Executives	Directors
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
$DComp^{China}_{IN,,jt-1}$	0.013^{a} (0.005)	0.013^{a} (0.005)	0.014^{a} (0.003)	0.013^{a} (0.005)	0.013^{a} (0.005)	0.013^{a} (0.005)	0.013^{a} (0.005)	0.013^{a} (0.005)
$FComp^{China}_{IN,jt}$	0.0002^{b} (0.0001)	0.0002^{b} (0.0001)	0.00003 (0.0001)	0.0002^{b} (0.0001)	0.0002^{b} (0.0001)	0.0002^{b} (0.0001)	0.0002^{b} (0.0001)	0.0002^{b} (0.0001)
$SkIntens_{t-1}$	0.001 (0.003)							
$Factories_{t-1}$		0.0001 (0.002)						
TFP_{t-1}			0.001^{a} (0.0001)					
$(MComp/TComp)_{it-1}$				0.002 (0.002)				
$(MWages/TWages)_{it-1}$					0.003 (0.002)			
$(MIncentives/TIncentives)_{it-1}$						0.002^{c} (0.001)	0.002^{c} (0.001)	-0.001 (0.002)
Firm Controls$_{t-1}$	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R-Square	0.56	0.56	0.72	0.56	0.56	0.56	0.56	0.56
N	41,515	41,515	23,511	41,515	41,515	41,515	41,515	41,515
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE (2-digit)*Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Notes: Columns (1) – (9) use expenditure on outsourcing on account of manufacturing jobs (Outsourcing Expenditure) as a share of total expenses (Total Expenses) as the dependent variable. '$DComp^{China}_{IN,,jt-1}$' is an index of Chinese import pentration ratio in case of India. It is calculated as the share of Chinese imports in industry j at time t by India divided by total domestic production, imports and exports for industry j in 1994 for India. '$FComp^{China}_{IN,jt}$' is the measure of Chinese import competition faced by Indian firms in an export destination (US). '*SkIntens*' is a proxy for skill intensity at the industry-level. It is defined as the share of non-production workers to total employees at the NIC 3-digit level. '*Factories*' is the number of factories at 3-digit level NIC 2004. '*TFP*' is total factor productivity at firm-level estimated using Levinshon and Petrin (2003). '*MComp/TComp*' is the share of managerial compensation in total labour compensation for firm i. '*MWages/TWages*' is the share of total manaegrial wages in total wages for firm i. '*MIncentives/TIncentives*' is the share of total managerial incentives in total incentives for firm i. 'Firm Controls' include age, age squared of a firm, size (assets) and technology adoption (sum of R&D expenditure and Technology Transfer). Both 'Assets' and 'Technology Adoption' are used at $t-1$ period and in real terms. Numbers in the parenthesis are robust clustered standard errors at the industry-level. Intercepts are not reported. ^{c},^{b},^{a} denotes 10%, 5% and 1% level of significance, respectively.

Table 11: Chinese Import Competition and Outsourcing of Manufacturing Jobs: The Intermediate Inputs Channel

	Outsourcing Exp/ Total Expenses				Outsourcing Exp/ GVA
	(1)	(2)	(3)	(4)	(5)
$DComp^{China}_{IN,jt-1}$	0.013^{a} (0.003)	0.016^{a} (0.004)	0.013^{a} (0.004)	0.011^{b} (0.004)	0.116^{b} (0.051)
$InpDComp^{China}_{IN,jt-1}$	0.004 (0.005)	−0.003 (0.005)	0.004 (0.005)	0.003 (0.005)	−0.023 (0.053)
$InpTariff_{jt-1}$			-0.005^{c} (0.003)	-0.006^{c} (0.003)	-0.022^{b} (0.011)
$OutTariff_{jt-1}$			0.002 (0.002)	0.002 (0.002)	0.007 (0.008)
$FComp^{China}_{IN,jt-1}$				0.0001 (0.0001)	0.0007^{b} (0.0003)
Firm Controls$_{t-1}$	Yes	Yes	Yes	Yes	Yes
R-Square	0.59	0.59	0.59	0.59	0.51
N	38,131	38,131	38,131	37,844	31,890
Firm FE	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes
Industry FE (4-digit)*Year Trend	Yes	No	No	No	No
Industry FE (2-digit)*Year FE	No	Yes	Yes	Yes	Yes

Notes: Columns (1) – (5) focus on manufacturing jobs. Columns (1) - (4) and (6) - (9) use expenditure on outsourcing (OutExp) as a share of total expenses (Total Expenses) as the dependent variable. Columns (5) and (10) use outsourcing expenditure as a share of GVA (gross value-added) as the dependent variable. '$DComp^{China}_{IN,jt-1}$' is the Chinese import pentration ratio in the domestic market of India. '$InpTariff$' and '$OutTariff$' is the natural logarithm of input and output tariffs faced by Indian industries at 2004 NIC 4-digit. '$FComp^{China}_{IN,jt-1}$' is the measure of Chinese import competition faced by Indian firms in an export destination (US). 'Firm Controls' include age, age squared of a firm, size (assets) and technology adoption (sum of R&D expenditure and Technology Transfer). Both 'Assets' and 'Technology Adoption' are used at $t-1$ period and in real terms. Numbers in the parenthesis are robust clustered standard errors at the industry-level. Intercepts are not reported.^{c},^{b},^{a} denotes 10%, 5% and 1% level of significance, respectively.

