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Urban Informal Sector and Poverty – Effects of Trade Reform and Capital Mobility in India'

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– Effects of Trade Reform and Capital Mobility in India'

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Executive Summary

Purpose of the Research

Main Issue: *The basic issue we wish to address is how liberalization of trade and investment, privatisation and dismantling of the public sector has affected the present state of the informal sector in India and more importantly, what impact have such changes lain on the incidence of income poverty in India. We also provide a regional-level study on West Bengal, where the informal sector has been largely responsible for recent growth in output and income.*

1. **Background, Motivation and Knowledge Gaps:** As in other developing countries, an overwhelmingly large proportion (approximately 93%, and excluding agriculture about 85%) of the workforce in India is employed in the informal sector. A substantial portion of such employment opportunities is generated in the urban or semi-urban areas and not surprisingly a majority of this workforce is economically marginalized. High incidence of poverty among these groups exposed to difficult and hazardous working conditions, non-existent social security or health benefit schemes other than poorly functioning state-provided medical facilities, and etc., is quite common. Sustained improvements in the living standards of these groups can only be brought about by capital accumulation, productivity gains and wage increases in this sector. *Thus, a clear understanding of the impact of economic liberalization on the informal sector is of critical importance in developing pro-poor economic policies in India and similar other low-income countries.*

Many parts of South Asia, Latin America and Africa have experienced a process of relative industrial decline in the last two decades. Liberalization and reduction of state investment in public sector industries has contributed significantly to this decline. On the other hand, some of these countries have also experienced agricultural growth, reduction in poverty, and, in some aspects, gender inequality. Nonetheless, the size of the (non-agricultural) informal sector remains large. *Surprisingly, however, there has been no comprehensive investigation of contemporary trends in this sector, other than disaggregated case studies. Thus, analysis of the Indian evidence, and experience, promises to yield important policy insights that can be generalized to other regional contexts.*

2. Principal Objectives

Downsizing of the formal organized sector, as a consequence of deregulation, tends to increase the size of the informal sector, where market forces are much more active and labour laws lax or non-existent. There is considerable evidence that deregulatory policies or a process of liberalization tends to increase output as well as employment in the informal sector. There is also a general apprehension, however, that this expansion is associated with a wage crash in the informal sector. This apprehension provides an impetus to criticisms of deregulation and privatisation. Recent studies have examined this issue in sufficient detail (Marjit, Kar and Sarkar (2003), Marjit, Kar and Beladi (2003), Marjit (2003), and Kar and Marjit (1999)). These studies show that contraction in the formal sector may actually lead to both higher employment and *wages* in the informal sector. This is likely if either capital is sufficiently mobile between formal and informal sectors, or if a capital-intensive segment within the informal sector

contracts in response to deregulation. Marjit, Kar and Sarkar (2003) have also provided evidence of substantial growth of wage rates in the informal sector in most parts of India. *Our principal research objective is to build on this work, both theoretically and empirically, and extend the results to capture the connection between developments in the informal sector and incidence of urban poverty across various states in India, over the last two decades.*

3. Key Hypotheses: Our theoretical starting point is the observation that capital stock in the formal sector has an incentive to move to the informal sector in response to deregulation in the formal sector. In the absence of major constraints on such movements, this effect will contradict the negative impact, on informal sector wage rates, of greater employment in the informal sector – typically the consequence of labor shedding in the formal sector. Once the trends in informal wage is appropriately documented, we explore the poverty reducing effects of such wage / income consequences. However, it is as well to provide some information here on what Marjit and Kar (2004) found regarding the state of informal wage in India between 1984-85 and 2000-01. Although, this study does not explicitly relates to the poverty questions that forms the prime motivation behind this proposal, it has been shown that the urban informal real wage has increased substantially for workers hired under Non-Directory Manufacturing enterprises in India. Table 11 in the appendix provides annual wage growths between 1984-85 and 2000-01, along with a post-reform average.

We intend to seek the relationship between such informal wage movements and the poverty trends in India. The way we intend to deal with this project, an exploration into such relationship will only serve as a starting point in this project. Our *main*

intention is to undertake a primary survey of both urban and rural informal sectors in the state of West Bengal, which reported (West Bengal Human Development Index) a phenomenal increase in the informal employment and wages over the last few years. The primary survey should be designed to account for the state of poverty in households where one or more persons work in the informal sector. We will offer a detailed discussion on the survey mode subsequently.

Besides, the trend in urban poverty in particular is expected to lend further insight into its effects on rural incidence of poverty (over and above the direct connections between rural informal activities and rural poverty) via channels of rural-urban migration, which remains a predominant feature of the labor markets in India.

The theoretical methodology incorporates a general equilibrium structure, although we want to emphasize that the designed empirical study *shall not* be a computable general equilibrium exercise, simply because it will clutter our results (with too many variables used and too many cross-relationships in operation) and shift away the focus away from the hypothesized relationship between informal income and income poverty. Nonetheless, a copy of our theoretical results is provided herewith for exemplifying our desired line of action. It should also be mentioned that the available data on the unorganized sector in India does provide fairly disaggregated account (across gender, skill or occupation types, age groups including child labor etc), which shall adequately be made use of. Nevertheless, there is need for caution involved in connecting such data set with the poverty picture, not only because they are compiled by different organizations with different sampling and estimation methods in use, but also because the periods of these surveys mostly do not match. Thus, we believe that our primary survey shall help

correct some of the time inconsistencies present in the available data sources and also help cross-checking the relationships (for West Bengal) that have emerged from the use of available secondary data.

4. Theory and Major Observations

As already mentioned, the purpose of this report is to explore the analytical implications of liberal economic policies on the real wage of informal workers. In particular, we argue that such impact critically depends on the degree of capital mobility between the formal and the informal sectors. The motivation of the paper is drawn from the fact that several developing countries have been experimenting with reformatory policies for quite some time. In fact all of these nations, be it in Africa, Latin America or Asia, have majority of their workforce engaged in informal activities conducted in the so-called unorganized segment of the economy. Informal labor market, characterized by competitive wage formation rather than unionized process of negotiations, has emerged as an important institution in the entire developing world. Agenor (1996) and references therein provide ample evidence testifying the predominance of informal labor markets in the entire developing world.[1]

This would mean that the success of economic reform has to be judged in terms of the welfare of the informal workers. There is some evidence, which suggests that the informal sector has a tendency to expand as reformatory policies are initiated. Close on the heels follows the concern that such expansion will reduce informal wage with workers crowding in from the formal sector.

[1] In India the size of the informal workforce is a staggering 90% of the total workforce. This includes agriculture, without which, the percentage is still as high as 50-60.

However, the major point of the report is that, when reformatory policies contract the formal sector and labor is driven out into the informal segment, informal wage can very well rise if the degree of capital mobility exceeds a critical level. Therefore, the main theoretical point we like to highlight is the role of capital mobility in determining the movements in informal wage, when the formal segment is adversely affected by liberal policies. The issue we discuss in the paper is quite important in the context of contemporary policy debates.

Theoretical literature in early years typically used the Harris-Todaro type structures to model informal sector. One may look at Fields (1975), Gupta (1993, 1997), etc. for this type of analysis. However, problems with the Harris-Todaro framework are now well known, and articulated in Basu (1984) and Majumdar (1976, 1983) etc. One crucial problem with this structure is that open unemployment among the poor workers is far less likely, since remaining unemployed implies severe costs for these groups. Therefore, it is most likely that they would take up any job they get. When the sector faces an excess supply of such workers, crashing of wages are more probable outcomes rather than unemployment. Using this very realistic phenomenon in the developing world, our theoretical framework uses a 'full-employment' model, where wage in the formal sector is set at a high level by unionized bargaining while the informal segment faces a low flexible wage. The theoretical inspirations behind this framework are drawn from Carruth and Oswald (1981), Agenor and Montiel (1996), Kar and Marjit (2001), Marjit and Beladi (2002) and Marjit (2003), etc.

A critical stance against downsizing artificially bloated and subsidized formal sector is supported by an argument that such downsizing will drive labor into the

informal sector, crashing wages and forcing workers to survive in poorer working conditions. If one assumes diminishing marginal productivity of labor, a larger work force, *ceteris paribus*, must mean lower real wage. This is the usual partial equilibrium response one should expect. However, the general equilibrium outcomes could be quite different. In fact, if the displaced workforce is accompanied by fresh investments in the informal sector, existing informal workers are likely to gain. In the present paper, we argue why mobility of capital is essential for understanding fully the implications of economic reform on the large informal sectors in the developing world.

We attempt to bring in imperfections in the allocation of existing stock of capital between the formal and the informal manufacturing. Albeit, the informal sector may not use up a vast amount of capital itself because of inadequate property rights or due to the absence of contractual protections, there is evidence of some degree of such intersectoral mobility of capital.[2] Essentially, therefore we model the mobility of capital explicitly, which depends on return differential and that the inability of capital to relocate affects the accumulation process in the informal segment. If capital is guaranteed of a protected return in the formal sector, it hardly has any reason to flow out to the informal counterpart. However, as the protectionary shelter is withdrawn, capital relocates where it continues earning its previous returns. In certain cases, such movements could be a lengthy process and quite costly, depending on existing institutional arrangements.

The empirical basis of our theoretical work is drawn from the evidence on informal wage and capital accumulation in the informal manufacturing sector in India. We use various rounds (1984-85, 1989-90, 1994-95, 1999-00 and 2000-01) of National

[2] Earlier, De Soto (1989) pointed out that a heavy burden of taxes, bribes and inflexible bureaucratic regulations in the formal sector drives many producers into the informal sector.

Sample Survey data to demonstrate that *(1) the real informal wage for the non-directory manufacturing enterprise (NDME) has increased between the pre-reform and the post-reform decades* (figure 5 and Table 1, see appendix II); *(2) real fixed assets in the NDME category have also grown in the post-reform period* (figure 4); *(3) capital stock in the organized manufacturing has remained stagnant or declined in real terms vis-à-vis real fixed assets in the informal sector, in the post-reform period* (figure 6); *(4) the above results hold for majority of the states and union territories in India.*

While we are not building up a model to explain the movement in the real informal wage in India, our theoretical work highlights the case of rising informal wage in accordance with a rising capital stock in the informal sector. We argue that if trade reform reduces the output of the import-competing product and subsequently drives labor to the informal sector, the informal wage tends to *rise* only when a 'critical' amount of capital is also reallocated to the informal sector alongside labor. In a static general equilibrium model this will be captured by a greater allocation of capital in the informal sector and a simultaneous decline in the capital stock in the formal counterpart. While such mobility is hard to capture by gathering empirical evidence, our calculations suggest that there have been phases in the post-reform India when capital in the organized manufacturing did not grow at all. However, during the same periods, real fixed assets – a true measure of capital stock in the informal sector grew substantially. We use this evidence as a plausible, rather a concrete, foundation for our theoretical propositions.

Finally, this study aims at a number of critical policy implications, among which the effect of changes in the informal sector on the level of income poverty in a typical developing economy receives the greatest attention. In fact, the present study is followed

up by a dedicated exercise on the poverty-alleviating impacts of the developments in the informal sector. Therefore, we are in the process of organizing an exercise in this regard, with an impending survey on the conditions of the informal sector in a number of urban locations in the province of West Bengal in India. A survey questionnaire prepared to meet this end is provided in the appendix. The analyses and discussion of our detailed survey shall be offered in the next round of the report.

Now, if intersectoral capital flow is severely restricted by institutional and other factors, downsizing of the formal segment will be harmful to the vast majority of informal workers. Excess supply of labor in the informal sector must be countered by adequate investments in this sector.

The following section (section 5) develops the theoretical model and section 6 offers detailed empirical evidence using the secondary data at the all-India level. The results of the empirical exercise offered here is to be substantiated by a study at the regional level, to which end an exhaustive survey is planned. Section 7 concludes. We provide detailed algebraic solutions of our results in Appendix I, the relevant graphs and tables in Appendix II and finally the Survey Questionnaire in Appendix III.

5. THE MODEL

We assume a two-sector small open economy. X is produced in the formal manufacturing sector and Y is the informal manufacturing sector. Both X and Y use labor and capital. Wage is fixed through bargaining in the formal segment. Initially, X is protected either through a tariff or by a subsidy, which artificially increases the price of X. Deregulation or reform implies a decline in the tariff rate, denoted by t. Workers,

who do not find jobs in the formal sector, flock in sector *Y* where they get the market determined wage rate. We call this the informal wage. There is no open unemployment in this model. People must find jobs to survive, and wage in the informal sector adjusts fully to accommodate workers moving out of the formal sector. Markets are competitive and technology exhibits CRS and diminishing marginal productivity.

The model is similar in spirit to Agenor and Montiel (1996), Carruth and Oswald (1981), Marjit and Beladi (2002) and Marjit (2003). Capital and land are fully employed.

The symbols we use are given as follows:

$\overline{w}$:	Formal unionized wage;	w :	Informal-rural flexible wage
r_i :	Return to capital in sector *i*;	R:	Return to land
X :	Output of formal sector;	Y :	Output of informal sector
(P_X, P_Y) :	Exogenous commodity prices		
$\overline{L}$:	Supply of Labor;	$\overline{K}$:	Total supply of capital
K_i :	Supply of capital in sector *i*, where *i*= *X, Y.*;		
(a_{LX}, a_{LY}) :	Per unit labor use in *X* and *Y.*		
(a_{KX}, a_{KY}) :	Per unit capital use in *X* and *Y;*	t :	Tariff rate or subsidy.

'^' represents percentage changes for particular variables and symbols used bear the same implications as in Jones (1965).

Equations that describe the system are given by,

$$\overline{w}a_{LX} + r_X a_{KX} = P_X(1+t) \qquad (1)$$

$$wa_{LY} + r_Y a_{KY} = P_Y \qquad (2)$$

Commodity prices are given from the rest of the world. Let us suppose *Y* and *Z* are exported and *X* is imported. *t* is the rate of tariff or subsidy.

