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A Study of India

Indrajit Bairagya

For additional information please contact:

Name: Indrajit Bairagya

Affiliation: Institute for Social and Economic Change,Nagarbhavi, Bangalore, India

Email Address: indrajit@isec.ac.in

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Liberalization, Informal Sector and Formal-Informal Sectors' Relationship: A Study of India

Indrajit Bairagya⁎

Ph.D. Scholar in Economics,
Institute for Social and Economic Change,
Nagarbhavi, Bangalore – 560072,
Karnataka, India.
E. Mail: indrajit@isec.ac.in, indrajitisec@gmail.com.

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Abstract

India initiated the process to integrate its domestic economy with the world economy from early 1990s due to severe balance of payments crisis, high fiscal deficit and high inflation rate. Since 1991 liberalization has exposed all industrial units including small home-based enterprises in the informal sector to the inherent risks of free market competition. Because of its wide coverage, the impact of economic liberalization is very significant on entire economy, or on both formal/organized and informal/unorganized sectors. How liberalization affects both the formal and informal sectors and what are the changing contributions of informal sector during pre and post liberalization periods in terms of income and employment are key researchable issues. The objective of this paper is to measure the relationship between economic liberalization and informal/ unorganized sector in India; and also measure the impact of formal and informal sectors' linkages on the informal sector's growth. The results show that as trade liberalization or country's openness increases the size informal sector also increases in absolute terms, while the relative size of the informal sector decreases. Though organized sector is expanding in terms of its percentages share in Net Domestic Product, this growth is jobless. Our empirical findings show that the linkages between organized and unorganized manufacturing sector helps to grow the unorganized manufacturing sector.

Key words: Liberalization, informal sector, formal sector, informal employment, factor income.

JEL classification: O17.

Liberalization, Informal Sector and Formal-Informal Sectors' Relationship: A Study of India

1. Introduction

Liberalization creates interdependencies among the people and organizations around the world. The phrase "economic liberalization" covers both stabilization and structural adjustment measures. It includes liberalization of both domestic and external sectors. Stabilization deals with controlling the fiscal balance, the balance of payments and external payment deficits and maintaining a low rate of inflation. On the other hand, structural adjustment aims at improving efficiency and productivity and integrating the domestic economy with the world trade and capital movements. External sector liberalization includes foreign trade, investment and exchange rate liberalization and depends upon various factors like the dependence of the economy on foreign trade, financial sector liberalization on external account etc. It expects trade to act as an engine of growth. If a country's dependency on foreign trade is limited, internal liberalization has a greater importance in influencing the growth of the economy.

Trade liberalization is an important component of economic liberalization and includes the removal of trade barriers, such as tariffs and non-tariff barriers, as well as internal restrictions, such as directed credit and preferential purchasing. It measures the extent of export promotion (i.e., shifting resources from import substitution to export activities), increase in the degree of openness (increase share of export and import in national income) and marketisation (i.e., changing the structure of incentives and institutions such that the reliance of market) (Narayana, 2008).

India initiated the process to integrate its domestic economy with the world from early 1990s due to severe balance of payments crisis, high fiscal deficit and high inflation rate. As part of this, the economic restructuring has done relied on "structural reforms". These structural reforms took the form of bringing reform in the trade and balance of payments regime and changes in the domestic financial sector. The main goal of the liberalization was making the economy more market oriented through increasing competitiveness and

reducing government interventions. Since 1991 liberalization has exposed all industrial units including small home-based enterprises in the informal sector to the inherent risks of free market competition. The setting up of WTO (World Trade Organization) in 1995 has further intensified the competition both in the domestic as well as global market by removing the restrictions on foreign direct investment.

Because of its wide coverage, impact of economic liberalization generally feet on the entire economy, or on both formal/organized and informal/unorganized[1] sectors. For instance, the contributions of both formal and informal sectors in terms of income, employment, productivity to whole economy have been changing between pre and post liberalization period, and through the liberalization period. As per the results of the National Sample Survey conducted in 2004-05, about 7.62% of the total work force was formal in nature, while remaining 92.38% or about 422.61 million workers were informally employed. The compound annual growth rate of labour absorption in informal sector in the post-liberalization period (from 1999-00 to 2004-05) is 2.76%, while in the pre-liberalization period (from 1983 to 1988) it was 1.38%. Informal sector has increased not only in terms of its employment size, its contribution to total industrial output and total exports have also been increasing. For instance, Indian handicrafts export crossing Rs. 1220 crores in 1990-91 from merely Rs. 10 crores in the mid fifties. Again the Ministry of Textiles data show, it increases to Rs. 4517.52 crores in 1994-95 and Rs. 7206.79 crores in 2000-01 [Jena (2007)].

A set of theoretical studies have focused on the issue of the impact of trade reform on the wage of the informal workers in a small open economy by using general equilibrium framework. Marjit and Kar (2003) argued that the role of capital mobility between the

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[1] Though the concept of unorganized sector is slightly different from the informal sector, but here we will use both the terms inter-changeably. Informal sector incorporates the unincorporated proprieties or partnership enterprises. In the unorganized sector, in addition to the unincorporated proprieties or partnership enterprises, enterprises run by cooperative societies, trust, private and limited companies are also covered. The informal sector can therefore, be considered as a sub-set of the unorganized sector (NSSO, 1999).

formal and informal sector becomes crucial for such analysis. Chaudhuri and Banerjee (2007) counter argued that proposition and they found that different liberalized policies produce diverse effects on the informal wage and these results are independent of the nature of capital mobility between the informal and the formal sectors. In another study Marjit and Kar (2007) argued that, with limited degree of capital mobility, trade reform reduces the informal wage.

Trade liberalization is a wide concept and includes the impact of some specific liberalization policies, such as, foreign capital inflow, tariff reduction etc. Chaudhuri et al. (2006) made an attempt to analyse the effects of liberalized trade and investment policies on welfare and open unemployment in a developing economy in terms of a three sector Harris-Todaro type general equilibrium model. It is assumed that there is wage rigidity in urban sectors, which leads to the simultaneous existence of open unemployment and an urban informal sector in the migration equilibrium. The results are contrasting to those generated by the standard Harris-Todaro model.

Removal of the restrictions of foreign direct investment due to liberalization attracts the inflow of foreign capital in the developing economy. A set of studies have focused on the issue of effects of the inflow of foreign capital in the developing economy, permitting the conception of informal sector activities. Following the concept of Bhagwati's (1968) immiserizing growth, Brecher and Alejandro (1977) argued that an inflow of foreign capital with full repatriation of its earnings is necessarily immiserizing if the import-competing sector is capital-intensive and is protected by a tariff. Grinols (1991) examined this traditional argument in the context of a segmented economy in which the urban unemployed subsist in the informal sector activities. Chandra and Khan (1993) extended Grinols's analysis and placed it in a broader context, permitting richer conceptions of informal-sector activities. Beladi and Yabuuchi (2001) extended the Harris-Todaro model to include an urban informal sector where the product of the informal sector is used as an industrial input in the urban formal sector.

Several studies have focused on this issue and measure empirically at the national and intentional levels. The growth in informal sector has occurred in conjunction with increasing globalization and opening up of economies, which has provoked a debate on the impact of these processes on the informal sector (Verick, 2006). Empirical findings confirm that migration profile in Colombia has changed especially from 1992 to 2000, towards a higher participation of rural flows and higher participation of men probably as a consequence of intensification of armed conflict (Florez, 2003). Results also indicate that migration condition has a large impact on the probability of being employed in the informal sector.

Given its contribution in the Indian economy, several studies have focused their analysis on its impact on Indian economy. Rani and Unni (2004) analyzed the impact of economic reforms on the organized and unorganized manufacturing sector from 1984-85 to 1999-00, and found (a) economic reform policies had a differential impact by industry groups, and (b) automobile industry and the infrastructure sector helped the growth of the unorganized manufacturing industry. Kar and Marjit (2001) and Marjit (2003) have analysed the impact of trade reforms on informal wage in terms of general equilibrium models. Marjit, Kar and Sarkar (2003) substantiate earlier theoretical claims with the National Sample Survey data on Informal Manufacturing in India between the periods 1984-85 and 1999-00. In these papers reform tends to expand size of the informal sector through a cut back in employment in the formal sector when formal and informal sectors are producing different goods and a tariff protects the formal sector. Singh and Sapra (2007) attempted to examine the impact of trade policy changes both on the formal and informal sectors and their employment by taking Garments sector as a case study. The field study of the garment sector was carried out in Triuppur and Delhi. The same issue was examined by Ghosh et al. (2007) by taking rice processing sector as a case study. The field study of rice processing sector was carried out in Punjab and West Bengal. Mitra (2007) examined the nature of relationship between industry and informal sector and argued that share of the informal sector is equally high in the states which are highly industrialized in comparison to the states which are industrially backward sub-contracting

and other indirect processes seem to be generating employment in the informal sector in the industrialized states.

