Exploring the link between Labour Market, Business Environment and Technology: Insights from India.

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Abstract

This paper, assessing employment status of Indian labour force, explores vital cues, which show how changes in business environment and technology impact labour market. Our research, using data extracted from databases such as National sample Survey, National Accounts Statistics, and Annual survey of Industries, examines changes in the composition of employment during 1999-00 to 2005-06. More importantly, focus is laid on the changes in labour market, which are influenced by business environment and technology, rather than determined by labour market and associated institutions. Moreover, we investigate this link in the context of structural aspects of employment in India, covering formal and informal employment. This paper is exploratory in nature, trying to unravel patterns existing among variables. Using these patterns, we discuss future dynamics of Indian labor market.

Keywords:

Employment Status, Changes in Business Environment and Technology

1 Introduction

This paper examines emerging patterns of employment in Indian Labour Market, focusing the link among these patterns and changes in business environment and technology during 1999-00 to 2005-06. From the pool of perspectives, which explain changes in employment, neo-classical economic theory of labour, though criticized for inept treatment of reality, shares two important inferences: (a) In a market economy, demand for labour can be derived from demand for product (b) There is a link between demand for product and technology used in production. Refraining from ardent pursuit of methodological stance of neoclassical or alternatives to it, we explore pattern of employment during 1999-00 to 2005-06, viewing these two inferences provide useful cues about dynamic processes explaining the change. Here, quite clearly, we deviate from

neoclassical approach, which starts with models explaining the decision process of micro decision units and then moving towards a predictive frame. Rather, our approach is to search for relevant patterns in secondary data on employment, business environment and technology; then these patterns are linked with the inferences drawn from neoclassical model.

Employment status is an important labour market outcome, which is driven by both economic and non economic factors. Broadly, following labour statistics conventions, employment status consists of three categories: Self Employment (SE), Regular Salary/Wage Employment (RE) and Casual Employment (CE)[1]. It is important to note that employment status varies with sector –urban or rural- and nature of economic activity. While RE forms significant percentage of employment in urban India, RE's share in rural employment is minuscule. This contrast between employments in rural-urban sectors has two important implications. First, compared to other two categories, average wage for RE is higher. Second, employment in tertiary sector is hugely RE, implying higher likelihood of RE participating in tertiary sector's visible impact in India's economic growth. In fact, the rural-urban gap in better employment, reflected in wage rate and inclusion in economic growth, remains pervasive as long as educational attainment in rural sector is low, viewing that there is a direct relation between RE as a proportion of total employment and educational attainment.

This raises an important question: Does an increase in RE as a proportion of Employment mean more employed persons have employment which assures rights such as employment security, work security and social security? This leads to the examination of composition of formal and informal employment since the type one is relatively better in assuring these rights than the second type is. Further, it is important to disaggregate the data on formal and informal employment for the economic activity, mainly to capture the link between dynamics in labour market and economic activity. Going back to cues we

[1] As given by National Sample Survey, total employment (E) is the sum of SE, RE and CE. E is a component of labour force (L), which consists of E and unemployed labour force (U). Adding L with persons not in labour force (NL) gives population (P). Therefore, P = L + NL; L = E + UE, E = SE + RE + CE.

source from neoclassical model, demand for output is sensitive to the nature of technology, which has implications for employment. Quite interestingly, Leontief's input output model provides a pragmatic frame for examining the link between demand for output and indicators of technology such as inter industry transaction of inputs. This study is exploratory in nature. For examining the change in employment status, we use National Sample Survey (NSS) 55th round and 62nd round data. NCEUS forms the base for data on formal-informal composition of employment. Changes in business environment and technology is assessed based on Annual Survey of Industries and inter industry input output data published by Central Statistical Organization (CSO).

The paper is organized into five sections. Section 2 deals with employment status, outlining the change during 1999-00 to 2005-06. Section 3 provides discussion on composition of formal and informal work, covering growth in employment and labour absorption in formal and informal sector. Section 4 explores the link among technology, business environment and employment. Section 5 concludes the paper.

2 Employment status

Table 1 gives composition of population (P), which consists of persons in labour force (L) and persons who are not in labour force (NL). L is constituted by employed persons (E) and unemployed persons (U). E comprises of three categories: self employed (SE), regular salary/wage employment (RE), and casual employment (CE). While composition of P hardly show significant change, for rural, urban and combined, during 1999-00 to 2005-06, compound annual growth rates (CAGR) of constituents of P vary from -1.23 to 5.67. Quite strikingly, the category unemployed rural person reports highest CAGR i.e. 5.67. On the other hand, RE, for rural sector, reports a CAGR of 4.36. Although the share of RE in rural employment is smaller compared to SE and CL, CAGR indicates an important change. It is interesting to note that, irrespective of the sector, CL reports negative CAGRs, varying from -1.23 to -0.27.

