JOBLESS GROWTH IN INDIAN MANUFACTURING: A KALDORIAN APPROACH

Michele Alessandrini*

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Abstract

Despite the remarkable economic performance in the last twenty-five years, India maintains a high discrepancy between the rate of growth of the economy and the rate of growth of employment. Labour elasticity to output has decreased over time and the capability of the Indian economy to generate employment seems to be limited. As a result, more than 60 percent of Indian workers are still employed in agriculture and 94 percent of total labour force can be found in the unregistered segment of the economy. This paper analyzes the jobless growth problem in India in terms of a Kaldorian framework where the linkages between agriculture and industry enter the labour demand through the changes in the terms of trade between the two sectors. Moreover, we investigate the role of the unorganized sector in influencing the growth of the registered employment. Using a dynamic panel dataset on registered manufacturing from the 15 major Indian states over the period 1980-2004, our System-GMM estimates show that states with a higher growth of demand for industrial goods originating from agriculture also exhibit a higher growth of employment. In addition, in those states where the weight of the unregistered manufacturing has risen over time, the jobless growth problem has worsened.

Keywords: India, jobless growth, manufacturing, intersectoral terms of trade, Kaldor

JEL classification: J22, E26, O14, O53

* Dipartimento di Economia e Istituzioni, Università di Roma "Tor Vergata", via Columbia 2, 00133 Roma, Italy. E-mail: m.alessandrini@hotmail.com

1. Introduction

The centrality of the role of employment in transferring the benefits of growth to the poor relies on the fact that labour is about the only resource in which the poor are relatively abundant (Khan 2007). The magnitude of the benefits of growth to the poor, therefore, largely depends on the nature and extent of employment that growth itself generates. However, the relationship between economic growth and employment is not automatic and predetermined and not all growth is equally employment intensive. The recent experience of some of the fastest growing Asian countries testifies that the employment intensity of growth, i.e. the rate at which employment grows when output increases, can not only be low but also decline over time despite a positive growth rate of the economy. In the case of India, the incredible growth performance in the last two and a half decades has rapidly modified the economic structure of the country, but without the expected transformations in terms of occupation. Although the strategy of "gradualism" (Ahluwalia 2002; Williamson and Zagha 2002), in less than twenty-five years, has transformed a closed, rural and centralized country into a market-oriented economy with more than half of GDP coming from services, the majority of Indians live in rural areas and/or are employed in informal activities.

The causes of inadequate employment growth and transformation in India are several. First, the nature of the transition form an inward-looking, regulation-based, import substitution economy to one based on competition and international integration could have entailed restructuring and job losses in inefficient enterprises and sectors and the reallocation of workers to new export-oriented industries (ILO 2005 and 2009). A second source is a sharp sudden shift away from labour intensive economic activities towards capital intensive ones. Even if India, for instance, has attained a strong comparative advantage in the highly skill-intensive information technology industry (IT) through its past policy of promoting higher technical education, the IT sector employs only 1.5 out of 500 million workers. Furthermore India lacks an effective diffusion of IT in all areas of the economy as well as incentives for education in order to upgrade manufacturing and agriculture where the bulk of the labour force is located (Dasgupta and Singh 2005). Third, inappropriate labour market regulations affect labour costs and the adequate labour transfers. Indian labour laws are numerous, complex and even ambiguous and this could have promoted litigation rather than resolution of problems related to industrial relations (Sharma 2006). Finally, the wage elasticity has negatively affected the registered sector labour market, although the consideration of worked hours growth could reduce the effect of the rise in real wages (see the debate between World Bank 1989 and Bhalotra 1998).

This paper explores the evolution of the labour demand in Indian organized manufacturing

by introducing the Kaldorian idea of the intersectoral linkages between agriculture and manufacturing among the possible economic explanations of jobless growth. On the one hand, we concentrate our attention on organized industry in order to investigate whether the sustained path of growth of Indian economy has positively affected the demand of those workers who receive higher wages, formal contracts and benefits in a sector, manufacturing, considered by Kaldor as the engine of growth. On the other hand, we want to study the role of effective demand coming from agriculture, the sector where most of Indians live and work, in influencing and sustaining industrial production and therefore labour demand. In the Kaldorian theory, in fact, manufacturing growth, and thus industrial employment, depend on the purchasing power of agriculture not only at the early stages of industrialization, but also in the long-run, through demand linkages for simple consumer goods and manufactured inputs. Since a strong productivity growth could generate job losses when aggregate demand is insufficient, a decline in rural purchasing power could contribute substantially to weaken industrial expansion and reduce employment.

Even if the Green Revolution virtually eliminated famine in India in the late 1970s, there are strong signals that economic conditions in rural areas have not improved at the same pace as the rest of the economy and that the transfer of labour from low- to high-productivity sectors has been incomplete. First, despite the official poverty rate having steadily decreased over time from 51.3 percent in 1978 to 27.5 percent in 2005[1] (NSSO 2007*a*), 75 percent of the poor are in rural areas, with most of them being daily wagers, self-employed householders and landless labourers. Furthermore, statistics on food (NSSO 2007*b*) indicate a reduction in per-capita food availability: the consumption of food grains, for example, felt from 473 grams per day in 1990 to 422 grams in 2005. Consequently, per capita output of cereals (wheat and rice) at present is more or less at the level that prevailed in the 1970s. Second, numerous researches demonstrated that the growth pattern of India has widened the gap between rich and poor states in terms of per capita income (Ahulalia 2000; Bhattacharya and Sakthivel 2004; Purfield 2006; Kochhar *et al.* 2006) and that economic backwardness persists in landlocked states with a predominant agricultural sector (Alessandrini, Buccellato and Scaramozzino 2008). Third, the evidence that the number of people living in slums in India has more than doubled in the past two decades[2] suggests that only a minority of the millions of farmers that have migrated from the countryside succeeded in earning the relatively high wages of manual labourers in India's cities (Mitra 2006; Mitra and Murayama 2008).

[1] However, a 2007 report by the National Commission for Enterprises in the Unorganized Sector found that 77 percent of Indians, or 836 million people, lived on less than 20 rupees per day (0.5 $), with most working in "informal labour sector with no job or social security, living in abject poverty" (NCEUS 2007).

[2] India's slum-dwelling population had risen from 27.9 million in 1981 to 61.8 million in 2001 (NSSO 2003). The expansion is partly due to the rise in India's total population, which increased from 683 million in 1981 to 1.03 billion in 2001.

We make use of the intersectoral terms of trade as a measure of the linkages between agriculture and manufacturing. Due to the lack of data especially at regional level, this represents the clearest way to evaluate the purchasing power of agriculture relatively to manufacturing, or the effective demand for industrial goods coming form agriculture. The analysis of the effects of the intersectoral terms of trade on the Indian economy has been the object of a long debate (see Deb 2002 for an accurate review) and their effect on industrial growth, or industrial consumption goods, has been found negative (Rangarajan 1982; Ahluwalia and Rangarajan 1989; Mathur, 1990). However, most of these studies are based on years before the early 1980s and do not take into account the long period of sustained growth of the economy. Furthermore the Kaldorian models proposed by Thirlwall (1986) and Rada (2007) and the considerations by Grabowski and Yoon (1984) on monsoon economies indicate that the relation between the intersectoral terms of trade and industrial production, and thus industrial employment, is still not well established (see also Rattso and Torvik 2003).