When the size of the informal sector in the developing countries like India is increasing at a rapid rate then the question arises regarding the relevance, applicability and impact of liberalization measures on the informal sector. More specifically, it is important to know how economic performance of the informal sector can be explained during the liberalization period. Thus, the first objective of this paper is to estimate the contribution of informal/ unorganized sector in comparison with formal/ organized sector and study the relationship between economic liberalization and informal/ unorganized sector in India. The second objective is to explore the relationship between formal/ organized and informal/ unorganized sector and its impact on the informal sector's growth.

The rest of the paper is organized as follows. Section-2 describes the framework for empirical analysis. Trends and patterns of total unorganized and unorganized manufacturing sectors are discussed in section-3. Section-4 describes the econometric analysis used for this study. Empirical analysis and results are discussed in section-5. Section-6 includes the conclusion.

2. Framework for empirical analysis

In the developing country like India everybody wants to get job in the formal sector. At the present scenario, formal sector is unable to absorb all the work force. Those who are unable to find job in the formal sector or retrenched by the formal sector generally get absorbed in the informal sector. If formal sector squeezes (i.e., job cut in the formal sector), the retrenched people immediately move to informal sector. On the other hand, if formal sector expands, people move from informal sector to formal sector. That means informal sector serves the role of 'reserve army of labour'. In this context, it is important to note that a large number of workers are working in the formal sector without having any social security benefit (i.e., contract workers). That means there is a percentage of informal employment within the formal sector.

Informal sector is also divided into two broad categories: traditional household based informal sector and modern informal sector (Ranis and Stewart (1999). Traditional informal sector is characterized as very small size, low capitalization, low labour productivity, static technology and household based production unit. Modern informal sector is characterized as larger in size, capital intensive and more dynamic in technology.

2.1. Formal-informal sectors' linkages

In economics literatures, several schools of thought have developed regarding the formal and informal sectors' relationship. According to first school, informal sector is an autonomous segment of the economy producing mainly for consumption within the sector. The second school believes that the informal sector has a dependent relationship with the formal sector and is exploited by the formal sector. According to the third school, the informal sector is integrated with the rest of the economy through complementary linkages (ILO, 1991).

Formal and informal sector are linked through production linkages, consumption linkages and technological linkages. According to Ranis and Stewart (1999), traditional informal sector produces consumer goods only, sold mainly to the low income consumer. Modern informal sector produces both consumer goods and capital goods, serves both low and middle income consumers. These goods often compete with the goods produced by the formal sector. On the one hand, the consumer goods produced by the modern informal sector, generally consumed by the sector itself and the people engaged in the formal sector. On the other hand, the intermediate products and simple capital goods produced by the modern informal sector that partly used the sector's own need and partly serve the demand of the formal sector. Thus, modern informal sector's production is complementary to and as well as competitive with the formal sector.

2.2. Impact of trade liberalization

According to Ghosh and Paul (2008), trade liberalization aims to promote an economy's exports to the world, creating employment opportunities to growth. Contrary to this

argument, it has been seen in the developing country trade liberalization has exposed all the industrial units to the inherent risk of free market competition. They are trying to reduce their cost of production. For doing so the consequences may be as follows:

1) Modern capital intensive technology replaces the labour intensive technology. So, there is large number of employment loss in the formal sector. The retrenched workers from the formal sector are getting absorbed in the informal sector due to its easy entry.

2) A large numbers of workers are informally employed in the formal sector.

3) There may be a change in the organization of production in the formal sector. A significant amount of sub-contracting taking place. By giving contract to the informal sector to produce semi-finished product, formal sector is reducing their cost of production. The output of the informal sector is used as a raw material of the formal sector.

Being unprotected informal sector has the problem of information asymmetry regarding the market access. If formal and informal sector compete with each other producing the same kind of product, the market will be divided between these sectors. On the contrary if there is a vertical linkage through subcontracting between formal and informal sector, the relationship is complementary i.e., growth of one sector will help to grow the other sector as well.

3. Trends and patterns

3.1. Informal employment and informal sector's employment

In this section, we have focused the trends and patterns of informal employment in India. National Commission for Enterprises in the Unorganised Sector (NCEUS, 2008) is the main data source for formal and informal sectors' employment. Using the NCEUS data we have estimated the informal employment in the formal sector. Moreover, informal sector contributing not only in terms of employment, it has a significant contribution of country's Net Domestic product (NDP). The contribution of informal sector in country's NDP is provided during 1980-81 to 2005-06. For netting out inflation, current prices data are converted in constant prices (1999-00 base year) using price indices of different base

year. In addition, to get an idea about the factor intensity we have segregated the total unorganized and organized sectors' NDP into different factor income.

Table-1 presents the total number of estimated population, labour force, employment, unemployment, informal employment and formal employment in India (in million).

Table-1: Total number of estimated population, labour force, employment, unemployment, informal employment and formal employment in India (in million).

	1983	1988	1994	1999-2000	2004-05
Estimated Population	718.21	790.00	895.05	1004.10	1092.83
Labour Force	308.64	333.49	391.94	406.05	--
Employed	302.75	324.29	374.45	396.76*	457.46*
Unemployed	5.89	9.2	7.49	9.74	--
Formally Employed	24.01	25.71	27.37	35.02*	34.85*
Informally Employed	278.74	298.58	347.08	361.74*	422.61*

Source: Various rounds of employment-unemployment survey of NSSO, Expert committee of population projection, DGE&T and for the '*' National Commission for Enterprises in the Unorganised Sector (NCEUS, 2008).

From the above table it is seen that the informal employment increases overtime along with the estimated population and labour force, while the formal employment decreases in recent years. These are represented in absolute numbers. To get a vivid picture, it is important to see the overtime changes of formal and informal employment in terms of their percentages share. Figure-1 presents the percentage share of formal and informal employment in total employment.

Figure-1: Percentage share of formal and informal employment in total employment.
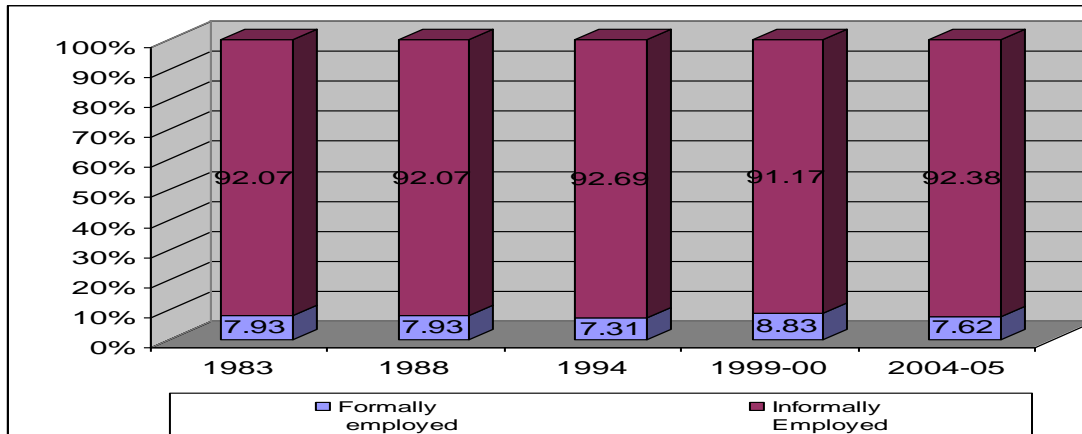
Source: Author's estimation using table-1

From the above figure it is seen that informal employment has the higher share (more than 90%) for the entire study period. Though there was a slight increase in the percentage share of formal employment in the year 1999-2000, it has decreased again afterwards. The above discussion has taken place only at the aggregate level. For getting a clear picture about which economic activity/ activities has/ have larger share in formal and informal employment, we should go for disaggregate analysis by economic activities. A disaggregate analysis by three major sectors (primary, secondary and tertiary) is described below. Table-2 presents the distribution of formal and informal employment by major economic activities.