Table 1: Employment Status* (%)

	Rural + Urban		Rural		Urban	
	2005-06	1999-00	2005-06	1999-00	2005-06	1999-00
Self Employed (SE)	19.6 (2.02)	18.4	21.4 (2.24)	20.2	13.9 (1.01)	13.2
Regular Salaried/ Wage (RE)	6 (2.53)	5.5	3.4 (4.36)	2.8	14.4 (1.31)	13.4
Casual Labour (CL)	11.7 (-0.38)	12.6	13.7 (-0.27)	15	5 (-1.23)	5.8
Unemployed (U)	1.2 (3.80)	1.1	1 (5.67)	0.7	1.9 (1.27)	1.8
Not in Labour Force (NL)	61.5 (0.72)	62.4	60.6 (1.06)	61.3	64.4 (-0.25)	65.8
Total (P)	100	100	100	100	100	100

Figure in parenthesis is the compound annual growth rate (CAGR).
*Employment is measured in Usual Principal Status.
Source: NSS 55th and 62nd round report

What accounts for higher CAGR for RE in rural sector? As given in Table 2, CAGRs for RE in tertiary and secondary sector are 4.42 and 7.12, respectively. It appears that structural changes in rural economy, resulting in increasing share of tertiary sector in output, indicate the growth of RE in rural sector. Moreover, similar changes are consistent with SE in rural area too. For employment in rural sector, irrespective of employment status, secondary sector reports relatively higher CAGR, ranging from 7.8 to 4.22. Interestingly, similar pattern, but CAGRs of much lower magnitude, holds good for urban sector as well. On the other hand, urban India depicts a different picture, all three categories reporting lower CAGRs. It is important to note there is a visible deceleration of persons employed as casual labour in tertiary sector of urban India during 1999-00-2005-06. However, combining rural and urban sectors, CL reports highest growth rate. During the period under reference, a noteworthy change for the rural plus urban is share of CL employed in secondary sector out of CL has increased from one sixth to one fourth. Another important change is SE generated by tertiary sector in rural India grew at 5.04 per cent during 1999-00 - 2005-06. Assessment of growth rates points to that RE and SE, compared to CL, report higher growth rates in two economic activities –tertiary and secondary, clearly implying that education is critical for rural labour force to remain employed, in particular in RE in tertiary economic activity. Taking cues from this link, more expansion of tertiary activities in rural economy will increase the size of

unemployed labour unless there is desirable progress in educational attainment in rural India[2].

Table 2: Distribution of employment status by Economic Activity (%)

	Rural + Urban		Rural		Urban	
	2005-06	1999-00	2005-06	1999-00	2005-06	1999-00
Self Employed (SE)						
Primary	63.18 (1.46)	65.29	74.10 (1.46)	77.55	10.53 (1.42)	10.28
Secondary	13.21 (3.15)	12.37	10.58 (4.22)	9.43	25.91 (1.24)	25.57
Tertiary	23.60 (2.96)	22.34	15.32 (5.04)	13.02	63.55 (0.85)	64.15
Total	100.00	100.00	100.00	100.00	100.00	100.00
Regular salaried/wage (RE)						
Primary	4.84 (-1.89)	6.30	10.64 (-1.32)	14.88	0.53 (-8.35)	0.97
Secondary	29.82 (3.67)	27.91	27.86 (7.12)	23.82	31.27 (1.76)	30.45
Tertiary	65.34 (2.42)	65.79	61.50 (4.42)	61.29	68.20 (1.21)	68.59
Total	100.00	100.00	100.00	100.00	100.00	100.00
Casual Labour (CL)						
Primary	69.47 (-1.85)	75.92	76.06 (-1.82)	83.42	16.58 (-3.00)	18.63
Secondary	24.11 (5.86)	16.73	19.44 (7.80)	12.17	61.55 (1.85)	51.62
Tertiary	6.42 (-2.59)	7.34	4.50 (0.03)	4.41	21.87 (-6.04)	29.75
Total	100.00	100.00	100.00	100.00	100.00	100.00
Total						
Primary	55.60 (0.04)	59.94	69.09 (0.06)	75.08	7.20 (-0.74)	7.88
Secondary	19.40 (4.28)	16.31	15.36 (6.21)	11.67	33.91 (1.59)	32.28
Tertiary	25.00 (2.17)	23.75	15.56 (4.20)	13.26	58.89 (0.48)	59.85
Total	100.00	100.00	100.00	100.00	100.00	100.00

Figure in parenthesis is the compound annual growth rate (CAGR)
Source: NSS 55th and 62nd round report

[2] It is to be noted that average years of schooling is highest for RS, followed by SE and minimum for CL (NCEUS, 2008).