We therefore test this hypothesis by including the ratio between agricultural prices and manufacturing prices among the explanatory variables of a dynamic labour demand equation. We then construct a panel dataset comprising the fifteen largest Indian states covering the period from 1980 to 2004. Applying a System-GMM procedure, our estimates confirm the positive economic relation between rising purchasing power in agriculture and labour demand growth in organized manufacturing: that is, states where the gap between agriculture prices and manufacturing prices has widened have significantly experienced a rise in manufacturing employment. Furthermore, the expansion of unregistered manufacturing exacerbates the jobless growth problem and reduces the response of formal employment to output growth.

The paper has the following structure. Section 2 describes the theoretical framework by considering the key features of the Kaldorian theory and introducing a simple model in line with the hypothesis of a positive relation between effective demand and employment. Section 3 looks at the characteristics of the Indian labour market, with particular regard to the evolution of informal employment. Section 4 explores the analytical framework, the data and the System-GMM method. Section 5 draws the main considerations on results. Section 6 concludes.

2. The Kaldorian framework

The theory

In 1967, in a series of lectures about the strategic factors in economic development, Nicholas Kaldor wrote that “economic growth which involves the use of modern technology and which

eventuates in high real income per capita, is inconceivable without industrialization" (Kaldor, 1967, p.54). This causal relationship is considered by the author as the unique road to economic development. Even if the debate on how economic growth can be translated into a development process is still open (Bolton 1997; Iscan 2004; Sala-i-Martin 2006; Basu and Mallick 2008), there is evidence that industrialization is a fundamental condition in order to achieve and sustain high rates of growth of the economy in the long run (Echevarria 1997).

Kaldor elaborated his concept in the three famous "laws" (Targetti 2005). The first law, called "the engine of growth hypothesis", asserts that the faster the rate of growth of manufacturing output, the faster the rate of growth of GDP. It follows that a greater excess of growth of industrial sector relative to GDP, that is when the share of secondary sector over GDP rises, will induce a faster growth of the economy as a whole. The transmission channels of this mechanism are formalized in the next laws. The second one, in fact, known as "Kaldor-Verdoorn law", suggests the existence of increasing returns to scale in manufacturing (Pieper 2003). The original relationship between output growth and labour productivity growth in manufacturing, as stated by Verdoorn (1949), is reversed in the Kaldorian theory: the growth rate of labour productivity is linear in output growth in the industrial sector. The Verdoorn's coefficient is determined by the effect of dynamic increasing returns, technical progress embodied in capital accumulation and the extent of the investment response to the growth of output, all of which are related positively to the degree of increasing returns to scale. This circular process becomes significant in sustaining economic growth in the long run. Finally, the third law states that the growth of productivity of an economy as a whole is positively related with the growth of output in the manufacturing sector through the labour reallocation to the manufacturing sector from the other sectors. This last law is based on the argument that the non-industrial sectors have diminishing returns to scale: as labourers move out of the other sectors, characterized by "disguised unemployment" as in the case of agriculture, the average productivity of the remainder of the labour force will increase. The productivity of manufacturing, instead, will increase as it absorbs more labour to produce more of goods according to the Kaldor-Verdoorn law.

However, the fundamental question is to understand the determinants of the growth of industrial output. Kaldor identified the answer in the interactions between manufacturing and agriculture, which play a key role especially during the early stages of the development process of an economy. In particular, the growth of the secondary sector is dependent on the growth of the agricultural surplus that is the excess of food production over food consumption of the agricultural labourers. The agricultural surplus over self-consumption, considered by Kaldor as "the best available indicator of the development potential of an economy" (1967, p. 56), acts in a twofold

way. First, if the demand for agricultural products increases after a raise in urban-industrial production and the agricultural supply is held constant, sooner or later, there will be inflation. Second, the growth of the agricultural surplus represents an essential condition for providing the growth of the purchasing power necessary for sustaining industrial expansion. In an economy at the early stages of its economic development, the largest part of the demand for manufacturing products comes from agriculture: the growth of industrial production is therefore primarily governed by the growth of effective demand. In agriculture, instead, the response to outside demand fluctuations plays a much smaller role. Agricultural production and productivity in the Kaldorian theory are mainly dependent on land-saving innovations, which include not only technical progress, but also the "social framework" of the sector incorporating the whole network of institutions through land reforms and the degree of education of rural population.

Under this set of economic relations, the initial impulse to industrialization has two main causes. First, it derives from the exports of agriculture and mining products that can be channelled to import the means – capital and technologies - for developing local industries. Second, it finds support on the adoption of protectionist policies: trade tariffs are effective for creating an internal demand for local industrial products, which substitute for manufacturing imports. However, the import-substitution policy through high barriers to international trade works till the local production satisfies the inner demand. From this point onwards, in order to prevent inflation and deficit in the trade balance, the growth of manufacturing should emerge from the exports of manufactured products, indicated as the fourth law or Thirlwall's law (see Targetti 2005) and/or from the development of the purchasing power of agriculture. To some extent, the growth of domestic industry is governed by agricultural surplus also in the long run.

The model

Following the Kaldorian argument, Thirlwall (1986) developed a general two-sectors model of growth and development in which the economic equilibrium is founded on the balanced complementarity between industry and agriculture. Extending the basic model discussed informally by Kaldor (1975 and 1979) also considering the case of an economy opened to trade, Thirlwall stresses the role of agriculture growth as the driving force in the early stages of development in an individual country, which starts as a closed economy and then opens to trade. The total amount of industrial goods produced by the agricultural sector is exchanged for the agricultural surplus deflated by the industrial terms of trade (as the price of steel in terms of corn). Agricultural surplus may be used to purchase either investment or consumption goods from industry, while agricultural output is a function of the product of the investment ratio and the productivity of investment in

agriculture. As a result, increases in agricultural output are also responsible for the growth of purchasing power, or demand, over industrial goods. Furthermore, while a rise in the industrial terms of trade reduces agricultural production growth (the industrial demand), the non-linear relation between the industrial terms of trade and the growth of industrial production (the industrial supply) is positive. Industrial production depends on the productivity of the investment in the sector and is indifferent to the workers' consumption preferences between food and industrial goods. In equilibrium, the growth rate of the economy is faster, the higher is the productivity of investment in both sectors, the higher is the agricultural savings ratio and the lower are industrial wage costs per unit of output. However, the stability of the model out of the equilibrium mainly relies on the coefficient of adjustment of the terms of trade to divergences between industrial demand growth and industrial supply growth. The behaviour of food dealers and merchants becomes therefore crucial: stability is guaranteed if they behave in such a way that the terms of trade adjust smoothly to the new equilibrium level. Low (relative) prices for agricultural goods constrain growth if the implied terms of trade reflect an excess supply of industrial goods due to the low purchasing power of agricultural sector to buy them. As a counterpart, a low price of steel positively affects the demand growth for industrial goods and is necessary for a higher rate of industrial growth.