Full employment conditions:

$$a_{LX}X + a_{LY}Y = \overline{L} \tag{3}$$

$$K_X + K_Y = \overline{K} \tag{4}$$

$$a_{KX}X = K_X \tag{5}$$

$$a_{KY}Y = K_Y \tag{6}$$

Let $\hat{\overline{w}}$ be so determined that,

$$\hat{\overline{w}} = \alpha\hat{P}_X + \beta\hat{P}_Y, \quad 0 < \alpha, \beta < 1 \tag{7}$$

Finally, the capital mobility condition:

$$\frac{K_X}{K_Y} = \phi\left(\frac{r_X}{r_Y}\right), \phi' > 0 \tag{8}$$

(3) to (6) are standard conditions. Equation (8) suggests the following. At any point of time $\overline{K}$ is allocated between *X* and *Y*. But such allocation depends on return differential. Hence there is imperfect mobility of capital. If $\left(\frac{r_X}{r_Y}\right)$, increases, $\frac{K_X}{K_Y}$ will also increase. The expression $(\frac{K_X}{K_Y})$ describes the relative supply of capital in sector *X*. The usual way to model this is to assume sector-specific capital for *X* and *Y* without any mobility and $(\phi' = 0)$. Perfect mobility will always imply $r_Y = r_X$ and there is no relevance for a separate sectoral supply function of capital. Relative supply adjusts to demand in each sector and this is the standard Heckscher- Ohlin structure. We shall demonstrate that our comparative static depends on the curvature of $\phi' = 0$.

Given $(P_X + t, P_Y)$, $\overline{w}$, *L,* and *K*, we have *w*, r_X, r_Y, *X, Y,* K_X, K_Y to solve from (1)-(6) and (8). The determination of general equilibrium proceeds as follows. From (1)

we can determine r_X. Now using (4) and (8) we get (8)′.

$$\frac{\overline{K} - K_Y}{K_Y} = \phi\left(\frac{r_X}{r_Y}\right) \qquad (8)'$$

As r_Y increases, given r_X and $\phi' > 0$, K_Y must rise. This defines the relationship *MM* in figure (1). Now using (5), (6) and (3),

$$\frac{a_{LX}}{a_{KX}}(\overline{K} - K_Y) + \frac{a_{LY}}{a_{KY}}K_Y = \overline{L} \qquad (9)$$

Since r_X is given by CRS, $\frac{a_{LX}}{a_{KX}}$ is given. Now as r_Y increases, from (2), $\frac{r_Y}{w}$ must rise and $\frac{a_{LY}}{a_{KY}}$ must rise as well. Hence in equation (9) the LHS unambiguously increases. To bring back the balance K_Y must fall substantially. As long as $\frac{a_{LY}}{a_{KY}} > \frac{a_{LX}}{a_{KX}}$, LHS must decrease with a decline in K_Y. Such an assumption implies that the informal sector is labor-intensive; an assumption by virtue of being realistic is kept all through the paper. Therefore as r_Y rises, K_Y must fall. This defines *FF* in Figure (1). Once (r_Y, K_Y) are determined from Figure (1), the rest of the variables can be determined easily.

The key comparative static exercise we are interested in is a decline in '*t*'. Figure (1) helps us to trace out the consequences of both. A decline in *t* reduces r_X, given $\overline{w}$ and P_X. Given r_Y a drop in r_X increases K_Y, as $\phi' > 0$. This will mean a rightward shift of *MM* to $M'M'$.

At the same time given r_Y and K_Y, a drop in r_X reduces $\frac{a_{LX}}{a_{KX}}$ and therefore LHS in (9) declines. The balance is restored through an increase in K_Y at a given r_Y. *FF* shifts to

the right as well. The way Figure (2) is drawn suggests that *Y* must expand. But r_Y may remain unchanged and can in fact go either way. Note that if *MM* shifts quite a bit relative to *FF*, r_Y will decline and w will increase. The mobility effect has to be significant for a positive effect on the informal wage.

A drop in $\frac{a_{LX}}{a_{LY}}$ releases labor to *Y* sector. That is why *FF* shifts up requiring more K_Y to accommodate displaced labor. Additional capital that comes to *Y* because r_X is lower must outweigh the required amount needed to absorb displaced labor at a given r_Y, hence at a given w to induce an increase in *w*. With zero mobility *MM* is vertical and remain unchanged. Hence, r_Y must increase and *w* must decrease through a shift in *FF*. With perfect mobility *MM* is horizontal at $r_Y = r_X$ and as r_X drops, *MM* shifts down. Notwithstanding the shift in *FF*, r_Y must adjust to the new level of r_X and *w* must increase. Figure (3) describes the effects of such adjustments.

The above two cases explicitly demonstrate the *partial and general equilibrium* results that can be derived from this model. In figure 2, the vertical line MM represents perfect immobility of capital between the formal and the informal segments. Under the circumstances, formal job losses and crowding in of workers into the informal sector leads to wage cuts in the latter. The situation undergoes a complete reversal if capital is perfectly mobile and is represented by a horizontal line MM (figures 2 and 3). Retrenchments from the formal sector and additional job creation in the informal could even lead to a wage gain for the informal workers, thus establishing the general equilibrium implications of our model.

Finally, the precise condition for ($\frac{dw}{dt} > 0$) is derived by following above arguments. In fact, there is an increase in the informal wage if the following condition is satisfied (Appendix I for detailed proof),

$$\hat{w} > 0, iff, \varepsilon > \sigma_X K_X f\left(\frac{\lambda_{LX}}{\lambda_{KX}}\right). \qquad (10)$$

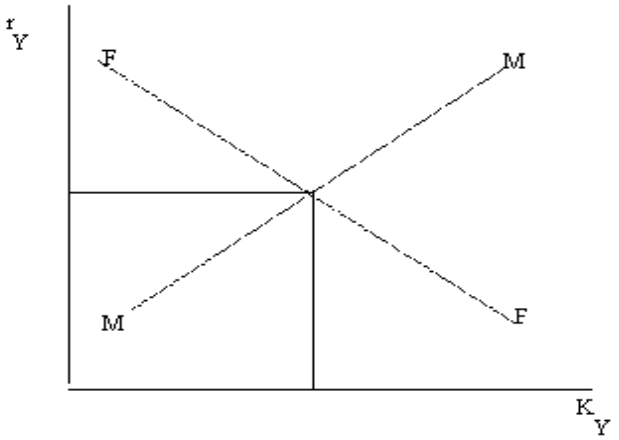

Fig 1

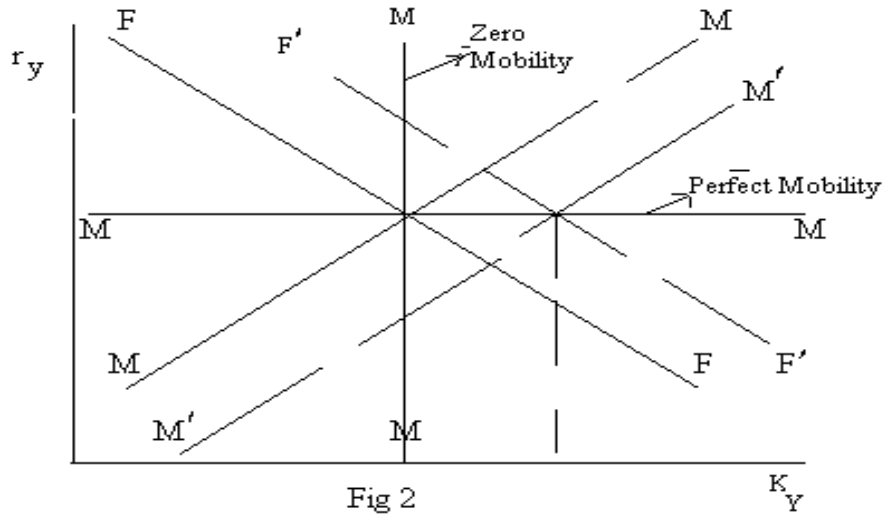

Fig 2

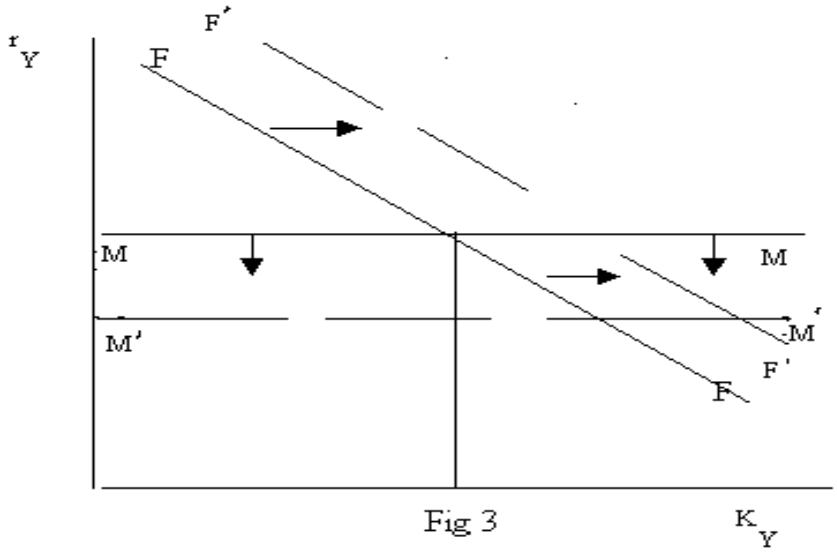

Fig 3

6. EMPIRICAL EVIDENCE

This section concentrates on the relationship between intersectoral capital mobility and the real informal wage by looking at the available Indian data for the pre-reform (pre 1991-92) and post-reform periods. In the process, we try to identify factors that explain the growth of informal wage for different states in India, namely, *Real Fixed Asset* (FA) formation in the informal sector, *Real Value Added* (VA) in the informal sector and the *Real Rural Wage* (RW). It has been previously argued (Kar and Marjit, 2001) that the workers migrating from the rural areas cannot afford to wait indefinitely in the urban sector for a potential job opening, and instead join the urban informal sector for lower wages. When wages are high in the rural area they tend to migrate back. Informal employment and thus informal wage in the developing countries are strongly influenced by such seasonality of rural-urban migration. We therefore use rural wage as an exogenous variable in explaining trends in urban informal wage, rather than assuming a

correlation between the two. Other factors, however, have clearer implications on the informal wage.

The empirical investigation involves choice of five strategic time periods over the last two decades in India. We begin by calculating the growth rates of informal wage and the explanatory variables between five data points: 1984-85, 1989-90, 1994-95, 1999-00 and 2000-01. Comparison between the first two data points gives us idea on the pre reform growth rates. 1989-90 to 1994-95 marks the reformatory transition period and 1994-95 to 1999-2000 captures the post reform situation. The period between 1999-00 and 2000-01 is useful for observing the matured impact of trade reform on informal wage. In fact, unavailability of a continuous time series restricts our choice to this five-point data set.

As already mentioned, we assume imperfect capital mobility between the formal and the informal sectors, which essentially means that following a contraction in the formal sector some capital may be relocated to the informal sector.[3] In our example, the capital reallocation occurs between the formal manufacturing sector and the non-directory manufacturing enterprises in the informal sector.[4]

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[3] Interest rate cuts in the commercial banks along with high volatility and lack of credit worthiness of the stock exchanges could contribute substantially to capital flight for supporting informal production. Industrial capital might also take a flight to the service sector, a large proportion of which is located under informal arrangements, viz. fast food joints, catering or decorating services, road-side automobile servicing, private transport providers etc. Alternatively, withdrawn formal industrial capital might be invested in a foreign country in the form of joint ventures or on foreign stocks. But, it is unlikely that there would be substantial flow of funds to a capital-abundant country from a capital-scarce one for capturing pure return differential. Moreover, with most countries where outbound capital flow from India is intended, there are legal possibilities of capital gains tax (both countries) – dividends taxed in both countries, interest earnings taxed in the source country. Bilateral tax rates on investments between India and countries like Mauritius, Cyprus or Malta are substantial. However, there is evidence among foreign exchange earners in India to hold their proceeds abroad. This possibility is propagated through mis-invoicing of export and import revenues.

[4] This is not to preclude the possibility that formal industrial capital may be reallocated to say, services within the formal sector. However, the overwhelming fixed assets formation in the informal sector clearly

Second, the real value added (VA) in the informal sector captures the productivity effect through which the informal wage is also affected. Thus, our objectives behind constructing the empirical exercise are primarily threefold.

a. We would like to check whether some relationship between the growth in the informal wage and the explanatory variables are borne out by the available data set. Tables 3 and 4 below describe such relationships explicitly. Table 4, in fact, shows that when Heteroscedasticity is controlled for the explanatory variables become mostly significant over the growth periods considered, in explaining the annual growth of IW.

b. Since we have already demonstrated that there has been a growth in one of the measures of capital stock in the informal sector, that too in a period where the fixed capital accumulation in the formal sector has been quite abysmal, we would like to examine whether its explanatory power has increased in the post reform stage. An empirical observation to this extent should provide strong support to the conjecture that *capital reallocation above a critical level* has a positive and significant effect on the informal wage.

c. Finally, we check for structural breaks between the pre and post-reform periods so far as the determination of a change in the growth of informal wage is concerned.

Following the plan of empirical study, we begin by providing observations on the annual growth of real wage, real VA and real FA (in 1989 prices) for the informal sector

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indicates that a large portion of the investments previously in the formal sector has flown in to the informal segment, especially when the real savings in India has not changed significantly.

as well as that of the real rural wage across different states and Union Territories in India.[5] Due to incompleteness of the data, we calculate the real growth rates for only 17 states during 1984-85, and expand the set to include 30 states and union territories for 1989-90, 1994-95, 1999-2000 and 2000-01. To begin with Table 2 (Appendix II) offers detailed descriptive statistics for the variables under consideration and Table 8 (Appendix II) shows that there does not exist any substantial problem of multi-collinearity among the variables.

The first of the three explanatory variables, *informal fixed assets* (real FA) grew at a temperate rate between 1984-85 and 1989-90 for many states (Fig. 4, series real FA; Appendix II), although Assam (AS), Haryana (HY), Kerala (KE), Tripura (TR) and West Bengal (WB) registered negative growth of informal real fixed assets during this period. However, during 1989-90 and 1994-95 (Fig. 6), immediately after the reforms took effect in India, informal fixed asset shows high growth rate in many of the states. Once again, Bihar (BH), Himachal Pradesh (HP), Lakshadweep (LA), Meghalaya (ME) etc, which report show negative growths. Between 1994-95 and 1999-2000 informal fixed assets grew positively (10% to 150%) for 29 out of 30 locations in India, with the exception of Manipur. The pattern seems to be dampened for many states during 1999-00 and 2000-01.