3 Formal and informal work

The aggregate, explored in the last section -employment status-, provides inadequate information about the quality of employment in terms of the nature of employer and the rights provided by employment such as employment security, work security and social security. Viewing this limitation, it is important to decompose employment into categories, which are based on the nature of employer and the social security content in work. Following NCEUS (2007), source of employment is classified into two: formal and informal. While formal sector consists of incorporated enterprises, unincorporated enterprises form informal sector[3]. If the employment provides rights - employment security, work security and social security- , then the work is classified as formal work, while work without any of these rights is called informal[4].

Taking into account categories of formal and informal, employment may be represented by an identity, which is the sum of four components i.e. informal work in informal sector (II), formal work in informal sector (FI), informal work in formal sector (IF) and formal work in formal sector (FF)[5]. Table 3 outlines the identity, comprising of formal and informal categories. Among four components, II has the highest frequency, accounting for 85% of E. In 1999-00, II had same share in E. Ordering frequency wise, FF is second to II, 7.3 % of E, followed by IF and FI, both having minuscule shares. Going to back to the question -*Does an increase in RE as a proportion of Employment mean more employed persons have employment which assures rights such as employment security, work security, and social security?*-, while RE forms one sixth of E, FF, the category having any of these rights is just one fourteenth. This implies approximately half of RE having any of these rights. In fact, FF as a proportion of employment in formal sector has

[3]Informal 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 than ten total workers". NCEUS (2007), p 3

[4] Informal workers "consist of those working in the unorganised (informal) 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 employees with informal jobs generally do not enjoy employment security (no protection against arbitrary dismissal) work security (no protection against accidents and illness at the work place) and social security (maternity and health care benefits, pension, etc.) and therefore any one or more of these characteristics can be used for identifying informal employment." NCEUS (2007), p 3

[5] E = II + FI + FF = SE + RE + CE

declined from 62 % in 1999-00 to 53 % in 2004-05. Moreover, CAGR of FF during this period is -0.15. On the other hand, IF as a proportion of employment in formal sector, during same period, has increased from 38 % to 47 %, reporting a CAGR of 7.33. It is to be noted that, as given in Table 3, IF reports highest growth rate. However, with ensuing informalization of formal work, RE appears to provide better quality of life than SE and CE, which is quite reflected proportion workforce below poverty line; while proportion below poverty line workers in RE is two third, same ratio for SE and CE are three fourth and nine tenth, respectively (NCEUS, 2007)[6].

Table 3: Distribution of workers by Type of Employment (in Million)

	1999-00			2004-05		
	Informal Worker	Formal Worker	Total	Informal Worker	Formal Worker	Total
Informal Sector	341.28 (99.60)	1.36 (0.40)	342.64 (100)	393.47 (99.64) 2.89*	1.43 (0.36) 1.01*	394.9 (100) 2.88*
Formal Sector	20.46 (37.80)	33.67 (62.20)	54.12 (100)	29.14 (46.58) 7.33*	33.42 (53.42) -0.15*	62.57 (100) 2.94*
Total	361.74 (91.17)	35.02 (8.83)	396.76 (100)	422.61 (92.38) 3.16*	34.85 (7.46) -0.10*	457.46 (100) 2.89*

Figure in parenthesis is percentage.
* indicates compound annual growth rate for 1999-00 to 2004-05.
Source: NCEUS (2008), p 44, Table 4.1

During 1999-00 – 2004-05, share of tertiary sector in formal employment, comprising of service sector industries, remained stable, hovering around two third. Interestingly, public administration and defense, run by Government of India, accounts for one third of formal employment in tertiary sector (Table 4). During this period, structure of informal employment, industry wise distribution, has not changed significantly, except share of agriculture dipping from two third to three fifth. A noteworthy rends in formal employment is shares of two major sources of formal employment -Public Administration & Defense and manufacturing have declined.

[6] To a greater extent, two major factors explain this phenomenon, including educational attainment, and economic activity. Compared to SE and CE, average year of schooling for RE is higher. Second, RE largely caters to tertiary sector while major part of CE and SE are directed towards other two economic activities.