The importance of intersectoral dynamics for growth as well as the interactions between sectors and the overall economy emerge also from the two-sector economy model developed by Rada (2007). The modern sector, which produces tradable goods, is governed by the Kaldor-Verdoorn law and labour productivity is therefore endogenous, that is, determined from a demand-side perspective. Higher investment leads to an increase in the growth rate of output and, consequently, labour productivity. If output grows faster than labour productivity in the modern sector, there will be an expansion in employment. A transfer of labour from low-productivity subsistence sector to high-productivity modern sector has a positive impact on growth through a more productive use of labourers and via the effective demand. The speed at which the modern sector could continue to expand depends on the adjustment variable, indicated in the price of non-tradable goods. A higher price for the non-tradable goods raises the wage in the subsistence sector contributing to a higher demand for the tradable goods coming from the subsistence sector, but it weakens the demand coming from the modern sector itself. The contribution of a rise in the price of non-tradable goods on the growth of the modern sector, hence, is determined by the strength of the Engel effects (Clements and Selvanathan 1994; Foellmi and Zweimuller 2008). In a developing country still characterized by large disguised and underutilized labour force, the Engel effects are weak, and a lower demand from the modern sector is larger than the contribution to demand by the subsistence sector. Furthermore, if the decrease of industrial wages in terms of food price is

significant, industrial labourers can be forced to return to agricultural work, causing a decline of labour supply to industry.

However, the classical hypothesis that a decrease in the industrial real wage in terms of agricultural goods is associated with a fall in industry labour supply does not seem to work in a monsoon agriculture context (see Grabowski and Yoon 1984). Many Asian countries are characterized by high variability in agriculture production due to the seasonality of the rainfalls. As noted by Oshima (1981), labour in monsoon agriculture is surplus only in a seasonal sense. If agricultural labour demand is highly seasonal, therefore, the deterioration of the terms of trade after a rise in food prices will not lead to a reallocation of workers from industry to agriculture whenever there are no additional jobs in the latter sector during the slack season. As a consequence, if the income level of industrial workers is close to subsistence, the rise in agricultural prices will force them to increase their (short-run) labour supply in order to maintain their standard of living[3]. Thus, unless the deterioration of the terms of trade reaches some critical level such that the ability of labourers to continue to work worsens, the supply of labour to industry will not decline.

Finally, it has to be noted that s strong tendency towards jobless growth can be accompanied by a high and increasing informal-sector employment. Individuals coming from agriculture who fail to find employment in the manufacturing formal sector can only find jobs in the informal activities. Even if the informal sector could offers rural migrants a better source of livelihood compared to rural conditions (Mitra 2006), the economy is constrained to a less efficient "dual" equilibrium (see Proto 2007). Tenurial contracts affect wealth accumulation (surplus) in the agrarian sector, which, in turn, determines the level of human capital investment of individuals migrating to the urban sector. The opportunity to migrate and find job in the formal activities depends on land rental price, which influences the competition of poor individuals for scarce land. If the income from such contracts is sufficiently high so that individuals can invest in education and find work in the formal manufacturing sector, the economy will tend to a modern equilibrium, characterized by the presence of a large manufacturing sector.

Summarizing, the theoretical implications discussed above can be formalized in the following simple Thrilwall-Kaldorian model. We start with the Kaldor-Verdoorn, which describes the positive relation between output growth (q) and labour productivity growth (pr) in the manufacturing sector (m):

(1) $pr_m = \alpha_0 + \alpha_1 q_m$

[3] The increase in labour supply may occur through individual workers working longer hours or secondary workers in their families deciding to join the labour force.

As productivity growth can be interpreted as the difference between manufacturing output growth and manufacturing employment growth, equation (1) can be rewritten in terms of employment:

(2) $e_m = \beta_0 + \beta_1 q_m$, with $\beta_0 = -\alpha_0$ and $\beta_1 = 1 - \alpha_1$

The surplus in agriculture - the food left over after demand from peasants has been satisfied - can be used for the purchase of manufacturing goods. The total amount of manufacturing goods obtained by agriculture can be defined as:

(3) $\frac{S_a}{P} = I_{ma}$

where P represents the manufacturing terms of trade as the ratio between manufacturing prices and agricultural prices ($P=Pm/Pa$); S_a is the level of surplus in agriculture; I_{ma} is the amount of manufacturing goods, both investment and consumption goods, obtained by agriculture in exchange for its surplus. In manufacturing, instead, nominal wages can be used for the purchase of manufacturing goods (C_{mm}) or agricultural goods (C_{am}):

(4) $WE_m = P_m C_{mm} + P_a C_{am}$

By multiplying WE_m for $\frac{Q_m}{Q_m}$ and dividing both terms of equation (4) by P_m, we obtain:

(5) $\kappa Q_m = C_{mm} + \frac{C_{am}}{P}$

where $\kappa = \overline{W} l$ represents the wage bill per unit of manufacturing output, $\overline{W}$ the real wage, l the labour input per unit of manufacturing output and P the manufacturing terms of trade. If the agricultural surplus exchanged for industrial goods satisfies the demand for food coming from manufacturing ($S_a = C_{am}$), by assuming C_{mm} equal to 0 for simplicity, it follows that:

6) $\kappa Q_m = \frac{S_a}{P}$

or

(7) $Q_m = \frac{S_a / P}{\kappa}$

Equation (7) says that manufacturing output can be expressed as the product of the propensity to export manufacturing goods to agriculture $1/\kappa$ (the Harrod trade multiplier) and the agricultural surplus deflated by the manufacturing terms of trade (see Thrilwall 1982 and 1986). It follows that manufacturing output growth is positively related to increases in agricultural surplus and to improvements in the propensity to export to agriculture but is negatively related to the growth of the manufacturing terms of trade that reduces the demand for manufacturing goods coming from agriculture. By assuming $1/\kappa$ constant, in terms of growth, equation (7) becomes:

(8) $q_m = s_a - p$

By putting equation (8) into (2) we obtain an inverse relation between the employment growth in manufacturing and the growth of manufacturing prices with respect to agricultural prices:

(9) $e_m = \gamma_o + \gamma_1(s_a - p)$

where $\gamma_0 = \beta_0$ and $\gamma_1 = \beta_1$.

If the terms of trade are a valid measure of the intersectoral economic linkages, the dynamics between manufacturing prices and agricultural prices represent the movements in agriculture surplus, and therefore, in the purchasing power or agricultural demand over industrial production. In a jobless growth scenario, employment in manufacturing depends indirectly on the effective demand over industrial production and so on agriculture surplus. Furthermore, a higher purchasing power in agriculture raises the probability of agricultural labourers to migrate and find jobs in the (formal) manufacturing sector and leaves the industrial labour supply constant.

3. Labour market in India

The Indian pattern of economic growth can be traced back to the first half of the 1980s, when the government of Indira Gandhi started to look at economic growth as the state's main goal (Kohli 2006*a*). The new strategy was implemented through a series of reforms aimed at increasing firms' productivity, by reducing the role of the central state on economy and by protecting them from foreign competition. Under this set of economic policy, the manufacturing sector recorded a growth rate of 5.7 percent per year during the decade and played the role of engine of economic growth till the financial crisis in 1991 (Rodrk and Subramanian 2004). The following decade, when India

opened its economy to international competition through a liberalization process that definitely transformed the country into a market-oriented economy (Kohli 2006*b*), manufacturing maintained the pace of growth of the previous decade and jumped to an average of 7.8 percent at the beginning of the new millennium.

