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Trade Liberalization and Indian Manufacturing Sector Dynamics: A Difference-in-Difference Estimation Approach

Aaheli Ahmed
Debashis Chakraborty

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Aaheli Ahmed[1] and Debashis Chakraborty[2]

Abstract

The liberalization policies were initiated in 1991 with the primary objective to enhance the role of foreign and private participation, in line with the newly embraced outward-oriented growth model. Since early nineties the country has initiated several policies to strengthen the economy, especially the manufacturing sector, which plays an important role in the development process. The current analysis evaluates the effects of the liberalization initiatives in India on industrial performance. A major branch of the literature has observed that when firms characterized by heterogeneity trade with their foreign counterparts, any change in trade policy will lead to a decrease in the number of firms and a rise in their average size (Melitz, 2003). Considering a dataset of twenty-four manufacturing industries, through the difference-in-difference (DID) estimation method the current empirical analysis illustrates that on average, trade reforms do not lead to an increase in the commodity prices and average size of establishments. In addition, both the real wages and real skilled wages appear to increase in the long run due to liberalization, with potential ramifications.

Keywords: India, Trade Liberalization, Manufacturing Sector, Skilled and Unskilled workers, Price, Wage, Difference-in-Difference Method, Time-Varying Treatment Estimation

JEL Classifications: D22, E31, J24, J31, L60, P41

[1] *Aaheli Ahmed (aaheliahmed01@gmail.com) is Doctoral Scholar at Indian Institute of Foreign Trade (IIFT), Kolkata Campus.*

[2] *Debashis Chakraborty (deb.chakb@gmail.com) is Professor at Indian Institute of Foreign Trade (IIFT), Kolkata Campus. He is the corresponding author of this paper.*

Trade Liberalization and the Indian Manufacturing Sector Dynamics: A Difference-in-Difference Estimation Approach

1. Introduction

These empirical evidence over the last three decades indicate that, as opposed to the predictions of the traditional theories of trade, most of the developing countries have witnessed a surge in wage disparity amongst the workers with heterogenous skills (Robbins, 1996; Mazumdar and Agnoli, 2002; Helpman, 2016; Cheong and Jung, 2021). The evidence on rising wage gap in developing countries endowed with abundant unskilled workers cannot be fully explained by the Stolper Samuelson Theorem (SS Theorem) (Vashisht, 2023).

Davis (1996) attempted to explain the surge in wage gap among the developing nations by dropping some of the assumptions of the SS Theorem, noting that in a multi-country scenario of traditional trade models, factor endowment becomes redundant. The analysis argued that a nation that contains unskilled labour as its abundant factor vis-a-vis the world, might also be characterized by abundant skilled labour relative to other nations that have similar factor endowments. In such a scenario, the distributional outcome of trade reforms can be contrary to what the SS Theorem predicts. For instance, India or Thailand may contain abundant supply of unskilled workers in relation to the global economy, but compared to Bangladesh, it may not be the case. In this kind of a scenario, trade reforms will lead to an increase in wage gap in presence of rise in imports from Bangladesh (Vashisht, 2023). This rise in wage gap may exceed the equalization of wages due to imports from developed nations, causing the inequality to rise as a whole. Other channels through which reforms may cause the wage disparity to rise, include their impact on industry-specific dynamics (Milanovic and Squire, 2005; Rojas-Vallejos and Turnovsky, 2017). Lowering of tariffs may cause a decline in wage premia of the industries, particularly in the short run, when workers are immobile between the sectors. Tariff liberalization may also lead to a fall in the profits of the domestic producers due to an increase in competition.

Recent empirical literature also indicates that owing to imperfections in the labour market (such as frictions in search and matching), workers with same characteristics receive different

wages from different firms within the same industry (Davidson and Matusz, 2010; Amiti and Davis, 2012). This observation, combined with the findings by Melitz (2003) which states that the impact of trade reforms will be unequal within a sector, generates the possibility of trade influencing the wage gap within sectors. The models of trade in the presence of firm heterogeneity predict that trade reforms will expand the productive firms by reallocating the resources towards these sectors. The less productive firms, on the other hand, will leave the market. Moreover, the number of firms and their markups are also expected to contract (Melitz and Ottaviano, 2008).

India has witnessed interesting transitions in its policy orientation and industrial performance since early nineties. Graduating from the four-decade long import substitution (self-reliance) led policy framework, in 1991 the country initiated the liberalization measures. The liberalization policies had a positive net effect on the formal manufacturing sector (Banga and Das, 2012). However, implementation of the recent initiatives on the manufacturing sector (e.g., the Make-in-India (MII) scheme in 2014), in a time characterized by deepening participation in the global value chains (GVCs), require a re-look on this question (Aggarwal et al, 2023). In this background, the current study attempts to empirically test the impact of trade liberalization on key outcome variables in the Indian manufacturing sector by using a difference-in-difference (DID) estimation approach. A panel data framework involving twenty-four manufacturing industries at the National Industrial Classification (NIC) 3-digit level over 1987-88 to 2017-18 is used in the analysis. The adoption of DID methodology generates comparative effects of liberalization (the treatment) on industry dynamics on the liberalized sectors before and after the policy relative to a group of industrial sectors which were not liberalized. In particular, the paper examines seven major potential reform implications (prices, per factory real wage, per factory real skilled wage, number of factories, average size of total establishment, average skilled worker intensity and average unskilled worker intensity), by classifying the sectors into two groups, i.e., one that received the treatment (i.e., sectors which underwent trade reform during the period under study) and the control group (i.e., sectors that did not undergo reform).

The literature covering the influence of liberalization on the Indian manufacturing sector by using the DID method is relatively nascent. Ahmed and Chakraborty (2022) analysed the effect

of trade reforms on thirty-six manufacturing sectors over the period 1987-2018 and noted that the real skilled wages and unskilled wages had increased in the post-reform period. However, the coefficient of real wages was insignificant. The commodity prices and average size of establishments, on the other hand, had decreased in the post-1995 period. Ahmed and Chakraborty (2024a) observed that the establishment of the National Manufacturing Competitiveness Council (NMCC) in 2004 benefitted only the skilled worker segment by augmenting their wages. The unskilled workers, however, failed to receive any positive gain from the change in policy architecture. On the other hand, introduction of the MII initiative in 2014 generated significant positive impact on the real wage rates, among both the skilled and unskilled workers. The analysis concluded that the MII scheme had more holistic impact and benefitted the industrial workers more effectively. Controlling for the industry-specific time trends, Ahmed and Chakraborty (2024b) observed that the real wages and real skilled wages of the workers in the reformed industrial segments had witnessed a decline in the post-liberalization period. A plausible underlying logic is that, if in the aftermath of tariff liberalization, the domestic firms face strong competition from their foreign counterparts, then they would be unable to exploit the benefits of scale efficiency.

However, all the above-mentioned studies have utilized the time-constant treatment effect. No other study in the existing literature so far have used the time varying treatment effect to examine the influence of trade reforms on the Indian manufacturing segment. This method is important because the industries, in anticipation of the upcoming changes, may start their adjustment process even before the reform policies are initiated. Conversely, it may take time for the industries to adapt to the new changes, and hence the adjustment process may begin a few years after the policy has actually been initiated / implemented. The current paper intends to address this gap in the literature. The rest of the paper is arranged as follows. A review of literature is presented briefly in the following section. The empirical model and data are discussed next, followed by analysis of the empirical results. Finally, on the basis of the findings, a few policy conclusions are drawn.

2. Evidence from Literature

According to the traditional theories, opening up an economy to trade flows prompts shifting of resources across different segments (Melitz, 2003; Greenaway et al., 2004; Lanteri et al., 2023). Most of these models, however, do not explain the influence of trade on the average size of firms and their number within the liberalizing industries. For instance, in the Ricardian model, trade causes a country to specialize in the production of that good in which it has comparative advantage in terms of labour productivity. On the other hand, the Hechsher-Ohlin model instigates the shift of resources to the exporting sector that utilizes the abundant factor intensively. While the exporting sectors experience an increase in their output, it is not clear if the rise is due to entry of new firms or due to expansion of the firms already present. The literature from late 1990s onwards underlined that exporting firms are larger in size and more efficient than the non-exporting firms (Bernard and Jensen, 1997; Aw et al., 2001; Alvarez and López, 2005). These new discoveries led to development of trade models incorporating heterogeneity in productivity across firms. The literature generally conclude that trade openness leads to an increase in firm size, decrease in number of firms while the markup remains unchanged (Melitz, 2003; Yeaple, 2005; Bernard et al., 2007).

One of the earliest works in this context is the seminal work by Melitz (2003). According to his one sector study, with one factor, and constant markups, in the presence of heterogeneity in firm productivity, trade liberalization generates reallocation of resources between firms. In response to liberalization initiatives, firms with high productivity enter the foreign market by incurring some additional fixed cost, while the less productive firms exit the market. Bernard et al. (2007) extended the Melitz (2003) model results by taking into account two goods and two factors. They concluded that the influence of reforms is relatively larger in industries enjoying comparative advantage. Further extension of the Melitz model was done by Melitz and Ottaviano (2008), who endogenized the markups across firms and predicted that trade causes markup and number of firms to fall on one hand and average firm size to increase on the other. Emami-Namini and Lopez (2008) proposed a dynamic model of trade by extending the Melitz (2003) model to incorporate the dynamic optimizing behaviour of households. According to their analysis, reforms will lead to an increase in a firm's size while markup will remain unchanged.

However, the impact on firm's number will depend on whether the technology is randomly assigned or selected by the firm. In the former case, the number of firms may accordingly increase or decrease. In the latter case, the number of firms will unambiguously increase.

The current paper analyses the effects of liberalization in India on the industrial sector using a DID approach. This method assumes that the unobserved differences between the two groups (treated and control) will be same if there is no treatment (liberalization in this case). Therefore, this method provides a more intuitive evaluation of any policy analysis, covering both ends of the distribution (Fredriksson and Oliveira, 2019). In particular, seven reform implications (prices, real wage, real skilled wage, average size of establishment, average skilled worker intensity, average unskilled worker intensity, number of factories) are examined by classifying the sectors into two groups, namely, the treated and control sectors.

3. Data and Methodology

3.1 Data

The current analysis requires data on the value of both exports and imports at the industry level on a yearly basis. The dataset should be such that it is possible to match the system of trade classification with the system of industry classification. Furthermore, the system of commodity classification in the trade database should remain invariant over time so that any study covering different time periods can be undertaken.

The data on imports and exports, valued at US dollars, has been taken from the Trade Map (ITC, undated) and the World Integrated Trade Solutions (WITS) databases (World Bank, undated). These databases generate data based on the Harmonized System (HS) of commodity classification. Since these sources provide data at a highly disaggregated level so it becomes easy to build up harmonization or concordance between industry and trade classification system in line with the existing literature (Debroy and Santhanam, 1992, 1993; Chakraborty, 2002; Aggarwal and Chakraborty, 2020a, 2020b; Ahmed and Chakraborty, 2022; Ahmed et al., 2024c).

The Indian manufacturing sector comprise of both organized (or registered) and unorganized (or unregistered) sectors. The most comprehensive data on industrial activities of the organized sector is published by the Annual Survey of Industries (ASI) annually under the Central Statistical Organization (CSO) (GoI, undated a). The unit of enumeration in this database is factory. The accounting period is from April to March. The data for all the industry-related variables, involving both treated and control groups, have been obtained from the ASI statistics.