The second explanatory variable *real Value Added* (VA) also registered a negative trend for all states except Gujarat and West Bengal during 1984-85 and 1989-90. It undergoes a turn around in the post reform period, when most states and union territories show significant increase in the value added. Finally between 1999-00 and

[5] Union Territories in India are areas administered directly by the Central Govt. of India, viz. Andaman and Nicobar Islands.

2000-01 it reports negative growth rates in many states.

Third, *real RW* denotes the real growth rate of *rural wage* (RW). It shows negative growth rates for all the states between 1984-85 and 1989-90, which changes to positive growth rates between 1989-90 and 1994-95 for majority of the states. However, this was not sustained since between 1994-95 and 1999-00 relatively more states like TR, Andaman and Nicobar Islands (AN), SI, Jammu and Kashmir (JK) etc., once again record negative growth in rural wage and this continues to later periods.

The dependent variable in our model, the growth rate of *real informal wage* (IW) shows a negative growth for all states between 1984-85 and 1989-90. The characteristics shifted substantially in favor of informal workers in the period immediately following the introduction of economic reforms in India. All the states including, GJ, MH, OR (28%), TN, RJ (40%), AP (48%) showed significant positive annual growth in informal wages. Between 1994-95 and 1999-00, twenty-nine out of thirty locations, except WB, -2% show moderate positive annual growth of informal wage and the trend continues in the recent years as well (Fig 5 and Table 1).

Based on these observations, we offer an ordinary linear regression analysis (Table 3) where, real informal wage is regressed on real FA, real VA and real RW, without however taking care of heteroscedasticity in the error terms. Between 1984-85 and 1989-90, only the constant term (at 10% level) explains the rate of change of informal wage while other factors are not significant. Notably, the intercept term is negative. Compared to this, between 1989-90 and 1994-95 the intercept term (α) is positive and highly significant at 1% level along with FA. Between 1994-95 and 1999-2000, real VA alone is the most significant explanatory variable. Finally, we consider the

rate of change between 1999-00 and 2000-01, and the growth of IW is significantly explained by the intercept term and by changes in VA (both significant at 1%), while the relationship between IW and RW turns out to be negative.

These trends undergo substantial modifications, however, once the heteroscedasticity in the error terms is taken care of. Table 4 reports these results and it immediately makes most of the explanatory variables highly significant in explaining the growth in IW. Therefore, one can clearly observe from the statistical analysis that the informal wage has experienced shifts in both direction and magnitude between pre-reform and post-reform periods. Thus, an important exercise in this analysis involves testing whether such shifts are indicative of a structural break between two comparison periods and whether the independent variables significantly explain the existence of such structural changes. Before that, albeit, the impending analyses requires that the effects of these variables be looked at over the entire time horizon considered. Consequently, we offer a pooled (a pseudo panel) regression for these variables and report the findings in Table 5. The top panel of Table 5 reports the 2-step GLS without taking care of heteroscadasticity, while the bottom panel uses the methodology of Least Squares Dummy Variables, after correcting the heteroscadasticity. The table is quite self-explanatory in terms of the effects the explanatory variables lay on the annual growth in informal wage, in that, both FA and VA are highly significant (at 5% level). Tables 5 also provides the diagnostic tests for the above panel regression and are indicative of the existence of a random effects model.

As mentioned above, one of the purposes behind this empirical exercise is an investigation into the existence of structural changes, if any. Thus, we use the standard

Chow test and identify that there exists multiple structural breaks over the entire span of the period, including 1994-95, 1999-00 and 2000-01 as the break years. Table 6 and Table 7 (in greater detail) clearly indicate that both the intercept and the slope have changed significantly over time. The graphical representation of the nature of the changes in the Annual Informal Wage Growth is given in Figure 7. The representation clearly shows the jumps and changes in both intercepts and slopes as we have discussed above.

Finally, we report one of the main results that have motivated the present exercise; i.e. the relationship between changes in informal wage in the different states and union territories in India and the changes in the percentage of people registered under the Below Poverty Line (BPL) category. The argument follows from the hypothesis that a large part of the urban poor in India works and lives in the so-called informal sector arrangements and that any improvement in the conditions of the informal workers can leave a significant and sustained impact on the incidence of poverty in the urban regions of the country. We would subsequently test for the relationship between Urban Head Count Ratio (HCR) and the level of informal wage in the urban manufacturing units. In fact, this exercise shall be repeated for the survey on West Bengal that we are in the process of conducting. For the present report, however, we offer a direct measurement of the relationship between BPL and urban informal wage. Once again, the exercise is done in two stages: first, we regress the current period's BPL percentage on previous periods Annual Informal Wage growth, where the results of the OLS suggests a negative relationship and significant at 5% level (Table 9, Appendix II). Second, we run the analysis as a panel of the states under consideration, which reveals the presence of

random effects and closely match that of the OLS results. However, as it can be seen from Table 10, the coefficient of IWPREV is still negative but now significant at 1% level. To summarize, therefore, one may state that the effect of an improvement in the annual wage growth in the informal sector has negative and significant impact on the incidence of poverty across states and union territories in India as per the data on the BPL category. We shall extend this analysis by considering the urban HCR across the same set of provinces and offer a subsequent report on the case of West Bengal in particular.

7. Results of Primary Survey in West Bengal

A major component of the study at hand involves corroborating the experience we gathered from the secondary data, as reported above, with the outcome of the household/unit level survey of the informal sector in the province of West Bengal. A total number of 500 informal sector units (Non-Directory Manufacturing units and Own Account Enterprise) have been surveyed in the four cities in West Bengal. The four cities that were chosen for the survey span the geographical boundaries of the province and are also the largest urban settlements in the state. The map available in Appendix II (Figure 8) provides the location of these four cities/towns – Siliguri in the North, Durgapur in central West Bengal, Kolkata (or Calcutta) and Howrah, the two close neighboring cities in the southern part of the state. Incidentally, Calcutta is both capital and the largest city in the state of West Bengal with a current population of 10 million. It can also be easily observed from the map that the cities and towns chosen are prime industrial locations in the province. While Siliguri acts more as a corridor for trade and commerce between the eastern provinces of India and the rest of the country, all the other three locations are well

known as industrial bases since independence. The major pattern of trade as observed in Siliguri are informal in nature, by the very definition we used in the beginning of this study. The township of Durgapur, in the district of Burdwan, for example hosted the Indian Iron and Steel Company of India (IISCO) and had been a rather prosperous industrial town until the decade of the 80s, when the steel industry in general started facing various problems. Although the steel plant at Durgapur underwent a facelift in the last few years, mainly owing to high demand for steel both in India and China, a large section of workers had to be retrenched. While it is understandable that such industrial towns always create a huge chain of producers both upstream and downstream, mainly dealing with accessories and thereby having some 'informal' nature of production relations, the volume of such trade have increased substantially over the last decade. While a primary survey in the nature if what we could conduct, given the time limitations cannot be expected to reveal such trends very clearly, yet there are sufficient evidences that the downturn in the industrial base has given rise to a large section of informal traders in the location.

The cases with Calcutta and Howrah are not very different either. The district and the city of Howrah (along the belt of river Ganges) had traditionally hosted a large number of jute factories, small-scale iron and steel factories, machine and tool factories etc., all of which have seen the general trend of decay over the last three decades. The huge number of employees that these industries drew from all over the country have lost their jobs and started operating their own trades as very small informal units. There has been a visible transformation from group of professional industrial workers to small-scale traders and retailers in this region.

The city of Calcutta being the nearest with a capacity of 10 million people have drawn many such retrenched workers as small traders, over and above its own industrial population. The population density in the city according to the last census (2001) has gone up to an astounding 24760 persons /sq. km, with a slum population of more than 0.8 million. It is important in the light of these facts that the cities we have chosen are further investigated in terms of the relationship between informal economic activities and its implications for poverty. In fact, there exists further support in favor of undertaking this survey, as in the Human Development Report of the Govt. of West Bengal (2004), which admits that 42% of all economic activities in the state are located in the so-called informal sector. This is also a major explanation why the present economic surge in the country as a whole is also termed as an era of 'jobless growth', simply because the creation of employment in the informal sector remains outside the purview of formal employment figures reported periodically. We would go to the extent in arguing that the official unemployment figure of 9% remains an overestimate, since employment in the informal sector is not accounted for.

In what follows, we give a description of the data and the methodology with regression results primarily showing that the capital deployment in the informal sector has been substantial, and that its effects on household income nearly matches our previous calculations for the all-India level. To re-iterate, we have previously argued that the flow of capital from formal to the informal sector has strongly influenced the growth of income in the informal sector, and in particular among the Unorganized Non-Directory Manufacturing Units all over the country. This effects has been most visible during the post liberalization era in India, i.e. between 1991 and the present.

7.1 Sample Data and Methodology

The data has been collected by a random sample of the production units in the four locations we discussed above. The questionnaire used for this purpose is given in Appendix III below, where we mainly focused on the aspect of improvement in the level of income for the people who are owners and/ or workers in the sample of Informal Units chosen by the random sampling method. Since most such informal units in India operate as a household level trade, almost in the nature of agricultural production organization, the dependent variable in our regression is the 'Average Household Income for the current Period: 2000-05' (Y). The dependent variables in this cross section sample are primarily two: 'The average stock of capital ownership/fixed assets between 2000-05' (C) and 'The per unit average price of the traded commodity between 2000-05' (P).

The sample is quite heterogeneous in terms of the informal occupation that the respondents are involved in, and it ranges from producers of iron safe, jewelry, machine tools, auto parts, to the worst possible cases of very low-paid maid servants. Since in our last report, interest was expressed in looking at the conditions of the self-employed or own-account enterprises within the informal sector, the survey had been organized to report both manufacturing and own-account enterprises in roughly 60-40 ratios. We begin by giving some descriptive analyses of the data on the four locations. The method applied is the following. We compare the household income of the respondents between pre-reform and post-reform periods. Figure 9a for example, reports the income distribution in the city of Durgapur. The present distribution is an average for the year 1991-05 and it is compared with that received by the households before 1991. It shows

that 53% households involved with informal manufacturing units earn more in the post-reform period. Furthermore, if the comparison is that between more recent period as 2000-05 and the pre-1991 era, 58% of households in this category have been better off (figure 9b). However, it is not self-evident from here that there is a one-to-one correspondence with poverty, and in the same direction. However, for services category within the urban informal sector, less households involved in such trade seems to have been better-off more recently than they were in the immediately preceding five years (see figures 9c and 9d). We perform similar exercise for Siliguri, Howrah and Calcutta. While Howrah display similar experiences for households engaged with manufacturing units in the informal sector, Kolkata and Siliguri show poor results for more recent periods, for the same category. In fact, the trend in the service sector is similar almost everywhere, where the period ending in the year 2000 seems more prosperous than that ending in the year 2005 (see figures 10, 11 and 12).

Next we report the results from our regression analyses for the four locations under review. Based on the explanatory variables discussed above we try to explain the changes in the household income for these places. It is to be noted, however that, conditions in Howrah has undergone such a rapid transformation that most respondents – be it in the manufacturing units or in the service units report little or no new capital expenditure for the period between 2000-05. We are therefore compelled to use the capital stock that they report for the immediately preceding period as the explanatory variable in place of the current capital stock, that we use for all the other locations. The results are given in Tables 11-14 in Appendix II. Interestingly, the level of current capital stock positively and significantly explains the positive surge in household income

for most locations, although the price/per unit turns out to be a poor explanatory variable in predicting the same.

Appendix I

Proof of condition (10)

$$\overline{w}a_{LX} + r_X a_{KX} = P_X(1+t) \qquad \textbf{(A.1)}$$

$$wa_{LY} + r_Y a_{KY} = P_Y \qquad \textbf{(A.2)}$$

$$\frac{K_X}{K_Y} = \phi\left(\frac{r_X}{r_Y}\right), \phi' > 0$$

$$\frac{\overline{K} - K_Y}{K_Y} = \phi\left(\frac{r_X}{r_Y}\right) \qquad \textbf{(A.3)}$$

From (A.1), $\hat{r}_X\theta_{KX} = \hat{P}_X - \theta_{LX}\hat{\overline{w}}$

$$= \hat{P}_X(1 - \theta_{LX}\alpha) \qquad \textbf{(A.4)}$$

Where, $\hat{\overline{w}} = \alpha\hat{P}_X + \beta\hat{P}_Y = \alpha\hat{P}_X$, since $\hat{P}_Y = 0$.

From (A.2), $\hat{w}\theta_{LY} + \hat{r}_Y\theta_{KY} = 0$. This implies, $\hat{w} = -\frac{\theta_{KY}}{\theta_{LY}}\hat{r}_Y$. **(A.5)**

Now using equations (3) to (6),

$$a_{LX}X + a_{LY}Y = \overline{L}.$$

Reformulating, $\frac{a_{LX}}{a_{KX}}(\overline{K} - K_Y) + \frac{a_{LY}}{a_{KY}}K_Y = \overline{L}$

Again, $\lambda_{LX}\hat{X} + \lambda_{LY}\hat{Y} + \lambda_{LX}\hat{a}_{LX} + \lambda_{LY}\hat{a}_{LY} = 0$

And $\lambda_{LX}\hat{K}_X + \lambda_{LY}\hat{K}_Y + \lambda_{LX}(\hat{a}_{LX} - \hat{a}_{KX}) + \lambda_{LY}(\hat{a}_{LY} - \hat{a}_{KY}) = 0$ **(A.6)**

But, as $K_X = \overline{K} - K_Y$

$\hat{K}_X = -\hat{K}_Y/\phi$, where $\phi = (K_X/K_Y)$.