However, despite such performance, the weight of industry on Indian GDP has experienced very few changes (Figure 1). In 1980 the share of manufacturing was 20.4 percent, it increased to 21.1 percent in 1990 but then remained fairly stable till 2000. The decrease registered by agriculture associated with the growth process has been absorbed by the incredible growth of services, risen from 42.7 percent of GDP in 1990 – it was 38 percent ten years before - to more than 50 percent in 2000, with an annual growth rate of 7.3 percent during the 1990s. With a share of services activities of 55 percent but with only one fifth of GDP coming from industry in 2005, the Indian economy seems to have skipped the phase of industrialization, jumping directly from agriculture to services in less than two decades (Dasgupta and Singh 2006). The anomaly of the Indian growth process, therefore, consists not only in the specific approach to growth demonstrated by the Indian policymakers, often labelled as "gradualism" (Ahluwalia 2002), but also in the particular consequences of growth on the structure of the economy. India has undoubtedly accelerated the linear stages of economic development which have generally implied the transformation of a country into a modern economy, and has implemented a rapid phase of "tertiarisation" of the structure of production. The Indian growth process, in fact, contrasts not only with the historical growth pattern performed by high-income economies (Chang 2002), but also with the experiences of similar countries as China (Alessandrini and Buccellato 2008)[4].

The low degree of industrialization in India characterizes also the labour market. The primary sector, which employed 70 percent of workers at the beginning of the 1980s, still employs more than 60 percent of total workforce (Dutt 2003; Joshi 2004). The occupation in industry has shown an increase from 13.8 percent to 16.8 percent while in services, despite their fast increasing share in the economy, has gradually moved to 22.7 percent from the value of 17.2 percent. However, even though the official unemployment rate has decreased to 7 percent, this value does not take into account that the majority of the labour force is employed in the informal economy. In fact, as shown by Table 1, the organised sector occupied less then 5.6 percent out of the 476 millions labourers in 2005, recording a continuous decline during the decades, especially in the 1990s. In terms of workers employed in the private organised sector, the share over total labour force falls to less then 1.8 percent. Therefore, the Indian growth performance has been

[4] Chinese sectoral structure has been constantly characterized by a predominant presence of the manufacturing sector, with more than 50 percent of GDP originating from industry in 2005.

accompanied by a constant increase of the weight of the informal employment[5] in the economy, with particular emphasis in the private segment. In terms of sector distribution, the organised sector has moved from industry to services, with the latter employing the 62 percent of the formal workers in 2005 (Table 2). Furthermore, the decline in the weight of the formal industrial sector has principally affected the private activities, with a decrease from 59.8 percent to 54.3 percent between 1991 and 2005.

Table 3 provides an estimation of the numbers of informal labourers in agriculture, industry and services, calculated, for each sector, as the difference between total workers and formal workers. The Table reveals that most of the informal jobs are located in agriculture, where about 240 million people were employed at the end of the 1990s, while industry and services account for 58.2 and 73.5 million workers respectively. However, the labour force in the unorganised segment has been steadily increasing in industry and services during the two decades, while it remains quite stable in agriculture. A clearer picture of the unorganised sector in India is depicted by Table 4, which illustrates the share of informal segment in Net State Domestic Product (NSDP) by economic activity. The contribution to economy of informal sector has progressively decreased over time, from 70 percent of NSDP in 1980 to 58 percent in 2005, mainly driven by the decline recorded in services, as financing and trade, and in manufacturing. Construction and transport activities, instead, show a steady increase over time, mostly due the rising incidence of casual workers[6] over sectoral labour force (see Dutta 2002). Finally, agriculture, excluding mining, is over-represented by informal economy, with around 95 percent of agricultural production generated by unregistered sector.

The above analysis leads to the conclusion that the capability of the Indian growth process to generate new job opportunities in the organized segment of the economy is dramatically limited and, despite the expansion of formal sector in total production, informal employment continues to rise. This result is supported by the evidence in Table 5, which presents the sectoral employment elasticities for the organised workers, obtained, for each sector, as the ratio between the average growth of formal workers and the average growth of NSDP at constant prices (1999-2000) over different periods. The Table indicates that there has been a considerable reduction in employment elasticity to aggregate output, from 0.33 in the 1980s to the value of 0.07 recorded in the 1990s. At

[5] According to NCEUS (2007, p. 3), unorganized or informal workers are "those working in the unorganised enterprises or households, excluding regular workers with social security benefits, and the workers in the formal sector without any employment/social security benefits provided by the employers". The unorganised sector consists "of all unincorporated private enterprises owned by individuals or households engaged in the sale and production of goods and services operated on a proprietary or partnership basis and with less ten total workers".

[6] Causal labourers are those who are "casually engaged in others' farm or non-farm enterprises (both household and non-household) and, in return, received wages according to the terms of the daily or periodic work contract" (NSSO 2008, p. 14).

the beginning of the new millennium, the elasticity becomes negative, that is, the growth of the economy between 2001 and 2005 has led to the situation of job-destruction in the organized segment. This tendency has regarded most of the sectors, with particular emphasis in manufacturing, where the response of organised employment growth to the expansion of sectoral output has declined till -0.43. Only agriculture and trade and financing services increased their employment elasticities in recent years.

The divergence between the growth rate of the economy and the growth rate of employment in India has been the object of several different interpretations. First of all, since the take off in the early 1980s, output growth has been mainly driven by improvements in labour productivity rather than by additional occupation. The growth of output per worker rose from the average of 1.3 percent between 1960 and 1980 to the value of 3.8 percent between 1980 and 2004 (Bosworth *et al*. 2007; Basu and Maertens 2007). The increasing contribution of labour productivity to the growth of the economy was principally determined by the increase in Total Factor Productivity (Unel 2003; Bhaumik *et al*. 2006), which denotes the changes in efficiency and/or in production technology. TFP growth jumped to the average of 2 percent during the period 1980-2004 from the value of 0.2 percent in the previous two decades. As noted by Rodrik and Subramanian (2004), TFP growth reflects the positive response of the economy to the reform process, from the attitudinal shift towards "pro-business" policies in early 1980s till the trade liberalization in the 1990s. The political trigger could have elicited a large response in TFP because India was below its production possibility frontier and could have affected the performance of individual sectors rather than a re-allocation of resources from low-productivity activities to higher productivity sectors (Panagariya 2004; Virmani 2004). This could also explain the discrepancy in labour productivity performance between formal and informal sector, given that the weight of organised segment has declined over time in terms of employment, but augmented as share over total production. The labour transfer towards higher productivity formal activities has been therefore limited over time.

Second, the Indian labour market is relatively inflexible and laws are highly protective of labour. Labour market rigidities have restricted labour mobility, have led to capital-intensive methods and adversely affected the long-run demand for labour (Dutta Roy 2004; Bhattacharjea 2006; Mitra and Ural 2007). Furthermore, state-level analysis show that states with pro-workers laws display lower rate of growth and poverty reduction (Besley and Burgess 2004). However, since labour restrictions apply only to the organised sector, the problem could lie in the lack of job security in the informal activities (Bhalotra 2003), which makes the modern informal sector more competitive (Sakthivel and Joddar 2006; Sharma 2006; Majumder and Mukherjee 2007). Lower wages together with the absence of unionization of workers in the informal economy would have

pushed firms to compete on labour cost reduction rather than on innovation and technological investment (Bhattacharya and Ray 2003; Erumban 2009).