Table-2: Distribution of formal and informal employment by major economic activities (in million).

Economic activities	1999-2000			2004-05		
	Informal employment	Formal employment	Total employment	Informal employment	Formal employment	Total employment
Agriculture	234.79 (98.79)	2.89 (1.21)	237.67 (100)	256.07 (98.89)	2.86 (1.11)	258.93 (100)
Industry	55.52 (85.56)	9.37 (14.44)	64.89 (100)	76.64 (89.39)	9.09 (10.61)	85.73 (100)
Services	71.43 (75.83)	22.77 (24.17)	94.20 (100)	89.91 (79.70)	22.90 (20.30)	112.81 (100)
Total	361.74 (91.17)	35.02 (8.83)	396.76 (100)	422.61 (92.38)	34.85 (7.62)	457.46 (100)

Note: Figures in the parenthesis represent percentage shares.
Source: National Commission for Enterprises in the Unorganized Sector (NCEUS, 2008).

From the above table it is seen that the percentages share of informal employment has increased in all the three sectors. In the primary sector about 98.79% workers are informally employed in 1999-2000. This figure has slightly increased to 98.89% in 2004-05. In the secondary sector, the percentage of informal employment has increased from 85.56% in 1999-2000 to 89.39% in 2004-05. In the tertiary sector also the informal employment has increased from 75.83% in 1999-2000 to 79.70% in 2004-05.

The above discussion has taken place regarding the informal and formal employment. ILO (2003) expanded their earlier definition of informal sector by including informal employment outside informal enterprises. According to them, some employment outside the informal sector (i.e., in formal sector) are also informal in nature. Informal sector's employment can, therefore, be a sub-set of informal employment. In Indian context, National Commission for Enterprises in the Unorganized Sector (NCEUS, 2008) came with clear cut definitions of informal sector and informal employment separately. So, it is important to present the information on informal employment and informal sector's employment separately. Table-3 presents the distribution of formal and informal sectors' employment by major economic activities.

Table-3: Distribution of formal and informal sectors' employment by major economic activities (in million).

Economic activities	1999-2000			2004-05		
	Informal sector's employment	Formal sector's employment	Total employment	Informal sector's employment	Formal sector's employment	Total employment
Agriculture	232.21 (97.70)	5.47 (2.30)	237.67 (100)	252.83 (97.65)	6.09 (2.35)	258.93 (100)
Industry	44.81 (69.05)	20.08 (30.95)	64.89 (100)	60.35 (70.40)	25.38 (29.60)	85.73 (100)
Services	65.62 (69.67)	28.57 (30.33)	94.20 (100)	81.72 (72.44)	31.09 (27.56)	112.81 (100)
Total	342.64 (86.36)	54.12 (13.64)	396.76 (100)	394.90 (86.32)	62.57 (13.68)	457.46 (100)

Note: Figures in the parenthesis represent percentage shares.
Source: National Commission for Enterprises in the Unorganized Sector (NCEUS, 2008).

In the primary sector about 97.70% workers are absorbed in informal sector in 1999-2000. This figure has slightly deceased to 97.65% in 2004-05. In the secondary sector, the percentage of informal employment has increased from 69.05% in 1999-2000 to 70.40% in 2004-05. In the tertiary sector also the informal employment has increased from 69.67% in 1999-2000 to 72.44% in 2004-05. Though there is a slight decrease in the informal sector's employment, informal employment is increasing overtime.

From the above discussion it is observed that there is a slight increase in the percentages share of formal sector's employment. As we have already discussed that a certain percentage of workers are informally employed in the formal sector, it is important to see whether the formal sector's employment is increasing due to the increase of formal or informal employment. Table-4 presents informal and formal employment in the formal sector by major economic activities.

Table-4: Informal and formal employment in the formal sector by major economic activities (in million).

Economic activities	1999-2000			2004-05		
	Informal employment in formal Sector	Formal employment in formal sector	Total employment	Informal employment in formal Sector	Formal employment in formal sector	Total employment
Agriculture	2.58 (47.17)	2.89 (52.83)	5.47 (100)	3.23 (53.04)	2.86 (46.96)	6.09 (100)
Industry	10.71 (53.34)	9.37 (46.66)	20.08 (100)	16.29 (64.18)	9.09 (35.82)	25.38 (100)
Services	5.8 (20.30)	22.77 (79.70)	28.57 (100)	8.19 (26.34)	22.9 (73.66)	31.09 (100)
Total	19.1 (35.29)	35.02 (64.71)	54.12 (100)	27.72 (44.30)	34.85 (55.70)	62.57 (100)

Note: Figures in the parenthesis represent percentage shares.
Source: Author's calculation by using National Commission for Enterprises in the Unorganized Sector (NCEUS, 2008) data.

From the above table it is seen that the percentages share of informal employment in all the three sub-sectors (in formal sector) are increasing overtime. In the primary sector about 47.17% workers are informally employed in the formal sector in 1999-2000. This figure has slightly increased to 53.04% in 2004-05. In the secondary sector percentages

share of informal employment is higher than the formal employment. In this sector, the percentages share of informal employment has increased from 53.34% in 1999-2000 to 64.18% in 2004-05. In the tertiary sector also the informal employment has increased from 35.29% in 1999-2000 to 44.30% in 2004-05. This may be due to the fact that liberalization exposed all the formal units to the inherent free market competition. So, they are trying to reduce cost of production by changing their organization of production and, thereby, the percentages of contract work in the formal units are increasing overtime.

3.2. Informal and formal sector's NDP

Our analysis considers the trends and growth of NDP at constant prices (1999-2000) by unorganized and organized sectors during thirty-five years (1970-71 to 2005-06). The trends in NDP of unorganized and organized sectors are presented in figure-2.

Fig-2: Trends in NDP of unorganized and organized sectors.
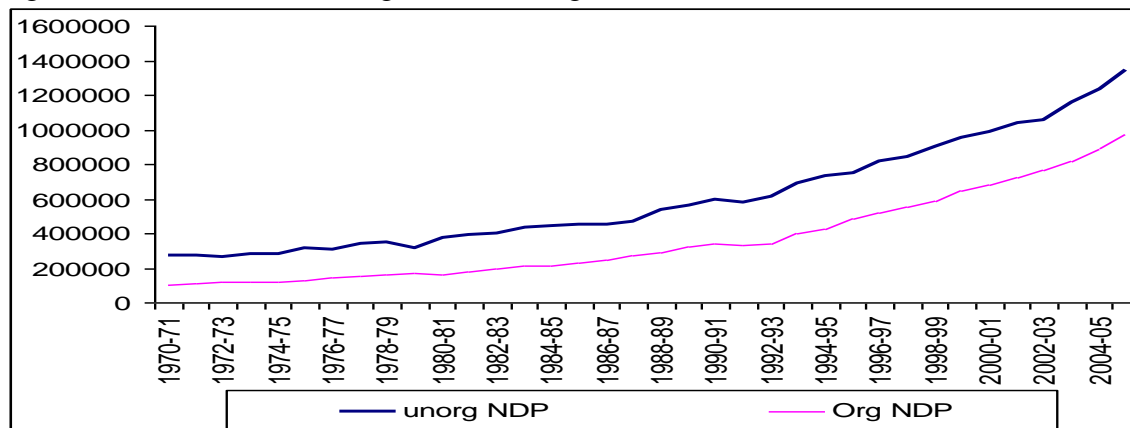
From the above figure it is observed that both the sectors (in absolute terms) are increasing with the passage of time. The contribution of unorganized and organized sectors in terms of their percentage shares in total NDP are presented in figure-3.

Figure-3: Percentage share of organized and unorganized sectors in total NDP.
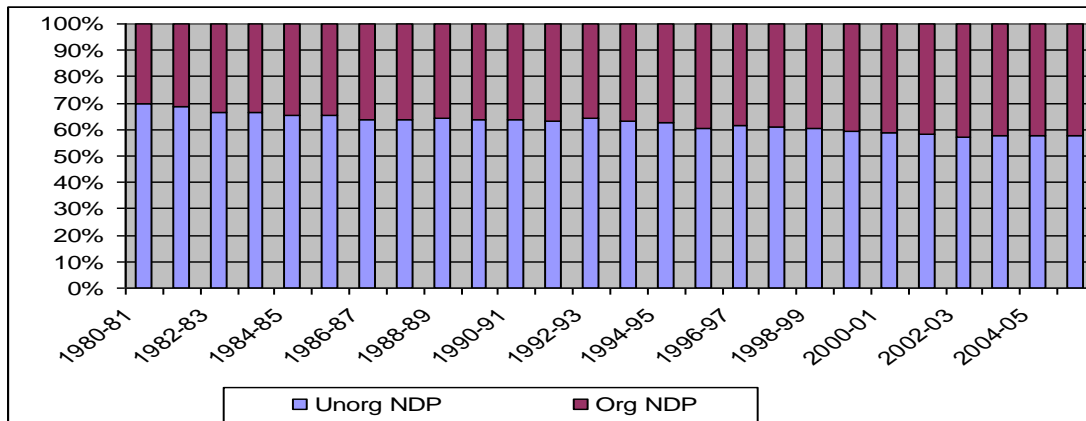
Source: Author's estimation using National Accounts Statistics (various reports from 1980 to 2008).

