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Industry Trade Exposure and the Quality of Employment in India's Manufacturing Sector

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Abstract

Globalization, trade and labour institutions have implications on the labour market affecting the regular nature of jobs and increasing dependence on contract labour. Using worker-level data for India's manufacturing sector, this paper evaluates the influence of outward orientation of the worker's industry on the informal nature of employment. We find that higher import penetration and export orientation of the manufacturing industries of workers promote employment of regular nature. However, the regular jobs come tied up with lack of job contracts in industries facing higher import competition. Export-oriented industries increase the chances of regular jobs with a written job contract.

Keywords

Trade, informal jobs, manufacturing sector, India, labour legislations

Introduction

In recent years, 'flexibilization' of labour has been a prominent feature of labour markets across developed as well as developing economies. The economic pressures of globalization and trade liberalization have translated into an increase in volatility in the labour market, higher labour demand uncertainty, flexibility of jobs and rise in job insecurity (Mazumdar, 2000; Rodrik, 1996). The informal employment arrangements and ambiguities with respect to terms and conditions of employment are, in fact, more widespread in the developing world.

Conventionally, in developing countries, the major forms of informal employment encompass the self-employed and the casual workers, and contributing family workers. In addition to this, there is a large presence of informal enterprises which are small and micro-enterprises and fall outside the purview of laws with respect to employment protection and social security. The exposure to trade and globalization in recent decades has led to more complex and diversified employment patterns, which go beyond the traditional source of flexible employment (Lee and Eyraud, 2008; Unni and Rani, 2008). In developed countries, it has generated informal jobs similar to those found in developing countries (Carré and Herranz, 2002). In developing countries, cross-border investments and global production sharing have sparked informalization of the

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formal sector. Within the framework of formal enterprises, there has been a greater reliance on low-cost informal workers, who lack access to social security. Additionally, there is significant recourse to agency-hired contract workers, who are outside the purview of trade unions and employment protection laws.

The economic rationale for the same is that in the face of global competition, firms increase the demand for low-wage contract workers to achieve short-run cost efficiency (Goldar and Aggarwal, 2012; Kapoor and Krishnapriya, 2017; Ramaswamy, 2008; Saha et al., 2013). Moreover, the hiring of contract workers allows for their buffering role during periods of economic distress.

One strand of literature perceives this flexibility in employment optimistically, contending that 'flexibilization' and liberalization of labour market is inevitable and a positive development in the face of globalization. Greater labour market flexibility is imperative to adjust to labour demand in response to cyclical fluctuations. In fact, it has also been argued that labour flexibilization can be used synonymously with contractualization or casualization of labour (Rajeev, 2010).

Nonetheless, it cannot be denied that these new forms of non-standard and flexible employment have added to the vulnerability and job insecurity of workers. Such 'flexible' and contract-based workers are generally faced with poor working conditions, lack of cohesion with regular workers and characterize lower productivity levels (Lee and Eyraud, 2008). A further implication of increase in demand of contract workers in a firm is that it erodes the bargaining capacity and wages of directly employed, regular workers (Goldar, 2006). While it reduces the firm's wage bill directly as well as indirectly, it adversely affects the welfare of all types of workers

In India, in the post-reform era and later, much of the employment gains have been in the unorganized and informal sectors, which are characterized by low productivity and low wages vis-à-vis the formal sectors of the economy. A number of studies based on the organized manufacturing sector confirm an increase in the proportion of contract workers (Kapoor, 2018; Kapoor and Krishnapriya, 2017; Sapkal, 2016). Ramaswamy (2008) points to the increase in contract intensity of unskilled workers since the 1980s, which is indicative of the greater uncertainty of employment and weakening of the bargaining power of unskilled workers. S. Das et al. (2014) find a high growth rate of contract workers in the relatively labour-intensive industries in organized manufacturing. Kapoor and Krishnapriya (2017) have reported a steady and secular substitution of directly hired workers with contract workers in the organized manufacturing sector and across all states in the country. Jajoria and Jatav (2022), focusing their study on non-farm sector, report a consistent decline in proportion of jobs with relatively longer-term job contract, and a consistent rise in formal jobs with shorter term or no job contract, indicating deteriorating quality of formal employment. Goldar and Aggarwal (2019) mention another source of informalization wherein the formal enterprises may contract out a part of its operations to other smaller, specialized enterprises. In this scenario, informal sector enterprises may supply workers to the principal firm, and these workers are generally denied most of the worker rights. Such structural adjustments have added to the worsening profile of manufacturing sector employment in India. Whether incidentally or not, the expansion of non-standard and inflexible forms of employment in India's manufacturing sector has coincided with the increasing global integration of manufacturing industries.

The objective of this paper is to study the impact of trade openness on informality of employment in the manufacturing sector. It measures the influence of import penetration and export orientation of a worker's industry affiliation on the quality of employment of workers in the manufacturing sector. In other words, we assess whether the probability of being in a regular wage job or a stable job with a written contract is significantly influenced by the trade exposure of the worker's industry. Using the worker-level employment data, this study controls for the socio-economic and job-related characteristics and also takes into account the inter-state variations in labour regulations.

The paper is structured as follows: following this introductory section, Impact of trade on informality – global empirical evidence highlights evidence on impact of trade on informality of jobs across countries, Trade and informality of manufacturing employment in India review India-based studies on the role of trade on influencing the informality and contract use of labour. The role of labour regulations discusses the important role of labour legislations and inter-state variations in labour laws in influencing formality and stability of manufacturing employment. Concepts, data and methods elaborate on the essential concepts of quality of employment, methodology, model specification and data sets employed in the study. Profile of the manufacturing workers in India describes the broad profile of the manufacturing workforce in India. Model results report and discuss the results of the econometric analysis. Conclusion concludes the study.