Third, even if the expansion of services has undoubtedly favoured the growth of the overall economy, it has not ensured an adequate absorption of labour. The IT sector, for example, viewed as the symbol of the Indian miracle, employs less than 1.5 million people and its potential for creating jobs is limited by the fact that it is able to occupy directly only educated people. Since the 5 percent of India's relevant age group receives college education (Joshi, 2004), the wide majority of workforce is unlikely to be met by IT industries as well as by financing or insurance services (Dasgupta and Singh, 2005). Furthermore, the fact that India is the main world exporter of highly skilled software engineers and financial service analysts (Chauvin and Lemoine, 2003) could hide a situation in which educated workers are forced to migrate to find job (Aneesh 2000; Manas *et al.* 2008). It follows that a greater extension of the IT advantages to the rest of the economy together with the reinforcement of the economic linkages between services and manufacturing industries would amplify the capability of the economy to employ the over two millions of scientists, engineers and technicians enrolled every year (Rao 2005).

4. The analytical framework

The analysis of the main features of the labour market shows that India displays most of the relevant characteristics of the Kaldorian theory. The Indian economy, in fact, with the largest size of labour force located in agriculture and in unregistered activities, has widespread disguised unemployment, which represents the potential hidden labour force for manufacturing sectors. Moreover, informal, casual and daily labourers constitute the majority of Indian workers in rural areas, where most of the poverty is concentrated. It follows that agricultural surplus over self-consumption is low and the demand for industrial products coming from agriculture could be insufficient to ensure a further growth of manufacturing production accompanied by the efficient allocation of disguised labourers in organized industrial activities. This leads to the expansion of the informal economy, which absorbs the mass of rural workers migrating to the urban centres and which could derail India away from its trajectory from a dualistic to a modern economy. Finally, historically, the pattern of Indian economic development has followed the phases of industrialization indicated by the Kaldorian theory. Economic policy has protected manufacturing firms from foreign competition in the 1980s and then has opened the industrial production to international integration with the liberalization process in the 1990s. As a result, the impulse to

industrialization has been transferred from the domestic market to the world demand for Indian manufacturing products[7].

The Kaldorian framework, therefore, is appropriate for the analysis of the Indian jobless growth scenario. In order to include the linkages between agriculture and manufacturing, we use the intersectoral terms of trade as a possible explanatory variable of the labour demand. The terms of trade measure the exchange relationship between agricultural output and industrial output and reflect the balance between the two sectors. In an agrarian labour-surplus economy like India, if the terms of trade move in favour of agriculture, we expect that the effective demand of industrial goods rises and causes the demand of workers to increase whenever industrial production adapts to the growing purchasing power of agriculture. It follows that if agricultural prices are relatively too low, agriculture's growth of demand for industrial goods is limited and industrial production (and labour demand) could be demand constrained to a lower level of growth.

To test the effect of the intersectoral terms of trade on Indian employment in the organized manufacturing, we consider a log-linear labour demand equation of the following form (Layard and Nickell 1986; Bhalotra 1998):

$$(10) \quad n_{st} = \Sigma_i \beta_i n_{st-i} + \Sigma_j \xi_j x_{st-j} + \upsilon_{st}$$

where the level of employment, n, in state s and year t is a function of its past values and of a distributed lag vector of explanatory variables, including capital (k), wage (w), output (y) and the intersectoral terms of trade (*itot*) between agriculture and industry expressed as the ratio of agricultural prices over manufacturing prices; *itot* and y can be viewed as a measure of the expected demand for manufacturing products. The vector υ_{st} contains the permanent but unobservable state specific effect and the remainder of the error term. The employment equation depicted in (10) captures the impact of adjustment in derived labour demand through the presence of a lagged dependent variable among the regressors. This is in line with the assumption that there exist costs associated with employment, implying that labour demand depends not only on current factors but also on the initial level of employment. It follows that the employment decision rule should be considered as a dynamic problem. An additional lag structure may be necessary to allow for the effects of labour heterogeneity adjustment when the sequence of bargain or expectation about future wage and output level is considered or to control for serially correlated technology shocks (Nickell and Wadhwani 1991; Hamermesh 1993). In a dynamic setting, a differenced employment equation

[7] Indian merchandise trade as a percentage of GDP remained stable around 13% during the 1980s and experienced remarkable growth in the 1990s, reaching 32% in 2006 (World Development Indicators 2008).

is adopted, so that the state specific effects can be transformed out. Thus, the model in first difference becomes:

$$(11)\quad \Delta n_{st} = \alpha_t + \sum_i \beta_i \Delta n_{st-i} + \sum_j \gamma_j \Delta k_{st-j} + \sum_j \delta_j \Delta w_{st-j} + \sum_j \theta_j \Delta y_{st-j} + \sum_j \lambda_j \Delta itot_{st-j} + \varepsilon_{st}$$

In equation (11) all variables are in logarithms and *i* runs from 1 to 3 while *j* runs from 0 to 2. The dependent variable is represented by the growth of workers, which is function of its lagged values and of current and past values of capital, wage, output and intersectoral terms of trade. Capital (gross fixed stock), and output are deflated by state annual inflation, obtained as difference between current and constant state income growth, while wage (annual per capita earnings) is deflated by registered manufacturing inflation. The growth of the intersectoral terms of trade enters the labour demand equation as difference between agricultural and manufacturing prices growth. Using data provided by ASI (Annual Survey of Industries 2005-06, Ministry of Statistics and Programme Implementation, Government of India) and CSO (Central Statistical Organization), we construct a panel dataset for the fifteen largest Indian states[8] covering the years from 1980 to 2004.

A dynamic first-differenced equation of the form represented in (11) is characterised by the presence of autocorrelation, due to the inclusion of the lagged dependent variables among the regressors, which may be correlated with the error term. It follows that the ordinary least squares (OLS) estimator can induce a downward bias while the generalised least squares (GLS) estimator can induce an upward bias about the coefficients of the lagged dependent variables (Hsiao 2003). Moreover, the instrumental variable (IV) estimation does not make use of all the available moment conditions and does not take into account the differenced structure of the residual disturbances (Ahn and Schmidt 1995). In order to overcome the autocorrelation problem, Arellano and Bond (1991) proposed a generalised method of moments (System-GMM) by using additional instruments obtained by utilising the orthogonality conditions that exist between lagged values of the dependent variable and the disturbances (see also Arellano and Bover 1995; Blundell and Bond 1998). The System-GMM uses the lagged first-differences as instruments not only for the standard set of equations in first differences, but also for a supplementary set of equations in levels (see also Bond, Hoeffler and Temple 2001). The predetermined and endogenous variables are instrumented with suitable lag(s) of their own difference in the level equation. The System-GMM estimator is therefore more efficient as it exploits information both in the level and first-differenced equations.

[8] The sample includes Andhra Pradesh, Assam, Bihar, Gujarat, Haryana, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Orissa, Punjab, Rajasthan, Tamil Nadu, Uttar Pradesh, and West Bengal. These states accounted for 95.5% of Indian population in 2004.