The above figure shows the higher share of unorganized sector than organized sector for the entire study periods. However, during this period there is a decreasing trend in the unorganized sector's share, while the organized sector has shown an increasing trend. Though there is a decreasing trend of the unorganized sector's share, still it accounts for a large share (almost 60%) in total NDP.
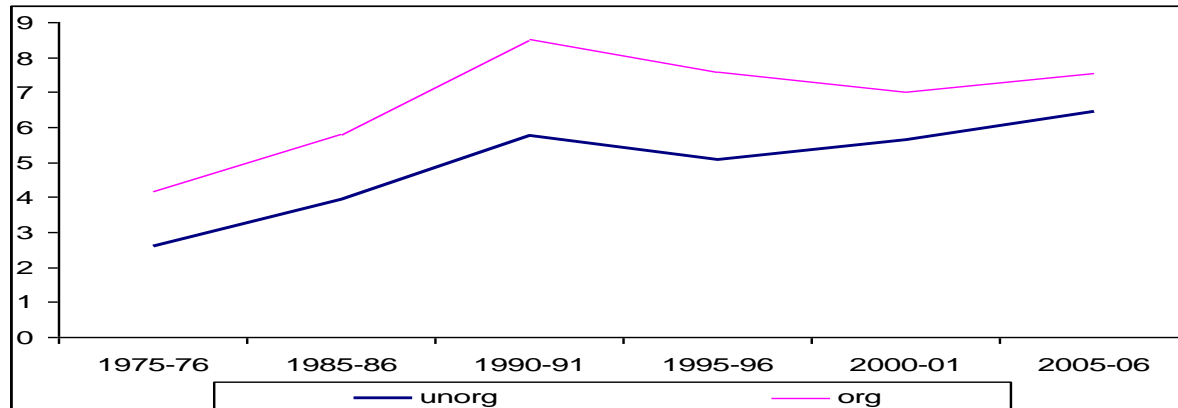
Rate of growth of organized and unorganized sectors can be described by average annual growth rate (AAGR[2]). Figure-3 shows the trends of annual growth rates of organized and unorganized sectors' NDP during 1971-72 to 2005-06. We have divided the entire study period into five phases on the basis of foreign trade policies[3]. From the available evidence it is seen that sub-contracting in the formal sector is taking place significantly in 2000-01. It will be very interesting to see whether there is any impact of forward linkages between formal and informal sector through sub-contracting on both the sectors' growth rates. So, we have divided the phase-V (1995-96 to 2000-01) into two different phases: 1995-96 to 2000-01 and 2001-02 to 2005-06. We have computed average annual growth rate (AAGR) of both unorganized and organized sectors of these six phases. The trends in

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[2] Average Annual Growth Rate (AAGR) is calculated by taking the arithmetic mean of the growth rate over two annual periods. For example, if the NDP grows 10% one year and 20% the next, the AAGR would be 15% (source: http://www.investopedia.com/terms/a/aagr.asp downloaded on the dated 10.11.09).

[3] The details of the foreign trade policies are given in table-A1 in the appendix.

growth of organized and unorganized NDP by AAGR during the six phases are shown in figure-4.

Fig-4: Comparison between the average annual growth rates (AAGR) of unorganized and organized sectors.

From the above figure it is seen that both the curves have increasing trend in Phase-II and III. But the rate of increase of the organized sector's growth is slightly higher than the unorganized sector's growth. But in Phase-IV, both the sectors have decreasing trend in growth. This implies that just after trade liberalization both the sectors may unable to compete with foreign firms in the open economic framework and couldn't able to maintain their previous growth rates. But in phase-V, organized sector's growth has decreasing trend, while unorganized sector's growth has increasing trend and both the trend curves are converging towards each other. In the phase-VI, both unorganized and organized sectors are increasing at increasing rate. It is already stated that in the last phase there is a forward linkage taking place between the organized and unorganized sectors through sub-contracting i.e., the relationship between the two sectors is complementary in nature. As a result of that the expansion of organized firms helps to expand the unorganized firms as well. So both the curves have increasing trend in this phase. But, it is imperative to keep in mind that the linkages may not same for different sub-sectors. For instance, the linkages in manufacturing sector may be different from construction sector. To substantiate our argument it is necessary to give some evidence regarding sub-contracting in the Indian economy. The nation-wide NSSO 1999-00 survey on informal sector's enterprises is first of its kind to give information about the magnitude of sub-contracting of informal sector in India. 2000-01 and 2005-06 surveys

on unorganized manufacturing enterprises also provide information about sub-contracting of the unorganized manufacturing sector. The proportion of enterprises operating under sub-contracting is presented in table-5.

Table-5: Proportion of enterprises operating under sub-contracting.

Year	Sector/sub-sector	% of units operating on contracts
1999-2000	Sub-sectors of informal sector:	
	1) manufacturing	17
	2) construction	23.5
	3) trade and repair services	1.1
	4) hotels and restaurants	1.1
	5) transport, storage and communication	2.7
	6) other service sector	2.9
	Total informal sector	7.2
2000-01	Unorganized manufacturing sector	30.7
2005-06	Unorganized manufacturing sector	31.7

Source: Author's calculation by using NSS reports and unit level data.

From the above table it is seen that 7.2% of total enterprises of the informal sector in 1999-00 were operating under sub-contracting. In 1999-00, 17% of the informal manufacturing units were operating on contracts, while 30.7% of the unorganized manufacturing units were operating on contracts in 2000-01. So a significant percentage of sub-contracting increases within one year. In 20005-06, 31.7% of the unorganized manufacturing units were operating on contracts. On the basis of these evidence it can be argued that significant amount of forward linkages between the organized and unorganized sectors through sub-contracting is taking place in the last phases (2000-01 to 2005-06) of our study period.

3.3. Factor Income of formal and informal sectors

It is generally argued that informal sector uses labour intensive technology and the high labour intensity of production is the main reason for huge employment generation in the informal sector. To get an idea about the factor intensity, it is important to segregate the total unorganized sector's NDP into different factor income. However, the factor intensity in informal sector may vary over time. This dynamism needs to be measured. Central statistical Organisation (CSO) in their National Accounts Statistics provides the data for compensation of Employee (CE) and mixed income (MI). Mixed income is the
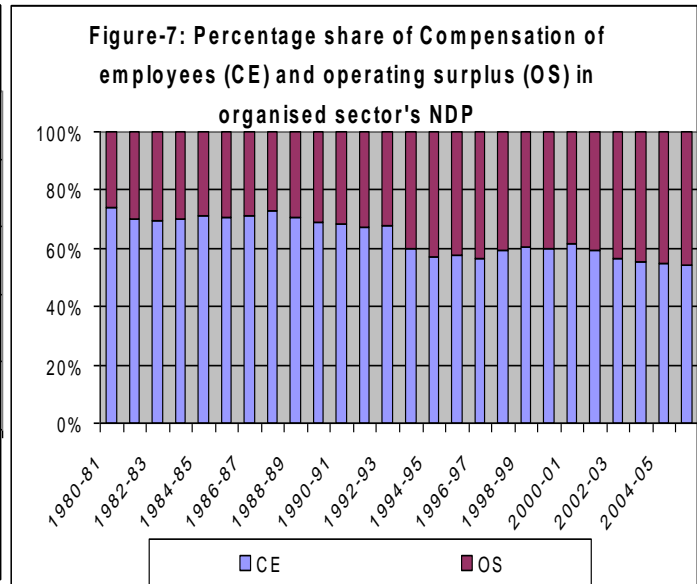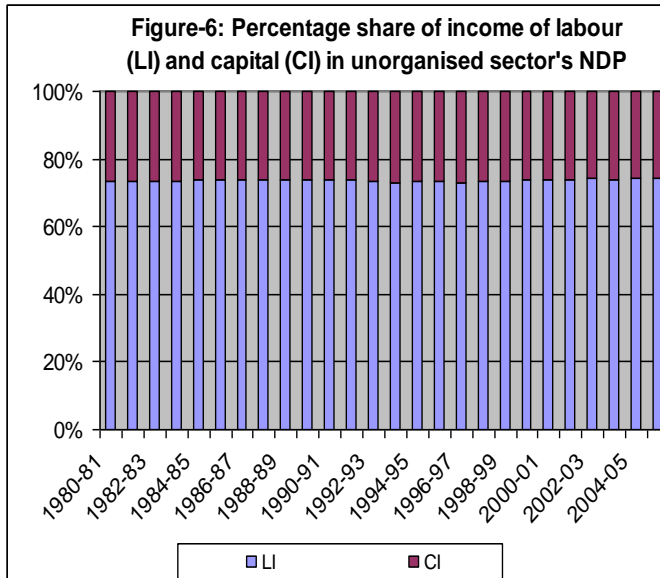
income where the segregation of income for capital and labour is difficult. Figure-5 presents the percentage share of compensation of employees (CE) and mixed income (MI) in unorganized sector's NDP.