Table 4: Percentage distribution of workers by economic activity

	1999-00			2004-05		
Industry	Informal Worker	Formal Worker	Total	Informal Worker	Formal Worker	Total
Agriculture	64.91	8.25	59.91	60.59	8.21	56.60
Mining	0.43	1.74	0.55	0.42	2.47	0.58
Manufacturing	10.19	20.56	11.10	11.67	18.59	12.19
Electricity, Gas & Water	0.06	2.63	0.28	0.06	3.04	0.28
Construction	4.67	1.80	4.42	5.99	2.01	5.69
Trade	9.79	3.46	9.23	10.07	2.35	9.48
Hotels & Restaurants	1.20	0.74	1.16	1.37	0.86	1.33
Transport & Storage	3.16	9.05	3.68	3.62	9.18	4.04
Banking, Finance & Insurance	0.17	4.65	0.57	0.29	5.39	0.68
Real Estate, Renting, Business Service	0.62	1.23	0.67	0.88	2.67	1.02
Public Administration & Defense	0.44	25.36	2.64	0.28	21.95	1.93
Education	0.90	14.93	2.13	1.25	17.62	2.50
Health & Social Work	0.41	3.88	0.72	0.52	4.39	0.81
Other Community, Social & Personal Services	2.57	1.34	2.46	1.89	1.21	1.83
Private Household	0.48	0.29	0.46	1.12	0.11	1.04
Total	100 (361.74)	100 (35.02)	100 (396.76)	100 (422.61)	100 (34.85)	100 (457.46)

Figure in parenthesis is the total number of workers
Source: NCEUS (2008), p 117, Table 4

In 2004-05, share in formal employment, across industries, varies from 1% to 86%, Public Administration & Defense sector reporting the highest percentage (Table 5). As given in Table 4, this sector has highest share in total formal employment, implying that the government is a major source of forma job. However, in this sector, number of persons employed in formal jobs decelerated during 1999-00 – 2004-05. It is to be noted that, for this sector, both formal and informal employment report negative growth rates, reflecting increase in Government's withdrawal from providing civic services. Quite clearly, three major employment providers –Manufacturing, Construction, and Trade-, accounting for slightly above one fourth of employment, implying three fifth of non agricultural employment, show significant growth in informal employment. While, formal employment has shrunk in two sectors -manufacturing[7] and trade- during this

[7]Patibandla (2008), citing Nagaraj (2004), puts forth "between 1995-6 and 2000-1, about 1.1 million workers in the organized sector lost their jobs. On the other hand, employment and wage levels of supervisors increased significantly. One of the conjectures he makes is that some of the jobs shed are likely to have reappred in the unorganized sector with growing subcontracting of production and shedding of auxiliary services, such as transport, security, cleaning, and provision of food at the work place." (p 101)

period, reporting CAGRs -2.09 and -7.52, respectively, formal employment in construction grew at 1.93. On the other hand, informal employment in all three sectors registered a visible expansion, clearing showing signs of *informalization* of formal work.

Table 5: Percentage Distribution of Informal workers and compound growth rate

	1999-00			2004-05			Compound Growth Rate (%) 1999-00 to 2004-05		
	Informal Worker (%)	Formal Worker (%)	Total	Informal Worker (%)	Formal Worker (%)	Total	Informal Worker	Formal Worker	Total
Agriculture	98.79	1.21	100	98.89	1.11	100.00	1.75 (1.50)	-0.18 (0.19)	1.73 (1.09)
Mining	71.75	28.25	100	67.39	32.61	100.00	2.68 (-0.04)	7.00 (0.78)	3.97 (0.85)
Manufacturing	83.65	16.35	100	88.38	11.62	100.00	5.99 (1.04)	-2.09 (0.58)	4.83 (0.75)
Electricity, Gas & Water	18.75	81.25	100	18.78	81.22	100.00	2.74 (1.18)	2.77 (0.73)	2.77 (0.67)
Construction	96.40	3.6	100	97.33	2.67	100.00	8.42 (0.91)	1.93 (0.81)	8.21 (0.93)
Trade	96.69	3.31	100	98.11	1.89	100.00	3.74 (0.52)	-7.52 (-0.36)	3.43 (0.42)
Hotels & Restaurants	94.30	5.7	100	95.02	4.98	100.00	5.89 (0.99)	2.89 (0.84)	5.72 (0.76)
Transport & Storage	78.30	21.7	100	82.70	17.3	100.00	5.95 (0.86)	0.15 (0.07)	4.80 (0.38)
Banking, Finance & Insurance	27.80	72.2	100	39.24	60.76	100.00	14.15 (0.94)	2.93 (1.03)	6.54 (1.13)
Real Estate, Renting, Business Service	83.73	16.27	100	80.09	19.91	100.00	10.75 (3.09)	16.35 (0.88)	11.74 (1.57)
Public Administration & Defense	15.27	84.73	100	13.46	86.54	100.00	-5.75 (1.11)	-2.94 (-0.46)	-3.35 (-0.93)
Education	38.22	61.78	100	46.28	53.72	100.00	10.32 (1.81)	3.25 (1.02)	6.17 (1.08)
Health & Social Work	52.51	47.49	100	58.80	41.2	100.00	7.79 (0.5)	2.43 (0.48)	5.38 (0.51)
Other Community, Social & Personal Services	95.15	4.85	100	94.99	5.01	100.00	-3.01 (-0.36)	-2.35 (13.49)	-2.97 (-0.65)
Private Household	94.54	5.46	100	99.23	0.77	100.00	22.13 (2.31)	18.32 (1.45)	20.95 (2.87)
Total	91.17	8.83	100	92.38	7.62	100.00	3.16 (0.71)	-0.10 (0.36)	2.78 (0.48)