Table 12: Chinese Import Competition and Outsourcing of Manufacturing Jobs: Labour Market Regulations

	Outsourcing Exp/ Total Expenses							Outsourcing Exp/ GVA	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
$DComp^{China}_{IN,,jt-1}$	0.020^{a} (0.003)	0.015^{a} (0.003)	0.025^{a} (0.005)	0.019^{a} (0.003)	0.018^{a} (0.004)	0.020^{a} (0.004)	0.018^{a} (0.004)	0.116^{a} (0.015)	0.095^{a} (0.017)
$DComp^{China}_{IN,,jt-1} \times LMktR_s$	-0.017^{a} (0.007)	-0.019^{a} (0.005)	-0.024^{a} (0.007)	-0.018^{a} (0.006)	-0.022^{b} (0.008)	-0.016^{a} (0.006)	-0.021^{b} (0.008)	-0.103^{a} (0.023)	-0.068^{b} (0.029)
$InpTariff_{jt-1}$				-0.005 (0.003)	-0.006^{c} (0.003)	-0.004 (0.003)	-0.004 (0.003)	-0.021^{c} (0.013)	-0.018 (0.013)
$InpTariff_{jt-1} \times LMktR_s$				-0.0002 (0.002)	0.0003 (0.003)	-0.0003 (0.003)	0.0003 (0.003)	-0.004 (0.016)	-0.009 (0.016)
$OutTariff_{jt-1}$				0.002 (0.002)	0.002 (0.003)	0.001 (0.002)	0.001 (0.002)	0.004 (0.009)	0.003 (0.010)
$OutTariff_{jt-1} \times LMktR_s$				-0.0001 (0.002)	-0.00003 (0.002)	0.0002 (0.002)	0.0003 (0.003)	0.007 (0.013)	0.008 (0.014)
$FComp^{China}_{IN,jt-1}$					0.0001 (0.0001)		0.0001 (0.0001)		0.001^{b} (0.0004)
$FComp^{China}_{IN,jt-1} \times LMktR_s$					0.0001 (0.0001)		0.0001 (0.0001)		-0.001^{c} (0.0004)
$DComp^{Other\ LWC}_{IN,jt-1}$						-0.004 (0.003)	-0.004 (0.003)		-0.005 (0.015)
$DComp^{Other\ LWC}_{IN,jt-1} \times LMktR_s$						0.004 (0.003)	0.004 (0.003)		0.013 (0.017)
Firm Controls$_{t-1}$	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R-Square	0.59	0.59	0.62	0.59	0.59	0.58	0.58	0.51	0.51
N	38,131	38,131	38,131	38,131	37,844	36,135	36,135	32,148	30,442
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE (4-digit)*Year Trend	Yes	No	No	No	No	No	No	No	No
Industry FE (2-digit)*Year FE	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
State FE*Year Trend	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Notes: Columns (1) – (7) and columns (8) - (9) uses expenditure on outsourcing (OutExp) as a share of total expenses (Total Expenses) and outsourcing expenditure as a share of GVA (gross value-added) as the dependent variable, respectively. All the measures focus on manufacturing jobs. '$DComp^{China}_{IN,jt-1}$' is the Chinese import pentration ratio in the domestic market of India. It is calculated as the share of Chinese imports in industry j at time t by India divided by total domestic production, imports and exports for industry j in 1994 for India. '$InpTariff$' and '$OutTariff$' is the natural logarithm of input and output tariffs faced by Indian industries at 2004 NIC 4-digit. '$FComp^{China}_{IN,jt-1}$' is the measure of Chinese import competition faced by Indian firms in an export destination (US). '$DComp^{Other\ LWC}_{IN,jt-1}$' is the share of imports from all other low-wage countries. '$LMktR_s$' is an indicator for labour market regulation. It takes a value 1 if a state has flexible labour market laws and 0 otherwise. 'Firm Controls' include age, age squared of a firm, size (assets) and technology adoption (sum of R&D expenditure and Technology Transfer). Both 'Assets' and 'Technology Adoption' are used at $t-1$ period and in real terms. Numbers in the parenthesis are robust clustered standard errors at the industry-level. Intercepts are not reported. ^{c},^{b},^{a} denotes 10%, 5% and 1% level of significance, respectively.

Table 13: Chinese Import Competition and Outsourcing of Professional Jobs: Labour Market Regulations - Placebo Effect

	Outsourcing Exp/ Total Expenses						Outsourcing Exp/ GVA	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
$DComp^{China}_{IN,,jt-1}$	−0.0004	−0.002	−0.001	−0.003	−0.001	−0.003	0.021[a]	0.014
	(0.005)	(0.010)	(0.005)	(0.008)	(0.005)	(0.008)	(0.008)	(0.010)
$DComp^{China}_{IN,,jt-1} \times LMktR_s$	−0.020	−0.019	−0.013	−0.008	−0.011	−0.007	−0.002	0.012
	(0.013)	(0.012)	(0.011)	(0.013)	(0.010)	(0.013)	(0.019)	(0.021)
$InpTariff_{jt-1}$			0.005	0.005	0.004	0.004	0.001	0.0001
			(0.011)	(0.011)	(0.012)	(0.012)	(0.006)	(0.006)
$InpTariff_{jt-1} \times LMktR_s$			−0.003	−0.004	−0.001	−0.001	0.001	0.001
			(0.011)	(0.014)	(0.015)	(0.015)	(0.009)	(0.010)
$OutTariff_{jt-1}$			−0.001	−0.001	−0.001	−0.001	−0.001	0.001
			(0.010)	(0.010)	(0.011)	(0.011)	(0.006)	(0.006)
$OutTariff_{jt-1} \times LMktR_s$			0.005	0.005	0.004	0.004	0.003	0.002
			(0.013)	(0.013)	(0.013)	(0.013)	(0.008)	(0.009)
$FComp^{China}_{IN,jt-1}$				0.0001		0.0001		0.0002
				(0.0003)		(0.0003)		(0.0003)
$FComp^{China}_{IN,jt-1} \times LMktR_s$				−0.0001		−0.0001		−0.0003[c]
				(0.0003)		(0.0003)		(0.0002)
$DComp^{Other\ LWC}_{IN,jt-1}$					0.006	0.006		0.001
					(0.012)	(0.012)		(0.009)
$DComp^{Other\ LWC}_{IN,jt-1} \times LMktR_s$					−0.007	−0.007		−0.001
					(0.014)	(0.014)		(0.011)
Firm Controls$_{t-1}$	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R-Square	0.35	0.35	0.35	0.35	0.34	0.34	0.44	0.45
N	31,824	31,824	31,824	31,577	30,228	30,228	32,148	30,442
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE (4-digit)*Year Trend	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE (2-digit)*Year FE	No	Yes	No	No	No	No	No	No

Notes: Columns (1) – (6) and columns (7) - (8) uses expenditure on outsourcing (OutExp) as a share of total expenses (Total Expenses) and outsourcing expenditure as a share of GVA (gross value-added) as the dependent variable, respectively. All the measures focus on professional jobs. '$DComp^{China}_{IN,jt-1}$' is the Chinese import pentration ratio in the domestic market of India. It is calculated as the share of Chinese imports in industry j at time t by India divided by total domestic production, imports and exports for industry j in 1994 for India. '$InpTariff$' and '$OutTariff$' is the natural logarithm of input and output tariffs faced by Indian industries at 2004 NIC 4-digit. '$FComp^{China}_{IN,jt-1}$' is the measure of Chinese import competition faced by Indian firms in an export destination (US). '$DComp^{Other\ LWC}_{IN,jt-1}$' is the share of imports from all other low-wage countries. '$LMktR_s$' is an indicator for labour market regulation. It takes a value 1 if a state has flexible labour market laws and 0 otherwise. 'Firm Controls' include age, age squared of a firm, size (assets) and technology adoption (sum of R&D expenditure and Technology Transfer). Both 'Assets' and 'Technology Adoption' are used at $t-1$ period and in real terms. Numbers in the parenthesis are robust clustered standard errors at the industry-level. Intercepts are not reported. [c], [a] denotes 10% and 1% level of significance, respectively.

Table 14: Import Competition, Labour Market Dynamics, and Outsourcing: Using Data from the Informal Sector

	OutS = 1 (a firm is on contract or sells its output to another firm or contractor)						OutS = 1 (firm sells to another firm)	OutS = 1 (a firm is on contract)	Size	Output per worker
		Probit	Logit		Urban	Rural				
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
$DComp^{China}_{IN,,jt}$	0.044**	0.057***	0.061***	0.077***	0.048**	0.155***	0.078***	0.031**	0.244*	0.072
	(0.018)	(0.020)	(0.021)	(0.020)	(0.019)	(0.034)	(0.019)	(0.018)	(0.131)	(0.132)
$DComp^{China}_{IN,,jt} \times LMktR_s$				−0.076***	−0.045***	−0.156***	−0.087***	−0.013	−0.388*	−0.370*
				(0.018)	(0.013)	(0.037)	(0.019)	(0.019)	(0.215)	(0.214)
Other Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R-Square	0.32	0.27	0.28	0.33	0.29	0.37	0.29	0.24	0.74	0.95
N	133,939	133,917	133,917	133,939	82,516	51,423	133,916	36,817	190,703	190,568
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE (4-digit)*Year Trend	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
State FE*Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Notes: Columns (1) – (6) use an outsourcing indicator variable which takes a value 1 if a firm sells or on contract to sell to another private enterprise or to a contractor/middleman as the dependent variable. Column (7) uses an outsourcing indicator variable which takes a value 1 when a firm sells most of its output to another firm. Column (8) uses an outsourcing indicator variable which takes a value 1 if a firm is on contract to sell to another firm or middlemen. Columns (9) and (10) use logarithm of employment and logarithm of gross value-added per worker as the dependent variable, respectively. '$DComp^{China}_{IN,jt-1}$' is the Chinese import pentration ratio in the domestic market of India. It is calculated as the share of Chinese imports in industry j at time t by India divided by total domestic production, imports and exports for industry j in 1994 for India. '$LMktR_s$' is an indicator for labour market regulation. It takes a value 1 if a state has flexible labour market laws and 0 otherwise. 'Other Controls' include input and output tariffs faced by Indian industries at 2004 NIC 4-digit, export market competition and their interaction terms with labour market regulation. 'Firm Controls' include assets (size) and GVA in real terms. Numbers in the parenthesis are robust clustered standard errors at the industry-level. Intercepts are not reported. *,**,*** denotes 10%, 5% and 1% level of significance, respectively.

Table 15: Import Competition and Outsourcing of Manufacturing Jobs: Testing for the Mechanism

	Costs				Prices				Sales			
	Outsourcing = 1		Outsourcing = 0		Outsourcing = 1		Outsourcing = 0		Outsourcing = 1		Outsourcing = 0	
	Inflexible States	Flexible States	Inflexible States	Flexible States	Inflexible States	Flexible States	Inflexible States	Flexible States	Inflexible States	Flexible States	Inflexible States	Flexible States
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
$DComp^{China}_{IN,,jt-1}$	-1.180^{**} (0.484)	-0.943^{***} (0.155)	-0.304 (0.326)	-0.211 (0.172)	-0.471^{***} (0.138)	-0.408^{**} (0.198)	-0.304 (0.326)	-0.211 (0.172)	0.707^{*} (0.430)	0.535^{*} (0.276)	-0.537 (0.633)	0.689 (0.665)
Firm Controls$_{t-1}$	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R-Square	0.69	0.59	0.89	0.89	0.89	0.67	0.89	0.89	0.87	0.84	0.84	0.85
N	10,227	3,303	17,097	8,435	10,227	3,303	17,097	8,435	10,227	3,303	17,097	8,435
Firm-Product FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE (3-digit)*Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
State FE*Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Notes: Columns (1) – (4) use logarithm of prices, columns (5) – (8) uses logarithm of marginal costs, and columns (9) – (12) uses logarithm of total sales of a firm as the dependent variable, respectively. The data on costs, prices, and markups have been sourced from the paper 'Efficiency Gains and Product Market Competition: Evidence from India' by Chakraborty, Henry and Singh (2019). '$DComp^{China}_{IN,jt-1}$' is the Chinese import pentration ratio in the domestic market of India. It is calculated as the share of Chinese imports in industry j at time t by India divided by total domestic production, imports and exports for industry j in 1994 for India. 'Firm Controls' include age, age squared of a firm, size (assets) and technology adoption (sum of R&D expenditure and Technology Transfer). Both 'Assets' and 'Technology Adoption' are used at $t-1$ period and in real terms. Numbers in the parenthesis are robust clustered standard errors at the industry-level. Intercepts are not reported. $^{*},^{**},^{***}$ denotes 10%, 5% and 1% level of significance, respectively.

Table 16: Chinese Import Competition and Outsourcing of Manufacturing Jobs: Short- vs. Long-term Effects

	Outsourcing Exp/ Total Expenses				Outsourcing Exp/ GVA			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
$DComp^{China}_{IN,,jt}$	0.011^{a} (0.003)			-0.0007 (0.007)	0.069^{a} (0.011)			-0.020 (0.038)
$DComp^{China}_{IN,,jt-1}$				0.019^{b} (0.009)				0.176^{a} (0.066)
$DComp^{China}_{IN,,jt-2}$		0.026^{a} (0.008)		-0.016 (0.017)		0.149^{a} (0.032)		-0.105 (0.116)
$DComp^{China}_{IN,,jt-3}$			0.033^{c} (0.018)	0.003 (0.051)			0.207^{a} (0.061)	-0.031 (0.164)
$(Out\,Jobs/TE)_{it-1}$				0.234^{a} (0.057)				0.085 (0.058)
Firm Controls$_{t-1}$	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R-Square	0.56	0.58	0.60	0.63	0.51	0.53	0.54	0.52
N	41,821	38,966	36,064	36,056	32,148	29,297	27,017	26,344
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE (4-digit)*Year Trend	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Notes: Columns (1) – (8) use expenditure on outsourcing (OutExp) as a share of total expenses (Total Expenses) as the dependent variable. Columns (1) - (4) focus on manufacturing jobs, whereas columns (5) - (8) exploits professional jobs, respectively. '$DComp^{China}_{IN,jt-1}$' is the Chinese import pentration ratio in the domestic market of India. It is calculated as the share of Chinese imports in industry j at time t by India divided by total domestic production, imports and exports for industry j in 1994 for India. '$Out\,Jobs/TE_{it-1}$' is the lagged dependent variable. 'Firm Controls' include age, age squared of a firm, size (assets) and technology adoption (sum of R&D expenditure and Technology Transfer). Both 'Assets' and 'Technology Adoption' are used at $t-1$ period and in real terms. Numbers in the parenthesis are robust clustered standard errors at the industry-level. Intercepts are not reported. ^{c},^{b},^{a} denotes 10%, 5% and 1% level of significance, respectively.

Table 17: Chinese Import Competition and Outsourcing of Manufacturing Jobs: Firm Characteristics

	Outsourcing Exp/ Total Expenses							
	Size	End Use	Export Orientation	Ownership	Single-Product Firms		Multi-Product Firms	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
$DComp^{China}_{IN,,jt-1} \times Small\ Firm$	0.020^{b} (0.010)							
$DComp^{China}_{IN,,jt-1} \times Big\ Firm$	0.026^{b} (0.013)							
$DComp^{China}_{IN,,jt-1} \times Final$		0.020^{b} (0.010)						
$DComp^{China}_{IN,,jt-1} \times Intermediate$		0.008^{b} (0.003)						
$DComp^{China}_{IN,,jt-1} \times Exporter$			-0.003 (0.009)					
$DComp^{China}_{IN,,jt-1} \times Non-Exporter$			0.014^{b} (0.005)					
$DComp^{China}_{IN,,jt-1} \times Domestic$				0.014^{a} (0.005)				
$DComp^{China}_{IN,,jt-1} \times Foreign$				-0.006 (0.008)				
$DComp^{China}_{IN,,jt-1}$					0.005 (0.013)	0.004 (0.013)	0.014^{a} (0.005)	0.019^{a} (0.004)
$DComp^{China}_{IN,,jt-1} \times LMktR_s$						0.022 (0.064)		-0.024^{b} (0.010)
Firm Controls$_{t-1}$	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R-Square	0.56	0.56	0.56	0.56	0.69	0.69	0.63	0.63
N	41,515	41,515	41,515	41,515	3,519	3,519	37,996	37,996
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE (4-digit)*Year Trend	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Notes: Columns (1) - (8) use expenditure on outsourcing on account of manufacturing jobs (Outsourcing Expenditure) as a share of total expenses (Total Expenses) as the dependent variable. '$DComp^{China}_{IN,,jt-1}$' is an index of Chinese import pentration ratio in case of India. It is calculated as the share of Chinese imports in industry j at time t by India divided by total domestic production, imports and exports for industry j in 1994 for India. '$LMktR_s$' is an indicator for labour market regulation. It takes a value 1 if a state has flexible labour market laws and 0 otherwise. *Small Firm* contain firms belonging to 1st and 2nd quartiles. *Big Firm* contain firms belonging to 3rd and 4th quartiles. Quartiles ($Qr_{i=1,2,3,4}$) are defined according to the total sales of a firm. A firm belongs to 1st quartile if the total assets of that firm is $\langle$ 25th percentile of the total sales of the corresponding industry and so on. '*Final*' is a dummy variable. It takes a value 1 if the industry produces consumer durable and non-durable products. '*Intermediate*' is a dummy variable which takes 1 if the industry produces basic, capital and intermediate goods. '*Exporter*' is a variable which takes a value 1 if a firm exports. '$Non-Exporter$' is a variable which assumes a value 1 if a firm's export flows is 0. '*Domestic*' is a variable which assumes a value 1 if firm's ownership is domestic. '*Foreign*' in case a firm has foreign ownership. All the regressions control for '$FComp^{China}_{IN,jt}$' and its interaction terms. 'Firm Controls' include age, age squared of a firm, size (assets) and technology adoption (sum of R&D expenditure and Technology Transfer). Both 'Assets' and 'Technology Adoption' are used at $t-1$ period and in real terms. Numbers in the parenthesis are robust clustered standard errors at the industry-level. Intercepts are not reported. ^{c},^{b},^{a} denotes 10%, 5% and 1% level of significance, respectively.

Appendix

A Data

We use an annual-based panel of Indian manufacturing firms that covers up around 9000+ firms, across 105 industries, over the period of 1995-2007. Data is used from the PROWESS database of the Centre for Monitoring Indian Economy (CMIE). All monetary-based variables measured in Millions of Indian Rupees (INR), deflated by 2005 industry-specific Wholesale Price Index (WPI). We use 2004 National Industrial Classification (NIC). We use import penetration data from the UN-COMTRADE.

Variable definitions

Expenditure on Outsourcing of Manufacturing Jobs: These are the expenses incurred by the firms for getting their manufacturing requirements done from outside parties. It is a normal practice followed by firms to outsource a part of their requirement. Also, certain firms which manufacture large products (like car manufacturers) outsource certain requirements to outside firms as it may not be feasible or economical for them to manufacture all the items necessary for manufacturing the entire product. Many firms outsource their entire manufacturing requirements and just add their brand name to the product. This variables reports any amount expended by a firm on outsourcing any manufacturing job. It includes labour charges, fabrication charges, processing charges, machining charges, fettling charges and the like. Other terms include - conversion charges, contracted production and sub-contracted production.

Expenditure on Outsourcing on Professional Jobs: These are the expenses incurred by firms for engaging external professional services. The services include: (i) Software development fees, (ii) IT enabled services charges, (iii) Cost audit fees, (iv) Legal charges, (v) Miscellaneous professional services, (vi) Auditors fees, and (vii) Consultancy fees. Such services exclude those relating to manufacturing jobs, selling and distribution and those related to financial intermediaries or financial services.

Outsourcing Indicator (NSSO): It takes a value 1 if a firm sells or is on contract to sell to another private enterprise or to a contractor/middleman. It can be divided into two parts – (1) takes a value 1 when a firm sells most of its output to another firm; and (2) takes a value 1 if a firm is on contract to sell to another firm or middlemen.

Chinese Competition at Domestic Market ($DComp^{China}_{IN,,jt}$): This is an index of Chinese import pentration ratio in the domestic market of India. It is calculated as the share of Chinese imports in industry j at time t by India divided by total domestic production, imports and exports for

industry j in 1994 for India.

Imported Intermediate Inputs from China ($InpDComp^{China}_{IN,jt-1}$): This is an index of imported intermediate inputs from China. We weight the I–O coefficient of each sector (at NIC 4-digit level) as an input by its import share, and then by the Chinese share in imports for that sector. By summing these measures, we arrive at a measure that gives the average weighted sum of intermediate goods imported from China at a sectoral level, where the weights are given by the coefficients of the I-O table.

States with (In)Flexible Labour Laws ($LMktR_s$): This is an indicator for labour market regulation. It takes a value 1 if a state has flexible labour market laws and 0 otherwise. States with Flexbile Labour Laws' are: Andhra Pradesh, Karnataka, Rajasthan, Tamil Nadu and Uttar Pradesh. 'States with Inflexible Labour Laws' are: Assam, Bihar, Gujarat, Haryana, Kerela, Madhya Pradesh, Maharastra, Orissa, Punjab, and West Bengal. Source: Gupta, Hasan and Kumar (2009).

Chinese Competition at Export Market ($FComp^{China}_{IN,jt}$): This is an index of Chinese import ratio in one of the export markets of India, namely the US. We also use combined ratio of the US, EU and ASEAN. It is defined as the share of Chinese imports in total imports.

Import Penetration from Other Low-Wage Countries ($DComp^{Other\ LWC}_{IN,jt-1}$): This is an index of import penetration ratio in the domestic market of India from low-wage countries other than China.

Chinese Competition for Other Developing Countries ($DComp^{China}_{BIMM,jt-1}$): We use $DComp^{China}_{BIMM,jt-1}$ as an instrument for $DComp^{China}_{IN,jt-1}$. We measure $DComp^{China}_{BIMM,jt-1}$ using imports from other developing countries such as Brazil (B), Indonesia (I), Malaysia (M) and Mexico (M).

Import Penetration Ratio from World ($DComp^{World}_{IN,jt-1}$): This is an aggregate import penetration ratio.

Import Penetration Ratio from High-Income Countries ($DComp^{High-Income}_{IN,jt-1}$): This is an import penetration ratio of high-income countries. It includes both OCED and non-OECD countries.

Import Penetration Ratio from North America ($DComp^{NA}_{IN,jt-1}$): This is an import penetration ratio of North America (USA, Canada and Mexico).

Import Penetration Ratio from European Union ($DComp^{EU}_{IN,jt-1}$): This is an import penetration ratio of the 27 European Union countries.

Import Penetration Ratio from Latin America ($DComp^{LA}_{IN,jt-1}$): This is an import penetration ratio of South American countries.

Import Penetration Ratio from Least Developed Countries ($DComp^{LDC}_{IN,jt-1}$): This is an import penetration ratio of Least Developed countries.

Import Penetration Ratio from Middle East and North Africa ($DComp^{MENA}_{IN,jt-1}$): This is an

import penetration ratio of Middle East and North African countries.

Import Penetration Ratio from South Asia ($DComp^{SA}_{IN,jt-1}$): This is an import penetration ratio of South Asian countries.

Input/Output Tariffs: Input/Output tariffs at the 4-digit industry level, obtained from Ahsan and Mitra (2014) for the period of 1990-2003, with the balance collected from the TRAINS-WITS tariff database.

Productivity: Firm-level Total Factor Productivity (TFP) is computed using the Levinsohn and Petrin (2003) methodology.

Mcomp/Tcomp: The share of managerial compensation in total labour compensation; compensation defined as the sum of all salaries, and additional bonuses.

MWages/TWages: The share of managerial wages in total wages of a firm.

MIncentives/TIncentives: The share of managerial incentives in total incentives of a firm.

Skill intensity: It is defined as the ratio of non-production workers to total employees at the 3-digit level of 2004 NIC. We obtain this from two different sources - for the years 1995-2000 has been generously shared by Dr. Sangeeta Ghosh; and for 2001-2007 from the various publications of ASI.

Factories: The number of factories at the 3-digit level of 2004 NIC.

Intermediate goods: The goods which are classified according to the I-O table as inputs by end-use. It combines intermediates, capital and basic goods.

Final goods: The goods which which are classified according to the I-O table as final products by end-use. It combines consumer durable and consumer non-durable goods.

TechAdop/GVA: Share of R&D expenditure and Royalty Payments for Technical Knowhow in gross value-added.

Cap/GVA: Share of total amount of capital employed in gross value-added.

GVA: Gross Value-Added = Total Sales - Total Raw Material Expenditure.

Assets: Total assets of a firm.

Sales: Total sales (exports + domestic sales) of a firm.

Exports: Total exports of a firm.

Imports: Total imports (import of raw materials, finished goods, stores & spares, and capital goods)

Ownership: It indicates whether a firm is domestic-owned or foreign-owned.

Age: Age of a firm in years.

B Tables

Table 18: Chinese Imports: By Industries - Before and After 2001

Industry Code	Industry Name	Chinese Imports/ World Imports	
NIC 2004 2-digit		1992–2001	2002–2007
		(1)	(2)
15	Foods Products and Beverages	1.72	3.04
16	Tobacco Products	0.69	4.95
17	Textiles	21.66	43.02
18	Wearing Apparel	9.11	18.84
19	Leather	8.80	33.70
20	Wood and Wood Products	2.81	15.73
21	Paper and Paper Products	0.92	5.39
22	Recorded Media	1.37	9.24
23	Coke, Refined Petroleum, Nuclear Fuel	10.05	10.97
24	Chemical and Chemical Products	7.94	20.12
25	Rubber and Plastics	2.27	13.51
26	Non-metallic Mineral Products	2.53	17.32
27	Basic Metals	2.05	9.01
28	Fabricated Metal Products	2.47	12.13
29	Machinery and Equipment	2.65	13.03
30	Office, Accounting & Computing Machinery	4.75	23.67
31	Electrical Machinery and Apparatus	4.75	21.57
32	Communication Equipment	4.62	19.00
33	Medical, Precision and Optical Instruments	2.82	7.42
34	Motor vehicles, Trailers and Semi-Trailers	0.39	1.28
35	Other transport equipment	1.51	20.74
36	Furniture; Manufacturing n.e.c	2.56	7.17
	Average	4.48	15.10

Notes: Numbers represent average across each industrial category according to National Industrial Classification (NIC) 2004 2-digit level. 'Chinese Imports/World Imports' is the share of Chinese imports in total imports of India.

Table 19: Outsourcing of Manufacturing Jobs - Total Expenditure, Share of Expenses, Percentage of Firms: User-based Industries

Industry Name	Outsourcing Manufacturing Jobs		
	Total	Share	% of Firms
	(1)	(2)	(3)
Basic Goods	32.46	0.50	12.55
Intermediate	30.74	0.30	12.81
Capital Goods	46.16	0.29	12.86
Consumer Durables	36.50	0.77	18.51
Consumer Non-Durables	46.43	0.64	16.30

Notes: Numbers represent average across manufacturing firms belonging to each user-based industries. Column (1) calculates the mean outsourcing expenditure by an Indian manufacturing firm. It is expressed in INR Million. Column (2) represents the mean share of outsourcing expenditure in total expenditure of a firm multiplied by 100. Column (3) represents mean percentage of firms involved in outsourcing of manufacturing jobs.

Table 20: India's Trade Reforms and Outsourcing of Manufacturing Jobs

	Outsourcing Exp/ Total Expenses					Outsourcing Exp/ GVA				
	Year 1992−2007	Year ≤2003	Year ≤2001	Year ≤1999	Year ≤1997	Year 1992−2007	Year ≤2003	Year ≤2001	Year ≤1999	Year ≤1997
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
$InpTariff_{jt-1}$	−0.004 (0.003)	−0.006 (0.005)	−0.001 (0.003)	0.0001 (0.002)	0.001 (0.001)	−0.029^{b} (0.013)	−0.013 (0.017)	−0.013 (0.015)	−0.003 (0.012)	0.014 (0.018)
$OutTariff_{jt-1}$	0.003 (0.002)	0.004 (0.003)	0.002 (0.002)	0.0002 (0.001)	−0.0002 (0.001)	0.017^{b} (0.008)	0.016^{b} (0.008)	0.019^{b} (0.008)	0.007^{b} (0.004)	0.003 (0.007)
Firm Controls$_{t-1}$	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R-Square	0.58	0.55	0.54	0.58	0.69	0.33	0.36	0.41	0.39	0.37
N	56,281	36,211	28,080	20,073	13,250	47,872	31,620	24,751	17,929	11,902
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE (4-digit)*Year Trend	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Notes: Columns (1) – (5) use expenditure on outsourcing (Outsourcing Expenses) as a share of total expenses (Total Expenses) as the dependent variable. Columns (6) - (10) use expenditure on outsourcing (Outsourcing Expenses) as a share of GVA (gross value-added). '$InpTariff$' and '$OutTariff$' is the natural logarithm of input and output tariffs faced by Indian industries at 2004 NIC 4-digit. 'Firm Controls' include age, age squared of a firm, size (assets) and technology adoption (sum of R&D expenditure and Technology Transfer). Both 'Assets' and 'Technology Adoption' are used at $t-1$ period and in real terms. Numbers in the parenthesis are robust clustered standard errors at the industry-level. Intercepts are not reported. ^{c},^{b},^{a} denotes 10%, 5% and 1% level of significance, respectively.