Figure-5: Percentage share of compensation of employees (CE) and mixed income (MI) in unorganized sector's NDP.
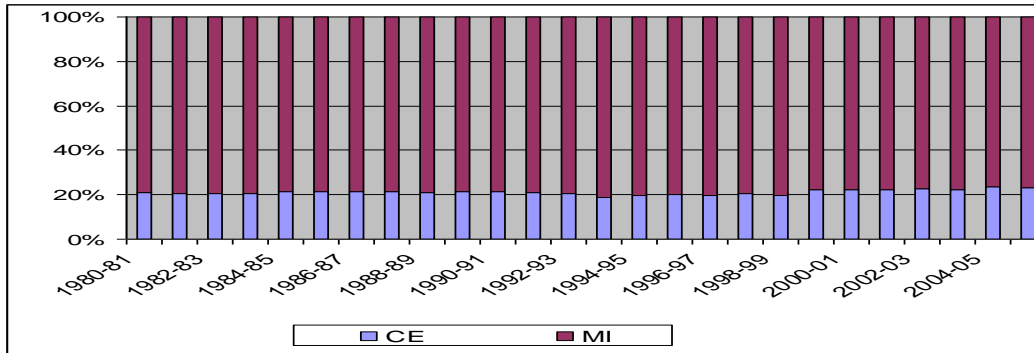
Source: Author's estimation using National Accounts Statistics (various reports from 1980 to 2008).

Mixed income, therefore, consists of both income of capital and labour. Unless we segregate mixed income between capital and labour, it is difficult to calculate the factor income. Various studies (Narayana, 2009) suggest that 2/3 of the mixed income can be considered as labour income and rest 1/3 of the mixed income can be considered as capital income. If we add this 2/3 of mixed income with the compensation employees we will get the total labour income i.e., total labour income = (2/3MI + CE). Figure-6 presents the percentage share of income of labour and capital in unorganised sector's NDP and figure-7 presents the percentage share of compensation of employees and operating surplus in organized sector's NDP.

Figure-6: Percentage share of income of labour (LI) and capital (CI) in unorganised sector's NDP

Figure-7: Percentage share of Compensation of employees (CE) and operating surplus (OS) in organised sector's NDP

Source: Author's estimation using National Accounts Statistics (various reports from 1980 to 2008).

From fgure-4 and 5 we can compare the distribution of factor income in unorganized and organized sectors' NDP. In the initial years of our study period, labour income was more than 70% in both unorganized and organized sectors. Still now the share of labour income remains same in the unorganized sector as it was earlier. This may be due to informal sector uses labour intensive technology and the high labour intensity of production is the main reason for huge employment generation and, thereby, it maintains the large share of labour income. But, the share of labour income decreases over time in the organized sector and it is about 55% in the recent years. From the figure it is seen that the share of labour income started to decrease significant amount just after liberalization (i.e., after 1991). The possible reason could include that liberalization exposed all the industrial units in an inherent risk of free market competition. It increases the use of modern capital intensive technology in the organized sector and, thereby, increases the share of capital income overtime which ultimately reduces the share of labour income.
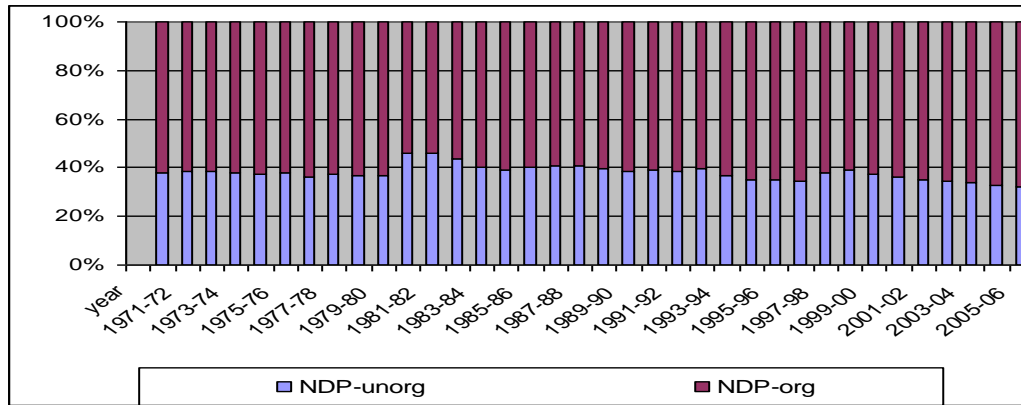
3.4. Unorganized manufacturing sector

The production linkages between formal and informal sectors are measured through subcontracting. Here, subcontracting refers to vertical inter-firm relationship between

informal and formal firms. This information is available for unorganized manufacturing sector for few years (1999-00, 2000-01 and 2005-06).

Fig-8 presents the percentage share of the organized and unorganized sectors in total manufacturing sector's NDP.

Figure-8: Percentage share of organized and unorganized sectors in total NDP.

From the above figure it is seen that share of organized sector is much higher than unorganized sector in total manufacturing sector's NDP, while in case of whole unorganized sector's share is higher than organized sector's NDP.

Fig-9: Annual growth rate of organized and unorganized manufacturing sectors' NDP.
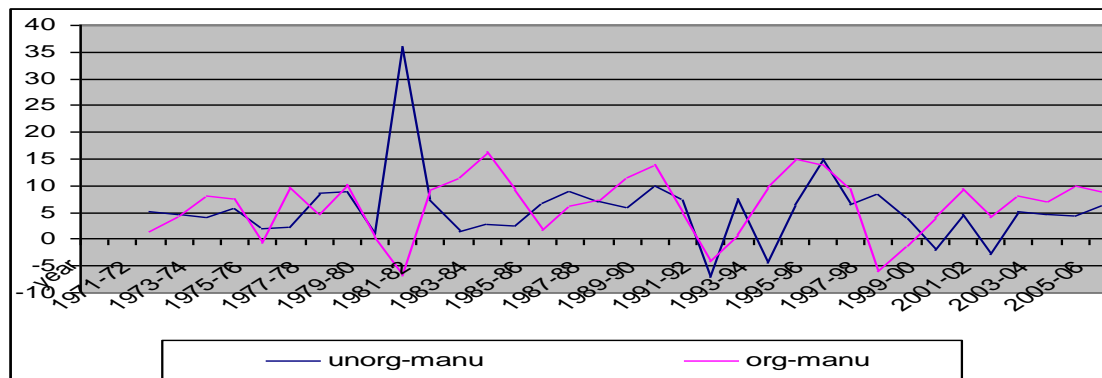
From the above figure it is seen that in the recent years organized manufacturing sector's growth rate is higher than the unorganized manufacturing sector. It is generally argued that informal sector uses labour intensive technology and the high labour intensity of production is the main reason for huge employment generation in the informal sector. To

get an idea about the factor intensity, it is important to segregate the total unorganized sector's NDP into different factor income.