The data on Wholesale Price Index (WPI) for all the commodity groups included in the treated and control groups is obtained from the Office of the Economic Adviser, Department for Promotion of Industry and Internal Trade (GoI, undated b).

3.2 Selection of Industries

To capture the effect of liberalization (did_t), the sectors are classified into control and treated groups. The treated (control) group consists of all those sectors that underwent (did not undergo) deeper tariff reforms and witnessed a consequent import penetration effect during the study period. The treated group is subjected to the treatment in the second period but not in the initial period. The control group is not subjected to the treatment during either period. As the tariff rate in India was reformed significantly owing to the multilateral commitments under WTO from 1995 onwards, along with major modifications in the import licensing regime, this is considered as the year of liberalization in the present study (Kalirajan, 2001).

The identification of the sectors had been carried out in the following manner. In order to segregate the reformed and non-reformed sectors, the weighted average tariff (WAT) and the percentage of duty-free imports (MV) are considered for all the 97 HS product groups at 2-digit level for the period 1990-2018[3], by drawing the requisite WITS data (World Bank, undated). The percentage of duty-free imports represents the following:

[3] The industry-level output data can be obtained from the year 1987-88 from ASI (GoI, undated a). However, the data for MV and WAT are obtained from 1990 from WITS (World Bank, undated). Hence, the current analysis has been conducted over 1990-2018.

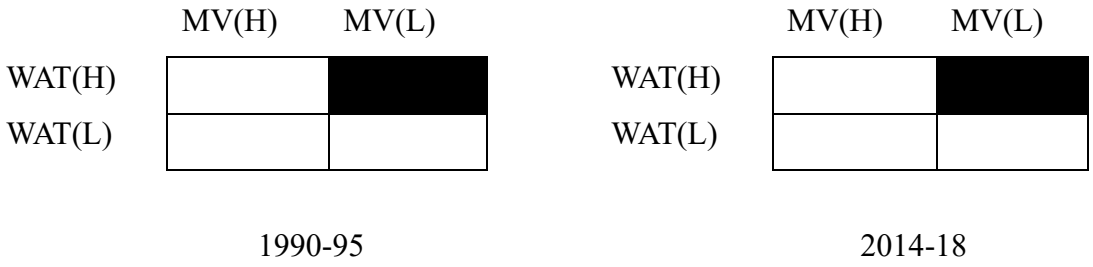
$$\text{Percentage of Duty} - \text{free Imports (MV)} = \frac{(\text{Value of Imports within a HS } 2 - \text{digit code facing Zero duty in 1000 USD })}{\text{Value of Imports within a HS } 2 - \text{digit code in 1000 USD}} \times 100$$

A sector has been included in the treated group if its MV is less than 25 percent and WAT is higher than 15 percent during the initial period (1990-95) but witnessed MV greater than 25 percent and WAT less than 15 percent during the last period (2014-18). Conversely, a sector has been included in the control group if it is characterized by MV less than 25 percent and WAT more than 15 percent, during both the periods. The value of simple average tariff (SAT) and WAT in India are 18 percent and 11.4 percent respectively (UNCTAD, 2022). A value of WAT close to the average of these two values have been taken as the cut-off point. In addition, the selection of 15 percent import duty at the cut-off is further justified by the fact the level is defined as the peak tariff in the international trade literature (UNCTAD, 2022). A sector with WAT less than 15 percent is therefore considered as a reformed sector and vice -versa. The value of MV more than 25 percent implies that the amount of goods entering the market is sufficiently high to bring in the reform effect. On the other, hand, if MV is less than 25 percent, then the import thrust in the domestic market is not high enough to cause any reform-led adjustment effect. Figure 1 visually summarizes the segregation of the considered sectors into the treated and control groups in terms of their WAT and MV.

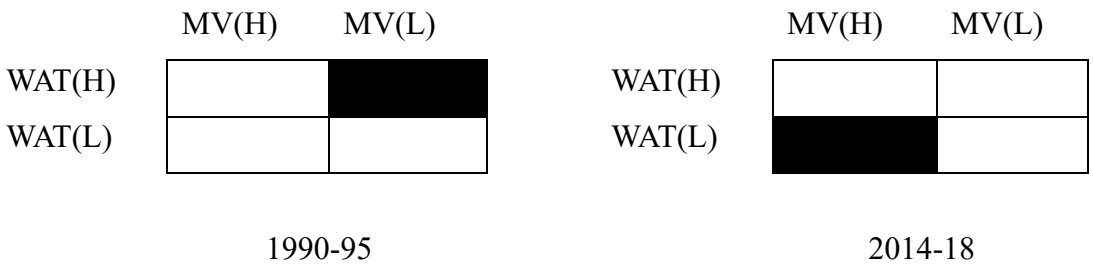
Through this exercise, the analysis identified nine and fourteen sectors at HS 2-digit levels as control and treated groups respectively. Obtaining data for these twenty-three sectors at HS 4-digit level from Trade Map database (ITC, undated), a concordance of the trade data is constructed with 4-digit industry data (GoI, undated a). The resultant NIC 4-digit classifications are then encompassed into NIC 3-digit industries. Through this analysis, twelve sectors at NIC 3-digit level are included both in the control and the treated group respectively (details provided in Appendix 1.1).

Figure 1: Segregation of Sectors into the Control and Treated Groups

(a) Control Group [WAT(H) refers to WAT>15 percent and MV(L) refers to MV<25 percent]



(b) Treated Group [WAT(H) refers to WAT>15 percent, MV(L) refers to MV<25 percent and WAT(L) refers to WAT<15 percent, MV(H) refers to MV>25]



Source: Constructed by authors with WITS (World Bank, undated) data

In order to investigate the influence of liberalization on prices, WPI data for all the commodity groups included in each of the twenty-four NIC 3-digit sectors (i.e., the treated and control groups) is obtained from the Office of the Economic Adviser, Department for Promotion of Industry and Internal Trade for all the years during 1987-2018 (GoI, undated b). Since price data is available for different base periods, taking the year 1982 as the common base period, the price indices of all the years till 2018 have been constructed.

The 3-digit industry-level information on wages, average size of establishments and the number of factories is obtained from ASI data, for the years between 1987-88 to 2017-18. In

order to analyse the actual effect of liberalization on wages, the real values are computed for the period 1987-88 to 2017-18 by using the following formula:

$$\text{Real Wages}_{it} = \frac{(\text{Total Emoluments}_{it}/WPI_{it})}{\text{Total Persons Engaged}_{it}}$$

$$\text{Real Skilled Wages}_{it} = \frac{\{\text{Total Emoluments}_{it} - \text{Total Wages to Workers}_{it}\}/WPI_{it}}{(\text{Total Persons Engaged}_{it} - \text{Total Number of Workers}_{it})}$$

The average size of total establishment, average skilled-worker intensity and average unskilled-worker intensity are computed for the study period using the following formula:

$$\text{Average Size of Total Establishment}_{it} = \frac{\text{Total Persons Engaged}_{it}}{\text{Total Number of Factories}_{it}}$$

$$\text{Average Skilled} - \text{worker Intensity}_{it} = \frac{(\text{Total Persons Engaged}_{it} - \text{Total Number of Workers}_{it})}{\text{Total Number of Factories}_{it}}$$

$$\text{Average Unskilled} - \text{worker Intensity}_{it} = \frac{\text{Total Number of Workers}_{it}}{\text{Total Number of Factories}_{it}}$$

4. Model with Time Varying Treatment Effects

There is a possibility that the influence of treatment changes over time on the industry-level outcomes. For instance, the wages or the average size of the firm may witness a change during a few years after the start of liberalization or a few years before the start of the policy in anticipation of the reform. Thus, the influence of trade liberalization may be stretched out over a number of periods. In such a case, using time unchanging instantaneous impact of trade reform, may lead to misspecification and erroneous results. Thus, in order to introduce more flexibility in the analysis and correct the possible mis-specification problems, the study estimates equation (1) using the method put forward by Laporte and Windmeijer (2005), which allows the treatment effects to change over time.

Following Laporte and Windmeijer (2005), equation (1) is estimated as follows:

$$Y_{it} = \alpha + \ldots. + \theta_{-3}P_{c,-3} + \theta_{-2}P_{c,-2} + \theta_{-1}P_{c,-1} + \beta_0 did_t + \beta_1(did_t * CV_{it}) + \gamma_0 P_{c,0} + \gamma_1 P_{c,1} + \gamma_2 P_{c,2} + \gamma_3 P_{c,3} + \ldots. + \delta_i + \delta_t + u_{it} \text{ ---------- (1)}$$

where $P_{c,-k}$ ($P_{c,k}$) can be defined as pulse variables, which take the value 1, k periods before (after) liberalization and 0 everywhere else.

Here, Y_{it} is the real output at 3-digit National Industrial Classification (NIC) level for industry i at time period t. did_t is a dummy variable assuming the value 1 in the period after the initiation of liberalization in the treated group and having the value 0 otherwise, δ_i a is a vector of industry fixed-effects and δ_t is a vector of time fixed-effects. The addition of δ_i will absorb any unobserved heterogeneity which are industry-specific and may be associated with the independent variables. Inclusion of δ_t in the model controls for macroeconomic and climatic shocks that are year-specific and common to all units (Alvarez and López, 2008).

The sign of the parameter β_0 is of prime interest in the current analysis, which captures the long run effect of trade reform. If liberalization leads to an increase in a particular reform implication, then β_0 should be positive and vice-versa. A common concern with DID estimation is the presence of serial correlation. Therefore, the standard errors are clustered at the industry level, which guarantees that the estimator of the variance covariance matrix is consistent even in the presence of any correlation pattern within sectors over time (Bertrand et al., 2004). Moreover, θ_{-j} estimates the treatment effect j periods before the trade liberalization and γ_j estimates the deviations from the long run effects, j periods after the trade liberalization. Through this method we can examine if the influence of trade liberalization takes place before the policy is actually applied. Such a situation can arise when there is uncertainty with regards to the precise initiation of the date of treatment or when some of the expected outcome happens in anticipation of the treatment. As such, it may be especially prudent to observe the effect before the period indicated as the start of liberalization, because trade restrictions are lessened prior to that period (Alvarez and Lopez, 2008). This kind of exercise is of crucial importance in the Indian context. While the pace of tariff reforms deepened in India in the aftermath of introducing the bound tariff regime in the post-1995 period, the process of trade reforms started from 1991 onwards in a phased

manner (Singh, 2017). Hence the firms may start their adjustment process before the start of the policy in expectation of the forthcoming changes.

In equation (1), CV_{it} is a dummy variable that takes the value 1 if the industry i enjoys competitive advantage (proxied with domestic profit viability) at time t. The parameter β_1 will indicate the disproportionate impact of liberalization for industries enjoying competitive advantage. The indicator CV is computed as:

$$CV_{it} = \frac{\text{Growth rate of Real Profit per Factory of industry i at period t}}{\text{Growth rate of Real Profit per Factory of all the sectors at period t}}$$

where real profit is computed through division of the sectoral profit data obtained from Annual ASI database (GoI, undated a) by the WPI of that particular year. A sector enjoys competitive advantage if the value of CV is greater than one and vice-versa.

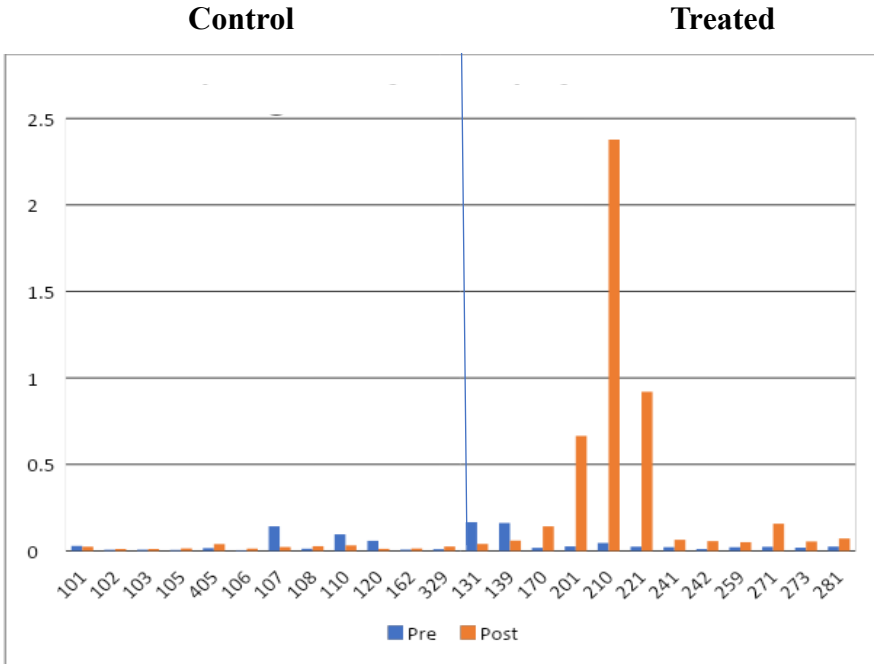
5. Observations from the Movement of the Secondary Data

Figure 2 plots the movement of real wages before and after liberalization within the control and treated groups. It can be observed that among the treated group, there was a significant rise in wages in the post liberalization period for particularly three industrial sectors, namely basic chemicals, pharmaceuticals and rubber. These product segments account for a significant proportion of India's export basket, which may provide a possible explanation for the surge in wages in these sectors post liberalization. On the other hand, the variation in wage level for the control group of industries (i.e., who have not reformed their tariff level in the post-reform period), has been comparatively far too modest.

From Figure 3, it can be observed that the trend in real wages both for competitive and non-competitive industries has been more or less stagnant. There is, however, a sharp rise in real wages for the non-competitive industries from around 2010, followed by a sudden fall subsequently. The initiation of the MGNREGA Act and augmentation of non-farm employment may have contributed potentially to the increase in wage rate during this period (Sahoo and

Pradesh, 2013; Himanshu and Kundu 2016; Jacoby, 2016). However, wages started to decline after 2013-14, which may be a function of the back-to-back droughts in the years 2014 and 2015, demonetisation in 2016 and initiation of Goods and Services Tax (GST) in 2017 and so on (Himanshu and Kundu 2016).

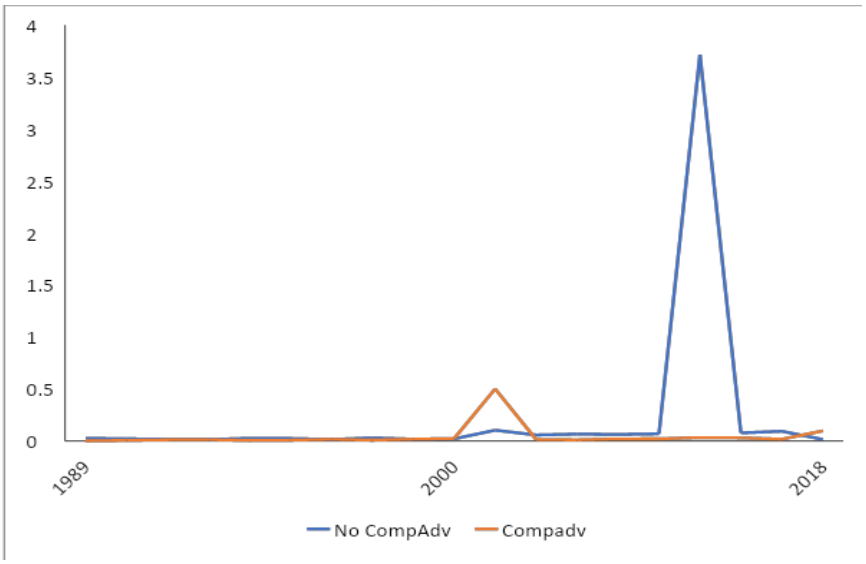
Figure 2: Real Wages of Select Sectors (in Rupees lakhs) in the Pre- and Post-Liberalization Period



Source: Constructed by authors from GoI (undated a) data

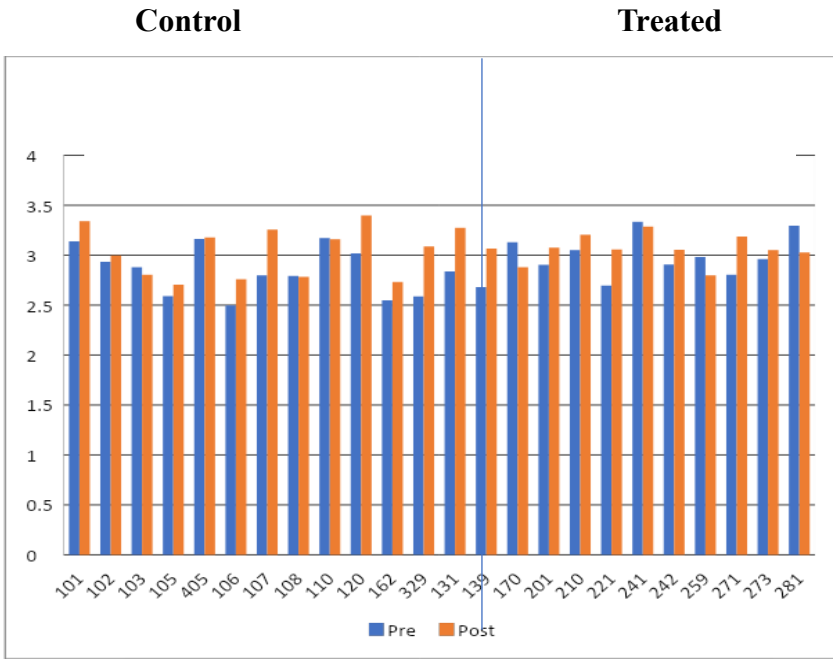
From Figure 4 it can be observed that the average size of total establishments in the sample has increased slightly in the post-reform period for some industries and has declined for other industries. Hence the net impact of liberalization on average size of total establishment is ambiguous from a casual observation of the data and further empirical tests need to be conducted. In the case of both competitive and non-competitive industries (Figure 5), the trend has been fluctuating and following more or less an oscillatory movement. Therefore, the trend in growth of average size of total establishments between the two types of industries is ambiguous.

Figure 3: Growth (in percentage) of Real Wage by Type of Industry (Competitive and Non-Competitive Advantage)



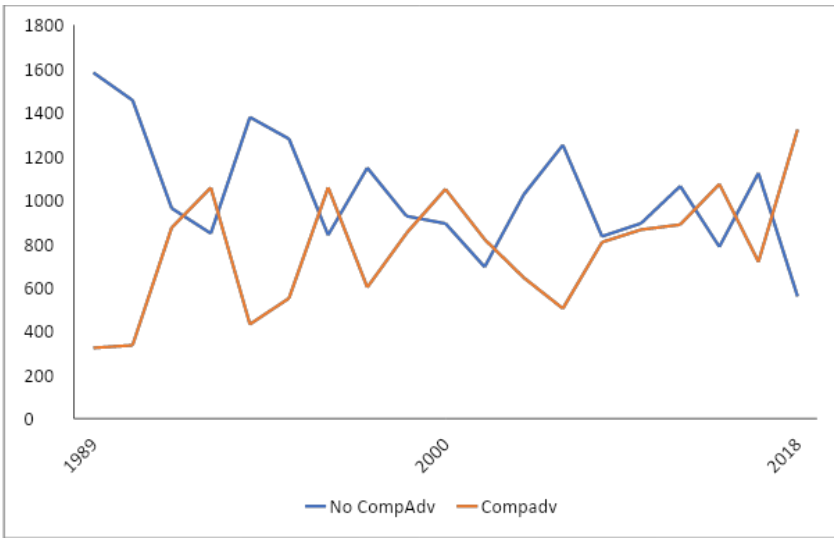
Source: Constructed by authors from GoI (undated a) data

Figure 4: Average size of Total Establishment of Select Sectors (in log) in the Pre- and Post-liberalization period



Source: Constructed by authors from GoI (undated a) data

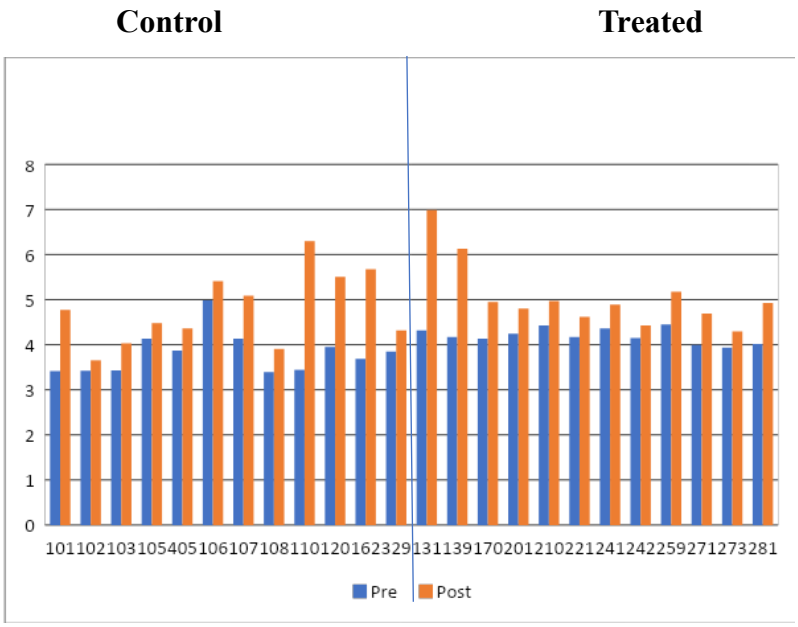
Figure 5: Growth (in percentage) of Average Size of Total Establishment by Type of Industry (Competitive and Non-Competitive Advantage)



Source: Constructed by authors from GoI (undated a) data

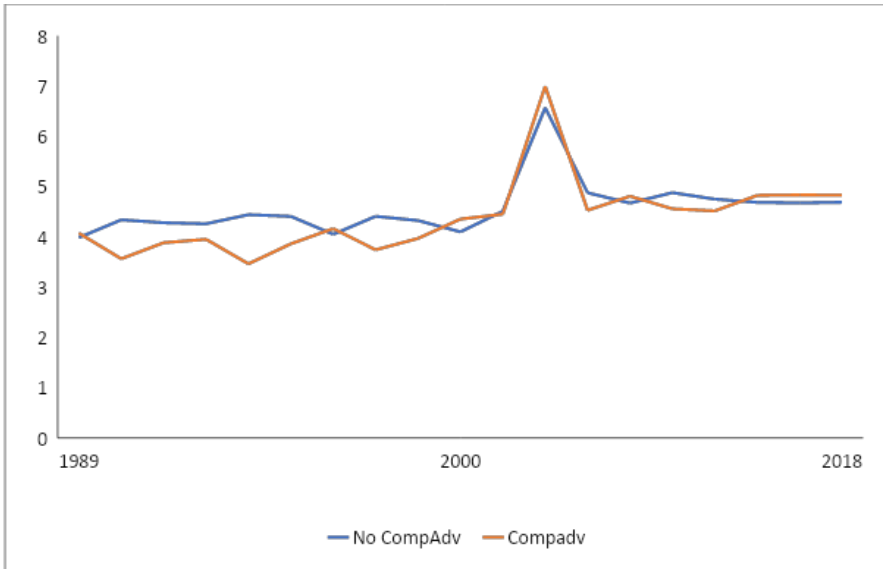
It can be observed from Figure 6 that there has been a rise in the number of factories post liberalization, particularly in the case of the treated group. Moreover, it is observed from Figure 7 that in the case of both competitive and non-competitive industries, the trend is also constant without many fluctuations. The number of factories showed a significant rise in around the year 2004-05. This may be contributed to the enactment of India's Foreign Trade Policy (2004-09), which exempted exporters from paying service tax (GoI, 2004). Also, exporters, with a turnover of at least Rs. 5 crores were excused from presenting bank guarantees in any of the export schemes. In addition, a number of State governments announced their industrial policies in 2004, with the intention of facilitating growth of manufacturing sector within their territories. All these led to a reduction in transaction costs and the burden of tax loads. Consequently, more firms started entering the industry (Hoda, 2020).

Figure 6: Number of Factories of Select Sectors (in log) in the Pre- and Post-Liberalization Period



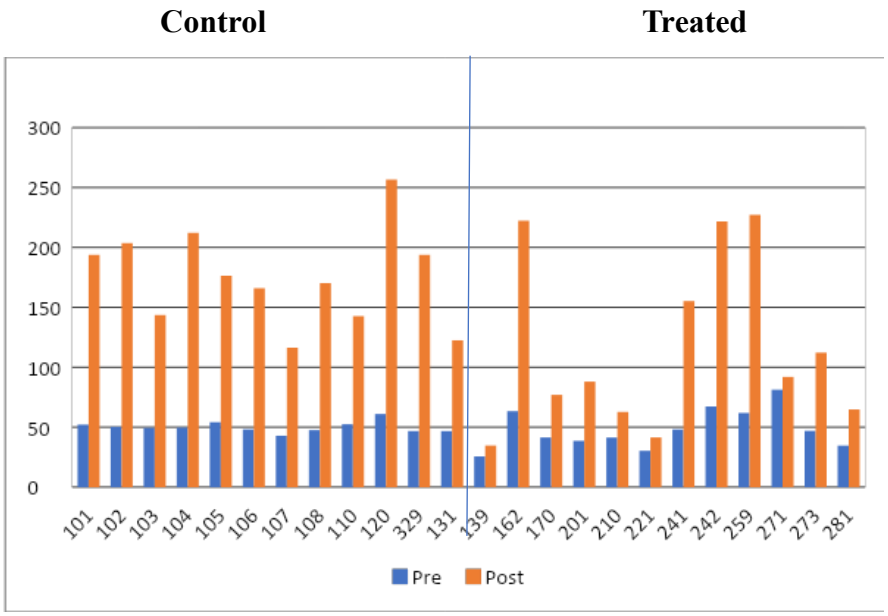
Source: Constructed by authors from GoI (undated)

Figure 7: Growth (in percentage) of Number of Factories by Type of Industry (Competitive and Non-Competitive Advantage)



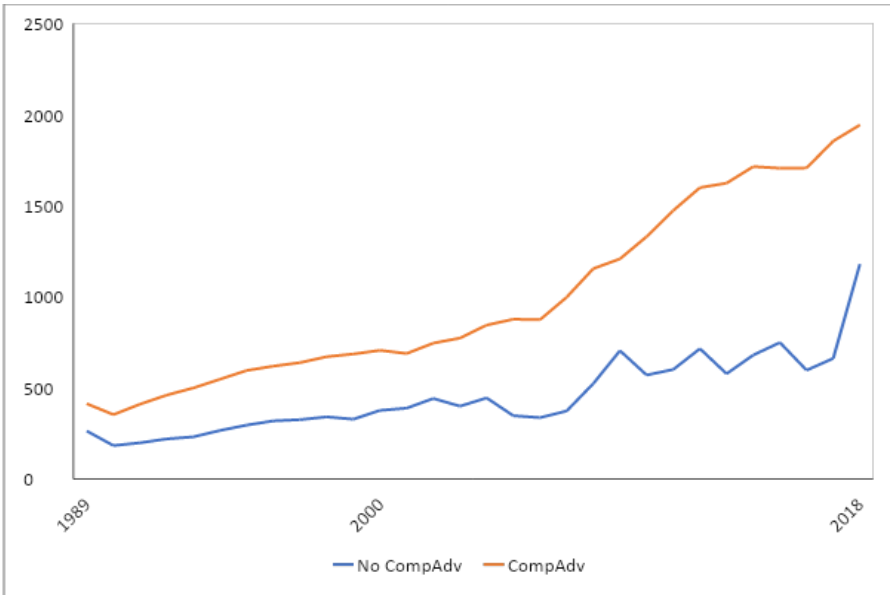
Source: Constructed by authors from GoI (undated a)

Figure 8: Prices in Select Sectors (in percentage) in the Pre- and Post-Liberalization Period



Source: Constructed by authors from GoI (undated a)

Figure 9: Growth (in percentage) of Prices by Type of Industry (Competitive and Non-Competitive Advantage)



Source: Constructed by authors from GoI (undated a)

Figure 8 underlines that the rise in prices in the industries in the control group is relatively more than the corresponding figure in the treated group. This suggests that sectors that were relatively more protected in the post liberalization period (i.e., the control group), witnessed a rise in the price level of the commodities they sold, presumably due to less competition from abroad. It has been observed from Figure 9 that the rise in prices in the post-reform period has been especially high for commodities like tobacco products, wood products, precious metals and fabricated metal products. In the case of both competitive and non-competitive industries, the rise in prices has shown an upward trend. However, in the post-reform period, the trend in prices was slightly higher in the case of competitive industries vis-a-vis non-competitive segments.

6. Empirical Results

The results of the empirical analysis are presented in Table 1. The liberalization dummy is found to be positive and significant both in case of skilled wages as well as real wages. This suggests that trade liberalization has led to an increase in both overall real wages and skilled wages in the treated group vis-à-vis the control group. However, interestingly, it is negative in case of industries enjoying competitive advantage. This potentially implies that higher profit-earning firms are paying lower wages to their workers, presumably in order to generate higher margins. The negative sign of the liberalization dummy in case of prices reveals a declining trend in prices in the treated group. The effect may underline the steep rise in foreign competition in the aftermath of reforms, which may exert a negative pressure on the pricing pattern of domestic firms in the sectors witnessing steeper tariff decline. However, the estimates of the pulse variable during second, fourth, sixth and eighth years before liberalization is positive and significant. This indicates that even though liberalization led to a long-term decline in prices, in certain years prices increased in response to the implemented reforms. The sign of the interaction term is positive, indicating that liberalization measures lead to a higher price realization in case of industries enjoying competitive advantage. This observation can be supported by the contention that sectors experiencing qualitative improvement by appropriating technology and skilled manpower will be able to augment their price level and earn greater profits as well.

The coefficients of the liberalization dummies are negative in case of average size of establishments, as well as average skilled and unskilled worker intensity. The result is in conflict with theoretical predictions of several trade models. However, this can be linked to the evidence of declining price-cost margins in India after liberalization (Krishna and Mitra, 1998), though fluctuations in the same across some industries have also been witnessed (Barua et al., 2012). Hence, this result may imply an increase in competition due to tariff reduction on imports. The estimates for the pulse variables are negative and significant for the fourth, eighth and ninth years before liberalization in case of average size of establishments and they are negative and significant for the fourth, seventh and eighth years before liberalization in case of average skilled worker intensity. These deviations from the long-run effect indicate that the impact of trade reforms showed up even before the reform was formally introduced. In the case of average unskilled worker intensity, the estimates for the pulse variables are negative and significant for the second, third, seventh and ninth years before liberalization and fifth and seventh year after liberalization. One possible driver of this empirical result is the initiation of industrial and trade policy reforms from the mid-eighties onwards (Panagariya, 2004).

The coefficient of the liberalization dummy for number of factories is however insignificant, indicating that there is no long run effect of liberalization on this front. Nonetheless, the estimates of the industries enjoying competitive advantage and the pulse variables corresponding to four years after reform is positive and significant, suggesting that trade liberalization led to an increase in the number of firms in sectors few years after its initiation. This result is consistent with the predictions of the dynamic models in which firms can choose their technologies (Emami-Namini and López, 2008; Alvarez and López, 2008). This further underlines the reality that while the high-tech firms may benefit from trade, emergence of low-tech firms focusing on domestic market leads to an increase in number of firms. The prevalence of low productivity and low skill in the Indian manufacturing context lends credence to this contention (Alonso and MacDonald, 2024).

Table 1: Basic Results for the Treatment Effect Model

Outcome	Explanatory Variable	Equation (1)
Per Factory Real Wages	did	0.04* (0.005)
	$did * cv$	-0.03* (0.004)
Per Factory Real Skilled Wages	did	0.006** (0.0004)
	$did * cv$	-0.002* (0.0002)
Prices	did	-408.598*** (42.017)
	$did * cv$	229.07*** (32.00)
Average size of establishments	did	-42.54* (3.80)
	$did * cv$	-2.29 (1.47)
Average skilled worker intensity	did	-32.40* (2.87)
	$did * cv$	1.54 (1.25)
Number of Factories	did	-19382.17 (3679.17)
	$did * cv$	134856.9* (15148.2)
Average unskilled worker intensity	did	-13.69* (1.99)
	$did * cv$	-1.90 (1.90)
Industry-specific dummies		Yes
Year dummies		Yes

Source: Estimated by authors

The results obtained in the present analysis provides contrasting empirical evidence vis-à-vis the theoretical predictions on efficiency and benefits of scale economies in the aftermath of implementing trade policy reform. A possible explanation behind these results are as follows. The industries included in the treated group are import-competing sectors. However, there also exists another set of industries that are export-competing and have currently not been considered in the analysis. For instance, there exists a labour market from which both the import- and export-competing sectors hire the skilled and unskilled workers. Once trade opens up, these export-oriented sectors experience an increase in their production level, leading to an increase in the

demand for workers of both types of skill sets. This will cause an overall rise in the wages of the workers, which will also be faced by the import-competing sectors. Therefore, while the exporting sectors expand in the aftermath of trade liberalization, the corresponding impacts on the worker's wages are borne by the importing sectors as well. Prior to liberalization many of these importing firms has been operating at a higher margin, being insulated from competition due to tariff protection (Krishna and Mitra, 1998). But post reforms, these firms face a contractionary pressure on their profits, not only due to increased competition following a lowered tariff, but also through a rise in the wages paid to the workers. If the fixed costs undertaken by these firms are not very high, then they may remain in the market with a reduced size. Moreover, if the sectors show some degree of trade overlap (for instance, a sector may be 40 percent import-competing and 60 percent export-oriented) or sector overlap (for instance, it operates as a multi-product firm, functioning as import-competing entity in sector *i*, but export-oriented player in sector *j*), then it may also provide some justification behind the rise in the number of operational firms.

Theoretical and empirical results underline that liberalization is generally followed by a rise in wages and fall in commodity prices (Dutta, 2007; Goldar and Aggarwal, 2005). It has been recently reported that while around 31 million jobs have been created in 2021Q3, majority of the establishments in the country are having vacancies (Sharma, 2022). The rise in real wages (both skilled and unskilled) combined with the fall in commodity prices may exert a negative pressure on the operating margin of the firms and consequently may lead to persistence of such vacancies. This will also provide another possible explanation for the obtained result on decline in the average size of establishments. The observation is in line with an earlier finding that Indian firms start small and stay small forever (Hseih and Klenow, 2014). Thus, there may be an increase in the firm number in the liberalized sectors in the post-reform period, but the anticipated realization of economies of scale benefits therein may remain unfulfilled. In that case, the realization of dynamic benefits in the industrial sector may turn out to be far too modest vis-à-vis the anticipated level.

7. Conclusion

The current study analysed the influence of reform measures, primarily from the tariff liberalization perspective, on the Indian manufacturing sector. Seven industry outcomes, namely real wage rate, real skilled wage rate, average size of establishment (both skilled and unskilled), number of factories and commodity prices have been included as the dependent variables in the empirical analysis. The results based on DID method of estimation reveals that trade liberalization has increased both the real wages and real skilled wages, which is arguably beneficial for motivating newcomers to the labour market. This is in accordance with the literature which states that trade specialization as well as trade reforms will enhance the wage rates of the workers in the country. The study however also finds that contrary to the theoretical predictions, average size of establishments has fallen, coupled with a rise in the number of factories. This indicates that in the aftermath of trade liberalization, the domestic firms failed to exploit the benefits of scale efficiency in the face of strong competition from their foreign counterparts. It also implies that while the NMCC established in 2004 primarily focused on the development of the manufacturing industries, it failed to have significant impact on the low-skilled wages and unskilled-worker intensity (Ahmed and Chakraborty, 2024a). Given this unintended development on firm-size, provision of jobs for all the newcomers in the labour market can remain a challenge.

The obtained observations are of crucial policy relevance for a developing country like India. It is apparent that trade liberalization in itself may not necessarily inflict a serious damage on labour returns (Ahmed et al., 2024c). On the contrary, growing sophistication of the production process and greater inflow of foreign direct investment (FDI) and cutting-edge technology benefits the workers (both skilled and unskilled), by raising their productivity (Ahmed and Chakraborty, 2024d). The policy focus therefore needs to be laid on promotion of greater skill formation and productivity enhancement through targeted programmes like Skill India Mission schemes under National Skill Development Corporation (NSDC) forum and similar initiatives, on one hand, and attracting relocation of high-tech global firms to the country for benefitting from the anticipated spillover effects on the other.

In addition, in order to decompose and understand the granular effects of trade liberalization, particularly on the skilled and unskilled wage dynamics at the disaggregated industry level, availability of cross-industry movement of workers needs to be effectively tracked (Ahmed and Chakraborty, 2024e). As the manufacturing labour market in the country witness new entrants (e.g., fresh job-seekers, school dropouts) as well as cross-sectoral movements (e.g., migration from the rural sector or other manufacturing segments) every year, the wage dynamics can be a function of various forces, e.g., labour demand and supply patterns, tariff reforms, technology upgradation and so on (Allen, 2001; Galiani and Porto, 2010). The collection of data on cross-sectoral labour movements and their periodic analysis will therefore enable the policymakers to address the long-term development objective of the country, particularly the ones related to manufacturing sector growth and labour market stability, more effectively.

References

Aggarwal, S., Chakraborty, D. & Bhattacharyya, R. (2023). 'Atmanirbhar Bharat Abhiyan': Smooth Drive to Self-Reliance? *Economic & Political Weekly*, 58(16), 40-47.

Aggarwal, S. & Chakraborty, D. (2020a). Labour Market Adjustment and Intra-Industry Trade: Empirical Results from Indian Manufacturing Sectors. *Journal of South Asian Development*, 15(2): 238-269.

Aggarwal, S. & Chakraborty, D. (2020b). Determinants of Vertical Intra-Industry Trade: Empirical Evidence from Indian Manufacturing Sectors. *Prajnan: Journal of Social and Management Sciences,* 49(3): 221-252.

Ahmed, A. & Chakraborty, D. (2024a). Undeterred from the Trade-Related Adjustment Challenges? Evidence from India's Skill-Specific Wage Dynamics. In C. Kim and M. Kim (eds), *Great Transition in India: An Interdisciplinary Approach,* pp. 97-121, Singapore: World Scientific Publishing.

Ahmed, A. & Chakraborty, D. (2024b). Influence of Liberalization on the Indian Manufacturing Sector: Empirical Evidence Over 1987–2018. In R. Bhattacharyya and D. Mazumdar (Eds.) *Contemporary Issues in International Trade,* pp. 113-125. New Delhi: Emerald Publishing.

Ahmed, A., Chakraborty, D. & Aggarwal, S. (2024c). Trade Liberalization and Labour Market Dynamics: Evidence from India. *Journal of Quantitative Economics*, Available at: https://doi.org/10.1007/s40953-024-00408-8 (accessed on September 12, 2024).

Ahmed, A. & Chakraborty, D. (2024d). FDI Reforms and Industrial Wage after launch of 'Make in India': Empirical Evidence. *Global Economy Journal*. Available at: https://www.worldscientific.com/doi/abs/10.1142/S2194565924500015 (accessed on September 9, 2024).

Ahmed, A. & Chakraborty, D. (2024e). Trade Reforms and Smooth Labour Market Adjustments in India? Scope for revisiting Industry-Level Employment Statistics. *World Economics Journal,* 25(2), 24-41.

Ahmed, A. & Chakraborty, D. (2022). Is India Ready for Tariff Reforms? Lessons from Difference in Difference Results. *Economic and Political Weekly*, 57(38), 21-25.

Allen, S. G. (2001). Technology and the Wage Structure. *Journal of Labor Economics*. 19(2), 440-483.

Alonso, C. P. K. & MacDonald, M. (2024). Advancing India's Structural Transformation and Catch-up to the Technology Frontier. IMF Working Paper No. WP/24/138. Washington DC: International Monetary Fund.

Alvarez, R. & López, R. A. (2005). Exporting and performance: evidence from Chilean plants. *Canadian Journal of Economics*, 38(4), 1384-1400.

Alvarez, R. & López, R. A. (2008). Trade Liberalization and Industry Dynamics: A Difference-in-Difference Approach, Working Paper No. 470, Santiago: Central Bank of Chile.

Amiti, M. & Davis, D. R. (2012). Trade, firms, and wages: Theory and evidence. *The Review of Economic Studies*, 79(1), 1-36.

Aw, B. Y., Chen, X. & Roberts, M. J. (2001). Firm-level evidence on productivity differentials and turnover in Taiwanese manufacturing. *Journal of Development Economics*, 66(1), 51-86.

Banga, R. & Das, A. (2012). Twenty Years of India's Liberalization: Experiences and Lessons, UNCTAD and Centre for WTO Studies. Available at: https://unctad.org/system/files/official-document/osg2012d1_en.pdf (accessed on August 30, 2024).

Barua, A., Chakraborty, D. & Hariprasad, C. G. (2012). Entry, Competitiveness and Exports: Evidence from the Indian Firm Data. *Journal of Industry, Competition and Trade*, 12(3), 325-347.

Bernard, A. B. & Jensen, J. B. (1997). Exporters, skill upgrading, and the wage gap. *Journal of international Economics*, 42(1-2), 3-31.

Bernard, A. B., Redding, S. J. & Schott, P. K. (2007). Comparative Advantage and Heterogeneous Firms, *Review of Economic Studies*, 74(1): 31-66.

Bertrand, M., Duflo, E. & Mullainathan, S. (2004). How Much Should We Trust Differences-in-Differences Estimates? *The Quarterly Journal of Economics*, 119(1), 249–275.

Chakraborty, D. (2002). India's Intra-industry Trade: An Analysis of the Pre-reform and Post-reform trends. M. Phil Dissertation (Unpublished), submitted at Centre for Studies in Diplomacy, International Law and Economics (CSDILE), Jawaharlal Nehru University, New Delhi.

Cheong, J. & Jung, S. (2021). Trade liberalization and wage inequality: Evidence from Korea. *Journal of Asian Economics*, 72, 101264.

Davidson, C. & Matusz, S. J. (2010). *International Trade with Equilibrium Unemployment*. Princeton: Princeton University Press.

Davis, D. R. (1996). Trade Liberalization and Income Distribution. NBER Working Paper No. 5693. Cambridge MA: National Bureau of Economic Research.

Debroy, B. & Santhanam, A. T. (1992). Concordance between National Industrial Classification and India Trade Classification (Revision 2). *Foreign Trade Bulletin*, 23(1), 7-16.

Debroy, B. & Santhanam, A. T. (1993). Matching Trade Codes with Industrial Codes. *Foreign Trade Bulletin*, 24(1), 5-27.

Dutta, P. V. (2007). Trade Protection and Industry Wages in India. *Industrial and Labor Relations Review*, 60(2):268–86.

Emami-Namini, J. & López, R. A. (2008). Technology Adoption and the Dynamics of Trade: Theory and Empirical Evidence. *Erasmus University (The Netherlands) and Indiana University (USA)*.

Fredriksson, A. & Oliveira, G. M. D. (2019). Impact evaluation using Difference-in-Differences. *RAUSP Management Journal*, 54(4), 519-532.

Galiani, S. and Porto, G. G. (2010). Trends in Tariff Reforms and in the Structure of Wages. *The Review of Economics and Statistics*. 92 (3), 482–494.

Goldar, B. & Aggarwal, S. C. (2005). Trade Liberalization and Price-Cost Margin in Indian Industries. *The Developing Economies*. 43(3), 346-373.

Government of India (GoI) (2004). Foreign Trade Policy 2004-09. Available at: https://www.india.gov.in/foreign-trade-policy-2004-09 (accessed on August 27, 2024).

Government of India (GoI) (undated a). Annual Survey of Industries Database. Ministry of Statistics and Programme Implementation, Central Statistical Organization. Available at https://microdata.gov.in/nada43/index.php/catalog/ASI (accessed on August 05, 2024).

Government of India (undated b), WPI data. Available at: https://eaindustry.nic.in/price_data_links.asp (accessed on August 07, 2024).

Greenaway, D., Sousa, N. & Wakelin, K. (2004). Do domestic firms learn to export from multinationals? *European Journal of Political Economy*, 20(4), 1027-1043.

Helpman, E. (2016). Globalization and wage inequality. Working Paper No. w22944, Cambridge MA: National Bureau of Economic Research.

Himanshu, H. & Kundu, S. (2016). Rural Wages in India: Recent Trends and Determinants, *The Indian Journal of Labour Economics*, 59(2), 217-244.

Hoda, A. (2020). Rethinking export incentives in India. Working Paper. No. 390, New Delhi: Indian Council for Research on International Economic Relations.

Hseih, C. T. & Klenow, P.J. (2014). The Life Cycle of Plants in India and Mexico, *The Quarterly Journal of Economics*, 129(3), 1035-1084.

International Trade Centre (undated). Trade Map database. available at: http://www.trademap.org/Index.aspx (accessed on August 05, 2024).

Jacoby, H. G. (2016). Food prices, wages, and welfare in rural India. *Economic Inquiry*, 54(1), 159-176.

Kalirajan, K. (2001). The Impact of a Decade of India's Trade Reforms. Available at: https://crawford.anu.edu.au/acde/asarc/pdf/papers/conference/CONF2001_07.pdf (accessed on September 8, 2024).

Krishna, P. & Mitra, D. (1998). Trade Liberalisation, Market Discipline and Productivity: New Evidence from India, *Journal of Development Economics*, 56(2), 447-462.

Laporte, A. & Windmeijer, F. (2005). Estimation of panel data models with binary indicators when treatment effects are not constant over time. *Economics Letters*, 88(3), 389-396.

Lanteri, A., Medina, P. & Tan, E. (2023). Capital-reallocation frictions and trade shocks. *American Economic Journal: Macroeconomics*, *15*(2), 190-228.

Mazumdar, J. & Quispe-Agnoli, M. (2002). Trade and the skill premium in developing countries: The role of intermediate goods and some evidence from Peru. Working Paper No. 2002-11. Atlanta: Federal Reserve Bank of Atlanta.

Melitz, M. J. (2003). The impact of trade on intra-industry reallocations and aggregate industry productivity. *Econometrica,* 71(6), 1695–1725.

Melitz, M. & Ottaviano, G. I. P. (2008). Market Size, Trade, and Productivity, *Review of Economic Studies*, *75*(1), 295-316.

Milanovic, B. & Squire, L. (2005). Does tariff liberalization increase wage inequality? Some empirical evidence. Available at: https://www.nber.org/papers/w11046 (accessed on September 7, 2024).

Panagariya, A. (2004). India in the 1980s and 1990s: A Triumph of Reforms. IMF Working Paper No. WP/04/43. Washington DC: International Monetary Fund.

Robbins, D. J. (1996). Evidence on trade and wages in the developing world. Technical paper No 111, Paris: OECD Development Centre.

Rojas-Vallejos, J. & Turnovsky, S. J. (2017). Tariff reduction and income inequality: Some empirical evidence. *Open Economies Review*, *28*, 603-631.

Sahoo, K. & Pradesh, A. (2013). NREGA and its Impacts on Rural Wage Rates. Hyderabad: International Crops Research Institute for the Semi-Arid Tropics. Available at: https://vdsa.icrisat.org/Include/Internrep/Report33.pdf (accessed on August 15, 2024).

Singh, H. V. (2017). Trade Policy Reform in India since 1991. Available at: https://www.brookings.edu/wp-content/uploads/2017/03/workingpaper_reformshvs_march2017.pdf (accessed on September 7, 2024).

UNCTAD (2022). Key Statistics and Trends in Trade Policy 2023. UNCTAD, Geneva. Available at: https://unctad.org/system/files/official-document/ditctab2023d2_en.pdf (accessed on June 05, 2024).

Vashisht, P. (2023). International Trade and Wage Inequality in India: Does Direction of Trade Matter? RIS Discussion Paper Series No. 279, New Delhi: Research and Information System for Developing Countries.

World Bank (undated). World Integrated Trade Solution (WITS), available at: https://wits.worldbank.org/ (accessed on September 5, 2024).

Yeaple, S. (2005). A Simple Model of Firm Heterogeneity, International Trade, and Wages, *Journal of International Economics*, 65(1), 1-20.

Appendix 1

Twelve sectors have been included in both the control and treated groups.

Appendix 1.1: Control and Treated Manufacturing Sectors (NIC'08 Classification at 3-Digit level)

Control		Treated	
101	Processing and preserving of meat	131	Spinning, weaving and finishing of textiles
102	Processing and preserving of fish, crustaceans and molluscs	139	Manufacture of other textiles
103	Processing and preserving of fruit and vegetables	170	Manufacture of paper and paper products
104	Manufacture of vegetable and animal oils and fats	201	Manufacture of basic chemicals, fertilizer and nitrogen compounds, plastics and synthetic rubber in primary forms
105	Manufacture of dairy products	210	Manufacture of pharmaceuticals, medicinal chemical and botanical products
106	Manufacture of grain mill products, starches and starch products	221	Manufacture of rubber products
107	Manufacture of other food products	241	Manufacture of basic iron and steel
108	Manufacture of prepared animal feeds	242	Manufacture of basic precious and other non-ferrous metals
110	Manufacture of beverages	259	Manufacture of other fabricated metal products; metalworking service activities
120	Manufacture of tobacco products	271	Manufacture of electric motors, generators, transformers and electricity distribution and control apparatus
162	Manufacture of products of wood, cork, straw and plaiting materials	273	Manufacture of wiring and wiring devices
329	Other manufacturing n.e.c.	281	Manufacture of general-purpose machinery

Source: Constructed by authors

Appendix 1.2: NIC Code Concordance Summary Table

NIC'08	Product Description	NIC'04	NIC'98	NIC'87
101	Processing and preserving of meat	151	151	200
102	Processing and preserving of fish, crustaceans and molluscs	151	151	203
103	Processing and preserving of fruit and vegetables	151	151	202
104	Manufacture of vegetable and animal oils and fats	151	151	212
105	Manufacture of dairy products	152	152	201
106	Manufacture of grain mill products, starches and starch products	153	153	204
107	Manufacture of other food products	154	154	205
108	Manufacture of prepared animal feeds	153	153	217
110	Manufacture of beverages	155	155	220
120	Manufacture of tobacco products	160	160	225
131	Spinning, weaving and finishing of textiles	171	171	
139	Manufacture of other textiles	172	172	236
162	Manufacture of products of wood, cork, straw and plaiting materials	202	202	260
170	Manufacture of paper and paper products	210	210	280
201	Manufacture of basic chemicals, fertilizer and nitrogen compounds, plastics and synthetic rubber in primary forms	241	241	300
210	Manufacture of pharmaceuticals, medicinal chemical and botanical products	242	242	304
221	Manufacture of rubber products	251	251	312
241	Manufacture of basic iron and steel	271	271	330
242	Manufacture of basic precious and other non-ferrous metals	272	272	340
259	Manufacture of other fabricated metal products; metalworking service activities	289	289	341
271	Manufacture of electric motors, generators, transformers and electricity distribution and control apparatus	311,312	311,312	360
273	Manufacture of wiring and wiring devices	313	313	361
281	Manufacture of general-purpose machinery	291	291	373

329	Other manufacturing n.e.c.	369	369	389

Source: Constructed by authors

Appendix 1.3: List of commodities included in each sector for computation of WPI

Control Group		Treated Group	
105	Milk	201	Manufacture of basic chemicals
	Other airy Products		Organic chemicals
101	Other non-food articles		
102	Canning & preserving & processing of fish	210	Antibiotics & preparations thereof
106	Wheat		API & formulations of vitamins
103	Grain Mills Products	131	Cotton Yarn
162	Vegetables		Cotton woven cloth
329	Jowar (broom corn)		Cotton cloth (dyed, printed, or otherwise finished/processed)
107	Sugar, Khandsari & gur		Cotton hosiery cloth
108	Cattle feed		Shirts/half shirts of cotton and/or man-made fibre
	Poultry feed		Trouser/pants made of cotton and/or man-made fibre
110	Wine industries	170	Preparation and spinning of textile fibres
	Malt liquor	139	Synthetic yarn
	Soft drink & carbonated water	221	Manufacture of made-up textile articles, except apparel
120	Manufacture of cigarette, tobacco & zarda		Inputs into steel making
104	Oil cakes		Metallic iron
			Alloy steel other than Stainless Steel- Shapes
			Mild Steel - Flat products
			Mild Steel -Long Products
			Mild Steel - Semi Finished Steel
			Stainless Steel - Semi Finished
		242	Copper metal/Copper Rings
			Copper shapes - bars/rods/plates/strips
			Copper bolts, screws, nuts
			Copper wire
			Lead ingots, bars, blocks, plates
		259	Copper wire
		281	Manufacture of engines and turbines, except aircraft, vehicle and two-wheeler engines
			Injection pump
			Hydraulic pump
			Water pump
			c. Manufacture of other pumps, compressors, taps and valves
			b. Manufacture of computers and peripheral equipment
		271	Manufacture of bearings, gears, gearing and driving elements
		271	Manufacture of electric motors, generators, transformers and electricity distribution and control apparatus
		273	Electric Wires & Cables

Source: Constructed by authors

APPENDIX 2: Results of Time Varying Treatment Effects

Appendix 2.1: Results of Time Varying Treatment Effects in Case of Real Wages

```
Fixed-effects (within) regression               Number of obs      =       526
Group variable: Sector                          Number of groups   =         2

R-sq:                                           Obs per group:
     within  = 0.1540                                         min =       231
     between = 1.0000                                         avg =     263.0
     overall = 0.1579                                         max =       295

                                                F(3,1)             =         .
corr(u_i, Xb)  = 0.1598                         Prob > F           =         .

                                    (Std. Err. adjusted for 2 clusters in Sector)
```

REALWAGE	Coef.	Robust Std. Err.	t	P>|t|	[95% Conf.	Interval]
_D_F12	-.000735	.0032615	-0.23	0.859	-.0421758	.0407057
_D_F11	-.0092347	.014823	-0.62	0.645	-.1975784	.1791091
_D_F10	.002095	.006303	0.33	0.796	-.0779917	.0821816
_D_F9	.0009256	.0044851	0.21	0.870	-.0560632	.0579144
_D_F8	.0018949	.0069171	0.27	0.830	-.0859958	.0897855
_D_F7	.0086378	.0043482	1.99	0.297	-.0466117	.0638873
_D_F6	-.0377514	.0439647	-0.86	0.548	-.5963759	.5208731
_D_F5	.0025246	.0025181	1.00	0.499	-.029471	.0345202
_D_F4	-.0022626	.0027676	-0.82	0.564	-.0374285	.0329032
_D_F3	.0013784	.004354	0.32	0.805	-.053944	.0567008
_D_F2	-.0012082	.0058364	-0.21	0.870	-.0753666	.0729502
_D_F1	-.008484	.0049549	-1.71	0.337	-.071442	.0544741
time	-.0017952	.0024033	-0.75	0.592	-.0323315	.0287411
_D_L1	.0140287	.0256436	0.55	0.681	-.3118042	.3398616
_D_L2	-.0187648	.0359607	-0.52	0.694	-.4756882	.4381587
_D_L3	-.0053619	.0077491	-0.69	0.615	-.1038232	.0930994
_D_L4	.0775921	.0432537	1.79	0.324	-.4719979	.6271821
_D_L5	-.083751	.0270794	-3.09	0.199	-.4278272	.2603252
_D_L6	-.0811938	.0577728	-1.41	0.394	-.8152674	.6528798
_D_L7	.051159	.0165436	3.09	0.199	-.1590473	.2613653
_D_L8	.0464489	.0173905	2.67	0.228	-.1745187	.2674166
_D_L9	-.0045296	.0062677	-0.72	0.602	-.0841681	.0751089
_D_L10	.0023815	.01643	0.14	0.908	-.206382	.211145
_D_L11	-.0216117	.0491486	-0.44	0.736	-.6461035	.6028801
_D_L12	.0013735	.0036002	0.38	0.768	-.0443719	.0471189
_D_L13	-.0024304	.0020857	-1.17	0.452	-.0289321	.0240713
_D_L14	-.001274	.018212	-0.07	0.956	-.2326789	.2301309
_D_L15	.0926409	.0789059	1.17	0.449	-.9099539	1.095236
_D_L16	-.0911538	.0779363	-1.17	0.450	-1.081429	.8991209
_D_L17	.0090013	.0024579	3.66	0.170	-.0222296	.0402322
_D_L18	-.0073421	.0157983	-0.46	0.723	-.208078	.1933938
_D_L19	.0035375	.0013189	2.68	0.227	-.0132208	.0202958
did	.0410008	.0054149	7.57	0.084	-.0278016	.1098032
cv	-.0357434	.004728	-7.56	0.084	-.0958186	.0243318

Source: Estimated by authors from Stata 14

Appendix 2.2: Results of Time Varying Treatment Effects in Case of Real Skilled Wages

```
Fixed-effects (within) regression               Number of obs      =       526
Group variable: Sector                          Number of groups   =         2

R-sq:                                           Obs per group:
     within  = 0.3995                                         min =       231
     between = 1.0000                                         avg =     263.0
     overall = 0.4815                                         max =       295

                                                F(2,1)             =         .
corr(u_i, Xb)  = 0.4310                         Prob > F           =         .

                                    (Std. Err. adjusted for 2 clusters in Sector)
```

REALSW	Coef.	Robust Std. Err.	t	P>|t|	[95% Conf.	Interval]
_D_F12	.0024933	.0050451	0.49	0.708	-.0616102	.0665969
_D_F11	.0020927	.0020972	1.00	0.501	-.0245544	.0287399
_D_F10	.0007429	.0013777	0.54	0.685	-.0167625	.0182482
_D_F9	.0004523	.0009222	0.49	0.710	-.0112655	.0121701
_D_F8	.000975	.001462	0.67	0.626	-.0176014	.0195513
_D_F7	.0004128	.0006631	0.62	0.646	-.0080129	.0088385
_D_F6	.0000345	.0006824	0.05	0.968	-.0086368	.0087059
_D_F5	-.0001277	.0003547	-0.36	0.780	-.0046343	.0043789
_D_F4	-.0007076	.0005114	-1.38	0.398	-.0072059	.0057906
_D_F3	-.0005955	.0009177	-0.65	0.634	-.0122562	.0110652
_D_F2	.0011798	.0033098	0.36	0.782	-.040875	.0432345
_D_F1	.0031683	.0054186	0.58	0.663	-.0656816	.0720183
time	.008285	.0062727	1.32	0.413	-.0714171	.087987
_D_L1	.0019917	.0013632	1.46	0.382	-.0153295	.0193128
_D_L2	-.0000797	.0005289	-0.15	0.905	-.0067996	.0066401
_D_L3	.001735	.0022524	0.77	0.582	-.0268848	.0303547
_D_L4	-.0000519	.0006775	-0.08	0.951	-.0086604	.0085566
_D_L5	.0011793	.0014165	0.83	0.558	-.0168186	.0191771
_D_L6	.0000483	.0015887	0.03	0.981	-.0201376	.0202342
_D_L7	.0005374	.000749	0.72	0.604	-.0089798	.0100545
_D_L8	-.0009996	.0020483	-0.49	0.711	-.0270253	.0250261
_D_L9	-.0035102	.0051912	-0.68	0.621	-.0694711	.0624508
_D_L10	.0027057	.0018304	1.48	0.379	-.0205519	.0259633
_D_L11	.0002743	.0003434	0.80	0.571	-.0040894	.0046381
_D_L12	.0005418	.0009636	0.56	0.674	-.0117017	.0127853
_D_L13	-.0008371	.0009884	-0.85	0.553	-.0133957	.0117214
_D_L14	.0013403	.0014058	0.95	0.515	-.0165221	.0192028
_D_L15	.0001734	.0005322	0.33	0.799	-.0065885	.0069354
_D_L16	.0009699	.0010426	0.93	0.523	-.0122775	.0142173
_D_L17	.000287	.0017784	0.16	0.898	-.0223094	.0228834
_D_L18	-.0000297	.0002665	-0.11	0.929	-.0034164	.0033569
_D_L19	-.0008867	.0008749	-1.01	0.496	-.0120031	.0102297
did	.0069481	.0004074	17.05	0.037	.0017712	.0121249
cv	-.0028652	.0002572	-11.14	0.057	-.0061326	.0004022

Source: Estimated by authors from Stata 14

Appendix 2.3: Results of Time Varying Treatment Effects in Case of Average Size of Establishments

Fixed-effects (within) regression — Number of obs = 523
Group variable: Sector — Number of groups = 2

R-sq:
within = 0.1333
between = 1.0000
overall = 0.0550

Obs per group:
min = 229
avg = 261.5
max = 294

F(1,1) = .
corr(u_i, Xb) = -0.6611 — Prob > F = .

(Std. Err. adjusted for 2 clusters in Sector)

AVGESTT	Coef.	Robust Std. Err.	t	P>|t|	[95% Conf.	Interval]
_D_F12	22.34845	15.56122	1.44	0.387	-175.3756	220.0725
_D_F11	-13.36087	5.635054	-2.37	0.254	-84.96101	58.23928
_D_F10	-14.28675	4.817077	-2.97	0.207	-75.49351	46.92002
_D_F9	-30.88828	3.828092	-8.07	0.078	-79.5288	17.75224
_D_F8	-30.32408	1.906321	-15.91	0.040	-54.54618	-6.101981
_D_F7	-22.69694	4.570582	-4.97	0.127	-80.77169	35.37781
_D_F6	-22.83848	9.133997	-2.50	0.242	-138.8969	93.21995
_D_F5	2.452927	2.236391	1.10	0.471	-25.96312	30.86897
_D_F4	-18.90693	.3642633	-51.90	0.012	-23.53533	-14.27852
_D_F3	-16.70337	4.782373	-3.49	0.178	-77.46918	44.06243
_D_F2	24.85239	4.022272	6.18	0.102	-26.25542	75.9602
_D_F1	35.1469	28.6914	1.22	0.436	-329.4119	399.7056
time	-13.64927	8.814297	-1.55	0.365	-125.6455	98.34699
_D_L1	4.462537	16.12141	0.28	0.828	-200.3794	209.3045
_D_L2	2.662708	5.468836	0.49	0.712	-66.82544	72.15086
_D_L3	4.380587	7.531059	0.58	0.665	-91.31059	100.0718
_D_L4	2.856026	.9473263	3.01	0.204	-9.180896	14.89295
_D_L5	-13.11736	16.54704	-0.79	0.573	-223.3674	197.1327
_D_L6	25.34145	16.17488	1.57	0.362	-180.1799	230.8628
_D_L7	10.60204	7.140996	1.48	0.377	-80.13291	101.337
_D_L8	-44.02835	23.3694	-1.88	0.311	-340.9647	252.908
_D_L9	-10.93373	13.00098	-0.84	0.555	-176.1268	154.2594
_D_L10	-2.643811	6.97653	-0.38	0.769	-91.28903	86.00141
_D_L11	12.39173	3.09857	4.00	0.156	-26.97934	51.7628
_D_L12	5.322742	18.67861	0.28	0.823	-232.0115	242.657
_D_L13	-2.10271	7.658875	-0.27	0.829	-99.41794	95.21252
_D_L14	-11.74261	5.831902	-2.01	0.293	-85.84395	62.35874
_D_L15	3.162296	5.666815	0.56	0.676	-68.84142	75.16601
_D_L16	-8.775077	17.15754	-0.51	0.699	-226.7823	209.2322
_D_L17	27.03465	5.809333	4.65	0.135	-46.77992	100.8492
_D_L18	-12.5333	.9148298	-13.70	0.046	-24.15732	-.9092908
_D_L19	-47.49738	9.043384	-5.25	0.120	-162.4045	67.40971
did	-42.54224	3.801272	-11.19	0.057	-90.84198	5.757493
cv	-2.299341	1.472351	-1.56	0.363	-21.00734	16.40866

Source: Estimated by authors from Stata 14

Appendix 2.4: Results of Time Varying Treatment Effects in Case of Average Skilled-Worker Intensity

```
Fixed-effects (within) regression               Number of obs      =       523
Group variable: Sector                          Number of groups   =         2

R-sq:                                           Obs per group:
     within  = 0.1162                                         min =       229
     between = 1.0000                                         avg =     261.5
     overall = 0.0546                                         max =       294

                                                F(2,1)             =         .
corr(u_i, Xb)  = -0.6805                        Prob > F           =         .

                                    (Std. Err. adjusted for 2 clusters in Sector)
```

AVGESTS	Coef.	Robust Std. Err.	t	P>|t|	[95% Conf.	Interval]
_D_F12	17.00754	13.70741	1.24	0.432	-157.1617	191.1767
_D_F11	-7.237637	5.025292	-1.44	0.386	-71.09002	56.61475
_D_F10	-6.672933	1.621786	-4.11	0.152	-27.27968	13.93381
_D_F9	-19.85941	3.906934	-5.08	0.124	-69.50171	29.78289
_D_F8	-19.77248	2.156388	-9.17	0.069	-47.17199	7.62703
_D_F7	-13.82073	1.893836	-7.30	0.087	-37.8842	10.24274
_D_F6	-13.97075	5.896969	-2.37	0.254	-88.89884	60.95735
_D_F5	2.037926	.9940907	2.05	0.289	-10.59319	14.66905
_D_F4	-8.803101	1.049138	-8.39	0.076	-22.13367	4.527468
_D_F3	-6.505824	4.013856	-1.62	0.352	-57.5067	44.49505
_D_F2	21.64346	5.001051	4.33	0.145	-41.90092	85.18784
_D_F1	33.50371	21.13762	1.59	0.358	-235.0753	302.0827
time	-4.44859	8.698953	-0.51	0.699	-114.9793	106.0821
_D_L1	-1.823551	13.1579	-0.14	0.912	-169.0106	165.3635
_D_L2	3.211254	5.088848	0.63	0.642	-61.44869	67.87119
_D_L3	2.018383	6.933184	0.29	0.820	-86.07607	90.11284
_D_L4	3.566724	.7163741	4.98	0.126	-5.535672	12.66912
_D_L5	-7.585145	13.35493	-0.57	0.671	-177.2756	162.1053
_D_L6	16.53437	16.70873	0.99	0.503	-195.7702	228.8389
_D_L7	7.726621	4.950598	1.56	0.363	-55.17668	70.62993
_D_L8	-30.92203	15.04973	-2.05	0.288	-222.147	160.303
_D_L9	-5.486954	6.607734	-0.83	0.559	-89.44618	78.47227
_D_L10	-4.33351	6.437815	-0.67	0.623	-86.1337	77.46668
_D_L11	9.851332	1.946519	5.06	0.124	-14.88153	34.5842
_D_L12	2.305221	15.02937	0.15	0.903	-188.661	193.2715
_D_L13	.5508421	6.113312	0.09	0.943	-77.12616	78.22784
_D_L14	-9.203371	3.379594	-2.72	0.224	-52.14519	33.73845
_D_L15	3.286859	4.697618	0.70	0.611	-56.40204	62.97576
_D_L16	-6.959893	12.2586	-0.57	0.671	-162.7202	148.8004
_D_L17	17.31483	7.215295	2.40	0.251	-74.36419	108.9938
_D_L18	-8.824991	.4401807	-20.05	0.032	-14.41802	-3.231965
_D_L19	-30.40041	6.813413	-4.46	0.140	-116.973	56.17221
did	-32.40377	2.870021	-11.29	0.056	-68.87085	4.063307
cv	1.54552	1.255797	1.23	0.434	-14.4109	17.50194