Table 21: Chinese Import Competition and Outsourcing of Manufacturing Jobs: Additional Results

	Outsourcing Exp/ Total Expenses						
	Controlling for $OutExp_{t-1}$	First Difference	Long Difference	FComp US, EU, ASEAN	Liu & Rosell (2013)	PPML	Fractional Logit
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
$DComp^{China}_{IN,jt-1}$	0.013^{a} (0.004)	0.002^{b} (0.001)	0.006^{a} (0.002)	0.016^{a} (0.004)	0.335^{b} (0.135)	0.387^{a} (0.155)	0.016^{a} (0.002)
$(OutMan\,Jobs/TE)_{it-1}$	0.303^{a} (0.055)						
$InpTariff_{jt-1}$		0.0001 (0.002)	−0.031 (0.038)	−0.005 (0.003)	-0.005^{*} (0.003)		
$OutTariff_{jt-1}$		0.0001 (0.001)	0.021 (0.035)	0.001 (0.002)	0.002 (0.002)		
$FComp^{China}_{IN,jt-1}$		−0.00004 (0.00005)	0.0004 (0.0003)	0.0003^{*} (0.0002)	0.0002^{**} (0.0001)		
Firm Controls$_{t-1}$	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R-Square	0.60	0.001	0.83	0.55	0.56	0.58	0.56
N	41,821	38,072	7,147	39,723	41,515	24,954	46,163
Firm FE	Yes	No	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	No	No	Yes	Yes	Yes	Yes
Industry FE (4-digit)*Year Trend	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE (2-digit)*Year FE	No	No	No	No	No	No	No
Industry FE (3-digit)*Year FE	No	No	No	No	No	No	No
State*Year FE	No	No	No	No	No	No	No

Notes: Columns (1) - (7) use expenditure on outsourcing on account of manufacturing jobs (Outsourcing Expenditure) as a share of total expenses (Total Expenses) as the dependent variable. '$DComp^{China}_{IN,jt-1}$' is an index of Chinese import pentration ratio in the domestic market of India. It is calculated as the share of Chinese imports in industry j at time t by India divided by total domestic production, imports and exports for industry j in 1994 for India. '$InpTariff$' and '$OutTariff$' is the natural logarithm of input and output tariffs faced by Indian industries at 2004 NIC 4-digit. '$FComp^{China}_{IN,jt-1}$' is the measure of Chinese import competition faced by Indian firms in an export destination (US) except for column (6), where we include Chinese imports by EU and ASEAN additionally. '$OutMan\,Jobs/TE_{it-1}$' is the lagged dependent variable. 'Firm Controls' include age, age squared of a firm, size (assets) and technology adoption (sum of R&D expenditure and Technology Transfer). Both 'Assets' and 'Technology Adoption' are used at $t-1$ period and in real terms. Numbers in the parenthesis are robust clustered standard errors at the industry-level. Intercepts are not reported. ^{c},^{b},^{a} denotes 10%, 5% and 1% level of significance, respectively.

Table 22: Chinese Import Competition and Outsourcing of Professional Jobs: Benchmark Results - Placebo Effect

	Outsourcing Exp/ Total Expenses							Outsourcing Exp/ GVA	Outsourcing Intensity	
	Year 1995−2007						Year 1995−2001	Year 1995−2007	Year 1995−2007	Year 1995−2007
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
$DComp^{China}_{IN,jt-1}$	−0.003 (0.006)	−0.004 (0.010)	−0.003 (0.006)	−0.002 (0.006)	−0.003 (0.007)	−0.002 (0.006)	−0.012 (0.018)	0.026[a] (0.008)	0.047 (0.067)	−0.005 (0.045)
$(Out\,\mathrm{Pr}\,of\,Jobs/TE)_{it-1}$			0.002 (0.003)							
$InpTariff_{jt-1}$				0.004 (0.007)	0.004 (0.007)	0.004 (0.007)	−0.0004 (0.003)	0.010 (0.006)	−0.044 (0.038)	−0.031 (0.042)
$OutTariff_{jt-1}$				−0.0003 (0.006)	−0.0002 (0.006)	−0.0003 (0.006)	−0.0004 (0.002)	−0.005 (0.005)	0.009 (0.033)	0.015 (0.039)
$FComp^{China}_{IN,jt-1}$					0.00004 (0.0002)					
$DComp^{Other\ LWC}_{IN,jt-1}$						0.002 (0.006)				
Firm Controls$_{t-1}$	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R-Square	0.35	0.35	0.36	0.35	0.35	0.34	0.68	0.30	0.51	0.58
N	34,951	34,951	33,604	34,951	34,686	33,052	13,761	35,221	41,821	41,821
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE (4-digit)*Year Trend	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE (2-digit)*Year FE	No	Yes	No	No	No	No	No	No	No	No

Notes: Columns (1) – (7) and (8) uses expenditure on outsourcing (Outsourcing Exp) as a share of total expenses (Total Expenses) and outsourcing expenditure as a share of GVA (gross value-added) as the dependent variable, respectively. Columns (9) and (10) use outsourcing intensity (OutIntensity) as the dependent variable. Column (9) takes a value 1 if the share of outsourcing expenditure (OutExp) as a share of total expenses (Total Expenses) $\rangle$ 0, whereas column (10) takes a value 1 if the share of outsourcing expenditure (OutExp) as a share of GVA $\rangle$ 0. All the measures focus on professional jobs. '$DComp^{China}_{IN,jt-1}$' is an index of Chinese import pentration ratio in the domestic market of India. It is calculated as the share of Chinese imports in industry j at time t by India divided by total domestic production, imports and exports for industry j in 1994 for India. '$InpTariff$' and '$OutTariff$' is the natural logarithm of input and output tariffs faced by Indian industries at 2004 NIC 4-digit. '$FComp^{China}_{IN,jt-1}$' is the measure of Chinese import competition faced by Indian firms in an export destination (US). '$DComp^{Other\ LWC}_{IN,jt-1}$' is the share of imports from all other low-wage countries. '$Out\,\mathrm{Pr}\,of\,Jobs/TE_{it-1}$' is the lagged dependent variable. 'Firm Controls' include age, age squared of a firm, size (assets) and technology adoption (sum of R&D expenditure and Technology Transfer). Both 'Assets' and 'Technology Adoption' are used at $t-1$ period and in real terms. Numbers in the parenthesis are robust clustered standard errors at the industry-level. Intercepts are not reported. [a] denotes 1% level of significance, respectively.