Substituting these information in (A.6),

$$-\frac{1}{\phi}\lambda_{LX}\hat{K}_Y + \lambda_{LY}\hat{K}_Y + \lambda_{LX}\sigma_X\hat{r}_X - \lambda_{LY}\sigma_Y(\hat{w}-\hat{r}_Y) = 0 \qquad \textbf{(A.7)}$$

Rearranging, and using (A.4), and $\theta_{LY}(\hat{w}-\hat{r}) = -\hat{r}_Y$

$$(\lambda_{LY} - \frac{1}{\phi}\lambda_{LX})\hat{K}_Y + \lambda_{LX}\sigma_X\hat{P}_X\left(\frac{1-\theta_{LX}\alpha}{\theta_{KX}}\right) + \lambda_{LY}\sigma_Y\frac{\hat{r}_Y}{\theta_{LY}} = 0\,.$$

Thus, $(\lambda_{LY} - \frac{1}{\phi}\lambda_{LX})\hat{K}_Y + \sigma_Y\frac{\lambda_{LY}}{\theta_{LY}}\hat{r}_Y = -\lambda_{LX}\sigma_X\hat{P}_X\left(\frac{1-\theta_{LX}\alpha}{\theta_{KX}}\right)$ **(A.8)**

Now, taking '*ln*' on (A.3),

$\ln(\overline{K}-K_Y) - \ln K_Y = \ln\phi\left(\frac{r_X}{r_Y}\right)$. Taking percentage changes,

$\hat{K}_X - \hat{K}_Y = \frac{1}{\phi}d\phi = \frac{1}{\phi}\frac{\delta\phi}{\delta\left(\frac{r_X}{r_Y}\right)}\frac{r_Y dr_X - r_X dr_Y}{r_Y^2} = \frac{\phi'}{\phi}\frac{r_X}{r_Y}(\hat{r}_X - \hat{r}_Y)$. Using (A.4),

or, $\hat{K}_X - \hat{K}_Y + \frac{\phi'}{\phi}\frac{r_X}{r_Y}\hat{r}_Y = \frac{\phi'}{\phi}\frac{r_X}{r_Y}[\hat{P}_X(1-\theta_{LX}\alpha)/\theta_{KX}]$

We define, $\varepsilon = \frac{\delta\phi}{\delta(r_X/r_Y)}\frac{r_X/r_Y}{\phi}$, as the elasticity of capital mobility between sectors *X* and *Y*.

Thus, $-\hat{K}_Y[1+\frac{1}{\phi}] + \varepsilon.\hat{r}_Y = \varepsilon\hat{P}_X(1-\theta_{LX}\alpha)$

Therefore, $\hat{r}_Y = \hat{K}_Y\frac{1}{\varepsilon}[1+\frac{1}{\phi}] + \hat{P}_X(1-\theta_{LX}\alpha)$ **(A.9)**

Rearranging equations (A.6) and (A.7),

Define, $\mu = (\lambda_{LY} - \frac{1}{\phi}\lambda_{LX}) = \left(\frac{\lambda_{LY}}{\lambda_{KY}} - \frac{\lambda_{LX}}{\lambda_{KX}}\right)K_X = \frac{\lambda_{LX}}{\lambda_{KX}}\frac{K_X}{\left(\frac{\lambda_{LY}}{\lambda_{KY}} - \frac{\lambda_{LX}}{\lambda_{KX}}\right)}$ **(A.10)**

$$\sigma_Y \frac{\lambda_{LY}}{\theta_{LY}} \hat{r}_Y + \mu \hat{K}_Y = -\lambda_{LX} \sigma_X \hat{P}_X \left(\frac{1 - \theta_{LX} \alpha}{\theta_{KX}} \right) \qquad \textbf{(A.11)}$$

and

$$\hat{r}_Y - \frac{(\phi + 1)}{\phi \varepsilon} \hat{K}_Y = \hat{P}_X (1 - \theta_{LX} \alpha) \qquad \textbf{(A.12)}$$

Using Cramer's rule to solve for $\hat{r}_Y$.

$$D = \begin{bmatrix} (\sigma_Y \frac{\lambda_{LY}}{\theta_{LY}} + \frac{\lambda_{LZ}}{\theta_{TZ}} \frac{\theta_{KY}}{\theta_{LY}} \sigma_Z) & \mu \\ 1 & -\frac{(\phi + 1)}{\phi \varepsilon} \end{bmatrix} = \begin{bmatrix} -\sigma_Y \frac{\lambda_{LY}}{\theta_{LY}} (\phi + 1) \\ \hline \phi \varepsilon \end{bmatrix} - \mu < 0$$

$$\text{Therefore, } \hat{r}_Y = \frac{1}{D} [\frac{\lambda_{LX} \sigma_X \alpha (\phi + 1)}{\phi \varepsilon} - \mu] . \hat{P}_X (1 - \theta_{LX} \alpha) \qquad \textbf{(A.13)}$$

Now, suppose $\hat{P}_X < 0$, then $\hat{r}_Y > 0$ iff, $\frac{\lambda_{LX} \sigma_X (\phi + 1)}{\phi \varepsilon} > \mu$

Finally, using (A.5)

$$\hat{w} > 0 \text{ , iff, } \frac{\lambda_{LX} \sigma_X (\phi + 1)}{\phi} < \mu \varepsilon \qquad \textbf{(A.14)}$$

or, $\varepsilon > \frac{\lambda_{LX} \sigma_X (\phi + 1)}{\phi \mu}$

or, $\varepsilon > \frac{\lambda_{LX} \sigma_X}{\mu} \frac{\phi + 1}{\phi} = \frac{\lambda_{LX} \sigma_X}{\mu} \frac{1 + \frac{K_X}{K_Y}}{\frac{K_X}{K_Y}} = \frac{\lambda_{LX} \sigma_X}{\mu} \frac{\overline{K}}{K_Y} \frac{K_Y}{K_X} = \frac{\lambda_{LX}}{\lambda_{KX}} \frac{\sigma_X}{\mu}$

Using (A.8), $\hat{w} > 0$, iff, $\varepsilon > \sigma_X K_X f \left(\frac{\lambda_{LX}}{\lambda_{KX}} \right)$