Impact of trade on informality – global empirical evidence

One of the adverse effects of trade reforms empirically investigated across countries is the replacement of good-quality formal jobs with low-quality informal jobs. Most studies evaluating the impact of trade on quality of jobs and informalization of employment are country-specific and based on micro-level data.

One of the earliest country-specific analyses is by Currie and Harrison (1997) which uses enterprise-level data to investigate the impact of trade reforms in Morocco. Their study finds that only state-owned enterprises resorted to hiring low-paid temporary workers in response to increased competition from trade. Goldberg and Pavcnik (2003) use Brazilian and Colombian data to examine whether exposure of formal firms to trade and foreign competition induces them to hire more temporary workers or rely on subcontracting relationships with smaller, informal firms. The study finds that trade reforms are not responsible for rising informality. Finding contradictory evidence in the context of Colombia, Attanasio et al. (2004) assert that trade reforms have led to rising informality in the labour market. Aleman-Castilla (2006) has assessed the impact of NAFTA (North American Free Trade Agreement) in Mexico and found that reduction in tariffs tends to reduce the likelihood of informality in tradable industries, with the effect being stronger for export-oriented industries. Another study in the context of Brazil by Paz (2014) finds that a reduction in import tariffs led to increase in informal employment and the average informal wage, and a relative decline average formal wage. Said (2012), focussing on the Egyptian manufacturing sector evaluates the effect of trade liberalization on wages and job quality. Said (2012) concludes that lower tariffs and expansion of exports translated into higher income for the poor, but at the expense of greater informality of jobs. Using data from the Republic of Korea, Lee and Lee (2015) find that the benefits of globalization do not accrue to temporary contract workers, even after controlling for worker-specific characteristics like education, occupation and ability. In the context of Brazil, Bosch et al. (2012) conclude that the impact of trade openness on informality is not uniform and is significantly influenced by the flexibility and structure of labour market institutions. Their study finds that constitutional reforms with respect to dismissal costs, overtime and union power have an important influence on informality in the labour market. Selwaness and Zaki's (2013) study based on Egypt has also evaluated the relationship between trade liberalization reforms and informality. Their study reports that lower tariffs increased informality in 1998, whereas tariff cuts led to a lower likelihood of informality in 2006. In another study, Ben Salem and Zaki (2019) report a rise in informal and irregular employment in response to tariff cuts during trade liberalization of the 1990s in Mexico. Cruces et al. (2018) report that average decline in the tariff levels led to decline in aggregate informality in Argentina's total manufacturing sector. At the industry level, their study finds evidence of larger tariff cuts translating to declining informality. Ben Yahmed and Bombarda (2020) evaluate the effect of Mexican trade liberalization on differential effects of

formality for men and women. Their study finds greater negative effect of trade openness on informality for women workers. Dix-Carneiro and Kovak's (2017) study on Brazil uses variations in tariff reductions across industries and differences in industry composition across regions to analyse changes in local labour demand caused by trade liberalization during the 1990s. The authors find that regions facing larger tariff cuts experienced more prolonged declines in formal employment and wages.

Trade and informality of manufacturing employment in India

Focussing on India, there is substantial literature that highlights expanding informal sector and contract usage of workers, particularly in the post-reform era. For instance, Ramaswamy (2008) points to the increase in contract intensity of unskilled workers since the 1980s, which is indicative of the greater uncertainty of employment and weakening of the bargaining power of unskilled workers. S. Das et al. (2014) report a high growth rate of contract workers in the relatively labour-intensive industries within organized manufacturing.

However, the empirical literature on the impact of trade on informal sector, informal jobs and contract intensity of employment is limited, and provides a mixed evidence. Linking exports with informality of jobs in India, Artuc et al. (2019) find that expansion of exports from India has led to increase in formality rates for unskilled workers. Their study reports that over the period from 1999 to 2011, the increase in manufacturing exports has converted 8 lakh jobs informal jobs to formal jobs.

Using country-level employment data, Goldar and Aggarwal (2012) investigate the role of labour market rigidities and import competition on informalization of industrial labour in India. Since it remains challenging to segregate workers across formal and informal jobs, the authors use the dichotomy between regular versus casual workers in their analysis, excluding self-employed workers from their analysis. Their study finds that the intensification of import competition increases the probability of a worker to be a casual worker. In other words, import competition in the post-reform era has been responsible for the increasing informalization of labour in the Indian manufacturing sector. Also, their analysis finds that labour market reforms help in generating more regular wage employment as against casual employment.

In a later study, Goldar and Aggarwal (2019) evaluate the impact of labour market reforms on informalization and contractualization of workers in the organized manufacturing sector. Their logit model-based analysis finds that probability of being in an informal job is not significantly higher in states with rigid labour laws, compared to more flexible states. In another model, they investigate the impact of labour market reforms and import competition on the contractualization of workers using plant-level data from the Annual Survey of Industries[1] for the year 2011–2012. They employ the tobit model to test for the inter-plant variation in the proportion of contract workers out of the total workers. The analysis reports that increase in import penetration of an industry decreases the use of contract workers, which is against the theoretical expectation.

Saha et al. (2013) also study the effects of trade openness and labour institutions on flexibilization of labour in formal labour markets in India, using data from the Annual Survey of Industries. The authors employ a three-dimensional panel to study the degree of contract labour employment in 58 industries across 15 major states over the period 1998–2004. Their analysis reports that stringent labour institutions and greater import competition have significant positive effects on contract labour usage. However, the authors do not find evidence of a clear relationship between export orientation of an industry and contract labour usage. Thus, according to their analysis, it is trade openness only in the form of greater import penetration that may be responsible for informalization of workforce in the formal labour market.

Pradhan (2006) uses cross-industry data to test the impact of trade, technology and foreign investment on contract patterns of employment. He finds that higher imports and exports (as a proportion of value added) have a negative and positive effect on the ratio of contract workers to regular workers. Pradhan's model results, though against the theoretical expectation are reported to be statistically insignificant.

Goldar (2023) uses plant-level data for India's organized manufacturing sector for the period 2008–2009 to 2017–2018 and finds that greater export participation by organized sector manufacturing plants increases the probability of hiring contract workers, as against direct employment workers.

Overall, the results of various studies on the impact of export intensity and import penetration of industry on the quality of employment are mixed and inconclusive.

The role of labour regulations

The literature in the context of India's labour market highlights the significant role of the long-existing rigid labour laws in influencing the type of jobs offered by the industrial enterprises. Several studies argue that these rigid labour laws have contributed to the widespread informality within the manufacturing sector (Dougherty, 2009; Nagaraj, 2002). India's labour market is subject to a panoply of labour regulations with 200 labour laws, out of which 52 are central acts. Out of these, the most restrictive laws are the Industrial Disputes Act (IDA), 1947; the Industrial Employment (Standing Orders) Act, 1946 and the Trade Union Act, 1926. Most of these labour laws involve a threshold of employment level above which they become applicable. That is, as the size of the factory increases (in terms of number of workers), it becomes subject to more number of legislations. Hence, firms often have an incentive to stay small and informal, or rather depend on contract workers. In the presence of strict Employment Protection Legislation setting, employers have resorted to alter their behavior to counter the restrictive labour laws. They tend to keep the enterprise size small and below the threshold at which labour laws become applicable and hire less protected forms of labour, i.e., contract labour with shorter-term contracts (Dougherty, 2009).

'Labour' as an issue appears in the concurrent list of constitution with both the Centre and the State governments having authority to pass and amend the legislations. Moreover, the degree of enforcement of laws is likely to vary across states, based on how that state institutionally handles the labour laws.

There is some literature which attempts to capture the inter-state variations in labour legislations and its impact on the economic performance and labour market outcomes in the manufacturing sector (Hasan and Jandoc, 2013; Kapoor, 2015; Mitra and Ural, 2008; Roy et al., 2020). Few studies report an improvement in employment quality in better-reformed states (Hasan et al., 2017, 2021; Saha et al., 2013; Sundaram et al., 2012; Van der Meulen Rodgers and Menon, 2013). Chaurey (2015) also empirically verifies that firms in states which have been identified as pro-worker (i.e., with a stricter labour regime) hired more contract workers in response to demand shocks. Kapoor and Krishnapriya (2017) observe sharp increase in contractualization not only in states with inflexible labour regime, but also in the states with flexible labour laws.

It must be acknowledged that quantification of differences in state-level legislations and amendment of labour regulations has been a matter of vigorous debate in studies that capture the effect of inter-state variations in legislations.

Besley and Burgess (2004) was a pioneering work which quantifies state-level legislations, taking into account the amendments at the state level. Besley and Burgess (2002, 2004) proposed an index of state-level amendments to the IDA between 1958 and 1992, to classify the states as pro-worker or pro-employer. This index, though critiqued by Bhattacharjea (2006), has been highly

utilized in several studies like Ahsan and Pagés (2009), Topalova (2004), Saha et al. (2013) and Hasan et al. (2007).

Bhattacharjea (2006) takes a radical departure from the work of Besley and Burgess (2004) and carries out his own assessment of legislative amendments. For the purpose of coding the states, Bhattacharjea considers two types of amendments: (1) those pertaining to threshold level of employment beyond which there are requirements for obtaining permission for retrenchment of workers; (2) those pertaining to obtaining permission for closure.

It is further been argued that, in addition to IDA, India's labour market is governed by several other laws that have differently reformed across states. Dougherty (2009) takes into account eight major legal areas to construct a new index of state-level reforms. The reforms covered in the index concern eight specific areas: IDA, Factories Act, State Shops and Commercial Establishment Acts, Contract Labour Act, the role of inspectors, the maintenance of registers, the filing of returns and union representation. The author finds differences in flexibility of labour market across states to be linked to state-level index of reforms. States with greater labour reforms were able to obtain greater flexibility and job turnover in the labour market.

Gupta et al. (2009), in another important study, construct a composite measure of labour market regulations which encompasses three components: (1) the Besley–Burgess index (Besley and Burgess (2004), (2) Bhattacharjea's measure focussing on the Chapter VB of the IDA, dealing with permissions for retrenchment and layoffs (Bhattacharjea, 2008) and (3) Other regulations like the Factories Act, Trade Union Act, Contract Labour Act, that go beyond the IDA. On the basis of this composite index, they classify the states as flexible, inflexible and neutral. In their study, the authors report slower output and employment growth in relatively rigid states with respect to labour legislations. Gupta et al. (2009) measure of labour market regulation has been used in Kapoor and Krishnapriya (2017).

All in all, the state-level labour laws and amendments do matter and have been a factor of consideration for analysing the status and quality of jobs, and employment outcomes in the Indian manufacturing sector.

Concepts, data and methods

The quality of employment is indeed a multidimensional concept, characterized by multiple elements, from physical safety to social protection and work–life balance. Different international organizations have adopted different frameworks to measure the quality of employment in a comprehensive manner.

The ILO's[2] concept of decent work encompasses the multifaceted objectives of 'full' and productive employment, socio-economic security, universal respect for fundamental rights at work, and strengthening of social dialogue (ILO, 2013). The United Nation's Economic Commission for Europe's framework for measuring the quality of employment covers seven broad dimensions addressing human needs: safety and ethics of employment, income and benefits from employment, security and social protection, social dialogue, working time and work–life balance, skill training and development and employment-related relationships and work motivation (UNECE, 2015). The OECD[3] Job Quality Framework (Cazes et al., 2015) is another comprehensive approach to assess the quality of employment across different countries and industries. It evaluates employment quality based on three core dimensions: earnings quality, labour market security, and the quality of the working environment. The application of these different frameworks of measurement is subject to the availability of relevant data on the statistical indicators to capture the different aspects of quality.

In the context of India, using the national-level employment survey data, the measurement of the quality of employment can be understood at different levels, capturing the different dimensions.

Firstly, an important and the simplest aspect of quality of employment is the composition of workforce by status of work. The 'status of work' criteria divides workers across three categories of employment: Self-employed, Regular wage/Salaried workers and Casual workers. Self-employed workers are further categorized into three types: Own account workers, employers and unpaid family workers. Regular workers, by definition, are on a relatively longer job tenure and receive wages or salary on a weekly/monthly basis. Regular wage employment is generally considered a better and more stable form of employment. Casual workers, on the other hand, do not have any fixed job tenure and mostly work for a daily wage. Casual work employment is considered to be poor quality employment, associated with irregular nature of work and low daily earnings.

Secondly, an important dimension used to segregate employment by quality is the availability of social protection. In general, social protection may be available in the form of unemployment benefits, maternity benefits, sickness benefits, health insurance, pensions or other forms. The criteria of access to social security benefits is used to classify all workers across formal and informal employment. All regular wage/salaried and casual workers who receive social security benefits are considered to be formal workers (National Commission for Enterprises in the Unorganised Sector [NCEUS], 2008). All regular wage and casual workers with no access to social security benefits are considered as informal workers.

Third, another dimension with respect to security of employment can be assessed through the indicator 'Availability of written and long-term job contract' among regular workers, to ensure stability of employment.

Apart from these criteria with respect to quality of employment at the level of worker,[4] another crucial aspect is the sector of employment, i.e., organized (or formal) sector of work or unorganized (or informal) sector of work. This segregation of workers across organized and unorganized sectors is done on the basis of the type of enterprise of work. All unorganized enterprises[5] are private unincorporated enterprises employing less than 10 workers (NCEUS, 2008). Being unregistered, they generally remain outside the ambit of government regulations and labour legislations.

In this study, the phenomenon of quality of employment has been addressed at two levels: (1) by status of work (regular/casual employment) and (2) by stability of work (whether a written job contract is available or not) among regular workers. In other words, we assess whether the probability of being in a regular wage job or a stable job with a written contract is significantly influenced by the trade exposure of industry, as measured by the export orientation and import penetration of industry. The analysis controls for the various worker-level socio-economic and job-related characteristics. It also takes into account the sector of work (organized/unorganized) and inter-state differences in labour reforms.

The phenomenon of 'status' of jobs (regular/casual) and 'stability' of regular jobs (whether a written job contract is available or not) has been evaluated in two separate models. This is because of the multi-layered structure of employment with a variety of conditions having a bearing on the quality of employment. For instance, a large part of regular wage jobs may be informal or with a lack of a stable or written job contract (Jajoria and Jatav, 2022).

Model specification

The analysis is based on the binary logit model, which is estimated by maximum likelihood estimation method.

The equation of the model to be estimated is as given below:

Type of worker = f(education, age, gender, rural/urban, caste, organized/unorganized sector, production worker, labour market regulation index, import penetration ratio of the industry in which the worker is employed, export–output ratio of worker's industry)

In the two models, the dependent variable is dichotomous, having two categories as mentioned:

Model I: Casual Worker/Regular Worker

Model II: Regular Job with No Job Contract/Regular Job with Job Contract

In both model specifications, various socio-economic indicators of worker characteristics have been used as control variables. The various socio-economic controls used are: age of worker, gender dummy, education dummy variable, social group dummy (i.e., whether the worker belongs to scheduled caste or scheduled tribe), rural/urban dummy (assigned on the basis of state of residence of the worker).

Two job-related characteristics of worker are also used as control variables in the analysis.

Firstly, a control dummy variable for employment of worker in formal sector (i.e., organized sector) has also been used in all specifications. The organized sector variable has been constructed based on the definition of formal sector given by NCEUS (2008). The intuition behind including the sector of work as an explanatory factor is that a large part of informal and casual jobs are expected to concentrate in the unorganized sector.

Secondly, an occupational dummy has been included in two categories: production worker[6] and non-production worker. This is relevant because a large segment of workers within the manufacturing sector are production workers, who actually work on the plant or as manual labour. It may be expected that across the import-competing as well as the exporting firms, the occupation of the worker may have a bearing on the type of employment, i.e., whether regular/casual/contract-based job. It is possible that employees at a higher level in the occupational hierarchy (i.e., professionals, managers, administrators, sales executives, etc.), are not only better qualified but may also be insulated by the shocks of trade. Hence, they are likely to fall under the formal/regular type of employment.

As discussed in the role of labour regulations, the rigidity of labour laws tends to squeeze away the formal employment, causing spillover into informal and contract-based employment. To capture for the effect of inter-state variations in labour laws, and to disentangle the effect of rigidity of labour market from that of industry trade exposure on informality, we include a state-level Labour Market Reform index as a control variable in the model. This is because inter-state differences in labour market regulation are likely to have a bearing on the proportion of workers with informal wage job in manufacturing sector. In other words, manufacturing enterprises in states with higher level of labour market reforms are expected to offer better formal and regular jobs. The Labour Regulation Index has been assigned to a worker based on the state in which he/she resides.