Fig-10: Percentages share of labour income and capital income in unorganized manufacturing sector's NDP.	Fig-11: Percentages share of labour income and capital income in organized manufacturing sector's NDP.
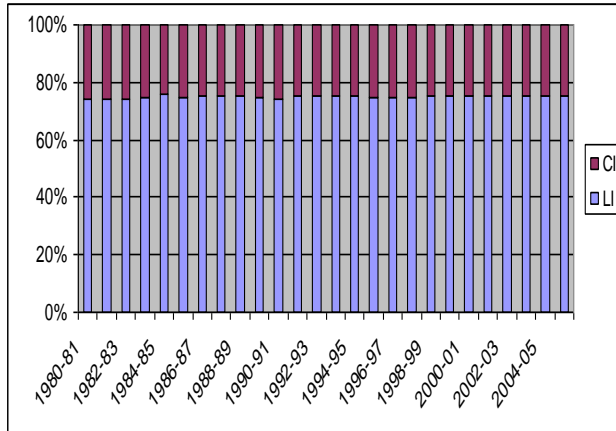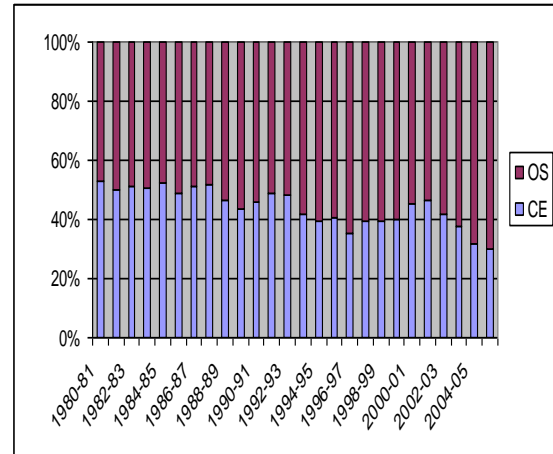
In the initial years of our study period, labour income was more than 70% in the unorganized manufacturing sector. Still now the share of labour income remains same in the unorganized manufacturing sector as it was earlier. This may be due to informal sector uses labour intensive technology and the high labour intensity of production is the main reason for huge employment generation and, thereby, it maintains the large share of labour income. But, the share of labour income decreases over time in the organized sector from about 52% in 1980-81 to 30% in 2005-06. The possible reason could include that liberalization exposed all the industrial units in an inherent risk of free market competition. It increases the use of modern capital intensive technology in the organized sector and, thereby, increases the share of capital income overtime which ultimately reduces the share of labour income.

4. Impact of liberalization: Econometric analysis

4.1. Methodology

The prime concern of this paper is to measure the impact of trade liberalization on the informal sector in India and test whether the relationship is indeed complementary when both the sectors are subject to perform in an open economic framework. Therefore, two essential variables, namely, trade liberalization and linkages between formal and informal sectors need to be captured in an efficient manner. Trade liberalization or the extent of the country's openness in our analysis is captured by two methods. The first one is the typical measure of trade openness- export plus import of goods and services as percent of GDP (often termed as 'degree of openness of trade'). In the second method, we have computed an openness index on the basis of the different foreign trade policies[4] using Principal Component Analysis (PCA). We have considered only the major foreign trade policies for the study periods 1970-71 to 2005-06 and given each policy weight equal to one.

Linkages between formal and informal sectors are measured through subcontracting. Here, subcontracting refers to vertical inter-firm relationship between informal and formal firms. But, this subcontracting information is not available for the whole unorganized sector. That's why we have not used this variable for the whole unorganized sector. This information is available for unorganized manufacturing sector for few years which we have used at the later stage.

The basic estimation model is as follows:

$$UNORG_t = a_0 + a_1 OPENNESS_t + a_2 GFCE_t + a_3 GFCF_t + \varepsilon_t \qquad (4.1)$$

The notations $UNORG_t$ are used to represent the dependent variable at period t. OPENENSS refers to trade openness as a proxy of trade liberalization, GFCE represents

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[4] Foreign trade policies are taken from Srinivasan (1994). The detailed discussion of the foreign trade policies is given in table-A1 in the appendix.

Government final consumption expenditure (% of GDP) and GFCF represents Gross fixed capital formation (% of GDP).

Formal and informal sector are linked through production linkages, consumption linkages and technological linkages. In India, the production linkage between the formal and informal sectors is taking place through sub-contracting. A large number of informal sector's firms in recent years are producing their products by receiving direct contracts from the formal firms/ agencies/ contractors. The contracts are on the sale of outputs, supply of raw materials and equipments etc. There is only one round enterprise level survey for the whole informal sector has carried out by National Sample Survey Organization (NSSO) in the year 1999-00 which provides some information regarding the subcontracting in the total informal sector. But, this information is available for unorganized manufacturing sector for few years (1999-00, 2000-01 and 2005-06). That's why we have taken unorganized manufacturing sector as a case study to capture both trade openness and formal-informal sectors' linkages.

We have measured trade liberalization or the extent of the country's openness by two methods. The first one is trade openness manufacturing sector- export of manufacturing goods plus import of manufacturing goods as percent of Manufacturing GDP. In the second method, we have used PCA openness indices which we have used for the whole unorganized sector. Linkages between formal and informal sectors are measured through subcontracting. But, the data is available only for three years 1999-00, 2000-01 and 2005-06. The data for the years in between 2000-01 and 2005-06 are computed using average growth rate. The years before 1999-00 we have mentioned two extreme specifications. These are i) there is no subcontracting before 1999-00 and ii) the percentages of subcontracting is same as 1999-00.

Unorganized manufacturing sector's NDP is a measure of the size of unorganized manufacturing sector in absolute terms. To obtain an idea about the impact of liberalization on relative size of the unorganized manufacturing sector, we have taken the percentage share of unorganized manufacturing sector in total manufacturing sector's

NDP and the relative size of the unorganized manufacturing sector's NDP (i.e., unorganized manufacturing sector's NDP/organized manufacturing sector's NDP) in different equations.

We have estimated four separate ordinary least squares regressions for four models of four different dependent variables, such as, unorganized manufacturing sector's NDP, log of unorganized manufacturing sector's NDP, the percentage share of unorganized manufacturing sector in total manufacturing sector's NDP and the relative size of the unorganized manufacturing sector's NDP. This is shown below:

$$MUNORG_t = a_0 + a_1MOPENNESS_t + a_2SUB_t + a_3GFCE_t + a_4MGFCF_t + \varepsilon_t \qquad (4.2)$$

The notations $MUNORG_t$ are used to represent the dependent variable at period t. MOPENENSS refers to trade openness as a proxy of trade liberalization, GFCE represents Government final consumption expenditure (% of GDP) and MGFCF represents Gross fixed capital formation in the manufacturing sector (% of manufacturing sector's GDP).

4.2. Variables, description, expected sign and economic interpretation

In order to accomplish the task stated above it is necessary to look at variables, their description, expected sign and economic interpretation. This is summarized in table-6.

Table-6: Variable description[5] of the regression analysis.

Variables	Description	Expected sign	Economic interpretation
1) Openness	Openness refers to trade openness as a proxy of trade liberalization. It is measured by two ways. These are i) export plus import of goods and services as percentage of GDP ii) Principal Component Analysis (PCA) indices computed on the basis of the	Positive	Liberalization exposed all the industrial units to the inherent risk of free market competition. But, formal enterprises are unable to reduce their cost of production instantly since they are bound to follow the rules and regulation imposed

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[5] Interpretations of the variables for unorganized manufacturing sector are same as the total unorganized sector.

	different foreign trade policies.		by the government. Informal sector can sustain due to its low cost of production. Moreover, due to liberalization retrenched people from the formal sector engage in the informal production units which may increase the volume of informal sector.
2) GFCE	Government final consumption expenditure as percentage of GDP.	Positive	The government expenditure multiplier is positive or as government expenditure increases national income also increases.
3) GFCF	Gross fixed capital formation as percentage of GDP.	Positive	The investment multiplier is positive. So, as capital formation increases net domestic product will also increase.
4) Subcontracting	Percentage share of subcontracted firms Gross Value Added (GVA) in total GVA.	Positive	When one sector is linked with other sector through production linkages, it implies the expansion of the size of one sector helps to expand the other sector as well.

5. Empirical analysis and results

To estimate the impact of trade liberalization on unorganized sector, we have estimated empirically the regression equation 4.1. Descriptive statistics of the explanatory variables used in these regression equations are given in table-A2 in appendix.