The above derivation provides the proof of condition (10). ¬

Appendix II

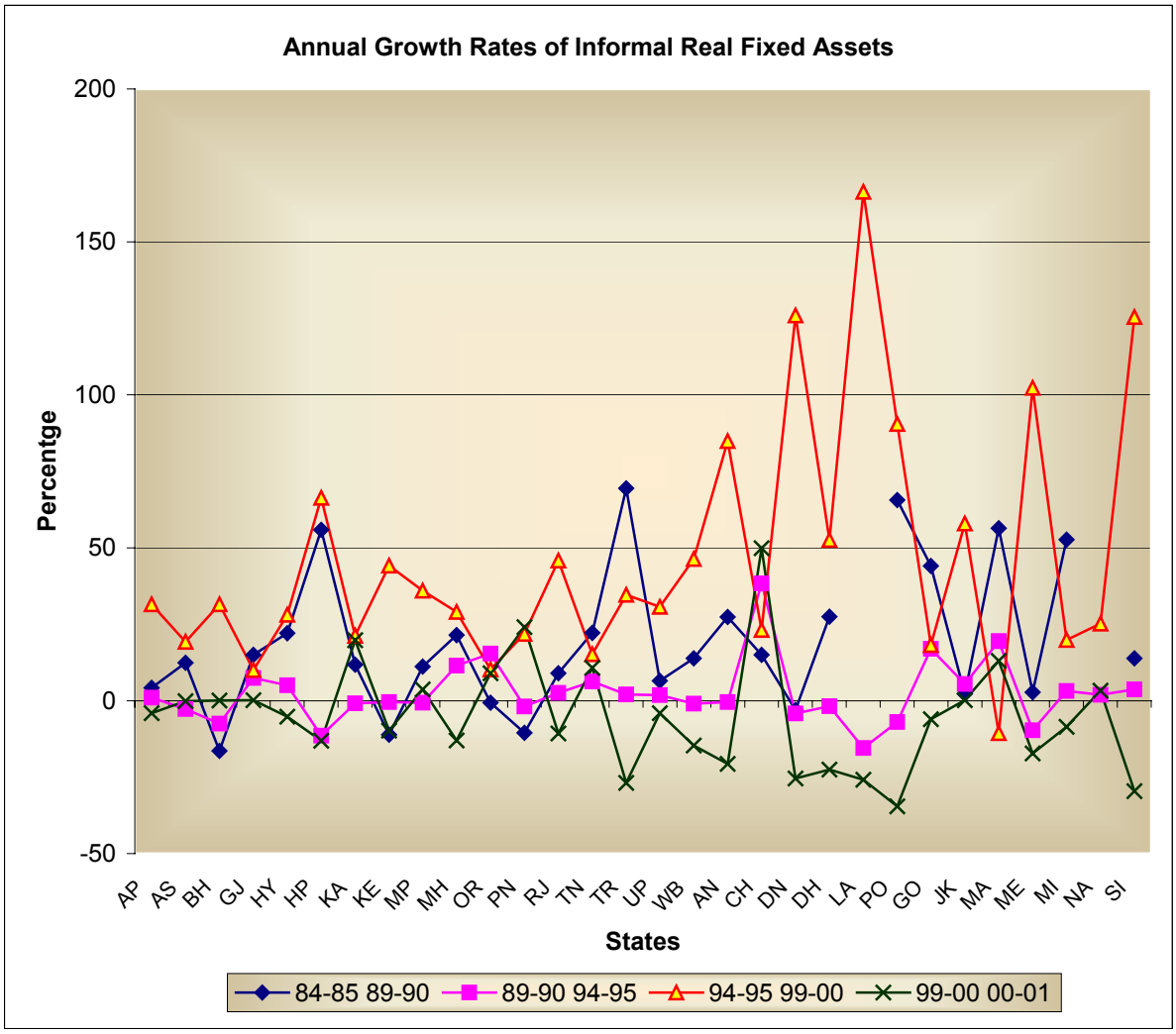

Figure 4

Source: NSS Reports, various rounds and own calculations

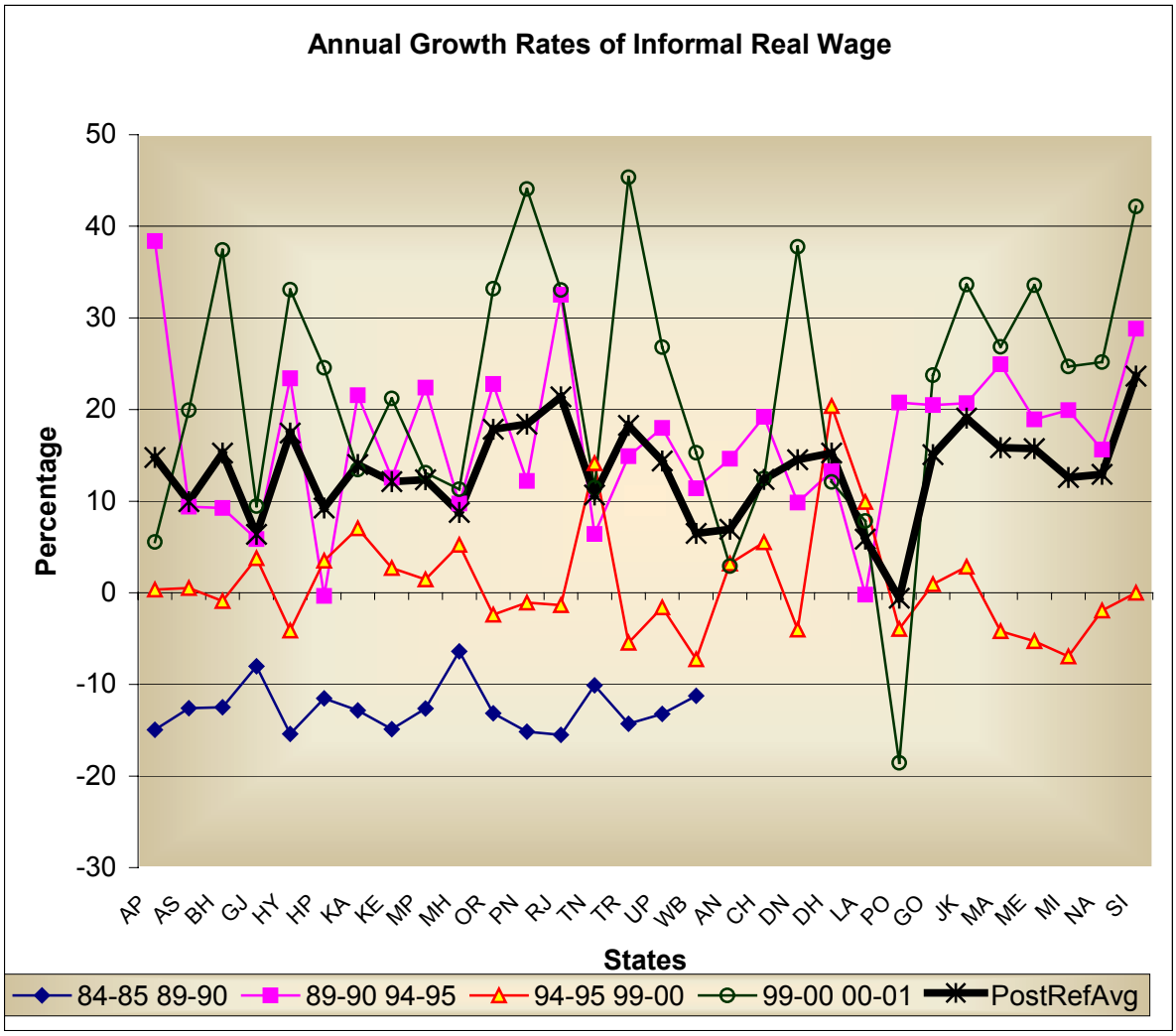

Figure 5

Source: NSS Reports, various rounds and own calculations

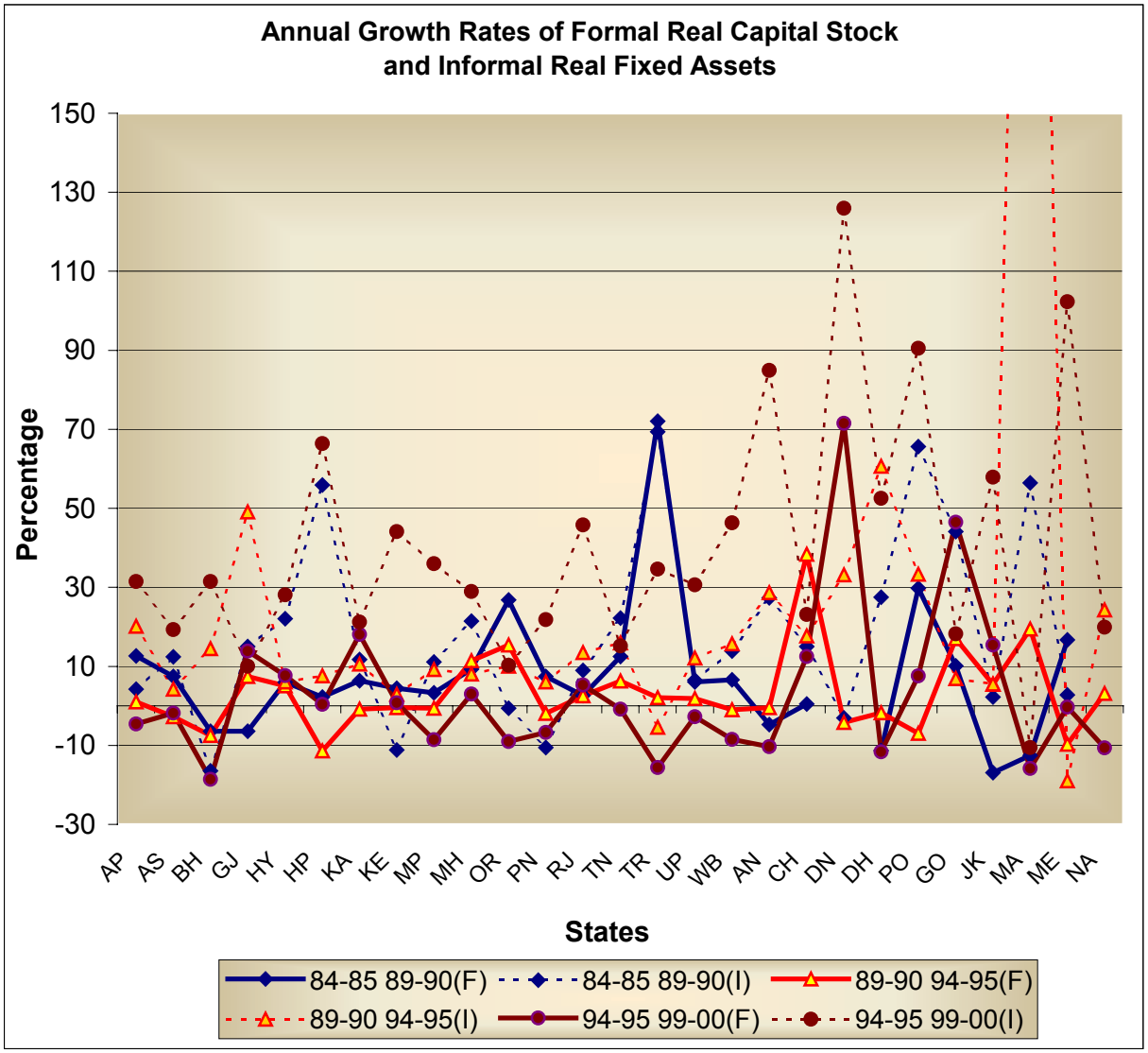

Figure 6

F – Formal Sector, I – Informal Sector.

Source: NSS Various rounds, ASI Reports, GOI and own calculations

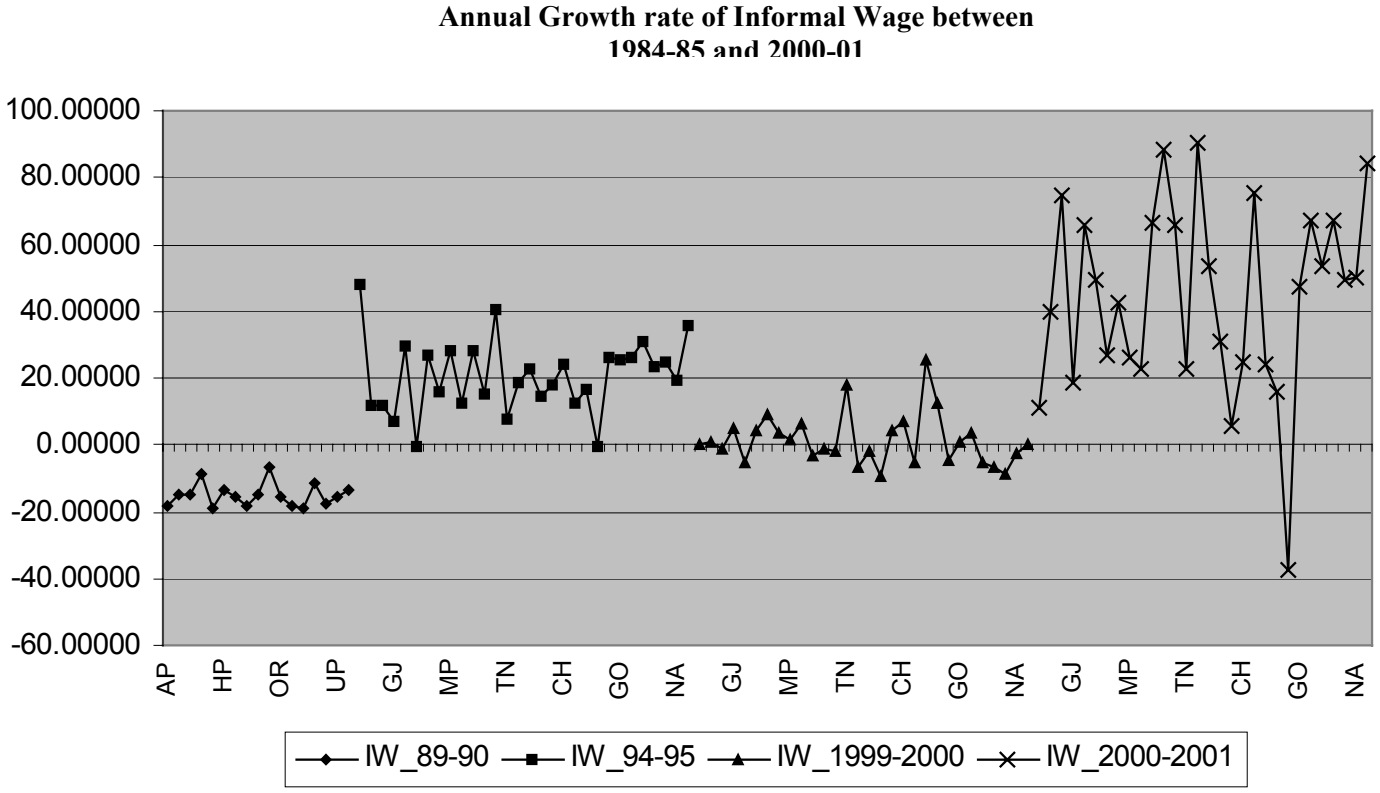
Annual Growth rate of Informal Wage between
1984-85 and 2000-01
100.00000
80.00000
60.00000
40.00000
20.00000
0.00000
-20.00000
-40.00000
-60.00000
AP
HP
OR
UP
GJ
MP
TN
CH
GO
NA
GJ
MP
TN
CH
GO
NA
GJ
MP
TN
CH
GO
NA
IW_89-90
IW_94-95
IW_1999-2000
IW_2000-2001

Figure 7

Table 1

Table Showing Annual Growth Rates of Real Informal Wage for States and Union Territories in India

States	1984-85 to 1989-90	1989-90 to 1994-95	1994-95 to 1999-00	1999-00 to 2000-01	Post Reform Average
AP	-14.9383	38.37914	0.351421	5.54216	14.75757
AS	-12.5909	9.400387	0.502013	19.94701	9.949804
BH	-12.4796	9.259229	-0.91022	37.41843	15.25582
GJ	-8.01461	5.856186	3.761828	9.471879	6.363298
HY	-15.417	23.39205	-4.11872	33.07289	17.44874
HP	-11.5206	-0.34082	3.509483	24.55454	9.241068
KA	-12.8237	21.54953	7.021524	13.43834	14.00313
KE	-14.8953	12.55645	2.686628	21.20452	12.1492
MP	-12.6123	22.41174	1.455013	13.11878	12.32851
MH	-6.4	9.7482	5.247609	11.28708	8.760962
OR	-13.1553	22.78583	-2.38878	33.1919	17.86298
PN	-15.1443	12.20414	-1.06954	44.061	18.39853
RJ	-15.4959	32.53101	-1.34439	33.03571	21.40744
TN	-10.1074	6.406688	14.13201	11.49062	10.67644
TR	-14.3066	14.89337	-5.45877	45.36927	18.26796
UP	-13.2014	18.00436	-1.58454	26.79013	14.40332
WB	-11.2556	11.41085	-7.25447	15.29931	6.485231
AN		14.62978	3.202789	2.910365	6.914311
CH		19.21098	5.496664	12.4677	12.39178
DN		9.828439	-4.01589	37.7676	14.52672
DH		13.26679	20.39249	12.10498	15.25476
LA		-0.21334	9.929694	7.832409	5.849589
PO		20.77112	-3.96475	-18.5548	-0.58281
GO		20.50309	0.947838	23.74566	15.06553
JK		20.71262	2.838103	33.64066	19.06379
MA		24.9116	-4.18481	26.83254	15.85311
ME		18.91503	-5.28746	33.57459	15.73405
MI		19.93168	-6.92451	24.69716	12.56811
NA		15.62657	-1.96228	25.16228	12.94219
SI		28.81384	-0.01264	42.15758	23.65293

Source: NSS Reports on Unorganized Sector in India, Various Rounds, and Own Calculations

Table 2. Descriptive statistics for the variables (year-wise)

Year	Variables	Mean	SD	Skewness	Kurtosis	Minimum	Maximum	Observations
1989-90	IW	(-) 15.08	3.45	0.97	3.16	(-) 18.96	(-) 6.75	17
	FA	4.71	9.29	0.54	3.18	(-) 10.75	26.92	17
	VA	(-) 7.90	7.12	1.20	4.20	(-) 19.04	10.00	17
	RW	(-) 7.56	3.48	(-) 0.13	1.94	(-) 14.38	(-) 2.80	17
1994-95	IW	20.72	10.97	0.22	3.03	(-) 0.43	47.97	30
	FA	3.23	12.93	1.36	5.99	(-) 19.28	47.98	30
	VA	5.89	13.31	1.98	7.94	(-) 12.24	56.44	30
	RW	8.03	6.94	(-) 0.37	2.90	(-) 8.23	20.73	28
1999-2000	IW	1.29	7.65	1.26	4.76	(-) 9.07	25.49	30
	FA	58.50	50.32	1.35	4.16	(-) 13.24	208.01	30
	VA	42.05	32.67	1.47	4.93	3.48	140.38	30
	RW	5.91	13.94	0.08	2.71	(-) 25.00	37.93	30
2000-2001	IW	44.18	28.51	(-) 0.52	3.30	(-) 37.11	90.74	30
	FA	(-) 10.52	35.77	0.87	4.19	(-) 69.15	99.74	30
	VA	(-) 40.18	25.04	0.82	4.42	(-) 94.69	26.49	30
	RW	(-) 2.07	17.17	2.22	7.34	(-) 19.91	58.87	29
All years	IW	16.16	26.84	0.81	3.20	(-) 37.11	90.74	107
	FA	15.10	43.33	1.69	7.54	(-) 69.15	208.01	107
	VA	0.92	38.68	0.59	4.54	(-) 94.69	140.38	107
	RW	2.13	13.52	1.12	5.14	(-) 25.00	58.87	104

Description of the variables:

IW = Annual Growth rate of real informal wage
FA = Annual Growth rate of real fixed assets
VA = Annual Growth rate of real value-added
RW = Annual Growth rate of real rural wage

Table 3. Regression results for individual time-points without taking care of Heteroscadasticity

METHODOLOGY: Ordinary Least Squares Dependent variable: Annual Growth Rate of IW							
Year	**Exp. Variables**	**Coeff.**	**t-ratio**	**R^2**	**Adj. R^2**	**AIC**	**LL**
1989-90	**CONSTANT**	(-) 11.35	(-) 5.91756*	0.48	0.36	5.01	-39.10
	FA	0.102	1.27877				
	VA	0.233	2.22626*				
	RW	0.313	1.57531				
1994-95	**CONSTANT**	15.89	5.40016*	0.23	0.14	7.59	(-) 109.98
	FA	0.278	1.90432**				
	VA	0.183	1.27715				
	RW	0.354	1.28587				
1999-2000	**CONSTANT**	(-) 3.76	(-) 1.28115	0.16	0.06	6.961	(-) 100.42
	FA	0.015	0.49287				
	VA	0.084	1.97285**				
	RW	0.115	1.07367				
2000-2001	**CONSTANT**	69.57	7.58718*	0.30	0.23	9.41	(-) 137.09
	FA	0.152	1.13612				
	VA	0.608	3.21470*				
	RW	(-) 0.307	(-) 1.11728				

Note: * denotes significance at 5% level & ** denotes significance at 10% level
Adj. R^2 = adjusted R^2
AIC = Akaike Information Criterion
LL = Log-likelihood

Table 4. Regression results for individual time-points after taking care of Heteroscadasticity

METHODOLOGY: Generalized Least Squares Dependent variable: Annual Growth Rate of IW							
Year	**Exp. Variables**	**Coeff.**	**t-ratio**	**R^2**	**Adj. R^2**	**AIC**	**LL**
1989-90	**CONSTANT**	(-) 11.35	(-) 6.70473*	0.48	0.36	5.01	(-) 39.10
	FA	0.102	2.58869*				
	VA	0.233	5.09886*				
	RW	0.313	1.73243**				
1994-95	**CONSTANT**	15.89	8.84668*	0.23	0.14	7.59	(-) 109.98
	FA	0.278	2.19006*				
	VA	0.183	1.74465**				
	RW	0.354	1.89854**				
1999-2000	**CONSTANT**	(-) 3.76	(-) 1.62243	0.16	0.06	6.961	(-) 100.42
	FA	0.014	0.45872				
	VA	0.083	2.04059**				
	RW	0.114	0.98769				
2000-2001	**CONSTANT**	69.56	5.69114*	0.30	0.23	9.41	(-) 137.09
	FA	0.152	0.86366				
	VA	0.607	2.23908*				
	RW	(-) 0.307	(-) 2.30538*				

Note: * denotes significance at 5% level & ** denotes significance at 10% level
Adj. R^2 = adjusted R^2
AIC = Akaike Information Criterion
LL = Log-likelihood

Table 5. Unbalanced panel regression

Top Panel

Methodology: 2-step GLS – Without taking care of heteroscadasticity

Model: Random Effects Model, Dependent variable = IW

Exp. Variables	Coeff.	t-ratio	R^2	AIC	Log - Likelihood
CONSTANT	(-) 0.10	(-) 1.36	0.114	--	--
FA	(-) 0.17	(-) 1.99**			
VA	0.12	0.57			
RW	17.79	5.10			

Diagnostic tests:

Random Effects Model: v(i,t) = e(i,t) + u(i)

Estimates: Var[e] = .785929D+03

Var[u] = .999496D+02

Corr[v(i,t),v(i,s)] = .112825

Fixed vs. Random Effects (Hausman) = 2.32

(3 df, prob value = .508079)

(High (low) values of H favor FEM (REM).)