The empirical framework employed in this study is along the lines of Goldar and Aggarwal (2012), which also uses India-level household-level data from NSS EUS (2004–2005) to assess the impact of import penetration and labour market reforms on casualization of jobs. This study differs from Goldar and Aggarwal's analysis in three ways: (1) it also considers the export orientation ratio of the worker's industry as an additional explanatory factor for influencing the status of jobs; (2) the study also uses the occupational detail of the worker (at NCO 1-digit level) to assess the differential influence of trade exposure for production workers and non-production workers; (3) the study also estimates an additional model to test for the influence of industry-level trade exposure on the stability of jobs among regular workers. The stability of jobs has been proxied by the indicator 'availability of written contract' among regular workers.

Data

The analysis is based on the quinquennial rounds of the Employment Unemployment Survey (EUS) of the National Sample Survey Office (NSSO), under the Ministry of Statistics and Programme Implementation (MoSPI). NSSO's EUS, which is a household-level survey, has been considered as a reliable and comprehensive source of labour market statistics in India. The last round of this survey was the 68th round conducted in 2011–2012, after which the main source of employment statistics in India was replaced by the annual Period Labour Force Survey in 2017–2018. For the purpose of our analysis, we use unit-level data from the last two rounds of NSSO's EUS, i.e., 61st round (conducted in 2004–2005) and 68th round (conducted in 2011–2012). Using the same data on trade exposure of industries, we also attempt the analysis employing one round of the Periodic Labour Force Survey (PLFS) conducted in 2018–2019.

To start with, the working sample for econometric model to be estimated is all workers working in the manufacturing sector according to Usual Principal Subsidiary Status[7] (UPSS). NSS EUS and PLFS provide data on socio-economic variables like age, gender, education, rural/urban sector, social group and occupation. These variables have been used in the model to control for worker-specific socio-economic and job-related characteristics. A control variable for organized/unorganized sector of work has also been added in the model. Workers' categorization across organized and unorganized sectors has been done according to the definitions of formal and informal sectors given by the NCEUS (2008).

Data on labour market reform index is drawn from Dougherty (2008). This study constructs a new index of state-level labour reforms on the basis of a state-level survey, covering eight major legal areas. The reforms covered in the index concern eight specific areas: IDA, Factories Act, State Shops and Commercial Establishment Acts, Contract Labour Act, the role of inspectors, the maintenance of registers, the filing of returns and union representation. This index, based on 50 specific subjects of possible reform, has been assigned by Dougherty for 21 major states. For the purpose of our analysis, we use relative scores reported in his paper. Several studies (e.g. Dougherty et al., 2011; Goldar and Aggarwal, 2012) have employed this index in various studies to analyse the effect of state-level labour reforms.

As a measure of the degree of import competition faced by the industry in which the worker is employed, we use Import Penetration Ratio which is measured as Imports/(Domestic Product + Imports − Exports). For export intensity of the industry, the export orientation ratio, as measured by export–output ratio, has been used. Industry-level data on these two measures is taken from Saha et al. (2013) and has been matched with worker's industry affiliation according to National Industrial Classification[8] (NIC) in India.

The number of observations in the working sample are restricted by the states for which the index of labour reform is available, and manufacturing industries for which information on import penetration ratio and export orientation ratio is available. Workers from all states for which index of Labour Market reform is not determined are excluded from the model of estimation. In Model II, the working sample is further restricted to only regular workers employed in the manufacturing sector.

A list of all explanatory variables used in the model is specified with details in Table A1 in the Appendix.

Profile of the manufacturing workers in India

This section discusses the profile of manufacturing workers in India by status of work, across organized and unorganized sectors and by type of job contract. The employment survey data in India divides

Table 1. Number of workers in the manufacturing sector by status of work[11] (in millions).

Status of work	2004–2005	2011–2012	2018–2019
Self-employed	25.48 (53.19)	26.01 (49.08)	19.69 (43.05)
Regular wage workers	14.16 (29.58)	18.21 (34.35)	19.90 (43.51)
Casual workers	8.25 (17.23)	8.78 (16.57)	6.15 (13.45)
Total	47.89 (100)	52.99 (100)	45.75 (100)

Source: Author's estimation using NSS EUS 2004–2005, 2011–2012 and PLFS 2018–2019.
Values in brackets are percentages.

Table 2. Distribution of workers across unorganized and organized manufacturing sectors by status of work (in percentage).

Status of work	2004–2005		2011–2012		2018–2019	
	Unorganized sector	Organized sector	Unorganized sector	Organized sector	Unorganized sector	Organized sector
Self-employed	96.55	3.45	97.21	2.79	96.98	3.02
Regular wage workers	36.72	63.28	26.98	73.02	28.73	71.27
Casual labour	56.88	43.12	57.78	42.22	71.41	28.59
Total	72.02	27.98	66.55	33.45	63.85	36.15

Source: Author's estimations using NSS EUS 2004–2005, 2011–2012 and PLFS 2018–2019.

all workers across self-employed, regular wage/salaried workers and casual workers. The distribution of manufacturing workforce across these categories is reported in Table 1. It can be seen that the proportion of regular wage workers has increased and the proportion of casual workers has decreased over the period from 2004–2005 to 2018–2019. A substantial proportion of manufacturing workers are self-employed, which includes own account workers, employers and unpaid family workers. Such workers have been excluded from our model of econometric analysis.

Table 2 shows the distribution of these workers across the organized and unorganized sectors of work in the manufacturing sector. We see that a larger proportion of regular workers are employed in the organized manufacturing sector and a larger proportion of casual workers are engaged in the unorganized manufacturing sectors. Self-employment workers predominantly concentrate in the unorganized manufacturing sector.

Table 3 reports the distribution of regular workers according to information regarding availability of job contract. About 75% or more of the regular workers do not have written job contract. In 2004–2005, the proportion of regular workers with more than 3 years of job contract is about 20% and it decreased in 2011–2012. Overall, we find that the stability of regular jobs has continually reduced overtime from 2004–2005 till 2018–2019.

Model results

Applying the binary logit model for estimation, we use two parameters for quality and stability of employment as dichotomous dependent variables in two different models: Regular/Casual Worker in *Model I* and Regular Worker with Job Contract/No Job Contract in *Model II*. The results for both models are discussed in the section. Both Model I and Model II reported overall significant results on applying the Hosmer–Lemeshow goodness-of-fit test.

Table 3. Distribution of regular workers by type of job contract (in percentage).

Availability of job contract	2004–2005	2011–2012	2018–2019
No job contract	74.1	78.02	78.97
Up to 3 years	4.93	5.57	8.88
More than 3 years	20.97	16.41	12.15
Total	100	100	100

Source: Author's estimations using NSS EUS 2004–2005, 2011–2012 and PLFS 2018–2019.

Table 4. Logit model estimates for regular versus casual worker status (Model I).

Dependent variable: Casual worker = 1 Regular worker = 0	2004–2005	2011–2012	2018–2019
Explanatory variables			
Age	−.015*** (0.003)	−.003*** (0.001)	.004 (0.004)
Male worker	−.302*** (0.099)	−.535*** (0.123)	−.461*** (0.12)
Urban	−.874*** (0.073)	−.831*** (0.094)	−.699*** (0.096)
SC/ST	.165** (0.081)	.377*** (0.103)	.357*** (0.106)
Education: illiterate	.	.	.
Primary and below	−.47*** (0.096)	−.502*** (0.142)	−.288* (.158)
Middle	−.958*** (0.112)	−.881*** (0.146)	−.82*** (0.153)
Sec. and higher secondary	−1.447*** (0.12)	−1.475*** (0.154)	−1.045*** (0.157)
Graduate and above	−3.105*** (0.435)	−2.046*** (0.241)	−2.169*** (0.241)
Organized sector	−.772*** (0.075)	−1.077*** (0.096)	−1.629*** (0.101)
Production worker	1.747*** (0.2)	1.78*** (0.251)	1.45*** (0.223)
State reform index	−3.356*** (0.468)	−3.935*** (0.589)	.
MPR	−2.096*** (0.264)	−2.576*** (0.294)	−1.672*** (0.287)
XOR	−1.237*** (0.298)	−2.13*** (0.467)	−.376 (0.33)
Constant	2.171*** (0.319)	2.255*** (2.255)	.043 (0.339)
Model summary			
No. of observations	9663	8008	9192
Pseudo R^2	0.247	0.287	0.251
Wald χ^2	869.147	816.575	658.764
Prob. $> \chi^2$	0.00	0.00	0.00

Standard errors in parenthesis. Base category in education is illiterate.
*Significant at 10%. **Significant at 5%. ***Significant at 1%.

Model I

Table 4 reports the results of *Model I* for the years 2004–2005 and 2011–2012, which uses the regular versus casual worker dichotomy as the dependent variable.

Among the socio-economic characteristics, all coefficients have the expected sign and are significant, the odds of being a casual worker decrease with age and education and are observed to be significantly lower for male workers and those in the upper caste social group. As expected, the probability of a worker to be employed as casual worker is higher for production workers vis-à-vis non-production workers. The probability of being in a casual job is lower in the organized sector

Table 5. Logit model estimates for job contract status of regular workers (Model II).

Dependent variable: No job contract = 1 Job contract = 0	2004–2005	2011–2012	2018–2019
Explanatory variables			
Age	−.047*** (0.004)	−.036*** (0.005)	−.019*** (.004)
Male worker	.241 (0.162)	−.176 (0.198)	−.173 (0.153)
Urban	−.329** (0.129)	−.183 (0.15)	.134 (0.099)
SC/ST	.343*** (0.132)	.142 (0.145)	.043 (0.115)
Education: illiterate			
Primary and below	−.191 (0.202)	−.09 (0.276)	.124 (0.238)
Middle	−.657*** (0.19)	−.592** (0.266)	−.271 (0.226)
Sec. and higher secondary	−1.312*** (0.179)	−1.375*** (0.245)	−.63*** (0.214)
Graduate and above	−1.81*** (0.219)	−1.868*** (0.247)	−1.338*** (0.218)
Organized sector	−1.276*** (0.156)	−1.241*** (0.18)	−1.996*** (0.161)
State reform index	1.393* (0.756)	4.955*** (0.763)	
MPR	2.365*** (0.387)	1.556*** (0.402)	.343 (0.272)
XOR	−2.216*** (0.367)	−1.626*** (0.305)	−.468** (0.205)
Constant	3.647*** (0.422)	2.59*** (0.549)	4.351*** (0.326)
Model summary			
No. of observations	5934	5215	7342
Pseudo R^2	0.225	0.194	0.136
Wald χ^2	483.298	350.023	389.228
Prob. $> \chi^2$	0.00	0.00	0.00

Standard errors in parenthesis. Base category in education is illiterate.
*Significant at 10%. **Significant at 5%. ***Significant at 1%.

and in states with higher level of reforms. This implies that the easing of labour laws in states motivates firms to rely more on regular workers, as a substitute for casual workers.

The coefficient of import penetration ratio takes a negative sign and is highly significant. This implies that the odds of being a casual worker decrease as the import penetration ratio of the worker's industry increases. Industries facing significant import competition tend to employ more of regular workers, which are better quality, high-skilled workers, and complement with the high-technology industries (Bacchetta et al., 2017). This finding supports the popular proposition that international competition induces import-competing industries to recourse to skill-biased technological changes and defensive innovation (Acemoglu, 2003; Berman et al., 1998; Wood, 1995). Such concomitant factors in importing industries share greater complementarities with the high-skilled, regular workers. This result is also consistent with Ramaswamy's (2008) finding of skill-biased technical changes to favour skilled workers in India.

The coefficient of export orientation ratio maintains a negative sign throughout and is highly significant in 2004–2005 and 2011–2012. This implies that large exporting firms are relying less on casual workers and more on regular workers. The explanation for this probably lies in the fact that increase in exports leads to expansion of exporting firms, inducing firms to rely on better-quality workers hired on a regular basis. Several studies report evidence that higher level of exports lead to better quality of jobs with relative employment stability (Dauth et al., 2014; Kurz and Senses, 2016). In the context of India, Artuc et al. (2019) also found that increase in manufacturing exports led to formalization of informal jobs in the post-2000s era.

Model II

NSS EUS data also provides information with respect to availability of job contracts and duration of job contracts for regular workers. Using this information and restricting the sample to regular workers, Model II tests for the probability of a regular worker to be with 'no job contract' in response to industry trade exposure. The logit model results for the same are presented in Table 5. The dependent variable takes the value 1 if the regular worker has no written job contract and takes the value 0 if there is a written job contract.

It is found that the odds of a regular worker to have 'no job contract' decrease with age and at higher levels of education. The probability of having 'no job contract' is lower for an urban worker and higher for a worker in the SC/ST group (these coefficients are significant only in 2004–2005 and not in 2011–2012). The socio-economic characteristics controls of gender, region and caste are also insignificant in 2018–2019. Moreover, in 2018–2019, the odds of having no job contract are not found to be significantly lower for primary and middle school-level educated workers vis-à-vis the illiterate. It is evident that lack of stability and security of employment is a phenomenon has become more widespread and universal across regular workers, irrespective of their socio-economic endowments.

The probability of a regular job with no contract is lower in the organized sector, compared to the unorganized sector. The estimates report that higher import penetration ratio significantly increase the odds of 'no job contract' (significant at 1%) in 2004–2005 and 2011–2012. This implies that greater exposure to international competition makes the regular workers more vulnerable and leading to greater job insecurity.

The influence of higher export orientation of an industry on the probability of regular job with no contract is found to be negative (significant at 1%). This suggests that large exporting firms catering to international demand offer longer-term job contracts, which ensure stability of employment to regular workers.

The coefficient of state reforms index[9] is found to be positive and significant. This finding contradicts the expectation and indicates an increasing tendency for a worker to have no job contract in better-reformed states. We infer this positive coefficient of state reform index with the support of Figure 1 using data for 2004–2005.

For the 21 states covered in the analysis, Figure 1 plots the proportion of regular workers (among regular plus casual workers) and the proportion of 'no job contract' workers (among the regular workers), as against the labour market reform index (measured on the horizontal axis). Clearly, the graph shows two linear fit upward sloping lines which are nearly parallel. This reveals two important findings: (1) in the aggregate, states which have reformed more make greater use of regular workers (as against casual workers); (2) the more reformed states also increasingly characterize lack of job contracts for the large pool of regular workers.

The second finding is rather ironical as labour market reforms are meant to be in favour of labour welfare, and are expected to lead to better, more stable employment outcomes. This result suggests that though the reforms seem to translate into jobs of 'regular' status, they come tied up with lack of job contracts and employment insecurity. In other words, as the states reform towards flexible laws, the employment of 'no job contract' regular workers increases at the same or even higher rate as the employment of regular workers.

Conclusion

The informality of employment in the developing countries is often associated with liberalization of trade policies. Intense competition from imports causes firms to resort to significant cost-cutting

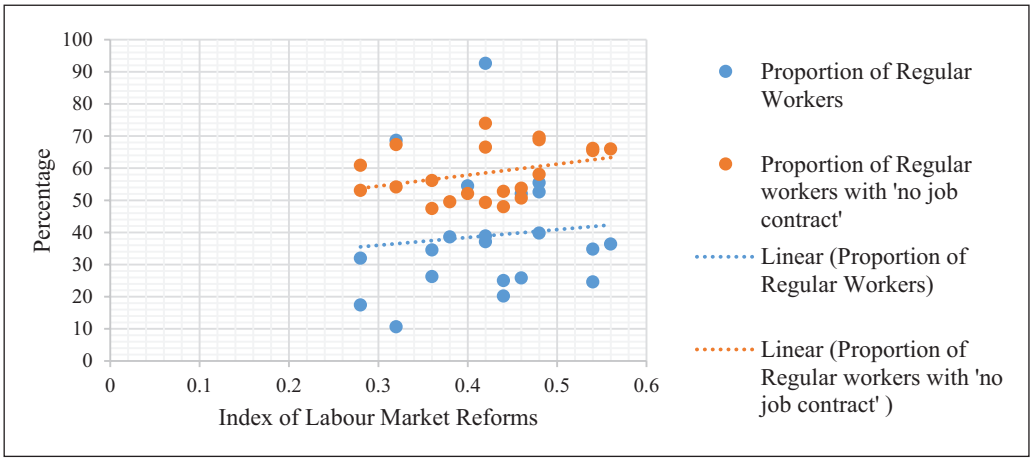

Figure 1. Relationship between labour market reforms Index, use of regular workers and regular workers with 'no job contract' (2004–2005).[10] Source: Author's estimation using NSS EUS for 2004–2005.

by hiring workers of the informal type. The increase in export volumes are expected to lead to an expansion of the formal sector and creation of formal jobs. At the same time, the uncertainty of global demand may negatively affect the stability of jobs.

The present study is an attempt to investigate how far the quality of employment of India's manufacturing workforce is linked to the import penetration and export orientation of the industry. It uses the regular-casual worker distinction and the stable-unstable (with or without job contract) job distinction to assess the impact of industry trade exposure on the quality of employment. The key socio-economic characteristics of worker and the sector of employment (organized/unorganized) have been used as control variables in the econometric analysis. The analysis also takes into account the inter-state variations in labour market reforms, as they are likely to influence the firm's decision on hiring regular and formal workers. Rigid state-level laws may encourage informal and casual jobs which remain outside the ambit of regulatory system. Our analysis indeed finds that the state-level labour laws have a significant role to play in influencing the status of jobs. Though better-reformed states have increasing proportion of regular jobs, they are characterized by lack of job contracts or very short-term job contracts. Even in the better-reformed states, the lack of job security remains tied along with regular workers. This finding is rather ironical as labour market reforms are meant to be in favour of labour welfare, and are expected to lead to better, more stable employment outcomes. It is apparent that the lack of job contracts and employment insecurity is becoming a universal phenomenon among all types of workers, including the large pool of regular workers in India's manufacturing sector.

With respect to trade exposure, it is found that intensification of import competition reduces the chances of 'casual' status of jobs. In the face of global competition, import-competing firms endogenously respond through 'defensive innovation' and skill-biased technological changes (Acemoglu, 2003; Wood, 1995). This reduces the demand for low-skilled casual workers and increases the employment of better-skilled, regular workers. Our findings are consistent with Ramaswamy (2008) who affirms that trade and endogenous technological changes increased the relative demand for skilled workers within the Indian manufacturing sector.

Our findings also indicate that the chances of casual job (vis-à-vis a regular job) decrease with the higher export intensity of an industry. That is, the expanding export-oriented firms not

only formalize their enterprises and processes, but also offer regular and stable jobs (Dauth et al., 2014; Kurz and Senses, 2016). Dauth et al. (2014) analysed Germany's worker-level data and concluded that the expansion of exports stabilized employment relationships and reduced the risk of job termination. Kurz and Senses's (2016) analysis of US manufacturing sector also reports lesser volatility in employment in exporting firms. In the context of India, Artuc et al. (2019) also find evidence on formalization of informal jobs with the expansion of exports in the post-reform period. Based on our findings, the relevant policy prescription would be export promotion schemes to encourage robust growth of the manufacturing sector that would boost the generation of good quality employment.

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Notes

1. The Annual Survey of Industries is the principal survey on industrial statistics in India, conducted by the MoSPI. It covers manufacturing enterprises in the organized sector, i.e., all factory units using electricity and employing 10 or more workers, and all factory units employing 20 or more workers but not using electricity.
2. International Labour Organization.
3. The Organization for Economic Cooperation and Development.
4. Other additional aspects of quality of employment at worker level can be: availability of paid leave, full-time/part-time worker, etc.
5. This definition of unorganized sector is according to the National Commission of Enterprises in the Unorganized Sector (2008).
6. Information on occupation of workers according to the National Classification of Occupation (NCO) in India has been used at l-digit level. NSS EUS 61st round (2004–2005) provides information on occupation according to NCO 68 and NSS EUS 68th round (2011–2012) and PLFS (2018–2019) provide information on occupation according to NCO 2004.
7. Usual Principal Subsidiary Status takes into account the Principal Status (activity status for major part of the year preceding the date of survey) and Subsidiary Status (economic activity status during the last 30 days preceding the date of survey.
8. In India, NIC is the statistical standard for classifying economic activities. It is consistent with the International Standard Industrial Classification (ISIC) recommended by the Statistical Commission of the United Nations.
9. The Index of Labour Market Reform by Dougherty (2009) has not been employed as a control variable in 2018–2019 for the reason that several Indian states reformed the employment-related and other legislations post-2013. Hence, Dougherty's index would not be valid for analysis for the period 2018–2019.
10. Similar trend was observed for 2011–2012.
11. The reported estimations are according to Usual Principal Subsidiary Status of Work which takes into account the principal activity as well as subsidiary activity of the workers.

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Appendix

Table A1. List of explanatory variables with description.

Explanatory variable	Variable name	Variable description	Value assigned
Age	Age	Age of the worker	Quantitative variable
Gender	Male worker	Gender of worker	1 = male 0 = female
Social group	SC/ST	Social group of the worker	1 = SC/ST 0 = otherwise
Region (rural/urban)	Urban	Sector of residence of the worker	1 = urban 0 = rural
Sector of work (organized/ unorganized sector)	Organized	Sector in which worker is employed as per UPSS status	1 = organized sector 0 = unorganized sector
Education level	Education	Education level of the worker	Dummy variable with five categories: illiterate, primary and below, middle, secondary and higher secondary, graduate and above
Labour market reform index	State reform index	Score for labour market reform in the state of residence of the worker (Dougherty, 2008)	Quantitative variable
Import penetration ratio	MPR	Imports/(Domestic Production + Imports–Exports). MPR of industry in which the worker is employed	Quantitative variable
Export–output ratio	XOR	Export/output ratio of the industry in which worker is employed	Quantitative variable
Production worker	Production worker	Defined according to worker's occupation at 1-digit level NCO	1 = production worker 0 = non-production worker