Trade liberalization or the extent of the country's openness in our analysis is captured by two methods. The first one is the typical measure of trade openness- export plus import of goods and services as percent of GDP (often termed as 'degree of openness of trade'). Informal sector has had a changing contribution to the country's economic growth in terms of income and employment. One of the reasons for such changes can be attributed to Government's foreign trade policies over time. For instance, one can broadly divide the foreign trade policies by pre and post liberalization periods or by different trade

policy regimes. In the second method, we have computed an openness index on the basis of the different foreign trade policies using Principal Component Analysis (PCA). We have considered only the major foreign trade policies for the study periods 1970-71 to 2005-06 and given each policy weight equal to one. We have created one dummy for each policy and computed the Principal Component Analysis (PCA) score which is used as an indicator of openness indices. The PCA openness indices are presented in table-A3 in the appendix.

On the basis of correlogram specification (autocorrelation and partial correlation) all the series of variable are nonstationary. The variables are stationary at the first differences i.e., all the series are integrated of order 1 [I(1)]. When all the series (both dependent and independent variables) are I(1), there is a chance of co-integration among the variables. In our model, we have run the regressions of all the variables as it is (i.e., nonsationary). Then, we have checked the correlogram of the residuals which shows the variables are co-integrated. So, it is confirmed that there exist long run equilibrium relationship among the variables.

Two ordinary least squares regressions are estimated for each of four alternative specifications. These are shown as model in table-7.

Table-7: Determinants of total unorganized sector's economic growth: estimation of regression model.

Independent Variables	Dependent Variable							
	Unorganized NDP		Log (unorganized NDP)		Percentage share of Unorganized NDP in total NDP		Unorganized NDP/ organized NDP	
	Model-1.1	**Model-1.2**	**Model-2.1**	**Model-2.2**	**Model-3.1**	**Model-3.2**	**Model-4.1**	**Model-4.2**
Trade openness	28932.44*** (1614.61)		0.039*** (0.005)		-0.252*** (0.053)		-0.014*** (0.005)	
Principal component openness index		100490.9*** (20342.37)		0.193*** (0.028)		-1.518*** (0.222)		-0.124*** (0.018)
Government final consumption expenditure (% of GDP)	44997.31*** (5648.84)	-35711.48** (15808.2)	0.136*** (0.018)	0.001 (0.022)	-1.516*** (0.185)	-0.535*** (0.173)	-0.137*** (0.018)	-0.066*** (0.014)
Gross fixed capital formation (% of GDP)	-10720.77 (6325.37)	55620.62*** (9747.534)	-0.008 (0.021)	0.061*** (0.013)	-0.204 (0.207)	-0.522*** (0.107)	-0.036* (0.020)	-0.038*** (0.008)
Intercept	-463.16 (111083.7)	-218465.6 (329826.4)	11.30*** (0.363)	11.812*** (0.451)	90.268*** (3.646)	82.932*** (3.607)	4.506*** (0.354)	3.534*** (0.302)
R^2	0.98	0.93	0.95	0.95	0.94	0.96	0.92	0.96
Durbin-Watson stat	1.89	0.69	1.07	1.23	1.04	1.60	1.03	1.83
No. of observations	36	36	36	36	36	36	36	36

Note: Figures in the parenthesis represent standard errors. ***, ** and * indicate statistical significance at 1%, 5% and 10% levels respectively.

From the above table it is seen that coefficients of both the specifications of trade openness are positive and significant in model-1 and 2. This implies that trade liberalization or country's openness increases the size of both organized and unorganized sectors increases in absolute terms. While model-3 and 4 show the coefficients of both the specifications of trade openness are negative and significant. This implies that as trade openness increases the relative share of the unorganized sector decreases. This implies that due to liberalization both unorganized and organized sectors increases but the rate of increase of the organized sector is much higher than the unorganized sector. The coefficient of GFCE is positive for model-1 and 2 (except model 1.2) but it is negative and significant for model-3 and 4. Moreover, in all the models (except model 1.2[6]) Durbin-Watson statistic is grater than the R^2 values. This implies that as government consumption expenditure increases the size of the unorganized sector increases in absolute terms, while the size decreases in relative terms. Thus, one can argue that government expenditure helps to grow formal sector much higher rate than informal sector.

To capture the formal-informal sectors' linkages, we have estimated the equation 4.2 for unorganized manufacturing sector. Like the previous regression estimation, we have checked the stationarity of all the variables thorugh correlogram specification (autocorrelation and partial correlation). All the variables are stationary at the first differences i.e., all the series are integrated of order 1 [I(1)]. Thus, there is a chance of co-integration among the variables. In this model also we have run the regressions of all the variables as it is (i.e., nonsationary). Then, we have checked the correlogram of the residuals which shows the variables are co-integrated. So, it is confirmed that there exist long run equilibrium relationship among the variables. The results are shown in table-8.

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[6] Model 1.2 may show the spurious relationship because the R^2 value is greater than the Durbin-Watson statistic. But, in rest of the models R^2 value is lower than the Durbin-Watson statistic.

Table-8: Determinants of unorganized manufacturing sector's economic growth: estimation of regression model.

Variables	Dependent variable: Unorganized manufacturing sector's NDP				Dependent variable: Log (unorganized manufacturing sector's NDP)			
	Model-1.1	Model-1.2	Model-1.3	Model-1.4	Model-2.1	Model-2.2	Model-2.3	Model-2.4
Trade openness	307.05*** (25.39)		361.135*** (25.85)		0.006*** (0.001)		0.007*** (0.001)	
Principal component openness index		7558.07*** (996.09)		9595.36*** (1168.84)		0.174*** (0.027)		0.198*** (0.026)
Sub-contracting1	742.476*** (111.39)	1134.23*** (128.36)			0.014*** (0.005)	0.019*** (0.004)		
Sub-contracting2			1390.24*** (311.99)	2381.3*** (414.36)			0.031*** (0.011)	0.043*** (0.009)
Government final consumption expenditure (% of GDP)	5302.039*** (456.83)	2426.35*** (832.03)	5448.03*** (560.86)	1958.49* (1085.65)	0.201*** (0.019)	0.130*** (0.023)	0.205*** (0.019)	0.127*** (0.024)
Gross fixed capital formation (% of GDP)	263.778*** (70.12)	539.13*** (79.13)	122.26 (72.94)	391.32*** (94.66)	0.008*** (0.003)	0.012*** (0.002)	0.007** (0.002)	0.010*** (0.002)
Intercept	-55005.21*** (6774.004)	-22832.68* (13257.83)	-74325.73*** (11995.95)	-48906.15** (22267.37)	7.228*** (0.277)	8.145*** (0.363)	6.716*** (0.406)	7.553*** (0.494)
R-square	0.98	0.97	0.98	0.95	0.96	0.96	0.96	0.96
Durbin-Watson stat	1.67	1.37	1.84	1.58	1.11	1.23	1.41	1.63
No. of observations	36	36	36	36	36	36	36	36

Note: Figures in the parenthesis represent standard errors. ***, ** and * indicate statistical significance at 1%, 5% and 10% levels respectively.

Table-8 continued

Variables	Dependent variable: Share of unorganized manufacturing sector to total manufacturing sector's NDP				Dependent variable: unorganized manufacturing sector's NDP/ organized manufacturing sector's NDP			
	Model-3.1	Model-3.2	Model-3.3	Model-3.4	Model-4.1	Model-4.2	Model-4.3	Model-4.4
Trade openness	-0.083*** (0.017)		-0.072*** (0.014)		-0.002*** (0.0005)		-0.002*** (0.0004)	
Principal component openness index		-1.82*** (0.527)		-1.81*** (0.474)		-0.049*** (0.015)		-0.049*** (0.014)
Sub-contracting1	0.133* (0.073)	0.003 (0.068)			0.004** (0.002)	0.0005 (0.002)		
Sub-contracting2			0.232 (0.172)	0.003 (0.168)			0.007 (0.005)	0.001 (0.005)
Government final consumption expenditure (% of GDP)	1.021*** (0.299)	1.68*** (0.44)	1.042*** (.309)	1.675*** (0.44)	0.025*** (0.009)	0.044*** (0.013)	0.026*** (0.009)	0.043*** (0.013)
Gross fixed capital formation (% of GDP)	0.152*** (0.046)	0.065 (0.042)	0.123*** (0.040)	0.064 (0.038)	0.004*** (0.001)	0.002 (0.001)	0.003*** (0.001)	0.002* (0.001)
Intercept	19.559*** (4.446)	13.27* (7.019)	16.616** (6.609)	13.33 (9.033)	0.122 (0.129)	-0.046 (0.202)	0.026 (0.193)	-0.056 (0.261)
R-square	0.65	0.55	0.64	0.55	0.61	0.50	0.59	0.50
Durbin-Watson stat	1.02	0.95	0.99	0.91	0.99	0.89	0.89	0.89
No. of observations	36	36	36	36	36	36	36	36

Note: Figures in the parenthesis represent standard errors. ***, ** and * indicate statistical significance at 1%, 5% and 10% levels respectively.