Figure in parenthesis is the employment elasticity.[8]
Source: NCEUS (2008), p 117, Tables 2 & 3, pp 116-117

Further, contraction of formal employment is evident in employment elasticity, which is ratio of proportionate change in Employment to proportionate change in Gross Value Added, representing employment absorption with marginal unit of Gross Value Added[9]; all three industries report elasticity of lower magnitude. Comparing informal and formal

[8] This is the ratio of proportionate change in employment to proportionate change in Gross Value Added from the sector during 1999-00 to 2004-05

[9] Gross Value Added is equal to value of output net of value of raw material.

employment, quite markedly, for most industries, informal employment reports higher employment elasticity than formal employment does.

4. Changes in Technology and Business Environment

Can the apparent contraction of formal employment in major sources of employment, as discussed in section 3, be linked to technology and business environment? Revisiting conclusions by neoclassical theory, demand for labour is determined by demand for product and technology. Interestingly, Braverman (2006, p 163), views this link as "A necessary consequence of management and technology is a reduction in the demand for labor"[10]. For assessing changes in technology and business environment, we use Input-Output Transactions Table 2003-04 and Input-Output Transactions 1998-99, published by Central Statistical Organization, government of India. Further, we focus on manufacturing sector, using data from Annual Survey Industry contained in EPW research foundation (EPWRF) compact disk. Table 6 gives percentage distribution of inputs used by primary, secondary and tertiary sectors. While input forms closer to one third of output in primary and secondary sectors, the input usage is slightly above one fourth of output in secondary sector in 2003-04[11]. Another interesting feature is two sectors –primary and secondary- sources more than half of inputs required from sector itself while composition of input for tertiary sector is more or less equally divided between tertiary and secondary sector. Almost same input composition exists for both beginning and end pint, during 1999-00 – 2003-04. However, there is noticeable change in Gross Value Added (GVA) as a percentage of output, barring tertiary sector. In primary and secondary sectors, share of GVA has declined during 1999-00 – 2003-04, implying production has become more input intensive. Perhaps, this implies a technical change, more pertinently in manufacturing, which is more input intensive, has been emerging.

[10] Braverman argues "let me try to make this clear. In striving to economize on labor time, the corporation is also striving to reduce the number of workers required for a given quantity of output, or -and this comes to much the same thing- to produce a rapidly growing output without a proportional growth in the number of workers. To use Marx's memorable way of putting it, unlike the generals who win their wars by recruiting armies, the captains of industry win their war by discharging armies." (p 322)

[11] Input usage = Output – Gross Value Added.

It is interesting to note output-demand multiplier, implying change in output with respect to change in demand, which provides cue regarding responsiveness of output to changes in business environment, reports a significant change; the multipliers, for all sectors, have gone up during the period under reference. For both the period, secondary sector shows markedly higher values. Further, multipliers are calculated 130 industries falling in primary, secondary and tertiary sectors (Figure 1). As shown in the figure, most of values which approximate mode represent industries falling under secondary sector.