We therefore apply the System-GMM procedure to equation (11) to check the role of output and intersectoral terms of trade in influencing labour demand growth. We use three different specifications of output growth for each state observation – registered manufacturing, manufacturing including unregistered activities and aggregate output – in order to analyze whether labour demand growth may be affected by scale dynamics. Furthermore, we want to investigate if the expansion of unregistered manufacturing has negatively influenced the employability in organized manufacturing; we test this hypothesis by replacing output growth with the growth of the share of informal manufacturing over total manufacturing. Next section provides the results.

5. Results

Between 1980 and 2004, the fifteen largest Indian states recorded an average growth of about 5 percent in terms of Net State Domestic Product (Table 6). Total manufacturing and, in particular, registered manufacturing output grew at a higher rate of 5.26 percent and 5.78 percent respectively, leading to a sensible reduction of the unregistered segment on total manufacturing of -0.83 percent per year. Despite this positive performance, the effect of growth on registered employment appears quite modest, with an average annual improvement of less than 0.5 percent across states. As a consequence, the increase in industrial output has been mainly sustained by labour productivity, as a result of the combined effect of the growth of the capital/labour ratio with the rise in TFP. The divergence between agricultural and manufacturing prices, instead, displays a rate of growth of less than 0.3 percent. The purchasing power of agriculture on manufacturing products has remained practically unchanged during the period under study.

The consequences on labour demand of the movements of these variables are described by Table 7, which shows the results of the estimation of equation (11) using the System-GMM technique. Columns from (a) to (e) report the five specifications using different variables for output growth; in particular, column (d) and (e) capture the effect on registered employment of an increase in the weight of unregistered manufacturing activities. It is expected that employment growth is positively effected by increases in capital, output and demand of manufacturing products coming from agriculture and negatively associated with wage and the share of informal activities over manufacturing output. In our System-GMM procedure, intersectoral terms of trade and the unregistered share in column (d) are treated as strictly exogenous to labour demand.

Two standard tests of instruments validity are depicted in the Tables. First, the Arellano-Bond test for autocorrelation (Arellano and Bond, 1991) checks whether the presence of autocorrelation in the idiosyncratic disturbance term would render some lags invalid as instruments.

In all the columns presented in the Table, the hypothesis of the presence of autocorrelation of order one is accepted while autocorrelation of order two is found to be absent. This confirms that the chosen lags are valid instruments for our specifications[9]. The second statistic is the Sargan test, which checks for joint validity of the instruments, that is, whether the instruments appear exogenous; it must be insignificant in order for the instrumental variables to be well identified. In five out of the six specifications the test confirms the exogeneity of the instruments, while in column (d) suggests that the unregistered share cannot be regarded as strictly exogenous with respect to labour demand.

In the regressions summarized in Table 7, all the current rates of growth of the explanatory variables display the expected sign and are highly significant, with the exception of the unregistered share coefficient in column (d), which is insignificant. Furthermore, the coefficients are not affected by the different specifications on output growth. Current real wage has a significant and negative impact on labour demand and its coefficient is steadily around -0.09, while capital is significantly positive, with a coefficient between 0.091 and 0.100. These two findings are perfectly in line with the theory, which predicts a negative response of labour demand for an increase in wage and a positive shift for capital improvements. The role of the intersectoral terms of trade is significant and positive in all the columns and, although the purchasing power of agriculture has remained practically unchanged during the period, this result is supporting of Kaldorian framework. Therefore, states where agricultural prices have grown at a faster rate relative to manufacturing prices have also experienced a more rapid increase registered employment. The effective demand of industrial goods coming from agriculture has a positive key role on determining labour demand fluctuations. A greater purchasing power for rural people sustains industrial production and generates positive spillovers for employment. The effect of a rise of the intersectoral terms of trade lies between 0.064 and 0.078, with the highest values recorded when state output growth and the unregistered share enter the labour demand.

Other revealing results emerge from the analysis of the role of output growth on labour dynamics. The effect of an increase in production, as described in columns from (a) to (c), is positive and significant, but the effect and the significance rise with the scale of output. In particular, it appears that the impact of production growth is lower with registered manufacturing and higher with state output growth, implying that labour demand is more responsive to the economic performance of the state than to improvement in sectoral production. The influence of

[9] In order to reinforce our assumption, we estimate a static version of equation (11) verifying the existence of significant first-order as well as second-order autocorrelation. Therefore, the inclusion of the lags among the explanatory variables controls for autocorrelation of second-order and indicates that the dynamic version of the employment model should be estimated when the problem of omission of dynamic effects arising out of adjustments costs is considered.

output dynamics on labour demand is therefore characterized by the presence of scale effects. Moreover, we explore the impact of the unregistered segment on registered workers. As demonstrated by the higher influence of total manufacturing with respect to registered manufacturing alone (columns (a) and (b)), the impact of unregistered growth itself should be positive and reinforce the idea on the intersectoral relations between registered manufacturing and other sectors of the economy, both formal and informal. In fact, if we disaggregate manufacturing into its two components, the coefficient for the unregistered sector is found to be positive, but highly insignificant, while the registered segment coefficient loses its significance. However, as described in section 3, there is a large discrepancy in labour productivity between the two sub-sectors, and the weight of the unregistered segment varies widely across states. In order to further investigate this aspect, we consider the growth of the share of the unregistered sector over total manufacturing (columns (d) and (e)); this allow us to control for the changes of the effective weight of informal activities considering the expansion of the informal segment at the expense of the registered one. The effect turns now to be negative, that is, states where unregistered output has grown faster than registered output have experienced a deceleration in formal labour demand growth. Hence, registered manufacturing growth affects employment if the excess of growth with respect to the informal sector is positive. However, the level of significance of the unregistered share depends on whether it is included among strictly exogenous regressors. In column (e), in fact, where the unregistered share is treated as endogenous, the Sargan test turns to be insignificant as well as the coefficient of the regressor.

Finally, by making use of the long-run elasticities depicted in Table 8, Table 9 evaluates the contribution of the different explanatory variables to the average growth rate of employment during the period 1980-2004. *Ceteris paribus,* given trend wage growth of 1.05 percent p.a., a long-run elasticity between -0.10 and -0.14 implies a decline in employment between 0.11 and 0.15 percent p.a.. The corresponding figure for capital is a positive increase between 0.27 and 0.33 percent. The long-run elasticities of different measures of output growth confirm the scale effect response of employment to output dynamics, with 1.14 percent p.a. of growth when state output is considered (column (c)). Employment growth due to the unregistered sector reduction of 0.83 percent p.a. lies between 0.04 and 0.07 percent. The contribution of intersectoral terms of trade is instead practically null, with a value steadily around 0.03 percent; in fact, despite a high long-run elasticity of employment between 0.90 and 0.10, the slow growth of only 0.27 percent p.a. has significantly reduced the impact of the intersectoral terms of trade on employment expansion. Together, the variables predict growth of registered manufacturing employment between 0.22 and 1.32 percent

p.a. between 1980 and 2004, which, in five out of the six specifications used, closely matches the actual rate of growth of 0.46 percent.