Source: Estimated by authors from Stata 14

Appendix 2.5: Results of Time Varying Treatment Effects in Case of Average Unskilled-Worker Intensity

```
Fixed-effects (within) regression               Number of obs      =       523
Group variable: Sector                          Number of groups   =         2

R-sq:                                           Obs per group:
     within  = 0.2011                                         min =       229
     between = 1.0000                                         avg =     261.5
     overall = 0.1314                                         max =       294

                                                F(3,1)             =         .
corr(u_i, Xb)  = -0.4983                        Prob > F           =         .

                                    (Std. Err. adjusted for 2 clusters in Sector)
```

AVGESTUS	Coef.	Robust Std. Err.	t	P>|t|	[95% Conf.	Interval]
_D_F12	3.586098	2.665399	1.35	0.407	-30.28101	37.45321
_D_F11	-5.802397	.1878236	-30.89	0.021	-8.188922	-3.415873
_D_F10	-6.989159	4.408515	-1.59	0.358	-63.00465	49.02633
_D_F9	-10.38476	1.62565	-6.39	0.099	-31.0406	10.27108
_D_F8	-11.19682	1.843684	-6.07	0.104	-34.62304	12.2294
_D_F7	-9.426406	1.453361	-6.49	0.097	-27.89311	9.0403
_D_F6	-9.672494	1.90514	-5.08	0.124	-33.87959	14.5346
_D_F5	-.5249043	1.59826	-0.33	0.798	-20.83272	19.78291
_D_F4	-7.684617	1.932783	-3.98	0.157	-32.24296	16.87372
_D_F3	-10.9823	.7920534	-13.87	0.046	-21.04629	-.9183088
_D_F2	1.948549	.2192123	8.89	0.071	-.8368073	4.733905
_D_F1	.0384896	8.267416	0.00	0.997	-105.009	105.086
time	-11.86669	1.126981	-10.53	0.060	-26.18633	2.45296
_D_L1	2.463918	1.678124	1.47	0.381	-18.85867	23.78651
_D_L2	-.6649595	4.7318	-0.14	0.911	-60.78818	59.45827
_D_L3	1.362303	2.90611	0.47	0.721	-35.56332	38.28793
_D_L4	2.586531	6.535093	0.40	0.760	-80.4497	85.62277
_D_L5	-6.457854	.9448971	-6.83	0.092	-18.46391	5.548203
_D_L6	1.415769	2.91773	0.49	0.712	-35.6575	38.48904
_D_L7	10.83821	1.152592	9.40	0.067	-3.806865	25.48328
_D_L8	-6.433398	24.25892	-0.27	0.835	-314.6722	301.8054
_D_L9	-6.18113	18.52363	-0.33	0.795	-241.5461	229.1839
_D_L10	-4.062192	1.652903	-2.46	0.246	-25.06432	16.93994
_D_L11	.0653993	1.902937	0.03	0.978	-24.11371	24.24451
_D_L12	3.426671	3.294828	1.04	0.488	-38.43809	45.29144
_D_L13	.297758	5.927536	0.05	0.968	-75.01873	75.61425
_D_L14	-2.69566	4.515842	-0.60	0.657	-60.07487	54.68355
_D_L15	.2840126	.9685265	0.29	0.818	-12.02228	12.59031
_D_L16	-2.977883	2.204624	-1.35	0.406	-30.99029	25.03453
_D_L17	.1350649	6.054539	0.02	0.986	-76.79515	77.06528
_D_L18	6.904689	6.049833	1.14	0.458	-69.96572	83.7751
_D_L19	-18.69908	3.029987	-6.17	0.102	-57.19871	19.80055
did	-13.69683	1.992821	-6.87	0.092	-39.01802	11.62436
cv	-1.907493	1.901059	-1.00	0.499	-26.06273	22.24775

Source: Estimated by authors from Stata 14

Appendix 2.6: Results of Time Varying Treatment Effects in Case of Number of Factories

```
Fixed-effects (within) regression               Number of obs      =       523
Group variable: Sector                          Number of groups   =         2

R-sq:                                           Obs per group:
     within  = 0.1149                                         min =       229
     between = 1.0000                                         avg =     261.5
     overall = 0.1158                                         max =       294

                                                F(1,1)             =         .
corr(u_i, Xb)  = 0.0951                         Prob > F           =         .

                                    (Std. Err. adjusted for 2 clusters in Sector)
```

NOFACTORIES	Coef.	Robust Std. Err.	t	P>|t|	[95% Conf.	Interval]
_D_F12	5635.012	22728.85	0.25	0.845	-283162.4	294432.4
_D_F11	39070.38	15867.06	2.46	0.246	-162539.7	240680.5
_D_F10	-133855.6	123819.3	-1.08	0.475	-1707129	1439418
_D_F9	34368.32	27254.02	1.26	0.427	-311926.9	380663.5
_D_F8	9835.347	16557.29	0.59	0.659	-200545	220215.7
_D_F7	499.2131	6000.317	0.08	0.947	-75742.04	76740.47
_D_F6	-12631.34	13436.72	-0.94	0.520	-183361.1	158098.4
_D_F5	24507.69	52061.68	0.47	0.720	-636998.7	686014.1
_D_F4	-5620.144	2395.891	-2.35	0.257	-36062.83	24822.54
_D_F3	23012.61	27012.57	0.85	0.551	-320214.7	366239.9
_D_F2	2713.273	11573.22	0.23	0.853	-144338.4	149765
_D_F1	37188.18	8178.828	4.55	0.138	-66733.69	141110
time	14454.8	42397.21	0.34	0.791	-524252.9	553162.5
_D_L1	-476702.3	353646.9	-1.35	0.406	-4970212	4016808
_D_L2	-304387.3	139179.4	-2.19	0.273	-2072830	1464055
_D_L3	229532.4	111136.6	2.07	0.287	-1182593	1641657
_D_L4	164687	624.6655	263.64	0.002	156749.8	172624.1
_D_L5	3627.767	7527.001	0.48	0.714	-92011.85	99267.39
_D_L6	126423.8	210912.5	0.60	0.656	-2553474	2806321
_D_L7	-150570.8	231209.7	-0.65	0.633	-3088368	2787227
_D_L8	37350.87	12326.88	3.03	0.203	-119277	193978.7
_D_L9	29834.57	103563.3	0.29	0.821	-1286062	1345731
_D_L10	-75854.62	83727.23	-0.91	0.531	-1139710	988000.7
_D_L11	362014.1	257058.3	1.41	0.393	-2904221	3628250
_D_L12	-380148.3	277159.9	-1.37	0.401	-3901798	3141502
_D_L13	60178.13	13016.22	4.62	0.136	-105208.6	225564.9
_D_L14	24426.73	44092.09	0.55	0.678	-535816.3	584669.8
_D_L15	18766.77	9907.44	1.89	0.309	-107119.2	144652.7
_D_L16	-76904.03	130801	-0.59	0.662	-1738888	1585080
_D_L17	62209.21	110538.6	0.56	0.674	-1342317	1466735
_D_L18	-59580.36	54656.76	-1.09	0.473	-754060.4	634899.7
_D_L19	55893.76	41727.01	1.34	0.408	-474298.2	586085.7
did	-19382.17	3679.518	-5.27	0.119	-66134.88	27370.54
cv	134856.9	15148.13	8.90	0.071	-57618.37	327332.1

Source: Estimated by authors from Stata 14

Appendix 2.7: Results of Time Varying Treatment Effects in Case of Prices

Linear regression

Number of obs	= 862
F(40, 821)	= 99.05
Prob > F	= 0.0000
R-squared	= 0.6630
Root MSE	= 204.62

PRICE	Coef.	Robust Std. Err.	t	P>|t|	[95% Conf.	Interval]
_D_F12	676.5097	245.0711	2.76	0.006	195.47	1157.549
_D_F11	95.17885	112.2083	0.85	0.397	-125.07	315.4277
_D_F10	634.7502	220.5641	2.88	0.004	201.8142	1067.686
_D_F9	124.1	138.6477	0.90	0.371	-148.0458	396.2457
_D_F8	763.7402	209.6298	3.64	0.000	352.2667	1175.214
_D_F7	187.1044	155.4558	1.20	0.229	-118.0333	492.242
_D_F6	849.533	193.6926	4.39	0.000	469.342	1229.724
_D_F5	247.681	177.7393	1.39	0.164	-101.196	596.5579
_D_F4	901.5562	170.9486	5.27	0.000	566.0084	1237.104
_D_F3	242.2275	199.9766	1.21	0.226	-150.2981	634.753
_D_F2	955.1261	139.6164	6.84	0.000	681.079	1229.173
_D_F1	266.2373	224.2623	1.19	0.236	-173.9578	706.4323
time	1019.042	82.96461	12.28	0.000	856.1943	1181.89
_D_L1	424.2939	254.6301	1.67	0.096	-75.50862	924.0965
_D_L2	24.89459	40.304	0.62	0.537	-54.21642	104.0056
_D_L3	45.51788	42.33926	1.08	0.283	-37.58807	128.6238
_D_L4	21.84172	45.21834	0.48	0.629	-66.91545	110.5989
_D_L5	35.16296	46.58584	0.75	0.451	-56.27842	126.6043
_D_L6	22.48062	47.13469	0.48	0.634	-70.03806	114.9993
_D_L7	59.75009	62.22821	0.96	0.337	-62.39503	181.8952
_D_L8	696.9034	232.8789	2.99	0.003	239.7952	1154.012
_D_L9	100.9934	138.0167	0.73	0.465	-169.9138	371.9006
_D_L10	738.4497	210.231	3.51	0.000	325.7961	1151.103
_D_L11	174.4264	154.5165	1.13	0.259	-128.8674	477.7202
_D_L12	822.6285	194.62	4.23	0.000	440.6171	1204.64
_D_L13	219.7905	176.2323	1.25	0.213	-126.1284	565.7093
_D_L14	884.174	173.1322	5.11	0.000	544.3401	1224.008
_D_L15	236.9967	197.8548	1.20	0.231	-151.3641	625.3575
_D_L16	938.9733	143.5518	6.54	0.000	657.2015	1220.745
_D_L17	261.827	221.3151	1.18	0.237	-172.5831	696.2371
_D_L18	883.199	90.23506	9.79	0.000	706.0804	1060.318
_D_L19	420.543	252.1089	1.67	0.096	-74.311	915.3969
did	-408.5986	32.17692	-12.70	0.000	-471.7573	-345.4399
cv	229.0765	42.00688	5.45	0.000	146.623	311.53
2.sec	-10.92897	14.12284	-0.77	0.439	-38.6501	16.79216
YEAR						
1983	430.8974	254.6641	1.69	0.091	-68.97195	930.7668
1984	457.2541	255.3879	1.79	0.074	-44.03601	958.5442
1985	509.358	255.41	1.99	0.046	8.024562	1010.692
1986	539.9502	256.3337	2.11	0.035	36.80356	1043.097
1987	582.0766	256.0337	2.27	0.023	79.5189	1084.634
_cons	-6905.155	1920.265	-3.60	0.000	-10674.36	-3135.948

Source: Estimated by authors from Stata 14

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