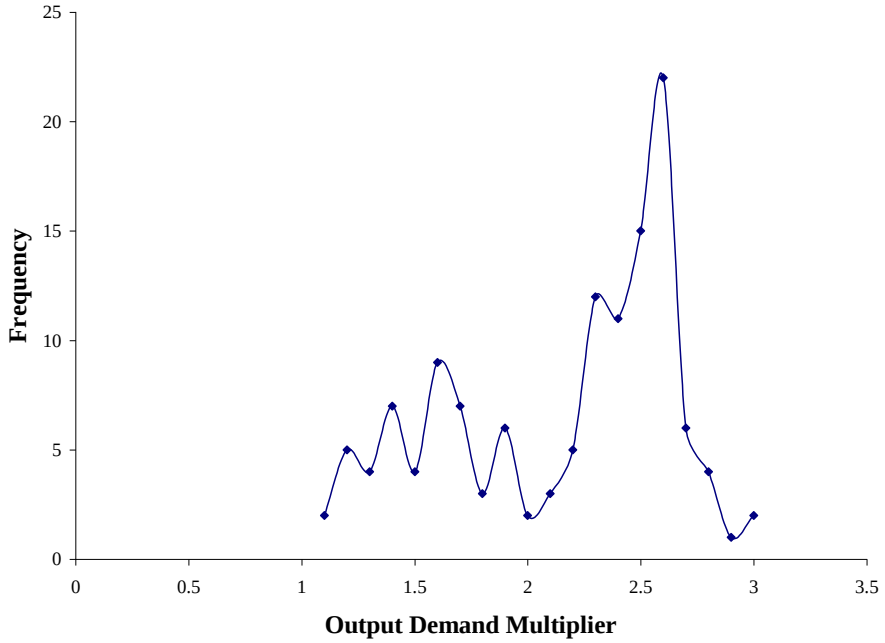
Table 6: Input, Gross Value Added and Output-Demand Multiplier

	Distribution of Inputs (2003-04) (%)		
Industry	Primary	Secondary	Tertiary
Primary	51.40	20.57	6.42
Secondary	27.68	54.10	47.94
Tertiary	20.92	25.33	45.64
Total	100.00	100.00	100.00
Gross Value Added as Proportion of Total Output	0.71 (0.67)	0.25 (0.27)	0.70 (0.71)
Output-Demand Multiplier *	1.63	2.45	1.56
	Distribution of Inputs (1998-89) (%)		
Industry	Primary	Secondary	Tertiary
Primary	45.71	21.66	5.49
Secondary	33.12	51.74	44.18
Tertiary	21.17	26.60	50.33
Total	100.00	100.00	100.00
Gross Value Added as Proportion of Total Output	0.78 (0.77)	0.29 (0.30)	0.69 (0.71)
Output-Demand Multiplier *	1.42	2.36	1.49

*derived from Leontief Inverse of technological coefficient matrix[12].
Figure in parenthesis is Gross Value Added net of net indirect tax as Proportion of Total Output.

Source: computed from Input-Output Transactions Table 2003-04 & Input-Output Transactions 1998-99

[12] Let A = technological coefficient matrix, which contains inter industry input output data. Supposing, the economy consists of two sectors, A is a 2 x 2 matrix. Each cell represents input from sector i to the sector j, who uses the flow from i as an input to the production of output by j divided by total output by j. If A is deducted from an identity matrix (I) of same dimension, we get I-A. Then F = (I-A) X; F = Final Demand, A = technological coefficient matrix, X = output. Then, $X = (I-A)^{-1} F$; $(I-A)^{-1}$ = Leontief Inverse. Therefore, output demand multiplier is $(I-A)^{-1}$



Source: based on values computed from Input-Output Transactions Table 2003-04

Figure 1: Frequency Distribution of Output Demand Multiplier (2003-04)

Figure 1, showing the frequency plot of output demand multiplier throws an interesting pattern, showing industries in secondary sector, in particular manufacturing, report higher values compared to industries in primary and tertiary sector. While production process in manufacturing has become more sensitive to change in demand –by increasing production more than 2 units for I unit change in demand- , manufacturing sector has become less labour absorptive, barring three exceptions: manufacturing of beverage, wearing apparel and non-metallic mineral product (Table A1, Appendix 1). Moreover, the relation between CAGR in respect of net value added and employment appears fuzzy. A plausible reasoning for high multiplier in manufacturing is the supply chain plays between the production and sales. Those supply chains which give importance to efficiency, pertinently in attaining minimum unit cost, gives importance to scale, while the second model which gives higher weight to the responsiveness of the product the needs of consumer lays focus on creation of facilities. Under first model, proportionately higher output is made in response to the demand. While first model is more popular and

practiced by products with higher maturity, second model is often explored by products in the early stage of life cycle.

Quite interestingly, employment in manufacturing appears to be sensitive form of ownership. While public limited companies, which enjoy access to share capital, reduced manpower strength to produce more output, private limited companies expanded manpower base for higher output during 1999-00 -2003-04 (Table 7). With emerging cues from the data, we posit as the share of public limited companies goes up in manufacturing output, viewing these firms' advantage in gaining capital at lower cost due to their participation in capital market, these firms are likely to produce more output by acquiring more capital goods, which will reflected in increasing input use and contraction of employment.