Reestimated using GLS coefficients:

Estimates: Var[e] = .787439D+03

Var[u] = -.113131D+03

Sum of Squares .678441D+05

R-squared .111240D+00

Bottom Panel

Methodology: Least Squares Dummy Variables – After correcting heteroscadasticity

Dependent variable = IW

Note: 'White' corrected covariance matrix has been used

Exp. Variables	Coeff.	t-ratio	R^2	AIC	Log - Likelihood
FA	(-) 0.123	(-) 2.114*	0.24	9.753	(-) 488.77
VA	(-) 0.162	(-) 2.403*			
RW	0.156	0.988			

Note: * denotes significance at 5% level & ** denotes significance at 10% level

AIC = Akaike Information Criterion

Table 6. Checking for structural breaks – results of Chow test

Year	F_{calc}	F_{tab} (5% level of sig.)	Presence of structural break
1989-90 & 1994-95	2.72	2.62	YES
1994-95 & 1999-2000	7.83	2.56	YES
1999-2000 & 2000-2001	7.45	2.56	YES

Table 7. Identifying structural breaks

Dependent variable = Annual Growth Rate of IW			
Years	**Exp. Variables**	**Coeff.**	**t-ratio**
1989-90 & 1994-95	FA	(-) 0.03	(-) 0.13698
Checking for structural breaks at 1994-95	VA	0.546	1.85573
	RW	1.22	2.92752
T2 = INTERCEPT DUMMY	T2	16.00	4.26033*
FA2 = T2 INTERACTS WITH FA	FA2	0.396	1.05172
VA2 = T2 INTERACTS WITH VA	VA2	0.064	0.154686
RW2 = T2 INTERACTS WITH RW	RW2	(-) 1.04	(-) 1.8349
1994-95 & 1999-2000	FA	0.397	2.41241
Checking for structural breaks at 1999-00	VA	0.309	1.91503
	RW	1.41	6.34088
T3 = INTERCEPT DUMMY	T3	(-) 3.76	(-) 0.81685
FA3 = T3 INTERACTS WITH FA	FA3	(-) 0.383	(-) 2.23524*
VA3 = T3INTERACTS WITH VA	VA3	(-) 0.226	(-) 1.29278
RW3 = T3 INTERACTS WITH RW	RW3	(-) 1.29	(-) 4.64913*
1999-2000 & 2000-2001	FA	(-) 0.008	(-) 0.14337
Checking for structural breaks at 2000-01	VA	0.054	0.611483
	RW	0.052	0.220547
T4 = INTERCEPT DUMMY	T4	69.56	10.3654*
FA4 = T4 INTERACTS WITH FA	FA4	0.160	1.4042
VA4 = T4INTERACTS WITH VA	VA4	0.553	3.37302*
RW4 = T4 INTERACTS WITH RW	RW4	(-) 0.359	(-) 1.15813

Note: * denotes significance at 5% level

Table 8. Correlation coefficient matrix (year-wise)

1989-90	IW	FA	VA	RW
IW	1.00000	.42767	.57368	.27155
FA	.42767	1.00000	.37750	-.09812
VA	.57368	.37750	1.00000	-.03692
RW	.27155	-.09812	-.03692	1.00000
1994-95	IW	FA	VA	RW
IW	1.00000	.33932	.27046	.28607
FA	.33932	1.00000	.04867	.00108
VA	.27046	.04867	1.00000	.17476
RW	.28607	.00108	.17476	1.00000
1999-2000	IW	FA	VA	RW
IW	1.00000	.06356	.35441	.14441
FA	.06356	1.00000	.13441	-.38761
VA	.35441	.13441	1.00000	-.07614
RW	.14441	-.38761	-.07614	1.00000
2000-2001	IW	FA	VA	RW
IW	1.00000	.15125	.54512	-.15355
FA	.15125	1.00000	-.20262	.16064
VA	.54512	-.20262	1.00000	.02964
RW	-.15355	.16064	.02964	1.00000

Table 9. Regressing current period's **BPL percentage** on previous year's **Annual Growth of Informal wage**

Dependent variable: BPLPER Methodology: OLS					
Exp. Variables	**Coeff.**	**t-ratio**	**R^2**	**AIC**	**Log - Likelihood**
IWPREV	(-) 0.236	(-) 2.57*	0.13	7.883	(-) 183.2454
CONSTANT	27.85	14.53*			
Note: BPLPER = **BPL percentage** IWPREV = Previous year's growth rate of informal wage					

Table 10. Unbalanced panel regression of current period's **BPL percentage** on previous year's **Annual Growth of Informal wage**

Dependent variable: BPLPER Model: Random Effects Model		
Exp. Variables	**Coeff.**	**t-ratio**
IWPREV	(-) 0.229	(-) 5.17*
CONSTANT	27.12	11.98*
Diagnostics tests for the model: Random Effects Model: v(i,t) = e(i,t) + u(i) Estimates: Var[e] = .253153D+02 Var[u] = .129246D+03 Corr[v(i,t),v(i,s)] = .836212 Fixed vs. Random Effects (Hausman) = .01 (1 df, prob value = .940154) (High (low) values of H favor FEM (REM).) Reestimated using GLS coefficients: Estimates: Var[e] = .253158D+02 Var[u] = .129353D+03 Sum of Squares .672385D+04 R-squared .124856D+00		
Note: BPLPER = **BPL percentage** IWPREV = Previous year's growth rate of informal wage		

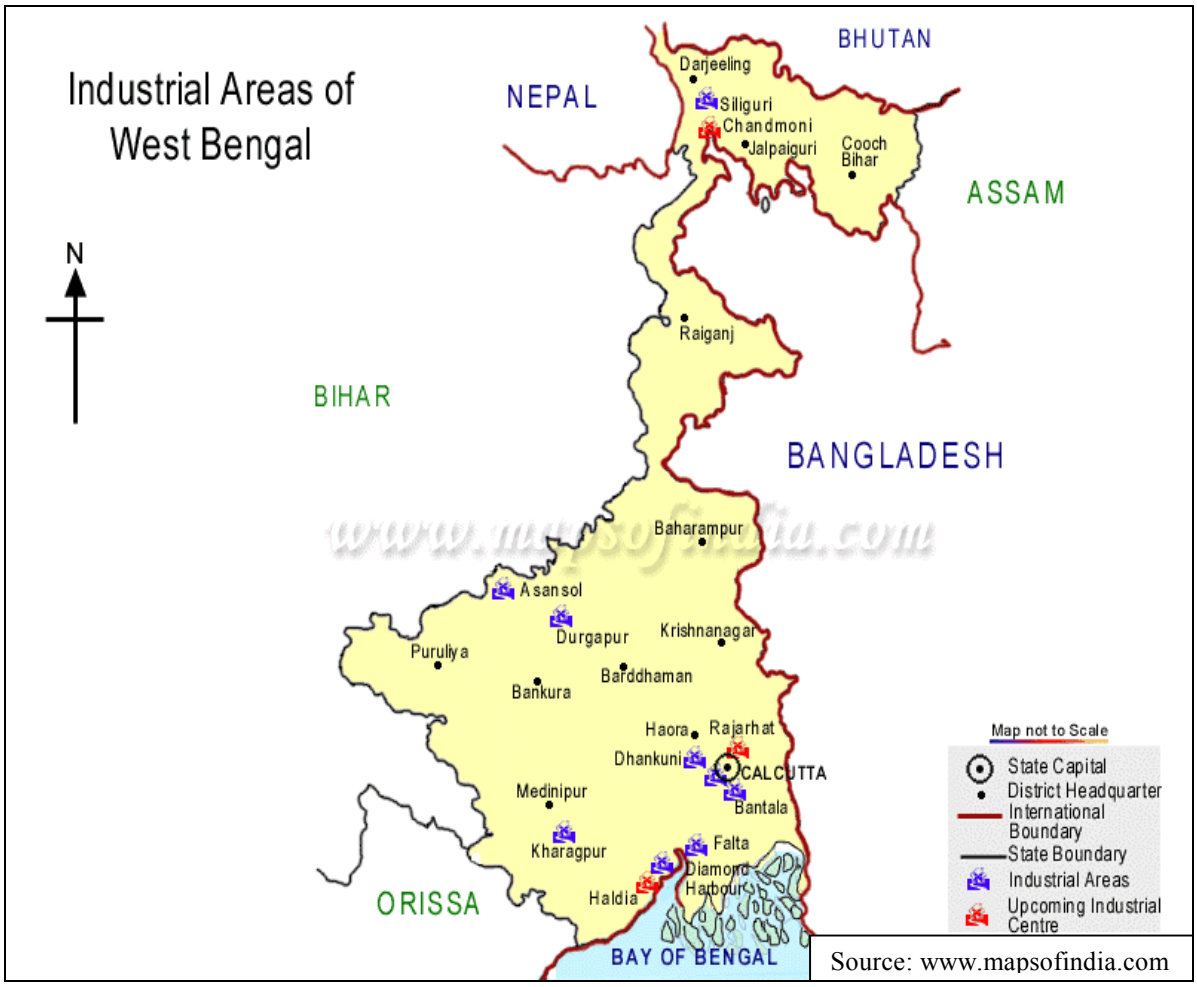
Industrial Areas of West Bengal
N
BHUTAN
NEPAL
ASSAM
BIHAR
BANGLADESH
ORISSA
BAY OF BENGAL
Darjeeling
Siliguri
Chandmoni
Jalpaiguri
Cooch Bihar
Raiganj
Baharampur
Asansol
Durgapur
Krishnanagar
Purulya
Barddhaman
Bankura
Haora
Rajarhat
Dhankuni
CALCUTTA
Bantala
Medinipur
Kharagpur
Falta
Diamond Harbour
Haldia
Map not to Scale
State Capital
District Headquarter
International Boundary
State Boundary
Industrial Areas
Upcoming Industrial Centre
Source: www.mapsofindia.com