6. Conclusions

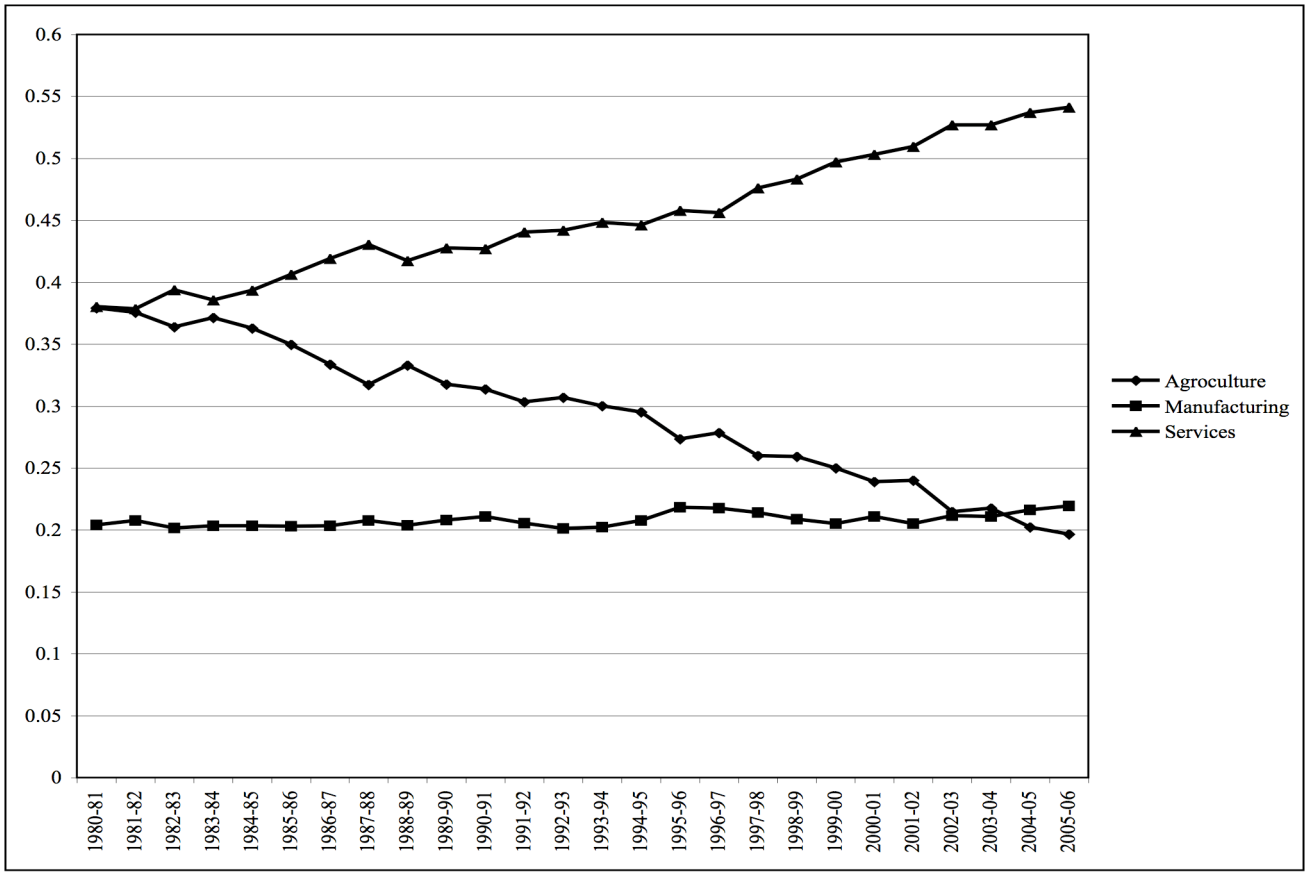
The 2008 Global Hunger Index of developing and transitional countries (Von Grebmer *et al.* 2008) ranks India at 66th position out of 88 countries. The survey says that not one of the 17 states of the Union under study is in the low or moderate hunger category and concludes that the entire sample is in the alarming or extremely alarming group. Furthermore, despite the notable economic performance of Indian industry in the last two and a half decades with an annual growth of 5.3 percent, organized manufacturing employment growth was less than 0.5 percent. Rural poverty and jobless growth in manufacturing may be strictly related if analyzed through a Kaldorian framework. The development of the purchasing power of agriculture, in fact, is essential to stimulate the effective demand for industrial goods and to sustain industrial production in the long run. Since a strong productivity growth could generate job loss when aggregate demand is insufficient, rising rural incomes unleash a multiplier effect, increasing demand for farm and non-farm products and services, thereby stimulating rapid growth of employment opportunities in other sectors.

Taking into consideration this causal relation, the paper has investigated the role of agricultural surplus in influencing labour demand in Indian organized manufacturing. Using a panel dataset on the 15 largest states of the Union for the period 1980 to 2004, our System-GMM estimates confirm the positive linkage between a rise in agricultural purchasing power and the growth in manufacturing employment. We find that where the increase in agricultural prices relative to manufacturing prices has been wider, the employment in organised manufacturing has been higher. Furthermore, labour demand growth seems to be more elastic to aggregate output growth rather than to increments in registered manufacturing production. Given that the recent pattern of growth of Indian economy has been accompanied by increasing inequality across states as testified by numerous researches, such result could be a further element of growing divergence between rich and poor states of the Union. In addiction, since more than two-thirds of the Indian industrial workers are employed in informal manufacturing, we explore the effect of an increase of the weight of unorganized activities on determining formal employment. Our results show that in those states where the share of the unregistered manufacturing has risen over time, the jobless growth problem has worsened.

However, the change in the agricultural purchasing power has been modest in the last two decades and the majority of Indian labourers still lack a steady income flow and fall outside the

social safety net system guaranteed by a formal occupation. As a consequence, India's potential manufacturing renaissance, especially in terms of employment, is still in its early stages. This appears quite surprising for a country whose supply of arable land is second only to the United States and which has successfully developed a process of tertiarisation of its economy. But modernization cannot only rely upon a strong IT sector and labour productivity growth could be not sufficient to solve problems of acute poverty or underemployment. India should look to establish and reinforce forward and backward linkages between agriculture and manufacturing if it wants to transform a jobless growth pattern into an inclusive growth process. After more than thirty years since the Green Revolution, the agrarian question is still open for India.

Figure 1. Sector evolution over GDP



Source: CSO

Table 1. Indian labour force, millions

	1981	1991	2001	2005
Labour Force	305.73	369.14	451.38	476.13
Unorganised Sector	282.83	342.41	423.59	449.67
Organised Sector	22.90	26.73	27.79	26.46
as percentage of labour force	*7.49*	*7.24*	*6.16*	*5.56*
Private Organised Sector	7.40	7.68	8.65	8.45
as percentage of labour force	*2.42*	*2.08*	*1.92*	*1.78*

Source: *Economic Survey*, different issues, and World Development Indicators (2006).

Table 2. Sector distribution of employment in the organised sector (in percentage)

	1981	1991	2001	2005
Public				
Agriculture	8.3	8.2	7.2	8.4
Industry	21.1	20.5	18.0	16.1
Services	70.6	71.3	74.8	75.5
Private				
Agriculture	13.4	12.9	11.7	12.6
Industry	62.9	59.8	59.2	54.3
Services	23.7	27.3	29.1	33.2
Total				
Agriculture	9.9	9.5	8.6	9.7
Industry	34.6	31.8	30.8	28.3
Services	55.4	58.7	60.6	62.0

Source: *Economic Survey*, different issues.

Table 3. Unorganized sector distribution of employment, millions (estimates)

	1983	1993	1999
Agriculture	206.7	242.6	237.4
Industry	33.7	46.9	58.2
Services	39.4	60.7	73.5

Source: author's calculations based on *Economic Survey*, different issues, and Dutta (2002).

Table 4. Share of unorganised segment in Net State Domestic Product by economic activities at current prices (in percentage)

	1980	1991	2001	2005
Agriculture, forestry and fishing	95.2	96.2	96.4	94.4
Mining and quarrying	9.6	7.7	9.0	7.9
Manufacturing	46.3	39.1	36.5	32.8
Electricity, gas and water supply	6.0	3.6	2.8	4.7
Construction	48.0	55.5	57.2	62.4
Trade, hotels and restaurants	89.6	91.9	83.7	80.6
Transport, store and communication	45.2	52.3	57.2	63.7
Financing, insurance, real estate and business services	65.0	40.6	49.2	44.5
Community, social and personal services	25.9	19.4	23.7	27.1
Net State Domestic Product	*70.0*	*63.8*	*60.4*	*58.0*

Source: *National Account Statistics*, Government of India, different issues

Table 5. Sectoral employment output elasticities, registered sector

	1981-1991	1991-2001	2001-2005
Agriculture, forestry and fishing	0.31	-0.03	0.39
Mining and quarrying	0.21	-0.37	0.63
Agriculture	**0.36**	**-0.20**	**0.81**
Manufacturing	0.08	0.03	-0.48
Electricity, gas and water supply	0.36	0.07	-0.40
Construction	0.14	-0.14	-0.39
Industry	**0.13**	**0.01**	**-0.43**
Trade, hotels and restaurants	0.25	0.14	0.32
Transport, store and communication	0.20	0.02	-0.17
Financing, insurance, real estate and business services	0.52	0.17	0.51
Community, social and personal services	0.40	0.12	-0.19
Services	**0.35**	**0.09**	**-0.08**
All	*0.33*	*0.07*	*-0.18*

Source: author's calculations based on *Economic Survey*, different issues

Table 6. Labour demand of registered manufacturing workers: variables average annual growth (in percentage), 1980-2004

Workers	0.46	Registered Manufacturing	5.78
Wage	1.05	Manufacturing	5.26
Capital	3.59	State Output (NSDP)	4.98
Intersectoral terms of trade	0.27	Unregistered Share	-0.83

Source: author's calculations based on *Economic Survey*, different issues

Table 7. System-GMM estimations of labour demand growth across 15 Indian states, 1980-2004

VARIABLES	(a)	(b)	(c)	(d)	(e)+
L.workers	-0.376***	-0.379***	-0.382***	-0.379***	-0.362***
	(0.074)	(0.079)	(0.082)	(0.073)	(0.074)
L2.worker	0.024	0.016	-0.017	-0.014	0.005
	(0.054)	(0.056)	(0.046)	(0.044)	(0.040)
L3.workers	0.105**	0.093*	0.068	0.066	0.074
	(0.049)	(0.048)	(0.046)	(0.048)	(0.045)
wage	-0.089***	-0.090***	-0.093**	-0.087**	-0.098***
	(0.032)	(0.034)	(0.037)	(0.038)	(0.037)
L.wage	-0.057**	-0.059**	-0.054***	-0.042*	-0.046**
	(0.026)	(0.025)	(0.020)	(0.022)	(0.020)
L2.wage	-0.027	-0.029	-0.010	-0.002	-0.007
	(0.025)	(0.025)	(0.020)	(0.017)	(0.018)
capital	0.092***	0.091***	0.090***	0.100***	0.099***
	(0.029)	(0.029)	(0.026)	(0.030)	(0.028)
L.capital	0.030*	0.029*	0.028*	0.040**	0.030*
	(0.017)	(0.017)	(0.016)	(0.017)	(0.018)
L.capital	-0.023	-0.025	-0.032	-0.017	-0.027
	(0.016)	(0.017)	(0.020)	(0.018)	(0.017)
terms_of_trade	0.064**	0.065**	0.078**	0.072**	0.075**
	(0.027)	(0.027)	(0.036)	(0.030)	(0.031)
L.terms_of_trade	0.014	0.014	0.018	0.015	0.012
	(0.032)	(0.033)	(0.035)	(0.032)	(0.031)
L2.terms_of_trade	0.047	0.048	0.042	0.028	0.031
	(0.036)	(0.036)	(0.037)	(0.033)	(0.033)
registered_manuf	0.030*				
	(0.016)				
L.registered_manuf	0.042**				
	(0.019)				
L2.registered_manuf	0.037**				
	(0.015)				
manufacturing		0.048**			
		(0.022)			
L.manufacturing		0.049*			
		(0.028)			
L2.manufacturing		0.062*			
		(0.033)			
state_output			0.126***		
			(0.041)		
L.state_output			0.105		
			(0.076)		
L2.state_output			0.101		
			(0.081)		
unregistered_manuf_share				-0.034*	-0.023
				(0.019)	(0.020)
L.unregistered_manuf_share				-0.029	-0.005
				(0.039)	(0.039)
L2.unregistered_manuf_share				-0.058*	-0.034
				(0.033)	(0.032)
Constant	-0.175***	-0.175***	-0.098***	-0.077***	-0.077***
	(0.039)	(0.039)	(0.025)	(0.023)	(0.024)
Observations	308	308	312	312	312
Number of states	15	15	15	15	15

Arellano-Bond test for AR(1) in first differences:					
z=	-3.31	-3.33	-3.33	-3.27	-3.29
Pr > z =	0.001	0.001	0.001	0.001	0.001
Arellano-Bond test for AR(2) in first differences:					
z=	0.22	0.38	0.32	0.78	0.61
Pr > z =	0.827	0.702	0.75	0.435	0.54
Sargan test of overid. restrictions:					
chi2 =	320.76	321.83	325.04	297.37	325.72
Pr > chi2 =	0.384	0.386	0.322	0.003	0.313

Note: figures in parentheses are robust standard errors. *Significant at 10%; ** significant at 5%; *** significant at 1%
[+] Unregistered share treated as endogenous.

Table 8. Long-run elasticities of employment growth with respect to different variables

	(a)	(b)	(c)	(d)	(e)
Wages	-0.138	-0.139	-0.105	-0.102	-0.122
Capital	0.080	0.075	0.075	0.091	0.079
Intersectoral terms of trade	0.102	0.101	0.095	0.088	0.092
Registered manufacturing	0.086	-	-	-	-
Total manufacturing	-	0.123	-	-	-
Output	-	-	0.228	-	-
Unregistered share	-	-	-	-0.087	-
Unregistered share (end.)	-	-	-	-	-0.048

Table 9. Contribution of variables to the average growth rate of employment based on long-run elasticities

	(a)	(b)	(c)	(d)	(e)
Wages	-0.15	-0.15	-0.11	-0.11	-0.13
Capital	0.29	0.27	0.27	0.33	0.28
Intersectoral terms of trade	0.03	0.03	0.03	0.02	0.03
Registered manufacturing	0.50	-	-	-	-
Total manufacturing	-	0.65	-	-	-
Output	-	-	1.14	-	-
Unregistered share	-	-	-	0.07	-
Unregistered share (end.)	-	-	-	-	0.04
Explained growth rate	*0.67*	*0.80*	*1.32*	*0.32*	*0.22*
Actual growth rate	0.46	0.46	0.46	0.46	0.46

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