Table 7: Persons Engaged and Net Valued Added in Manufacturing Sector

	Total Persons engaged (%)			Net Value Added (%)			
Form of Ownership	1999-00	2003-04	Trend Growth	1999-00	2003-04	Trend Growth	Employment Sensitivity
Individual Proprietorship	7.79	9.80	4.49	2.24	2.07	5.34	0.84
Joint Family HUF	0.87	1.05	5.03	0.31	0.28	8.94	0.56
Partnership	19.23	18.98	-1.23	8.27	6.11	-0.93	1.32
Public Limited Company	41.21	37.57	-3.50	63.72	63.09	6.76	-0.52
Private Limited Company	19.97	24.52	5.16	13.72	15.92	11.86	0.43
Govt. Dept. Enterprises	1.60	0.56	-26.15	2.26	0.80	-3.84	6.81
Public Corporation	4.56	3.43	-7.72	6.34	10.36	18.22	-0.42
Co-operative Societies	3.70	3.61	-2.34	2.51	1.19	-9.83	0.24
Khadi & Village Industries	0.69	0.10	-47.79	0.46	0.03	-63.46	0.75
Handloom Industries	0.06	0.05	-4.46	0.04	0.02	-20.12	0.22
Others	0.33	0.32	-5.59	0.13	0.12	5.45	-1.03
Total	100 (8166000)	100 (7870000)	-0.80	100 (Rs 1549020 million)	100 (Rs 2029540 million)	7.23	-0.11

Note: Employment sensitivity refers to the ratio of trend growth rate of Total Persons Engaged to trend growth rate of Net Value Added. This measure approximates employment elasticity.

Source: Computed from EPW Research Foundation, Annual Survey of Industries 1973-74 to 2003-04 (Vol II)

5. Conclusion

This paper, exploring the link between employment, and changes in technology and business environment during 1999-00 – 2005-06, finds evidence for contraction of formal employment in India, in particular in manufacturing. This phenomenon has its roots in business environment and technology. It is important to note that while manufacturing sector is responsive to demand, it is not labour absorptive. Although there is an expansion in employment in tertiary sector, reflecting the increasing role of services in economic growth, increasingly work is informalized, depriving workers of rights such as employment security, work security and social security. This trend is going to remain unabated, viewing increasing exposure of both manufacturing and services to financial market, unless institutional changes find innovative ways of combining skill formation, productivity and right to have a decent job. On going initiatives from the state and civil society, to attain inclusive growth, towards skill formation, decent work, and sustainable livelihood need to attain more gravity for resisting the ongoing informalization of work.

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Appendix 1

Table A1: Industrial Activity, NVA, Persons Engaged and Employment Sensitivity

NIC 3 Digit	Industrial Activity	Persons Engaged (%)	NVA (%)	Persons Engaged (CAGR)	NVA (CAGR)	Employment Elasticity
		2003-04		1999-00 to 2003-04		
142	Mining and quarrying, n.e.c.	0.12	0.02	20.89	47.80	0.44
151	Production, processing and preservation of meat, fish, fruit vegetables, oils and fats	1.99	1.24	-0.55	1.62	-0.34
152	Manufacture of dairy products	1.08	1.08	-1.02	6.67	-0.15
153	Manufacture of grain mill products, starches and starch products, and prepared animal feeds	3.87	1.21	-0.64	0.52	-1.23
154	Manufacture of other food products	**8.83**	**3.09**	**-1.83**	**-4.65**	**0.39**
155	Manufacture of beverages	1.20	1.42	4.75	2.04	2.34
160	Manufacture of tobacco products	**6.27**	**2.42**	**0.40**	**6.49**	**0.06**
171	Spinning, weaving and finishing of textiles	**12.66**	**5.05**	**-4.30**	**0.62**	**-6.99**
172	Manufacture of other textiles	1.38	0.70	4.69	7.67	0.61
173	Manufacture of knitted and crocheted fabrics and articles	1.80	0.63	16.05	5.54	2.90
181	Manufacture of wearing apparel, except fur apparel	**4.95**	**1.66**	**5.17**	**0.99**	**5.21**
182	Dressing and dyeing of fur; manufacture of articles of fur	0.01	0.00	-31.75	-12.32	2.58
191	Tanning and dressing of leather, manufacture of luggage, handbags, saddlery and harness	0.66	0.22	5.12	2.10	2.43
192	Manufacture of footwear	1.25	0.47	3.73	0.02	204.40
201	Saw milling and planning of wood	0.13	0.02	-2.37	-0.69	3.43
202	Manufacture of products of wood, cork, straw and plaiting materials	0.53	0.19	0.64	5.30	0.12
210	Manufacture of paper and paper product	2.29	1.67	-0.42	8.62	-0.05
221	Publishing	0.67	1.07	0.59	7.90	0.08
222	Printing and service activities related to printing	0.78	0.42	0.16	6.67	0.02
223	Reproduction of recorded media	0.03	0.03	-8.32	-26.82	0.31
231	Manufacture of coke oven products	0.34	0.34	-3.10	18.36	-0.17
232	Manufacture of refined petroleum products	0.63	11.92	3.21	40.83	0.08
241	Manufacture of basic chemicals	2.59	7.13	-6.35	-4.14	1.53
242	Manufacture of other chemical products	**6.76**	**10.23**	**-0.99**	**6.15**	**-0.16**
243	Manufacture of man-made fibers	0.34	0.68	-1.28	-7.85	0.16
251	Manufacture of rubber products	1.50	1.53	-2.64	-1.26	2.10
252	Manufacture of plastic products	2.15	1.68	3.56	10.47	0.34
261	Manufacture of glass and glass products	0.61	0.46	-1.88	13.49	-0.14
269	Manufacture of non-metallic mineral products n.e.c.	**5.34**	**3.60**	**3.73**	**0.61**	**6.14**
271	Manufacture of Basic Iron & Steel	4.77	11.22	-3.87	15.85	-0.24
272	Manufacture of basic precious and non-ferrous metals	0.96	2.28	-5.13	0.62	-8.24
273	Casting of metals	1.33	0.67	-1.70	1.96	-0.87
281	Manufacture of structural metal products, tanks, reservoirs and steam generators	1.18	0.93	-5.05	2.21	-2.28

289	Manufacture of other fabricated metal products; metal working service activities	2.52	1.61	2.44	7.25	0.34
291	Manufacture of general purpose machinery	2.50	2.81	-1.79	5.48	-0.33
292	Manufacture of special purpose machinery	2.32	2.36	-5.09	-1.33	3.84
293	Manufacture of domestic appliances, n.e.c.	0.39	0.30	-8.09	-11.39	0.71
300	Manufacture of office, accounting and computing machinery	0.28	0.81	2.96	28.69	0.10
311	Manufacture of electric motors, generators and transformers	0.88	1.53	-5.13	11.70	-0.44
312	Manufacture of electricity distribution and control apparatus	0.68	0.73	-1.76	8.27	-0.21
313	Manufacture of insulated wire and cable	0.45	0.27	-5.03	-24.12	0.21
314	Manufacture of accumulators, primary cells and primary batteries	0.26	0.33	2.09	7.89	0.27
315	Manufacture of electric lamps and lighting equipment	0.28	0.22	-2.34	-1.28	1.82
319	Manufacture of other electrical equipment n.e.c.	0.32	0.22	3.06	5.25	0.58
321	Manufacture of electronic valves and tubes and other electronic components	0.62	0.78	3.05	12.33	0.25
322	Manufacture of television and radio transmitters and apparatus for line telephony and line telegraphy	0.32	0.32	-7.93	-4.10	1.93
323	Manufacture of television and radio receivers, sound or video recording or reproducing apparatus, and associated goods	0.38	0.75	-7.17	5.07	-1.41
331	Manufacture of medical appliances and instruments and appliances for measuring, checking, testing, navigating and other purposes except optical instruments	0.63	0.87	3.25	12.96	0.25
332	Manufacture of optical instruments and photographic equipment	0.07	0.08	2.29	-10.81	-0.21
333	Manufacture of watches and clocks	0.14	0.10	-16.06	-2.47	6.49
341	Manufacture of motor vehicles	0.94	3.10	-4.28	16.95	-0.25
342	Manufacture of bodies (coach work) for motor vehicles; manufacture of trailers and semi-trailers	0.25	0.08	-3.82	-7.11	0.54
343	Manufacture of parts and accessories for motor vehicles and their engines	2.54	2.87	2.62	10.82	0.24
351	Building and repair of ships & boats	0.33	0.16	-1.92	5.59	-0.34
352	Manufacture of railway and tramway locomotives and rolling stock	0.27	0.22	-10.54	4.89	-2.15
353	Manufacture of aircraft and spacecraft	0.06	0.10	-6.75	-14.84	0.45
359	Manufacture of transport equipment n.e.c.	1.63	2.71	-0.06	17.61	0.00
361	Manufacture of furniture	0.34	0.26	-0.19	-2.35	0.08
369	Manufacturing n.e.c.	1.59	1.11	5.39	-0.95	-5.65
371	Recycling of metal waste and scrap	0.01	0.00	20.88	56.08	0.37
372	Recycling of non-metal waste and scrap	0.01	0.01	60.55	65.03	0.93
		100.00	100.00			

Source: Computed from EPW Research Foundation, Annual Survey of Industries 1973-74 to 2003-04 (Vol II)