Figure 8

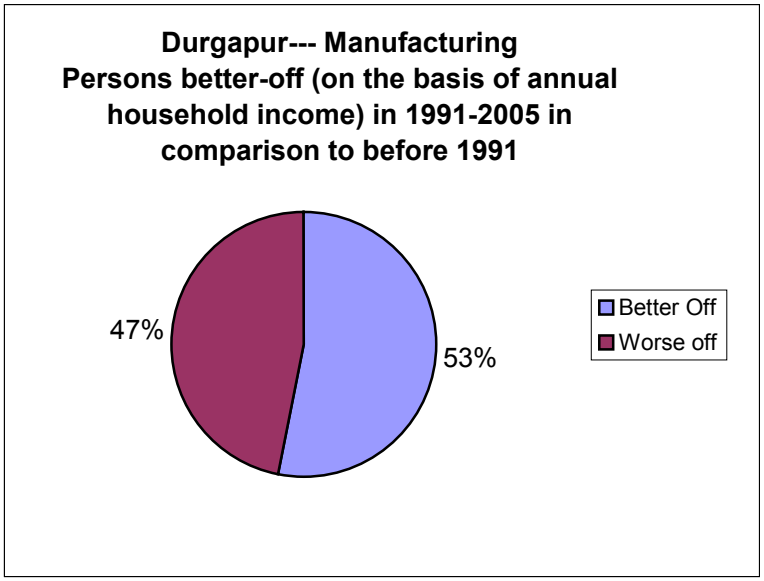

Figure 9a

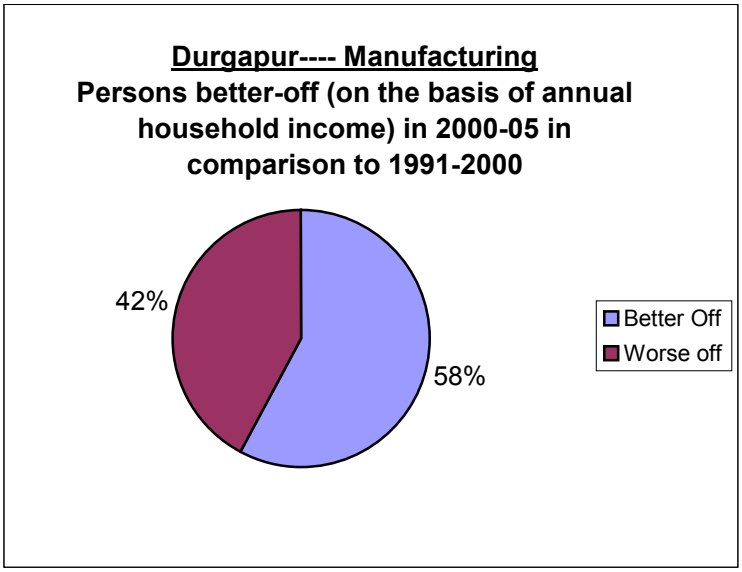

Figure 9b

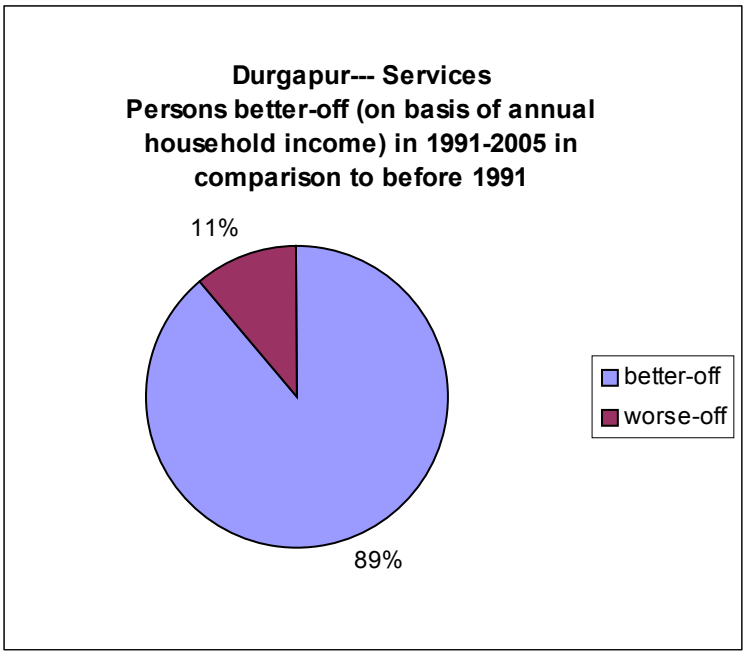

Figure 9c

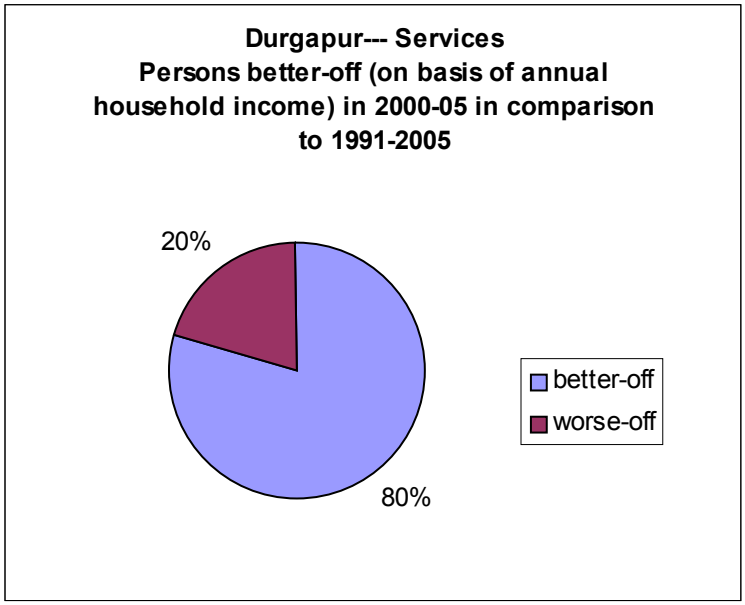

Figure 9d

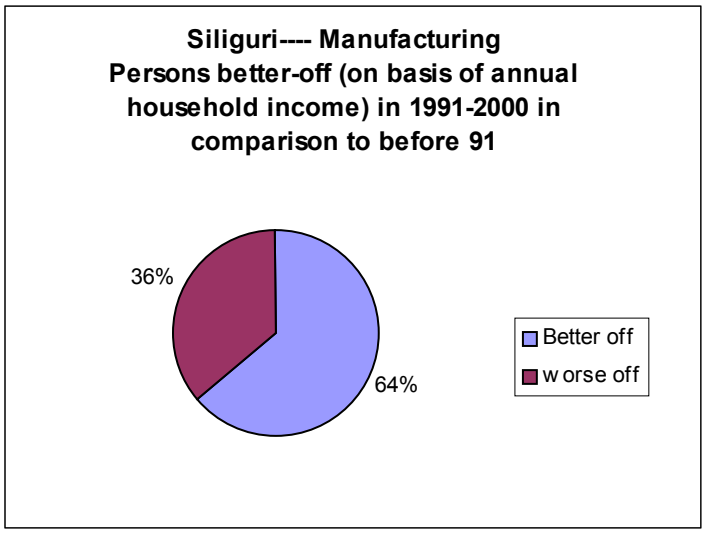

Figure 10a

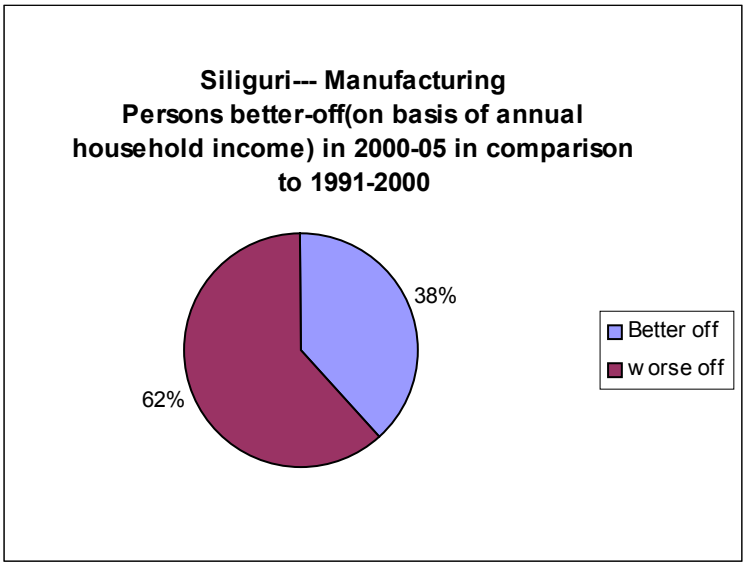

Figure 10b

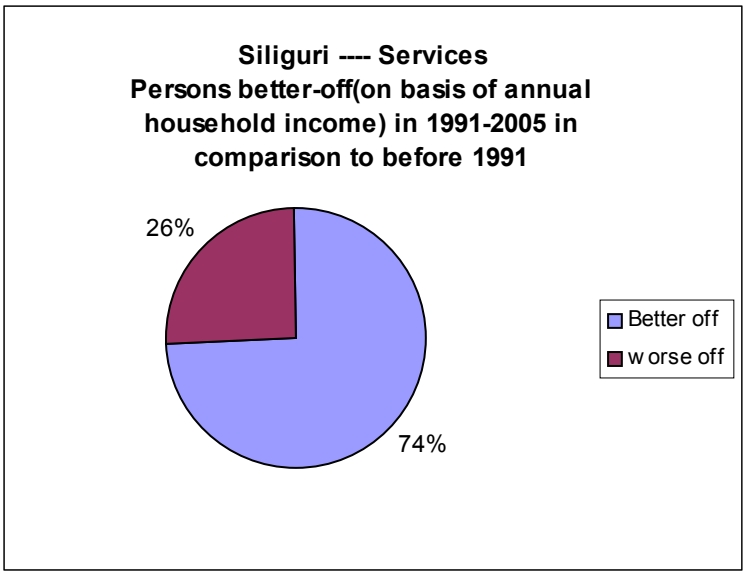

Figure 10c

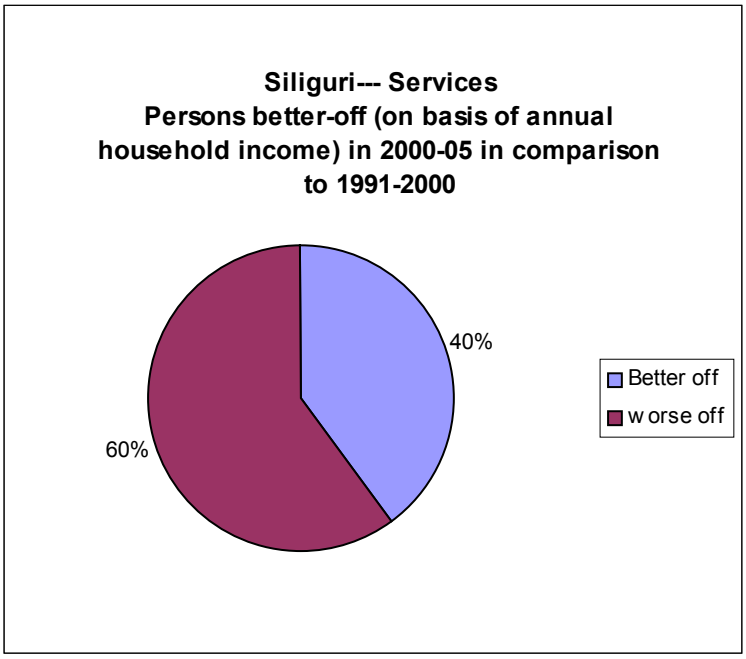

Figure 10d

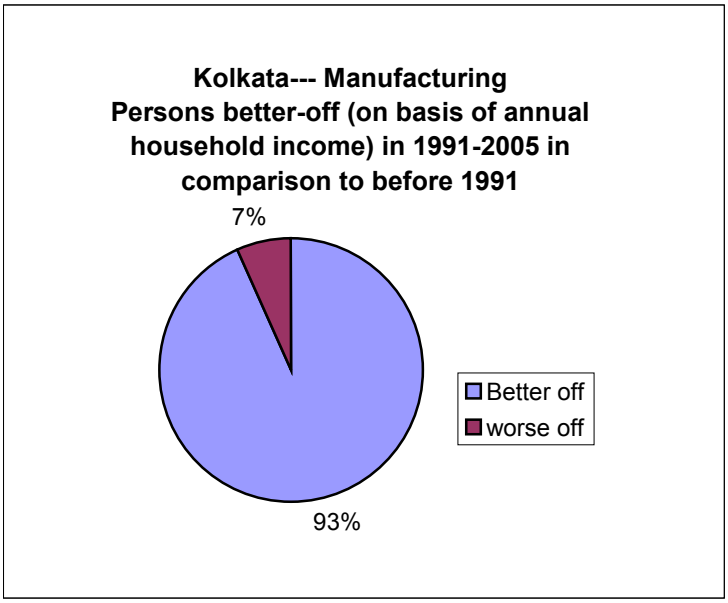

Figure 11a

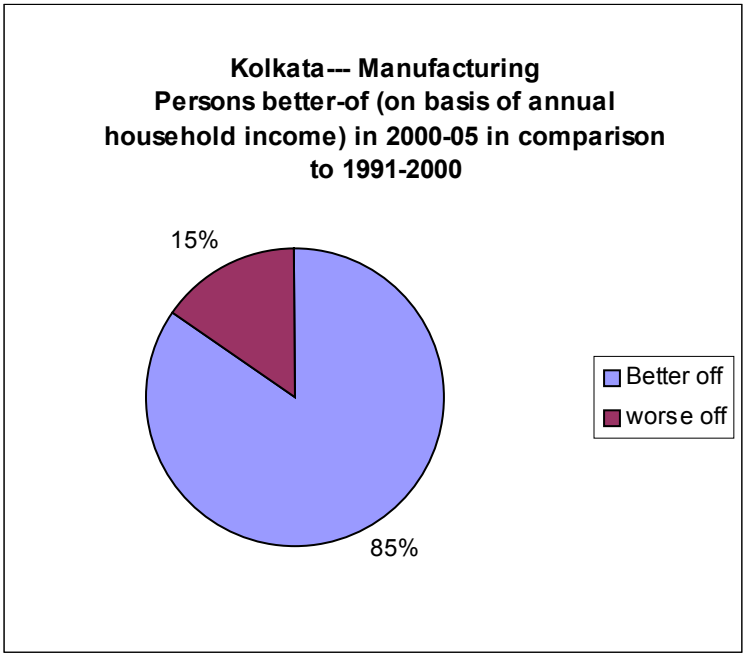

Figure 11b

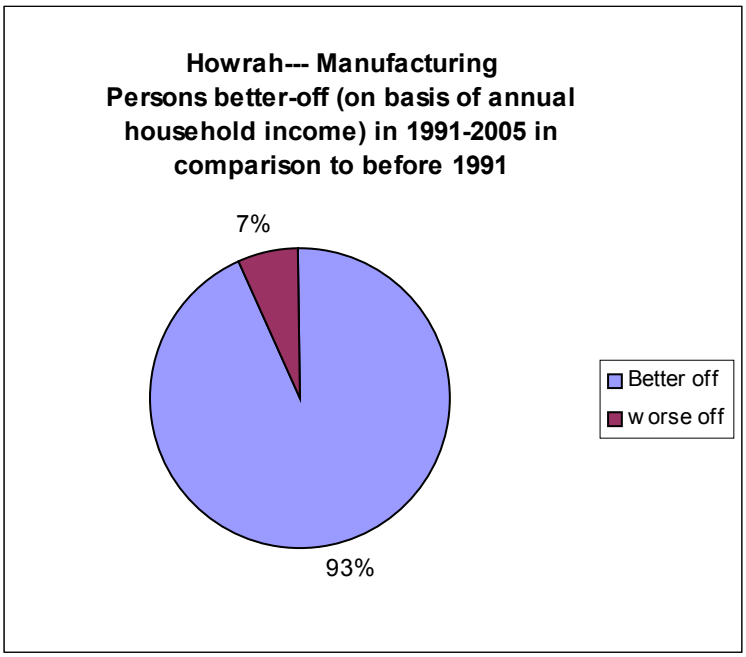

Figure 12a

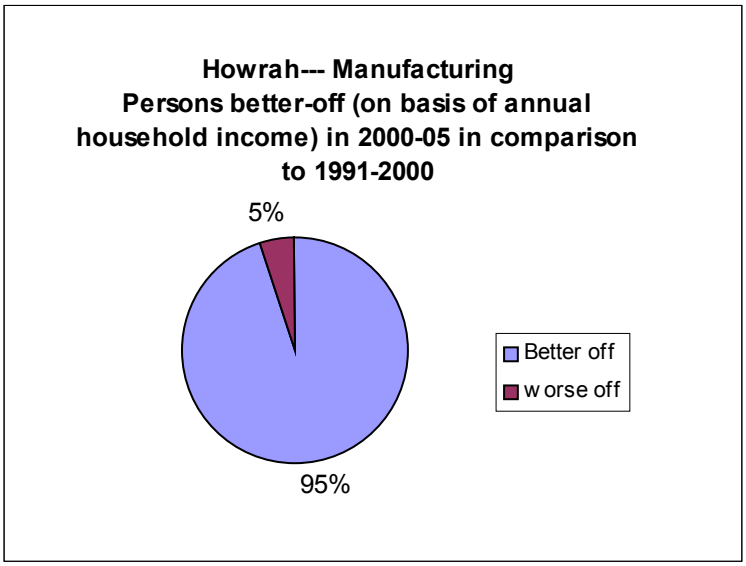

Figure 12b

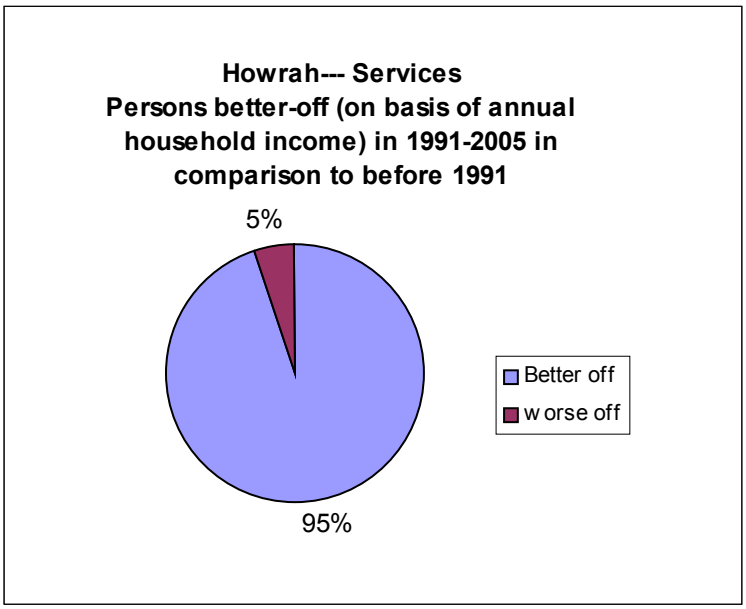

Figure 12c

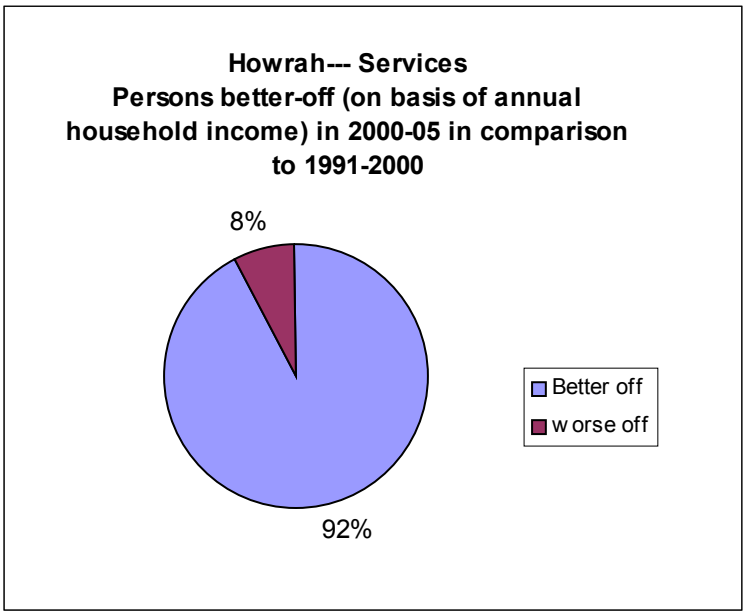

Figure 12d

Table 11

Regression Results for Kolkata

```
+----------------------------------------------------------------------+
| Ordinary    least squares regression    Weighting variable = none     |
| Dep. var. = Y        Mean=   34371.27119    , S.D.=   24572.42894     |
| Model size: Observations =      59, Parameters =   3, Deg.Fr.=     56 |
| Residuals:  Sum of squares= .3156247328E+11, Std.Dev.=    23740.58959 |
| Fit:        R-squared=  .098747, Adjusted R-squared =          .06656 |
| Model test: F[  2,     56] =    3.07,    Prob value =          .05441 |
| Diagnostic: Log-L =   -676.5994, Restricted(b=0) Log-L =    -679.6665 |
|             LogAmemiyaPrCrt.=   20.199, Akaike Info. Crt.=     23.037 |
| Autocorrel: Durbin-Watson Statistic =   2.04972,   Rho =      -.02486 |
+----------------------------------------------------------------------+
+---------+--------------+----------------+--------+---------+----------+
|Variable | Coefficient  | Standard Error |t-ratio |P[|T|>t] | Mean of X|
+---------+--------------+----------------+--------+---------+----------+
 Constant  27942.55175      4036.7368        6.922   .0000
 C          .7764296007      .33602089       2.311   .0246  8043.4237
 P         2.664320418      12.990821         .205   .8382  68.898305
--------------------------------------------------------------------------------------------------
                            Descriptive Statistics
               All results based on non-missing observations.
Variable        Mean          Std.Dev.        Minimum          Maximum
Cases
--------------------------------------------------------------------------------
_
Y          37646.2963      23061.1060      3000.00000      112000.000
54
C          8360.70175      9685.37629      240.000000      35000.0000
57
P          106.368421      150.418687      .500000000      801.000000
57

--------------------------------------------------------------------------------------------------
```

Table 12

Regression Results for Howrah**

```
**Here we have taken the lagged value of C,i.e, Lag C(-1).
+----------------------------------------------------------------------
+
| Ordinary    least squares regression    Weighting variable = none
|
| Dep. var. = Y        Mean=   45950.05000    , S.D.=   17229.54120
|
| Model size: Observations =      60, Parameters =   3, Deg.Fr.=     57
|
| Residuals:  Sum of squares= .1429890788E+11, Std.Dev.=    15838.49845
|
| Fit:        R-squared=  .183599, Adjusted R-squared =          .15495
|
| Model test: F[  2,     57] =    6.41,    Prob value =          .00308
|
| Diagnostic: Log-L =   -663.8094, Restricted(b=0) Log-L =    -669.8949
|
|             LogAmemiyaPrCrt.=   19.389, Akaike Info. Crt.=     22.227
|
| Autocorrel: Durbin-Watson Statistic =   2.01378,   Rho =      -.00689
|
+----------------------------------------------------------------------
+
+---------+-------------+----------------+--------+---------+----------
+
|Variable | Coefficient  | Standard Error |t-ratio |P[|T|>t] | Mean of
X|
+---------+-------------+----------------+--------+---------+----------
+
 Constant  39146.44867      2896.0425       13.517   .0000
 C          .2504987932     .70517948E-01    3.552   .0008  27200.417
 P        -.9851998569E-02  .98908081         -.010   .9921  1022.1500
```

```
                Descriptive Statistics
              All results based on nonmissing observations.
Variable        Mean         Std.Dev.        Minimum         Maximum
Cases
-----------------------------------------------------------------------
-------
Y         48421.0526      13728.1611      30000.0000      80000.0000
C         47342.8571      22493.0615      7000.00000      100000.000
P         1022.15000      2101.96347      6.00000000      15000.0000
```

Table 13

Regression Results for Durgapur

```
-----------------------------------------------------------------------
-+
| Ordinary    least squares regression    Weighting variable = none
|
| Dep. var. = Y        Mean=   35223.10000    , S.D.=   28594.85248
|
| Model size: Observations =      50, Parameters =   3, Deg.Fr.=
47 |
| Residuals:  Sum of squares= .3889491271E+11, Std.Dev.=
28767.19198 |
| Fit:        R-squared=  .029220, Adjusted R-squared =         -
.01209 |
| Model test: F[  2,     47] =     .71,    Prob value =
.49813 |
| Diagnostic: Log-L =   -582.7496, Restricted(b=0) Log-L =    -
583.4910 |
|             LogAmemiyaPrCrt.=   20.592, Akaike Info. Crt.=
23.430 |
| Autocorrel: Durbin-Watson Statistic =   1.87972,   Rho =
.06014 |
+---------+-------------+----------------+--------+---------+--------