Like the total unorganized sector, coefficients of both the specifications of trade openness are positive and significant in model-1 and 2 of unorganized manufacturing sector. This implies that as trade liberalization or country's openness increases the size of both organized and unorganized manufacturing sectors increases in absolute terms. While model-3 and 4 show that the coefficients of both the specifications of trade openness are negative and significant. So, one can conclude that as trade openness increases the relative share of the unorganized manufacturing sector decreases. This implies that due to liberalization both unorganized and organized manufacturing sectors increases but the rate of increase of the organized manufacturing sector is much higher than the unorganized manufacturing sector.

In all the specifications of each model, the coefficients of subcontracting are positive and most of the cases significant. This implies that as subcontracting increases the unorganized manufacturing sector also increases both in absolute and relative terms. So, our empirical findings show that the linkages between organized and unorganized manufacturing sector helps to grow the unorganized manufacturing sector.

Unlike the total unorganized sector, the coefficients of GFCE are positive and significant. This implies that as government consumption expenditure increases the size of the unorganized manufacturing sector also increases both in absolute and relative terms.

6. Conclusion

The size of the unorganized sector is higher in terms of percentages share than organized sector for the entire study periods. However, during this study period there has been a decreasing trend in the unorganized sector's share. In spite of that decreasing trend, still it accounts for a large share (almost 60%) in total NDP.

Informal employment increases overtime along with the estimated population and labour force, while the formal employment decreases in recent years. In this context, it is very important to note that though the size of unorganized sector in terms of its percentage shares in NDP decreases overtime, in terms of informal employment it is increasing over

time. So, it can be concluded that organized sector is expanding in terms of its percentage share in NDP but this growth is unable to create formal employment i.e., the growth of the formal sector is jobless growth. This picture is very clear to us from the segregate analysis of the total unorganized sector's NDP into different factor income. In the initial years of our study period, labour income was more than 70% both in total unorganized and unorganized sectors. Still now the share of labour income remains same in the unorganized sector as it was earlier. This may be due to the fact that the informal sector uses labour intensive technology and this high labour intensity of production is the main reason for huge employment generation and, thereby increasing the labour income. But, the share of labour income decreases in the organized sector from 70% in 1980-81 to 55% in 2005-06. It can be seen that the share of labour income started decreasing significantly immediately just after liberalization (i.e., after 1991). Moreover, it shows a diminishing trend over time in the organized manufacturing sector from about 52% in 1980-81 to 30% in 2005-06. The possible reason could be that liberalization exposed all the industrial units in an inherent risk of free market competition. It increases the use of modern capital intensive technology in the organized sector thereby enhancing the share of capital income overtime which ultimately reduces the share of labour income.

In the pre-liberalization period, annual average growth rate of both organized and unorganized sectors have increasing trends. But the rate of increase of the organized sector's AAGR is slightly higher than the unorganized sector's AAGR. But in Phase-IV, both the sectors have decreasing trends in growth which implies that just after trade liberalization both the sectors were unable to compete with foreign firms in the open economic framework and were unable to maintain their previous growth rates. But in phase-V, organized sector has a decreasing trend, while unorganized sector has an increasing trend and both the trend curves are converging towards each other. In the phase-VI, both unorganized sector and organized sectors are increasing at increasing rate. In this phase, significant amount of forward linkages take place between the organized and unorganized sectors through sub-contracting i.e., the relation between the two sectors is complementary. As a result of that the expansion of organized firms helps to expand the unorganized firms as well. But, it is imperative to keep in mind that the linkages may

not be the same for different sub-sectors. For instance, the linkages in manufacturing sector may be different from construction sector.

From the regression analysis it is seen that as trade liberalization or country's openness increases the size of unorganized sector and unorganized manufacturing sector increases in absolute terms. The coefficients of both the specifications of trade openness are negative and significant when we have taken relative size of unorganized sector and unorganized manufacturing sector as dependent variable. One can conclude that as trade openness increases the relative share of the unorganized manufacturing sector decreases. This implies that due to liberalization both unorganized and organized manufacturing sectors increases but the rate of increase of the organized manufacturing sector is much higher than the unorganized manufacturing sector. In all the specifications of each model, the coefficients of subcontracting are positive and most of the cases significant. This implies that as subcontracting increases the unorganized manufacturing sector is increasing both in absolute and relative terms. So, our empirical findings show that the linkages between organized and unorganized manufacturing sector helps to grow the unorganized manufacturing sector.

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Appendix

Table-A1: Different trade policy regimes in India.

Phase	Period	Policy highlights/ regime
Phase-I	1971-72 to 1975-76	1. Import premia rose but not as high as immediately before devaluation i.e., import policy became increasingly restrictive and complex. 2. Import allocation criteria became more complex and subject to marginal conditions. 3. Tariff rates were gradually escalated. 4. Export subsidies were reinstated and augmented. 5. Industrial licensing reverted to its severely restrictive mode.
Phase-II	1976-77 to 1985-86	1. Import allocation rules were made simpler and most non-competing 'essential' imports were liberalized. 2. Protective quotas remained intact and domestic industry continued to be completely shielded from import competition.
Phase-III	1986-87 to 1990-91	Open general license (OGL) (i.e., a license to import but with no quantitative restrictions) for capital goods increased.
Phase-IV	1991-92 to 1995-96	1. Devaluation of the rupee. 2. Abolition of import licensing. 3. Replacement of cash subsidies for exports by exim scrips (freely salable rights to imports linked to exports) and partial convertibility of the rupee under which exporters could sell 60 percent of their foreign exchange receipts at a market determined exchange rate. 4. Abolition of industrial licensing except for investment in eighteen industries. 5. Relaxation of restrictions on large industrial houses under the Monopolies and Restrictive Trade Practices Act. 6. Easing of entry requirements (including equity participation) for direct foreign investment. 7. Allowance of private investment in some industries hitherto reserved for public sector investment.
Phase-V	1996-97 to 2005-06	The setting up of WTO (World Trade Organization) in 1995 has intensified trade liberalization by removing restrictions on foreign direct investment.

Source: Phase-I to Phase-IV [Srinivasan (1994)].

Table-A2: Descriptive statistics of the variables used in the regression analysis.

Variable	No. of observations	Mean	Std. Dev.	Minimum	Maximum
Unorganized NDP	36	605707.5	309807.6	266214.2	1348181
Log (unorganized NDP)	36	13.19	0.49	12.49	14.11
Percentage share of Unorganized NDP in total NDP	36	64.68	4.41	57.82	72.27
Unorganized NDP/ organized NDP	36	1.88	0.37	1.37	2.61
Trade (% of GDP)	36	10.51	11.04	0.67	42.69
Principal component openness index	36	3.70E-08	1.65	-3.47	2.06
Government final consumption expenditure (% of GDP)	36	12.09	1.19	10.08	14.15
Gross fixed capital formation (% of GDP)	36	22.58	2.98	17.87	31.78

Table-A3: Principal Component Analysis scores in different years.

year	Principal Component Analysis scores
1970-71	-3.467309
1971-72	-2.158223
1972-73	-2.158223
1973-74	-2.158223
1974-75	-2.158223
1975-76	-2.158223
1976-77	-1.111473
1977-78	-1.111473
1978-79	-1.111473
1979-80	-1.111473
1980-81	-1.111473
1981-82	-1.111473
1982-83	-1.111473
1983-84	-1.111473
1984-85	-1.111473
1985-86	-1.111473
1986-87	-0.063698
1987-88	-0.063698
1988-89	-0.063698
1989-90	-0.063698
1990-91	-0.063698
1991-92	1.014069
1992-93	1.014069
1993-94	1.014069
1994-95	1.014069
1995-96	1.014069
1996-97	2.06213
1997-98	2.06213
1998-99	2.06213
1999-00	2.06213
2000-01	2.06213
2001-02	2.06213
2002-03	2.06213
2003-04	2.06213
2004-05	2.06213
2005-06	2.06213

Figure-A1: Scree plot of eigen values after Principal Component Analysis

Scree plot of eigenvalues after pca