Table 23: Chinese Import Competition and Outsourcing of Manufacturing Jobs: Firm Characteristics

	Outsourcing Exp/ Total Expenses							
	Single-Product firms				Multi-product firms			
	Size	End Use	Export Orientation	Ownership	Size	End Use	Export Orientation	Ownership
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
$DComp^{China}_{IN,,jt-1} \times Qr_1$	−0.022 (0.021)				0.023 (0.029)			
$DComp^{China}_{IN,,jt-1} \times Qr_2$	−0.035 (0.029)				−0.016 (0.033)			
$DComp^{China}_{IN,,jt-1} \times Qr_3$	0.033 (0.043)				0.010 (0.010)			
$DComp^{China}_{IN,,jt-1} \times Qr_4$	0.011 (0.013)				0.020** (0.010)			
$DComp^{China}_{IN,,jt-1} \times Final$		0.035[c] (0.018)				0.012[a] (0.005)		
$DComp^{China}_{IN,,jt-1} \times Intermediate$		−0.049 (0.039)				0.026[a] (0.009)		
$DComp^{China}_{IN,,jt-1} \times Exporter$			0.061[a] (0.017)				0.005 (0.007)	
$DComp^{China}_{IN,,jt-1} \times Non-Exporter$			−0.033 (0.021)				0.005 (0.013)	
$DComp^{China}_{IN,,jt-1} \times Domestic$				−0.005 (0.022)				0.008 (0.013)
$DComp^{China}_{IN,,jt-1} \times Foreign$				−0.091 (0.1781)				0.004 (0.018)
Firm Controls$_{t-1}$	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R-Square	0.73	0.73	0.73	0.73	0.63	0.63	0.63	0.63
N	4,212	4,212	4,212	4,212	37,609	37,609	37,609	37,609
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE (4-digit)*Year Trend	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Notes: Columns (1) – (8) use expenditure on outsourcing on account of manufacturing jobs (Outsourcing Expenditure) as a share of total expenses (Total Expenses) as the dependent variable. '$DComp^{China}_{IN,,jt-1}$' is an index of Chinese import pentration ratio in case of India. It is calculated as the share of Chinese imports in industry j at time t by India divided by total domestic production, imports and exports for industry j in 1994 for India. '$LMktR_s$' is an indicator for labour market regulation. It takes a value 1 if a state has flexible labour market laws and 0 otherwise. Quartiles ($Qr_{i=1,2,3,4}$) are defined according to the total assets of a firm. A firm belongs to 1st quartile if the total assets of that firm is $\langle$ 25th percentile of the total sales of the corresponding industry and so on. '*Final*' is a dummy variable. It takes a value 1 if the industry produces consumer durable and non-durable products. '*Intermediate*' is a dummy variable which takes 1 if the industry produces basic, capital and intermediate goods. '*Exporter*' is a variable which takes a value 1 if a firm exports. '$Non-Exporter$' is a variable which assumes a value 1 if a firm's export flows is 0. '*Domestic*' is a variable which assumes a value 1 if firm's ownership is domestic. '*Foreign*' in case a firm has foreign ownership. All the regressions control for '$FComp^{China}_{IN,jt}$' and its interaction terms. 'Firm Controls' include age, age squared of a firm, size (assets) and technology adoption (sum of R&D expenditure and Technology Transfer). Both 'Assets' and 'Technology Adoption' are used at $t-1$ period and in real terms. Numbers in the parenthesis are robust clustered standard errors at the industry-level. Intercepts are not reported. [c],[b],[a] denotes 10%, 5% and 1% level of significance, respectively.

C Proof of Proposition

Proof. 1 ■

Implicitly differentiating 6 at the optimal k_i^* with respect to σ

$$\Gamma\gamma_i^{-1}(c-w)p_i^{*-\sigma}\log(p_i^*) + \sigma\Gamma p_i^{*-\sigma-1}\gamma_i^{-1}(c-w)\frac{\delta p_i^*}{\delta\sigma} - G''(k_i^*)\frac{\delta k_i^*}{\delta\sigma} = 0 \tag{15}$$

From 5

$$\frac{\delta p_i^*}{\delta\sigma} = -\gamma_i^{-1}(k_i c + (1-k_i)w)\frac{1}{(\sigma-1)^2} + \frac{\delta p_i^*}{\delta k_i^*}\frac{\delta k_i^*}{\delta\sigma} \tag{16}$$

Substituting into 15 and utilizing 7

$$\Gamma\gamma_i^{-1}(c-w)p_i^{*-\sigma}\log(p_i^*) - \sigma\Gamma p_i^{*-\sigma-1}\gamma_i^{-1}(c-w)\gamma_i^{-1}(k_i c + (1-k_i)w)\frac{1}{(\sigma-1)^2} + \frac{\delta^2\pi_i}{\delta k_i^2}\frac{\delta k_i^*}{\delta\sigma} = 0$$

$$\frac{\delta k_i^*}{\delta\sigma} = -\frac{\Gamma\gamma_i^{-1}(c-w)p_i^{*-\sigma}\log(p_i^*) - \sigma\Gamma p_i^{*-\sigma-1}\gamma_i^{-1}(c-w)\gamma_i^{-1}(k_i c + (1-k_i)w)\frac{1}{(\sigma-1)^2}}{\frac{\delta^2\pi_i}{\delta k_i^2}}$$

From 5 and given demand, this equals

$$\frac{\delta k_i^*}{\delta\sigma} = -\frac{\gamma_i^{-1}y_i^*(c-w)(\log(p_i^*) - \frac{1}{\sigma-1})}{\frac{\delta^2\pi_i}{\delta k_i^2}}$$

The sign of this derivative depends on the sign of the expression in brackets $(\log(p_i^*) - \frac{1}{\sigma-1})$. For small enough p_i, we can approximate this as

$$(p_i^*) - \frac{1}{\sigma-1} = \frac{1}{\sigma-1}(\frac{\sigma k_i^* c + (1-k_i^*)w}{\gamma_i} - 1) \tag{17}$$

Hence, as long as $\sigma k_i^* c + (1-k_i^*)w < \gamma_i^*$, $\frac{\delta k_i^*}{\delta\sigma} > 0$.