+---------+-------------+----------------+--------+---------+--------
|Variable | Coefficient  | Standard Error |t-ratio |P[|T|>t] | Mean of
X|
+---------+-------------+----------------+--------+---------+--------
 Constant  32000.10912      4889.3757        6.545   .0000
 C         .1263837746E-01  .16261086E-01     .777   .4409  95954.360
 P         2.266981478      2.2565658        1.005   .3202  886.76660
```

Descriptive Statistics

All results based on nonmissing observations.

Variable	Mean	Std.Dev.	Minimum	Maximum	Cases
Y	39247.7778	27293.2308	1350.00000	110000.000	
Skewness= .7071 Kurtosis= 2.9108					
C	150490.625	307651.132	700.000000	1000000.00	
Skewness= 2.2216 Kurtosis= 6.1146					
P	965.340208	1837.45711	1.50000000	7935.00000	
Skewness= 2.1936 Kurtosis= 7.1710					

```
**********************************************************************
```

Table 14

Regression Results for Siliguri

```
+----------------------------------------------------------------------+
| Ordinary    least squares regression    Weighting variable = none     |
| Dep. var. = Y        Mean=   37978.00000    , S.D.=   23854.81160     |
| Model size: Observations =     100, Parameters =   3, Deg.Fr.=     97 |
| Residuals:  Sum of squares= .4131891509E+11, Std.Dev.=    20638.99699 |
| Fit:        R-squared=  .266565, Adjusted R-squared =          .25144 |
| Model test: F[  2,     97] =   17.63,    Prob value =          .00000 |
| Diagnostic: Log-L =  -1133.8647, Restricted(b=0) Log-L =   -1149.3655 |
|             LogAmemiyaPrCrt.=   19.899, Akaike Info. Crt.=     22.737 |
| Autocorrel: Durbin-Watson Statistic =   2.01790,   Rho =      -.00895 |
+----------------------------------------------------------------------+
+---------+--------------+----------------+--------+---------+----------+
|Variable | Coefficient  | Standard Error |t-ratio |P[|T|>t] | Mean of X|
+---------+--------------+----------------+--------+---------+----------+
 Constant  34298.70376      2184.9612       15.698   .0000
 C          .1920142881      .49296178E-01    3.895   .0002  16122.000
 P          .9567233272      1.5834027         .604   .5471  610.04250
```

Descriptive Statistics
All results based on nonmissing observations.

Variable	Mean	Std.Dev.	Minimum	Maximum	Cases
Y	37978.0000	23854.8116	3600.00000	144000.000	
C	16122.0000	57687.6973	.000000000	500000.000	
P	610.042500	1795.99480	.350000000	15250.0000	

List of Abbreviations for States and Union Territories in India

AP – Andhra Pradesh, AS – Assam, BH – Bihar, GJ – Gujarat, HY – Haryana

HP – Himachal Pradesh, KA – Karnataka, KE – Kerala, MP – Madhya Pradesh

MH – Maharastra, OR – Orissa, PN – Punjab, RJ – Rajasthan, TN – Tamil Nadu

TR – Tripura, UP – Uttar Pradesh, WB – West Bengal, AN – Andaman and Nicobar Islands

Ch – Chandigarh, DN – Dadra and Nagar Haveli, DH – Delhi, LA – Lakshadweep

PO – Pondicherry, GO – Goa, JK – Jammu and Kashmir, MA – Manipur

ME – Meghalaya, MI – Mizoram, NA – Nagaland, SI - Sikkim.

Appendix III

Survey Questionnaire

A SURVEY ON INFORMAL SECTOR IN SELECTED DISTRICTS OF WEST BENGAL: 2005-06

1.Identification of the Unit & Household Details

1.1 Sample serial no. of the unit:

1.2 Name of the unit:

1.3 Address:

1.4 Name of the respondent:

1.5 Position of the respondent – Owner of the Unit / Employee:

1.6 Years in this occupation:

1.7 Previous occupation, if any:

1.7 Details of family members

Sl. No.	Age /Sex	Highest Education	Type of Occupation: Business/Service (Formal/Informal)
Self			
Father			
Mother			

1.8. Whether registered with the Unemployment Bureau of the State Government: Y / N

2. Sector Specification of Activity

2. Type of activity

3. Manufacturing: Y/N

3.1 Main Product (s)

3.2 Price(s) per Unit (s):

3.2.1 Upstream inputs:

3.2..2 Downstream inputs:

3.3 Service: Y/N

3.4 Type of Service (eg. Motor Mechanic, Supplier, etc.)

3.5 Average Charges per unit of service provided

3.5.1 Upstream inputs

3.5.2 Downstream inputs

4. Year of establishment of the unit:

5. Impact of Economic Reforms

Items/ Issues (Express in Rupees)	Pre-1991		1991-2000		Post-2000/ 2005	
General Economic Condition	Good	Bad	Good	Bad	Better	Worse
Average Yearly Earnings						
Average Profit						
Capital Employed						
Availability of Loans/ Business Capital						
Wage Rate / employee						
No. of Employees						
Bribes Paid, if any						

6. Average Yearly Family Income

Items		Before 1991	Before 2000	After 2000
Family Earnings (Rs.)				
Wage Rate (Rs./day)	Male			
	Female			

7. Yearly Rent for the Production Unit (in Rs.)

Type	Area	Own/ Rented (if Own, Value)	Pre- 1991-rent	Rent 1991-2000	Rent after 2000 / for 2005
Residential building					

Business premises					
Other					

8. Labour Input (Employment)

No. of Employees:

Types	Before 1991	1991- 2000	After 2000 / for 2005
Family Labour			
Hired Labour			
Permanent			
Casual Labour			

9 Capital Input

Types	Before 1991	1991- 2000	After 2000 / for 2005
Own Capital (Rs.)			
Loan: Amount(Rs.)			
Source:			
Interest Rate (%)			

10. Export and Imports

Types	Before 1991	1991- 2000	After 2000 / for 2005
Exports (Rs.)			
Imports (Rs.)			

11. Market Conditions

Items/ Issues	Pre-1991		1991-2000		Post-2000 / for 2005	
	High	Moderate / Low	High	Moderate / Low	Increased	Decreased
Demand						
Supply Capacity						

12. Any other comments / suggestions: