Growth, Employment and Poverty Trends in India:

Unbundling the links

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ABSTRACT

In this paper we look at long-term links between poverty reduction and trends in labor markets using state level data for India's major states, for the two decades spanning 1983 to 2003. The aim of the paper is to see how labor productivity growth, employment intensity, demographics and the sectoral pattern of growth can explain differences in poverty reduction and growth.

We follow the methodology used by Gutiérrez, Paci, Orecchia, and Serneels (2009), to profile growth in terms of its sector employment and productivity intensity, and use the decomposition components of per capita GDP growth to explain changes in poverty across states in India. We also look at the evolution of wages.

We find that (i) increases in long-term labor productivity are positively correlated with a decrease in poverty— i.e., a labor productivity increase within a sector is caused by movements to sectors with higher productivity that matter for poverty reduction; (ii) increases in labor productivity in the agriculture and commerce sectors is positively and robustly correlated with poverty reduction. Given that nearly half the labor force is employed in agriculture and that a shift of workers has taken place to the higher-productivity commerce sectors (trade, hospitality) sectors, it follows an increase in productivity in the latter sectors play a key role; (iii) the role of employment in the manufacturing sector in reducing poverty is not significant; (iv) an increase in per capita GDP has a robust and significant effect on headcount poverty changes; and (v) there is some evidence suggesting that the observed link between productivity and poverty has been mediated through the movement of casual workers from low-paying sectors to higher-paying sectors, and through channels other than an increase in wages.

Contents

Introduction

Although India has witnessed more than two decades of rapid growth of 6 per year since the mid-1980s, two concerns have persisted throughout this period. First, poverty reduction has been steady but muted in comparison to other high-growth countries such as China or Vietnam. Combined with considerable higher initial poverty levels and larger inequalities, this explains why, despite a markedly higher per capita income level, poverty rates in India remain much higher than in some East Asia countries, like Vietnam. Second, employment and wage growth has also been weak. In the 1990s there was widespread concern about "jobless" growth. While the growth of jobs post-2000 has allayed this concern, job growth has been partly offset by the deceleration in wage and earnings growth in the same period. Consequently, in the mid-2000s the number of working poor was estimated to have increased over the previous 5 years (Sundaram, 2007) and around a quarter of the labor force earned less than poverty-level wages. While intuition suggests that these issues— employment growth and poverty reduction— are closely linked, there has been little research in this area. This paper tries to fill this gap by studying the experience of a panel of Indian states for two decades. It decomposes GDP growth into key labor market characteristics to be able to separately measure their impact on poverty reduction.

The analysis suggests the concern with "jobless" growth to be somewhat misplaced as neither the employment intensity of growth nor the employment rate across states is found to be significant in reducing poverty. Rather, it is growth in labor productivity that has the largest impact. Productivity growth reduces poverty rates through two channels: (i) through increased returns to labor in agriculture, the sector that employs the largest number of workers; and (ii) through shift of employment away from agriculture to higher productivity sectors. However, contrary to the evidence from other countries, the sectoral shift in employment that is most critical for poverty reduction is not towards manufacturing but rather towards services in general and the transport and hospitality sector in particular.

This paper is organized as follows: section 1 provides the conceptual framework for our results; section 2 discusses the stylized facts; section 3 explains the methodology applied and the data used. Section 4 presents findings on the empirical relationship between aggregate employment intensity and poverty reduction. Section 5 analyzes the role of sectoral patterns of growth while section 6 explores different possible reasons why productivity-intensive growth may have been more effective in reducing poverty than a growth pattern. Section 7 presents the main conclusions of the study.

1 Conceptual Framework: Why Would the Sectoral Growth Pattern or Its Employment Profile Matter for Poverty?[1]

There is a growing body of literature that investigates specifically what factors—economic sectors, initial inequality or endowments, government interventions, the sectoral pattern of growth, to name a few— explain the effectiveness of growth in reducing poverty (see Gutiérrez et al. 2009 for a review).[2] To date,

[1] This section draws heavily from Gutiérrez et al. 2009.

[2] See, for example, Dollar and Kraay (2002), Kraay (2006), Ravallion (2005), Ravallion and Chen (2004), Ravallion and Datt (2002), Loayza and Raddatz (2006), and Bourguignon (2002).

an important number of papers have concentrated on the sectoral pattern of growth while others have concentrated on the relative role of employment and productivity in shared growth. The empirical evidence discussed above seems to suggest the sectoral pattern of growth as well as its employment and productivity profile matter for poverty alleviation. This finding should come as no surprise because the poor and the non-poor own factors in different proportions; as long as different growth patterns affect factor demands and factor returns differently, their impact on poverty is likely to differ. It is less clear from the evidence whether productivity growth or employment growth is more important for reducing poverty, and what are the sectors in which these have had the largest impact.

With some notable exceptions (Satchi and Temple, 2006, and Loayza and Raddatz, 2006), the available theoretical models yield little insight into these issues. In a simple competitive supply and demand framework, with no frictions or barriers to mobility, the economy is always at "full employment," and so there is no scope for "employment intensive growth." That is, there is no space for growth to modify the employment rate. However, although there would be no role for "employment-intensive growth," the sectoral pattern of growth would still matter: growth in one sector would raise the demand for labor and raise wages everywhere uniformly, but the amount of upward pressure exerted on wages would depend on the amount of labor demanded by the growing sector. More labor-intensive sectors would generate a higher demand for labor for each "unit" of growth (for example, a 1 percent growth in an employment-intensive sector would exert a higher pressure on wages than a 1 percent growth in a capital-intensive sector). Under perfect mobility and factor price equalization, growth in sectors such as agriculture (which is mostly labor-intensive in developing countries) would achieve a greater reduction in poverty than, for example, growth in high-tech manufacturing or utilities, which could be less labor-intensive.[3]

In models that do allow for friction and barriers to mobility (e.g., search and matching models), or in models of labor market segmentation, there *is* space for employment-intensive growth—that is, growth that is accompanied by increases in the employment rate. The theoretical literature on labor markets in developing countries stresses the duality and segmentation of these labor markets.[4] At the core of this model is the idea that there is a "bad jobs sector" and a "good jobs sector."[5] In the good jobs sector, productivity is higher and so wages are higher. In the bad jobs sector, productivity is relatively low and income from self-employment/wages is likewise low. Because productivity in the bad jobs sectors is low, households that earn a living in the bad jobs sector are more likely to be poorer than the rest. Jobs in the good jobs sectors are rationed because wages are institutionally set above the competitive market clearing level—minimum wages may exist, unions may bargain for higher wages, firms may set "efficiency wages", and so on. Movement between the bad jobs sector and the good jobs sector may be limited, and people queue for a good job. On top of the limited mobility created by institutionally set wages, there

[3] See Loayza and Raddatz (2006) for a model that deals with this mechanism.

[4] Labor market segmentation is now part of the standard labor economic textbooks (see, for example, Borjas [1996], Bosworth et al. [1996], and Layard, Nickel, and Jackson [1991]). The main reason is that it offers a better explanation for some empirical observations than the competitive model. An often-quoted example is the persistent existence of intra-industry wage differentials for observationally equivalent workers (Katz and Summers [1988]). For other contributions, see Dickens and Lang (1985), and Esfahani and Salehi-Isfahani (1989).

[5] The bad jobs sector is usually associated with the agricultural sector or the informal sector, while the good jobs sector is generally associated with the industrial or modern sector or the formal sector. We believe that these distinctions may be too simplistic, and that the division of the labor market between good and bad jobs goes beyond the formal/informal or agricultural/industrial divide.

may be geographic barriers to mobility. For example, many bad sector jobs are found in rural areas and migration to urban areas may be costly and risky, because of a lack of roads and little property rights enforcement on land for those who leave their land. Barriers to mobility may also result from discrimination and segregation, as good jobs may be given only to those of a certain ethnic group or a particular gender. Similarly, good jobs may be reserved for those with a specific education, so that the unskilled poor may be left out of the good jobs sector.[6] Besides being employed, agents may be in the non-employment state, either searching and queuing for a job or being out of the labor force. Movement between the bad jobs sector and the non-employment state may also be limited.

In such models the sectoral employment and productivity pattern of growth may play a crucial role in alleviating poverty. For example, if there are extensive barriers to mobility between sectors so that factor returns do not equate across sectors, then growth in the sectors where the poor are found may be more effective at moving people out of poverty than growth in the sectors to which the poor have limited mobility. If there are no extensive barriers to mobility, then, growth in the good jobs sectors may be more effective in pulling people into the higher-earning sectors and out of poverty. On the other hand, the distribution of the poor between the non-employment state and the bad jobs sector will determine whether cutting unemployment and raising participation rates or moving people out of the bad jobs sector will have a greater impact on poverty. It will also determine the trade-offs of different policies.

India's labor market shares many characteristics of segmented labor markets but in an accentuated form: there is a large share of workers in the informal sectors in subsistence agriculture or in low- productivity (and low-pay) employment. The urban labor market is highly segmented, displaying a concentration of firms in low-productivity, low capital-intensity production and high- productivity, capital-intensive production. In this setting, it is natural to think that the sectoral pattern of growth as well as its productivity and employment-intensity matter for poverty reduction. Understanding which factors are the drivers of poverty reduction in India is crucial not only for the formulation of policy but also because India is simultaneously one of the countries with the highest concentration of poor people and a country which has achieved a steady reduction in poverty— from 44 percent of the population to 28 percent of the population— in two decades.

2 Stylized facts of labor markets, growth and poverty in India

There are several stylized facts about labor markets, growth and poverty in India salient for this paper. First, with 454 million workers (2004/05), the Indian labor force is of continental proportions. Of these, the prime-age labor force (15 to 59 years) stood at about 413 million (see table 1.1), i.e., about 90 percent of the labor force. Outside the prime-age group, close to 9 million workers were children between the ages of 5 and 14. Another 33 million workers were older than 59 years, of which 28 million were working in rural areas.

Second, the Indian economy has grown at a robust average rate of close to 6 percent per year since the mid-1980s, and at more than 8 percent per year since 2004. The sectoral pattern of growth has been unusual in that the growth has been service sector- driven for most of this period. In recent years, growth in the manufacturing and agricultural sectors has also accelerated, but growth rates in the former have been led by capital- and skill-intensive sectors.

[6] For example, in several African economies, the best jobs are found in the public sector, and only the educated have access to these jobs. In Nicaragua, to be able to work in many of the *maquila* firms, a person is required to have completed secondary education.

Third, employment growth has been more uneven, showing a deceleration in employment growth rates between 1993 and 2000, and an acceleration since 2000. However, long-term job growth has been fairly constant at about 2 percent per year, or even slightly declining if only full-time "principal" workers are considered. Although job growth has accelerated since 2000, this has largely been due to an increase in the number of part-time or "subsidiary workers", i.e., workers who worked less than half the number of hours they had worked the preceding year.

Fourth, informality has persistently dominated the Indian labor market. The formal labor market employs between 7 percent of the work force (as per official definition) to about 16 percent of the work force, if the broader definition of salaried workers is used to measure the formal sector. These shares have remained remarkably unchanged, even in recent years. In fact, since 2000, while the share of casual workers has been falling, this drop was almost wholly offset by an increase in the share of self-employed workers. One by-product of the informal sector has been the segmentation and duality of labor markets—a formal sector characterized by relatively high wages and productivity, and an informal sector characterized by relatively low wages and productivity.

Fifth, the sectoral composition of employment, largely unaltered for nearly two decades, has changed perceptibly since the economic liberalization of 1993, and particularly since 2000. The share of the agricultural sector has declined, to the benefit of the services sector—especially the trade, transport, and construction subsectors. Most important, this change has bypassed the manufacturing sector.

Sixth, higher employment growth and the growing share of the services sector amid the persistent domination of the informal sector has translated into a significant softening of average and median real wage growth. Most strikingly, the wages of casual workers in urban areas have declined on average. Given labor is the principal asset of the poor, this factor is of much significance for the trends in poverty reduction.

Seventh, as noted earlier, poverty reduction has been steady but relatively muted in India. Overall, poverty headcount rates have declined from 44 percent in 1983, to 34 percent in 1993, and to 28 percent in 2004/05. The decline in the last period has thus been less than 1 percentage point per year, considerably less than the decline in poverty in China or Vietnam, and even less than in the slower growing and poorer economies of Bangladesh.

3 Methodology and Data

In this section the methodology and data used are described in more detail. We follow the methodology in Gutiérrez et al. (2009); which is outlined here for more clarity.

3.1 Profiling Growth: A Shapley Decomposition Approach

The first challenge in understanding how sectoral growth patterns, and their employment and productivity profile affect poverty is to find a suitable methodology to profile growth. Ideally, the methodology should be able to provide some measure of how employment-intensive or productivity-intensive a growth process is, and of the way in which this intensity is distributed across sectors of economic activity.

A simple way of understanding how growth is associated with increases in productivity and employment at the aggregate level and by sector is to perform a simple decomposition of per capita GDP growth into

three components: productivity changes, employment rate changes and demographic changes.[7] When doing so, it should be noted that GDP per capita, $Y/N=y$, can be expressed as:

$$\frac{Y}{N} = \frac{Y}{E}\frac{E}{A}\frac{A}{N}$$

Equation 1

Or $$y = \omega * e * a$$

where Y is value added, E is employment, A is the population of working age and N is the total population. The ratio $\omega=Y/E$ corresponds to output per worker, $e=E/A$ corresponds to the share of the working age population that is employed, and $a=A/N$ corresponds to the share of the population that is of working age, in other words, the ratio of working-age population to total population.

The decomposition can easily be extended to multiple sectors:

$$\frac{Y}{N} = \left(\sum_s \frac{Y_s}{E_s}\frac{E_s}{A} \right)\frac{A}{N}$$

Equation 2

or its equivalent:

$$y = \left(\sum_s \omega_s * e_s \right) * a$$

where the sub-index s stands for a specific sector of economic activity.

Our purpose is to describe growth (changes in value added per capita) through growth in each of its components, that is, through changes in ω, e, and a; and changes in the vectors of sectoral labor productivities ($\omega_1,\omega_2,\ldots,\omega_s$) and employment ($e_1$, e_2, $\ldots,e_s$). One suitable methodology is the Shapley

[7] We will depart from the most common measure of employment-intensive growth: the partial elasticity of employment with respect to growth $\partial E * Y / \partial Y * E$, which is obtained by regressing the log of aggregate employment against the log of total GDP, aggregate wages and other controls. This measure poses both conceptual and empirical difficulties. Conceptually, the employment elasticity of growth looks at changes in the *level* of employment, not at changes in employment rates. We believe that what matters for poverty reduction is not the absolute number of employed, but rather the number of employed relative to the labor force: positive employment elasticity might very well be consistent with growing unemployment rates. This is particularly important for developing countries, where population growth accounts for an important fraction of labor force growth. From an empirical point of view, the partial elasticity of employment with respect to growth poses two difficulties. Arriving at consistent estimates at the aggregate level is rather difficult (see Hammermesh 1986, 1993). But, perhaps most important for our purposes, rarely are there enough data available to adequately estimate the partial elasticity for a large number of countries.

decomposition approach,[8] which is based on the marginal effect of eliminating the change in each of the contributory factors in a sequence on the value of a variable or indicator. The method then assigns each factor the average of its marginal contribution in all possible elimination sequences (see Shorrocks, 1999). For example, in Equation 1, the amount of growth that can be attributed to changes in output per worker (ω) is obtained by calculating the resulting growth in per capita value added under the hypothetical scenario in which employment rates *(e)* and the share of the working age population *(a)* had remained constant, but output per worker had changed as observed. The difference between the resulting *hypothetical* growth and the *observed* growth is defined as the contribution of changes in output per worker to per capita value added growth. The Annex describes the decomposition in greater detail.

Shapley decompositions have the advantage of being additive. In other words, if $\bar{\omega}$, $\bar{e}$ and $\bar{a}$ are the marginal contribution of each component to the observed change in per capita value added, obtained through the Shapley decomposition, then:

$$\bar{\omega} + \bar{e} + \bar{a} = \frac{\Delta y}{y}.$$

Similarly, decomposing Equation 2 yields:

$$\sum_s \bar{\omega}_s + \sum_s \bar{e}_s + \bar{a} = \frac{\Delta y}{y}.$$

In this case, $\bar{e}$ represents the amount of growth that can be linked to changes in the employment rate, as measured by the ratio between total employment and the working age population. Although employment rates as defined by the ILO measure the population that "participates" in the labor market, in other words, is employed, throughout this paper the term "employment rate" will refer to employment as a fraction of the working-age population.[9] Increases in employment rates will thus reflect both increases in participation and movements of people out of unemployment and into employment. The term $\bar{\omega}$ captures changes in output per worker, but its interpretation is not so straightforward. Increases in output per worker have three different sources: (i) increases in the capital/labor ratio; (ii) increases in total factor productivity (TFP); and (iii) relocation of jobs from bad jobs sectors (low productivity) to good jobs sectors (high productivity). To see the first two sources, it should be noted that under constant returns to scale, if $Y_t=\Phi_t f(E_t,K_t)$, where K_t is the capital stock and Φ_t a technological parameter (which captures TFP growth), then output per worker $Y_t/E_t= \Phi_t f(1,K_t/E_t)$. Therefore, it captures changes in the capital/labor ratio and in TFP growth. It should be noted, however, that it may also capture cyclical behavior of output: firms operating in economic downturns may have underutilized capital; when the demand rises again, this will be reflected as a rise in output per worker. The third source is simply the result of workers moving from a low-productivity sector (or firm) to a high-productivity sector (or firm), so that, in the aggregate, average output per worker will rise. Throughout this paper we will refer to output per worker as productivity, under the understanding that it captures all of the above-mentioned factors.

[8] In the case of Equation 1, the easiest way would be to take logarithms and then changes. In the case of Equation 2, the summation term hampers this approach. Because of this, we opt instead for a unified approach that can be applied to both equations.

[9] In developing countries, particularly in low-income countries, measuring participation is extremely difficult. In many cases, unemployment is very low but the inactive include agents that are seasonally unemployed and large

The component $\bar{a}$ reflects changes in the demographic structure of the population. For example, despite rises in labor productivity and employment, countries with a rapidly rising young population may see a decline in per capita income if the employment and productivity growth is not sufficient to counter the growing dependency ratio. The same conclusion might apply to countries that have a rapidly aging population.

To differentiate sectoral employment and productivity intensity from aggregate intensities, we use sub-indexes. The term $\bar{e}_s$ denotes the amount of growth that can be linked to changes in the share of employment of sector *s*. The term $\bar{\omega}_s$ denotes the amount of growth that can be linked to productivity changes in sector *s*. Again, the productivity term captures TFP growth, changes in the capital/labor ratio and employment shifts within the sector.

Aggregate growth can also be profiled in terms of sectoral growth, without discriminating between productivity and employment. This is the approach followed by most papers that analyze the sectoral growth pattern. In this simple case, the Shapley decomposition boils down to aggregate growth just being the sum of growth in each sector multiplied by the (average) share of the sector in total value added. This decomposition can thus be expressed as:

$$\sum_s \bar{y}_s = \frac{\Delta y}{y}$$

And $\bar{y}_s$ is the amount of growth that can be attributed to value added growth in sector *s*.

Using the methodology described above, a growth episode can be profiled in three different ways by the vectors $(\bar{\omega},\bar{e},\bar{a}),(\bar{\omega}_1,\bar{\omega}_2,...,\bar{\omega}_S;\bar{e}_1,\bar{e}_2,...,\bar{e}_S;\bar{a})$ and $(\bar{y}_1,\bar{y}_2,...,\bar{y}_S)$. The first vector profiles growth according to aggregate productivity, employment and demographic changes. The second vector profiles growth according to changes in sectoral productivity, sectoral employment shares and aggregate demographic changes. The third vector profiles growth according to its sectoral pattern.

3.2 Exploring the Link between the Sectoral Growth pattern, its Productivity and Employment Intensity and its Poverty Reducing Impact

Once growth has been profiled, the second step is to link the profile of growth to poverty changes. A straightforward method for this would be to regress each of the components that profiles growth against percent changes in poverty. This would be the equivalent of regressing percent changes in poverty against aggregate growth (controlling for other factors), which is the route followed by the poverty-growth literature.[10] In this case, however, we have decomposed aggregate growth into different terms. To analyze whether poverty changes are correlated with the aggregate employment and productivity profile, we can estimate the following equation:

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numbers of discouraged workers. We believe that, in these cases, a better measure of the labor force is the working-age population rather than those actively participating in the labor market.

[10] It should be noted that most of the poverty-growth literature uses changes in mean survey income as a measure for growth. Instead we are concerned with growth in per capita value added.

$$\frac{\Delta P}{P} = \beta_0 + \beta_1 \bar{e} + \beta_2 \bar{\omega} + \beta_3 \bar{a}$$

Equation 3

If movements out of non-employment and into employment reduce poverty then we would expect the coefficient of $\bar{e}$ to be significantly and negatively correlated with changes in headcount poverty *P*. On the other hand, if the income of the poor rises because they change from low productivity jobs to high productivity jobs, or because their earnings are positively correlated with TFP or the capital/labor ratio, then the coefficient of $\bar{\omega}$ should be significantly and negatively correlated with changes in poverty. If increases in the fraction of the working population reduce poverty, then the coefficient of $\bar{a}$ should be significant and negative. Note that if $\beta_1 = \beta_2 = \beta_3$, then Equation 3 boils down to $\frac{\Delta P}{P} = \beta_0 + \beta_1 \frac{\Delta y}{y}$, and what matters would be overall growth rather than its profile.

To find out whether the sectoral growth pattern is correlated with changes in poverty, we estimate the following:

$$\frac{\Delta P}{P} = \beta_0 + \sum_{s=1}^{S} \beta_s \bar{y}_s$$

Equation 4

In this case, growth in a particular sector would decrease poverty if its coefficient is negative and significant. Finally, to estimate whether the sectoral productivity and employment profile of growth are correlated with changes in poverty, we estimate the following:

$$\frac{\Delta P}{P} = \beta_0 + \sum_{s=1}^{S} \beta_s \bar{e}_s + \sum_{s=1}^{S} \gamma_s \bar{\omega}_s$$

Equation 5

Interpretation of the coefficients is straightforward. As all variables are in percentage changes, the coefficients are the (partial) elasticity of poverty with respect to our measure of employment-intensive growth or productivity-intensive growth. Because of the way the decomposition has been performed, β_s indicates the percentage change in the headcount poverty ratio that is likely to accompany a 1 percent increase in our employment-intensive measure in sector *s*. Analogously, the coefficient γ_s indicates the percentage change in the headcount poverty ratio for a 1 percent growth in our measure of productivity-intensive growth in sector *s*.

3.3 The Data

To analyze whether employment matters for poverty reduction we make use of data at the state level on total and sectoral GDP, poverty, population and employment between 1983 and 2003, at 10-year intervals.

Table 1: Descriptive Data: Percent Changes in Main Variables

State	Spell	GDP per Capita	Output per Worker	Change in Employment rate	Working-Age to Total Population	Headcount Poverty	Gini Coefficient
Andhra Pradesh	83-93	55.15	43.23	20.38	8.33	-57.68	-3.77
Andhra Pradesh	93-03	63.09	57.73	19.63	5.67	-44.86	3.51
Assam	83-93	1.98	-6.41	53.74	8.43	5.18	-63.63
Assam	93-03	14.51	-0.72	41.54	1.08	-60.23	3.27
Bihar	83-93	20.95	18.80	10.36	9.37	-26.42	-57.49
Bihar	93-03	25.97	22.47	38.41	-2.32	-41.33	-9.51
Goa	83-93	137.83	123.04	-15.64	18.58	-49.82	-15.40
Goa	93-03	89.69	103.71	6.46	-7.13	-28.46	2.81
Gujarat	83-93	38.99	32.03	17.10	7.69	-56.50	-12.31
Gujarat	93-03	77.12	57.26	38.35	3.83	-49.17	14.81
Haryana	83-93	104.30	108.54	-14.96	5.10	-48.94	-9.56
Haryana	93-03	57.00	31.17	49.86	12.44	-57.29	7.31
Himachal Pradesh	83-93	37.50	30.06	27.28	8.39	5.89	13.86
Himachal Pradesh	93-03	55.39	45.42	29.74	6.38	-77.45	-10.15
Karnataka	83-93	61.20	49.88	16.22	9.67	-24.17	-24.32
Karnataka	93-03	75.74	52.46	35.12	9.85	-34.37	15.23
Kerala	83-93	66.54	54.57	9.99	9.46	-48.94	-38.76
Kerala	93-03	49.79	42.25	36.01	1.92	-48.37	11.95
Madhya Pradesh	83-93	35.01	35.14	18.49	7.65	-39.58	-5.17
Madhya Pradesh	93-03	25.65	15.00	39.86	1.86	-24.18	-2.23
Maharashtra	83-93	68.55	69.74	18.67	6.33	-35.69	1.67
Maharashtra	93-03	20.85	14.59	34.11	5.03	-21.93	1.08
Meghalaya	83-93	35.10	7.27	61.03	14.55	-44.94	-62.38
Orissa	83-93	19.07	13.97	22.25	6.98	-18.56	-4.22
Orissa	93-03	39.32	29.25	23.08	4.08	-11.27	3.27
Punjab	83-93	52.25	52.51	9.83	5.76	-61.48	-2.91
Punjab	93-03	27.22	21.88	31.64	5.23	-35.17	2.03
Rajasthan	83-93	38.53	34.98	13.10	5.55	-42.59	-21.08
Rajasthan	93-03	40.97	40.79	41.72	1.12	-30.87	-2.33
Tamil Nadu	83-93	59.21	47.67	22.83	7.34	-28.04	-13.49
Tamil Nadu	93-03	79.87	71.49	4.62	3.79	-46.67	3.11
Uttar Pradesh	83-93	23.96	20.06	24.80	3.89	-28.38	-18.35
Uttar Pradesh	93-03	24.15	24.34	28.85	1.07	-33.85	-8.17
West Bengal	83-93	41.03	31.54	22.37	4.48	-35.33	-26.84
West Bengal	93-03	73.86	64.64	28.71	7.13	-34.84	8.77
AVERAGE	**83-93**	**49.42**	**40.81**	**31.04**	**3.59**	**-40.02**	**2.63**
AVERAGE	**93-03**	**49.84**	**42.59**	**18.77**	**8.20**	**-35.33**	**-20.23**
AVERAGE	**83-03**	**49.64**	**41.72**	**24.73**	**5.96**	**-37.61**	**-9.13**

Data on poverty rates employment, working-age population, and earnings comes from three rounds of the National Sample Survey (NSS), corresponding to the years 1983 (round 38), 1993 (round 50), and 2003 (round 61).

Data on aggregate and sectoral GDP at the state level are drawn from official Central for Statistical Organization (CSO), Ministry of Statistics and Program Implementation sources. The CSO is responsible for estimating both national and state income accounts, and household surveys. The classification of sectors is consistent across both national accounts and household surveys, and follows the National Industrial Classification systems.

To profile growth in terms of employment and productivity by sectors, we construct long-term "growth spells." For each state, growth spells are constructed as the percentage change in value added per capita (VA) observed over a period of 10 years. For each growth spell in VA, the corresponding changes (for the exact same years) in employment to working-age population ratios (E/A, also named employment rate from now on) by sectors, value added per worker (Y/E) by sectors, and ratio of labor force to total population (A/N) are constructed. To link the profile of growth to poverty, the corresponding changes in the poverty headcount ratio are constructed. Most states experienced two growth spells, 1983–1993 and 1993–2003, but a few states did not experience the latest growth spell.[11] There are a total of 32 states and union territories in India; however, some states had to be dropped due to inconsistency in the data, leaving a total of 18 states,[12] which still account for the bulk of the work force. This, however, means that we have a total of 35 growth spells.

4 Employment Intensity and Poverty Reduction: a Weak Link

The role of employment intensity in over all changes in output per worker varies considerably across different Indian states. This is evident from Figure 1 where the bars show the relative contribution of changes in output per worker (Y/E), employment rates (E/A), and share of working-age population (A/N) for the 20 years spanned by the data. The figure shows that the major component of the change in output per worker (Y/N) was the growth in per worker value added in all states except Meghalaya. Employment changes and demographic changes played only a minor role suggesting that growth in India during these years was clearly due to a more productive workforce.

[11] Meghalaya, Mizoram, Sikkim, Tripura, A & N Islands, Chandigarh and Pondicherry data from round 61 were dropped because no information is available.

[12] Daman & Diu and Jammu & Kashmir were dropped because the number of regions within each of these states is not constant across time. Manipur, Nagaland, Dadra & Nagar Haveli and Lakshdweep were dropped because no consistent information about total population is available at the state level. Arunachal Pradesch was dropped because it shows abnormal growth rates. A & N Islands, Chandigarh, Delhi, Mizoran, Pondicherri, Sikkim were dropped because per capita GDP is not available for every year. Tripura was dropped because sectoral employment and value added breakouts are not available for round 38 and 50.

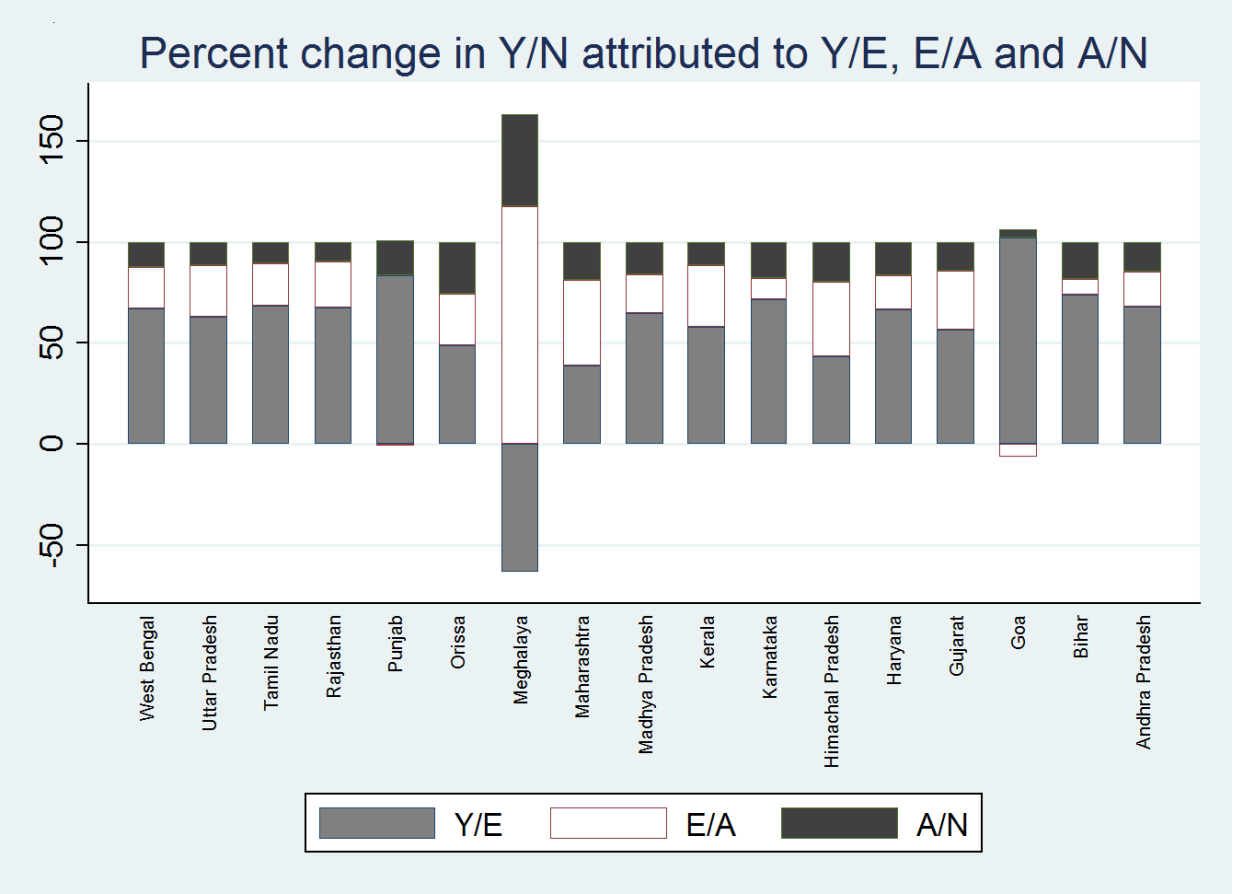

Figure 1: Aggregate Profile of Growth

Figure 2 illustrates the relationship between poverty changes, GDP changes and the aggregate profile of growth. Each data point represents a growth spell for a given state. What clearly stands out is the long-term relationship between productivity growth on the one hand, and per capita growth and poverty reduction on the other hand. The relationship between employment changes and demographic changes is less clear, and shows wider confidence intervals. Another finding that stands out is that higher employment rates are *not* associated with higher per capita GDP; in fact, if there is any relationship at all, it is negative. This result points to the fact that states that witnessed higher employment intensive growth, grew much less overall. In spite of this, they saw larger reductions in poverty, be it that the confidence intervals are quite large. Demographic changes have helped fuel per capita growth but have contributed little to poverty reduction.

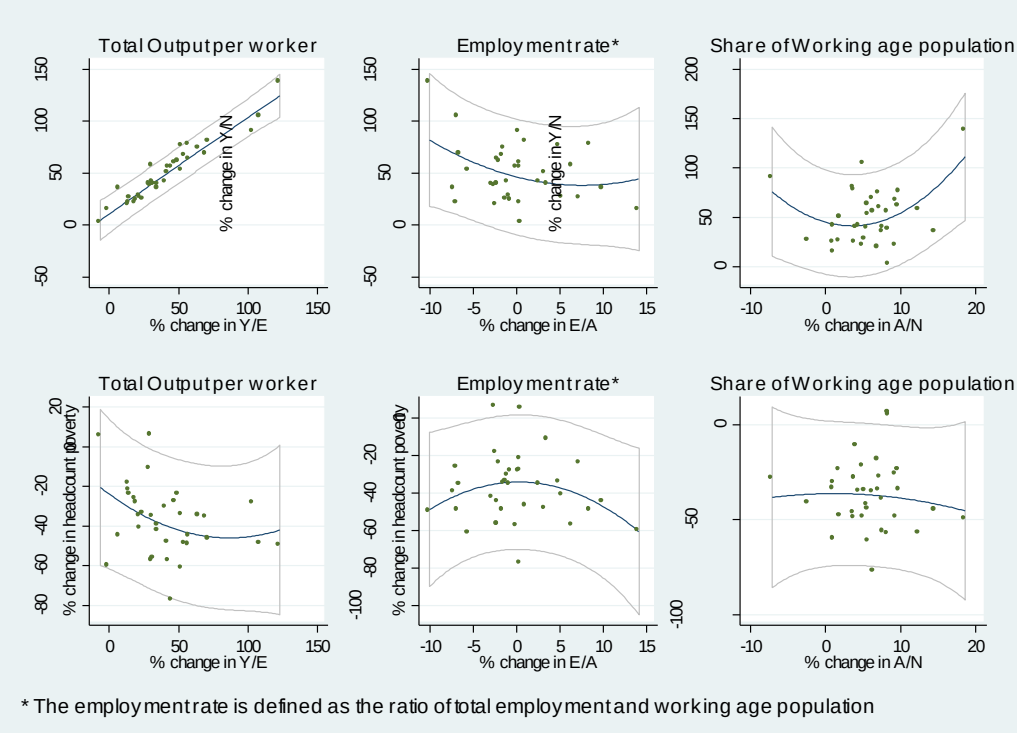

Figure 2: The profile of growth and changes in GDP per capita and poverty

A more rigorous investigation of the role of employment intensity in poverty reduction is obtained by equations 3 to 5, as described in section 3. This is done in differently stages. In the first instance we estimate the impact of overall growth on poverty changes. Next we estimate whether the overall employment or productivity intensity of growth matters for poverty reduction, by estimating equation 3. To analyze whether growth in some sectors is more conducive to poverty reduction than growth in other sectors, we estimate equation 4. Lastly, we estimate whether the sectoral pattern of employment and productivity growth matters for poverty reduction using equation 5.

Each growth spell spans 10 years. This means that the results are best interpreted as long-term relationships among the variables under study. Most states have two growth spells. We perform several specifications and control for initial levels of inequality (Gini Coefficient), poverty and GDP per capita, as well as changes in inequality. We also perform estimations excluding outliers to see whether the results are robust.

4.1 The Impact of Growth on Poverty

The results of the first estimation confirm earlier findings of a negative and significant effect on overall GDP growth on poverty which is robust to different specifications. However, the implied elasticity seems low compared with other results in the literature and compared to the results in the cross-country study (Gutiérrez et al. Op. Cit.). The results (shown in table 2) suggest a poverty elasticity of growth of around 0.2. As expected, positive changes in the Gini coefficient (higher inequality) increase the headcount poverty ratio, with an elasticity of 0.6, much higher than the one observed for GDP growth, and much

higher than the one observed across countries. This result highlights the role of income inequality in determining trends in poverty in India, during the past two decades.

Table 2: Changes in Poverty Level (%) and Overall Growth

	(1)	(2)
Change in per-capita value added Y/N (%)	**-0.226****	**-0.246****
	[0.102]	[0.111]
Gini at t=0		**1.533***
		[0.754]
Per-capita value added Y/N at t=0		-1.076
		[9.795]
Poverty at t=0		0.0001
		[0.003]
Change in Gini (%)		**0.63091***
		[0.370]
Constant	-0.263***	-0.739**
	[0.05814]	[0.281]
Observations	33	33
Adjusted R-squared	0.11	0.26
Standard errors in brackets		

* significant at 10%; ** significant at 5%; *** significant at 1%

4.2 The Overall Employment and Productivity Intensity of Growth and Poverty Reduction

Table 3 illustrates the result of estimating equation 4. Overall increases in productivity reduce poverty and the effect is robust across specifications. Overall, employment-intensive growth also reduces poverty, provided we control for initial levels of inequality and changes in the level of inequality. However, the results are not robust to different samples and are mostly driven by West Bengal. Nevertheless, the relevant coefficient is high, suggesting an elasticity of 0.7, much higher than that of any other component of per capita GDP growth, and than any elasticity found in the cross-country study.

It is important to remember that the employment rate is measured as the fraction of total working-age population that is employed. Therefore, increases in the employment rate reflect both decreases in unemployment and increases in participation. As unemployment rates in India did not register big changes, this means that the higher employment rate mainly reflects increases in participation rates (mostly among women). It is this increase in participation rates that is responsible for reducing poverty. On the other hand, an increase in productivity would be expected to reduce poverty if it translates into higher earnings for the poor, either through higher wages or more rewarding self-employment opportunities. The relationship between earnings and productivity will be explored further in this section.

Table 3: Changes in Poverty Level (%) and Employment/Productivity Intensity of Growth

	(1)	(2)
Working age-to-total population ratio A/N	-0.189	-0.819
	[0.482]	[0.584]
VA per worker Y/E	**-0.2575****	**-0.249***
	[0.116]	[0.136]
Employment rate E/A	-0.529	**-0.756***
	[0.341]	[0.393]
Gini at t=0		**2.072****
		[0.811]
Per-capita value added Y/N at t=0		-13.344
		[12.086]
Poverty at t=0		-0.003
		[0.003]
Change in Gini (%)		**0.787****
		[0.373]
Constant	**-0.224*****	**-0.576***
	[0.073]	[0.294]
Observations	33	33
Adjusted R-squared	0.07	0.12

Standard errors in brackets
* significant at 10%; ** significant at 5%; *** significant at 1%

5 The Role of Sectoral Patterns of Growth

To explore the impact of the sectoral pattern of growth on poverty reduction we estimate equation 4. We do so at nine and three sector breakdown. The results are shown in tables 4 and 5. Growth in agriculture, mining, manufacturing utilities and commerce all appear to reduce poverty in at least one specification, but only commerce is robust and statistically significant at 1 percent. It is worth highlighting that the implied elasticity is much larger and more in line with other results in the literature. A 1 percent growth in the commerce sector reduces the headcount poverty rate by 2–3%. A similar magnitude but of opposite sign is observed for community, social and personal services. If the nine sectors are aggregated into three broad industry sectors, only the tertiary sector turns out to be significant (see table 5).

To properly interpret these results, it is important to understand in which sectors the poor are concentrated. Given that nearly three quarters of the poor reside in rural areas, it is to be expected that increases in agricultural productivity and increases in productivity in rural, non-agricultural jobs in trade and commerce will significantly reduce poverty. Manufacturing growth has little impact on poverty, probably for two reasons: the share of manufacturing in employment is relatively small and most productivity growth in manufacturing has taken place in the high-end capital- and skill-intensive sectors (e.g. Kochaar, et. al.). What remains a puzzle is why growth in community and social services increase poverty. As this sector primarily reflects government activity, growth here may reflect the lack of growth in other sectors in the poorer states.

Table 4: Changes in Poverty Level (%) and Sectoral Pattern of Growth (nine-sector aggregation)

	(1)	(2)	(3)	(4)
	full sample	**no outliers**	**Full sample**	**no outliers**
Per-capita VA Agriculture	-0.580	-0.100	**-0.916****	-0.410
	[0.449]	[0.416]	[0.429]	[0.377]
Per-capita VA Mining	-2.068	**-3.402***	-2.110	-2.212
	[1.622]	[1.756]	[1.435]	[1.675]
Per-capita VA Manufacturing	-0.024	**-1.555***	0.531	-0.614
	[0.574]	[0.814]	[0.619]	[0.703]
Per-capita VA Utilities	-3.187	**6.660***	**-4.642****	2.593
	[2.382]	[3.329]	[2.204]	[2.830]
Per-capita VA Construction	-0.189	**3.350****	0.378	2.143*
	[1.273]	[1.442]	[1.100]	[1.214]
Per-capita VA Trade, Hotel & Restaurants	-1.451	-0.780	**-3.093*****	**-1.971****
	[0.981]	[0.930]	[0.940]	[0.877]
Per-capita VA Transport, Storage & Communication	0.054	-0.102	0.281	0.311
	[1.100]	[1.381]	[1.110]	[1.236]
Per-capita VA Financing, Insurance, Real Estate	-0.070	-0.070	-0.035	-0.128
& Business Services	[0.636]	[0.534]	[0.545]	[0.480]
Per-capita VA Community, Social and	1.917	-1.041	**2.600***	-1.219
Personal Services	[1.616]	[1.675]	[1.403]	[1.657]
Gini at t=0			**3.034*****	**2.682*****
			[0.834]	[0.756]
Per-capita value added Y/N at t=0			-9.405	**-30.684***
			[11.893]	[16.904]
Poverty at t=0			-0.001	-0.005
			[0.002]	[0.003]
Change in Gini (%)			**1.087****	**1.024****
			[0.391]	[0.450]
Constant	-0.288***	-0.288***	**-1.108*****	-0.619*
	[0.079]	[0.080]	[0.280]	[0.301]
Observations	35	28	35	28
Adjusted R-squared	0	0.28	0.3	0.56

Standard errors in brackets

* significant at 10%; ** significant at 5%; *** significant at 1%

Table 5: Changes in Poverty Level (%) and Sectoral Pattern of Growth (three-sector aggregation)

	(1)	(3)	(4)	(6)
	full sample	no outliers	full sample	no outliers
Per-capita VA Primary Sector	-0.245	-0.322	-0.284	-0.436
	[0.356]	[0.366]	[0.382]	[0.328]
Per-capita VA Secondary Sector	-0.204	-0.170	0.083	-0.046
	[0.326]	[0.459]	[0.394]	[0.429]
Per-capita VA Tertiary Sector	-0.254	-0.437	-0.514	**-0.881*** **
	[0.273]	[0.295]	[0.316]	[0.252]
Gini at t=0			**1.806** **	**3.074*** **
			[0.877]	[0.716]
Per-capita value added Y/N at t=0			-2.224	**-43.292*** **
			[11.184]	[12.476]
Poverty at t=0			0.000	-0.007**
			[0.003]	[0.002]
Change in Gini (%)			**0.769***	**1.366*** **
			[0.426]	[0.440]
Constant	-0.275***	-0.226***	-0.804**	-0.469**
	[0.063]	[0.066]	[0.296]	[0.222]
Observations	35	28	35	28
Adjusted R-squared	0.04	0.11	0.05	0.53

Standard errors in brackets

* significant at 10%; ** significant at 5%; *** significant at 1%

5.1.1 The Sectoral Patterns of Employment/Productivity Intensity Matters

The estimates of equation 5 including all the measures for employment intensity and productivity intensity for the nine sectors give very poor explanatory power (results not shown for brevity). This could be in part explained by possible collinearity between employment and productivity intensity that may mask the individual effects. In addition, the degrees of freedom are very limited due to the small number of observations in the data relative to the large number of explanatory variables required to estimate equation 5.

However, the estimates of the impact of sectoral patterns of employment intensity on poverty reduction presented in Table 6 suggest that employment intensity in manufacturing seems to reduce poverty, but the results are not robust to the exclusion of outliers. Moreover, the fit of the regression is very poor. When the results are aggregated into three broad sectors, employment intensity is not significant (not shown for brevity). In order to determine whether a different sectoral aggregation would yield better results, we tested for equality of coefficients. The results showed that the sectoral employment intensity of mining,

manufacturing, utilities and construction were statistically no different from each other, but subsectors within the service sector had markedly different effects. However, even using this aggregation, sectoral employment intensity did not appear significantly or robustly correlated with poverty reduction.

Table 6: Changes in Poverty Level (%) and Sectoral Employment Intensity (nine-sector aggregation)

	(1)	(2)	(3)	(4)
	full sample	no outliers	full sample	no outliers
Employment share in Agriculture	0.454	0.587	0.205	0.204
	[0.671]	[0.651]	[0.728]	[0.724]
Employment share in Mining	1.136	1.465	0.833	1.372
	[0.782]	[0.868]	[0.980]	[1.082]
Employment share in Manufacturing	**-1.625***	-1.398	-1.459	-0.216
	[0.866]	[1.064]	[1.049]	[1.369]
Employment share in Utilities	-0.354	0.799	-0.724	-0.656
	[0.533]	[3.113]	[0.761]	[3.406]
Employment share in Construction	1.371	0.115	1.887	0.980
	[1.651]	[1.978]	[1.949]	[2.150]
Employment share in Trade, Hotel & Restaurants	0.662	1.294	-0.941	-1.093
	[2.040]	[2.112]	[2.718]	[2.655]
Employment share in Transport, Storage & Communication	-1.394	-0.396	-0.755	-0.550
	[1.697]	[2.701]	[1.978]	[3.056]
Employment share in Financing, Insurance, Real Estate & Business Services	-0.075	-0.775	-0.544	-1.977
	[0.531]	[1.447]	[0.753]	[1.692]
Employment share in Community, Social and Personal Services	-0.450	-0.271	-1.110	-0.579
	[1.569]	[1.995]	[1.765]	[2.055]
Gini at t=0			1.484	**2.488***
			[1.098]	[1.403]
Per-capita value added Y/N at t=0			-10.543	-22.164
			[15.461]	[19.971]
Poverty at t=0			-0.002	-0.003
			[0.004]	[0.004]
Change in Gini (%)			0.660	1.135
			[0.511]	[0.742]
Constant	-0.381***	-0.340***	-0.655	-0.737
	[0.081]	[0.117]	[0.389]	[0.447]
Observations	35	28	35	28
Adjusted R-squared	-0.06	-0.03	-0.15	-0.07

Standard errors in brackets

* significant at 10%; ** significant at 5%; *** significant at 1%

We then proceeded to estimate the impact on poverty reduction of productivity-intensive growth in the different sectors. The results are shown in tables 7 and 8. At nine-sector disaggregation, we find that increases in productivity in the trade, hotels and restaurants sector is positively and robustly correlated with poverty reduction. The same holds true for agriculture, when we exclude outlier observations. At three-sector aggregation, on the other hand, only the tertiary sector is correlated with poverty reduction.

Table 7: Changes in Poverty Level (%) and Sectoral Productivity Intensity (nine-sector aggregation)

	(1)	(2)	(3)	(4)
	full sample	no outliers	full sample	no outliers
VA per worker in Agriculture	-0.337	**-0.525****	-0.271	**-0.407***
	[0.280]	[0.232]	[0.247]	[0.197]
VA per worker in Mining	-0.742	-0.567	-0.557	-0.670
	[0.588]	[0.531]	[0.606]	[0.517]
VA per worker in Manufacturing	-0.073	-0.926	-0.219	-0.849
	[0.508]	[0.744]	[0.530]	[0.534]
VA per worker in Utilities	-0.557	-0.501	0.164	-0.987
	[0.622]	[1.711]	[0.672]	[1.312]
VA per worker in Construction	1.316	**4.399*****	0.962	2.495*
	[1.528]	[1.512]	[1.403]	[1.238]
VA per worker in Trade, Hotel & Restaurants	-1.503	-0.664	**-3.283*****	**-2.937*****
	[1.007]	[0.857]	[1.035]	[0.843]
VA per worker in Transport, Storage & Communication	-0.026	-1.740	-0.354	-1.173
	[1.562]	[1.461]	[1.694]	[1.253]
VA per worker in Financing, Insurance, Real Estate & Business Services	-0.385	-0.319	0.039	0.710
	[0.398]	[0.640]	[0.448]	[0.597]
VA per worker in Community, Social and Personal Services	0.739	-0.196	1.912	0.968
	[1.193]	[1.089]	[1.156]	[1.045]
Gini at t=0			**3.087*****	**3.132*****
			[0.937]	[0.771]
Per-capita value added Y/N at t=0			-5.797	-8.149
			[12.966]	[14.732]
Poverty at t=0			0.001	-0.001
			[0.003]	[0.002]
Change in Gini (%)			**1.011****	**0.999****
			[0.439]	[0.428]
Constant	-0.329***	-0.153*	-1.345***	-1.101***
	[0.080]	[0.083]	[0.341]	[0.345]

Observations	35	28	35	28
Adjusted R-squared	-0.05	0.36	0.24	0.69

Standard errors in brackets

* significant at 10%; ** significant at 5%; *** significant at 1%

These results are consistent with the hypothesis that an increase in employment in manufacturing draws poor workers out of low-paying jobs into better paying jobs in manufacturing. However, the results can't be generalized to all states (as they are more driven by some outlier observations). However, increases in productivity in those sectors in which the poor might be concentrated (trade, hotel and restaurants; and agriculture) do have a significant poverty-reducing effect, the effect being stronger in the tertiary sector: an increase of 1 percent in the productivity-intensity of growth in the trade sector reduces the headcount poverty by between 2 and 4 percentage points. The effect of agricultural productivity-intensive growth in the agricultural sector is much smaller, be it still significant.

Table 8: Changes in Poverty Level (%) and Sectoral Productivity Intensity (three-sector aggregation)

	(1)	(3)	(4)	(6)
	full sample	no outliers	full sample	no outliers
VA per worker in Agriculture	-0.20721	-0.2896	-0.18646	-0.27986
	[0.25893]	[0.24407]	[0.26728]	[0.22317]
VA per worker in Secondary Sector	-0.10103	-0.05147	-0.06796	-0.24115
	[0.16826]	[0.34630]	[0.18864]	[0.38117]
VA per worker in Tertiary Sector	-0.23866	**-0.62939***	-0.35077	**-0.94160*****
	[0.25670]	[0.34547]	[0.29617]	[0.28551]
Gini at t=0			**1.45623***	**2.89572*****
			[0.82648]	[0.77677]
Per-capita value added Y/N at t=0			2.71797	**-43.40324*****
			[11.60372]	[12.96061]
Poverty at t=0			0.00163	**-0.00588***
			[0.00335]	[0.00301]
Change in Gini (%)			0.58957	**1.32213****
			[0.40493]	[0.48721]
Constant	-0.31621***	-0.24556***	-0.84529**	-0.50760*
	[0.05032]	[0.05436]	[0.30593]	[0.26331]
Observations	35	28	35	28
Adjusted R-squared	-0.01	0.13	-0.02	0.49

Standard errors in brackets

* significant at 10%; ** significant at 5%; *** significant at 1%

To wrap up the main findings, we observe that long-term increases in productivity are positively correlated with a decrease in poverty, whereas the employment to working-age population ratio shows a less clear-cut effect. The ratio of working age to total population does not show any significant correlation with changes in poverty.

Growth that is associate with growing productivity in agriculture and commerce sectors is positively correlated with poverty reduction, with changes in productivity in the trade, hotel and restaurants subsector as the most highly correlated. The role of manufacturing is less clear. Employment-intensive growth in this sector does seem to have a poverty- reducing effect, but the result is far from robust.

Most studies that analyze the relation between poverty growth and income inequality find a significant effect for both changes in, and initial levels of, income inequality and India is no exception. In fact, the results suggest that in India, reductions in inequality played a comparatively important role, as shown by an elasticity of between 1 and 3.

Further analysis to determine where the poor are employed and how they move may shed some light on these findings.

6 Why does productivity-intensive growth reduce poverty?

The most immediate hypothesis is that most of the poor can't afford to be unemployed or inactive, suggesting that most poor are employed. If this is true, the only way poor workers have to raise their standard of living is by increasing their earnings.

Theoretically there are many potential determinants of earnings, productivity being only one of them. For example, under competitive settings, the marginal product of labor is equal to the wage. Depending on the specific functional form the production function takes, there are other determinants. In the simplest case of a Cobb-Douglas production function, the wage is equal to the average product of labor (Y/L), which is what we can measure in the data, multiplied by the share of payments to labor from total profits. This share reflects technology, and has been shown to be relatively constant over time for developed countries, although it tends to decrease with development, as production becomes more capital-intensive. Using this very simple framework, wages would increase with productivity.

There are, of course, other settings. For example, in the case where the production function is not Cobb-Douglas or when there are multiple factors of production, determinants of wages are more complex and also depend on the price of other inputs, and the complementarity and substitutability among labor and other factors of production. In non-competitive settings, wages also depend on the bargaining power of workers and firms, and on labor turnover costs. In all these settings, the average product of labor is positively correlated with wages, all else being equal. Nevertheless, empirically, more productive countries tend to pay higher wages and, within a country, wages tend to rise with overall average product, particularly in the long run.

However, wages are not the only channel through which higher productivity can reduce poverty. In fact, most of the poor are not wage earners, but rather self-employed workers. Consequently, productivity would need to affect the earnings from self-employment. For example, if higher productivity is correlated with better markets, and financial and business services for the poor, the earnings for the self-employed may be enhanced. Changes in productivity can also affect relative prices, which may in turn favor the poor, if the goods they consume get cheaper relative to the goods they produce.

In what follows we describe the relationship between wages and productivity in India. Figure 3 illustrates the relation between the daily wage and the level of output per worker and figure 4 illustrates the relationship between the changes in the logarithm of these variables. While states with higher output per worker tend to pay higher wages—both for salaried and casual workers—*changes* in output per worker have not been reflected in *proportional* changes in wages. The relationship for salaried workers is almost null, while for casual workers it is slightly positive. A similar result is obtained for total earnings rather than wages. It is important to note, however, that wages did increase during the two decades studied, at a rate of 1–3 percent per decade for all states. The results suggest that productivity growth may have reduced poverty via an increase in the casual workers' wages, but not through higher wages for the non-casual workers.

When we analyze the results by sectors (figure 5), we find that within industries the relationship between productivity and wages is almost null, both for casual and salaried workers. The fact that for casual workers, the relationship is positive in the aggregate , but almost null within sectors , means that any gain in average wages in the economy for these workers had to have been achieved by movements of labor from low-wage (and low-productivity) sectors to high-wage (and high-productivity) sectors. We can also see that wages increased much more than productivity, thus clearly other forces were pushing wages up.

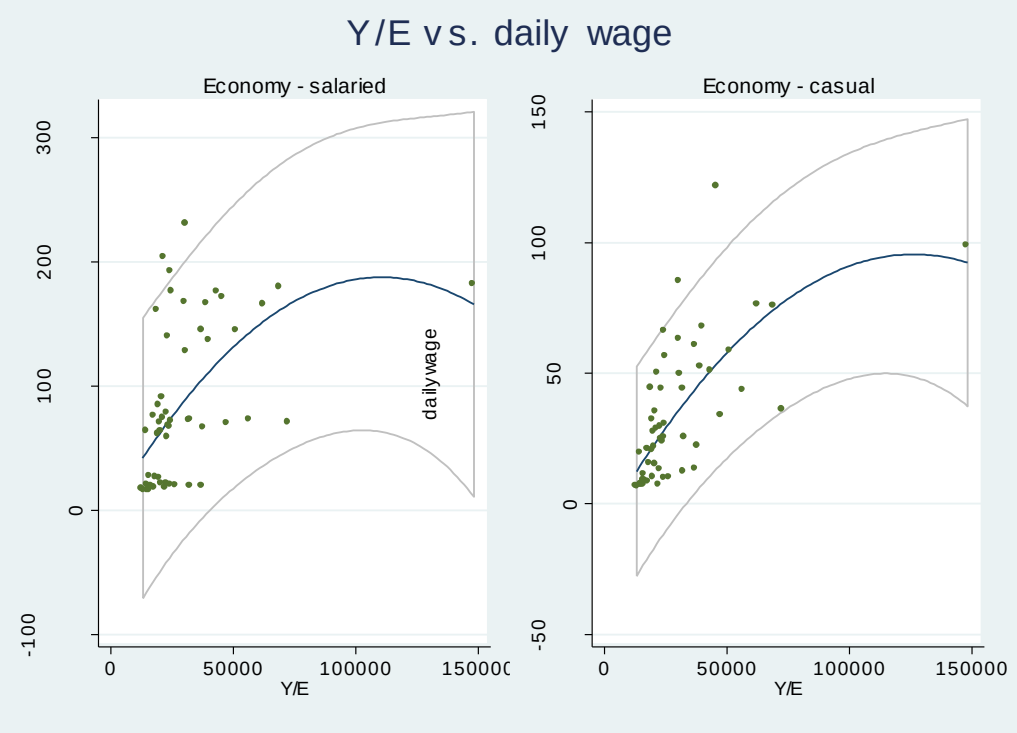

Figure 3: Level of Daily Wages versus Output per Worker – All Economy

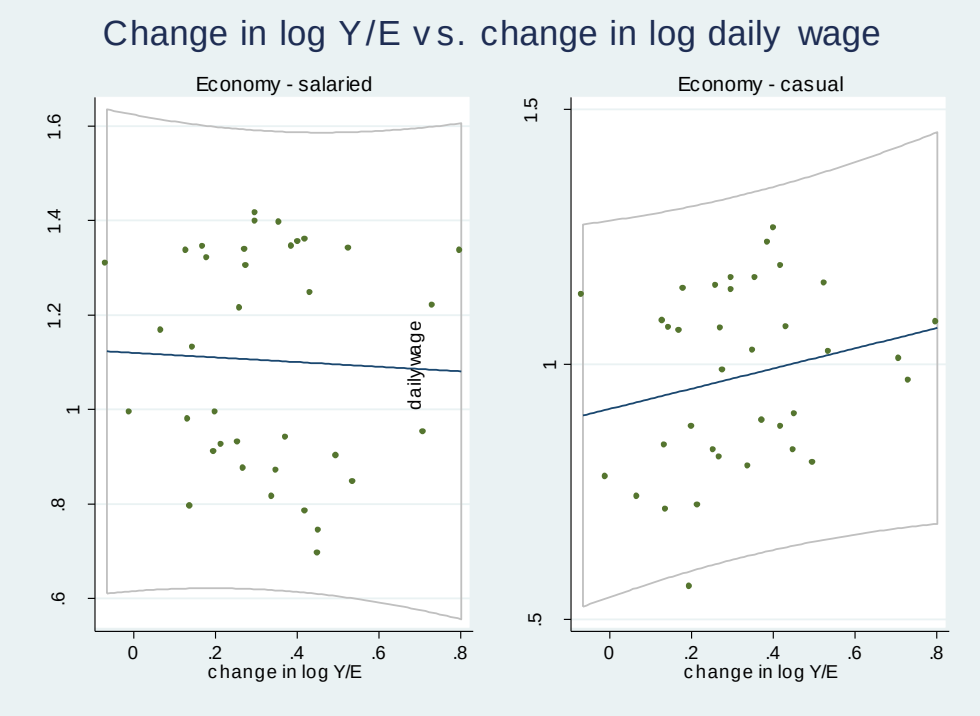

Figure 4: Log-Daily Wages versus Changes in Log-Output per Worker – All Economy

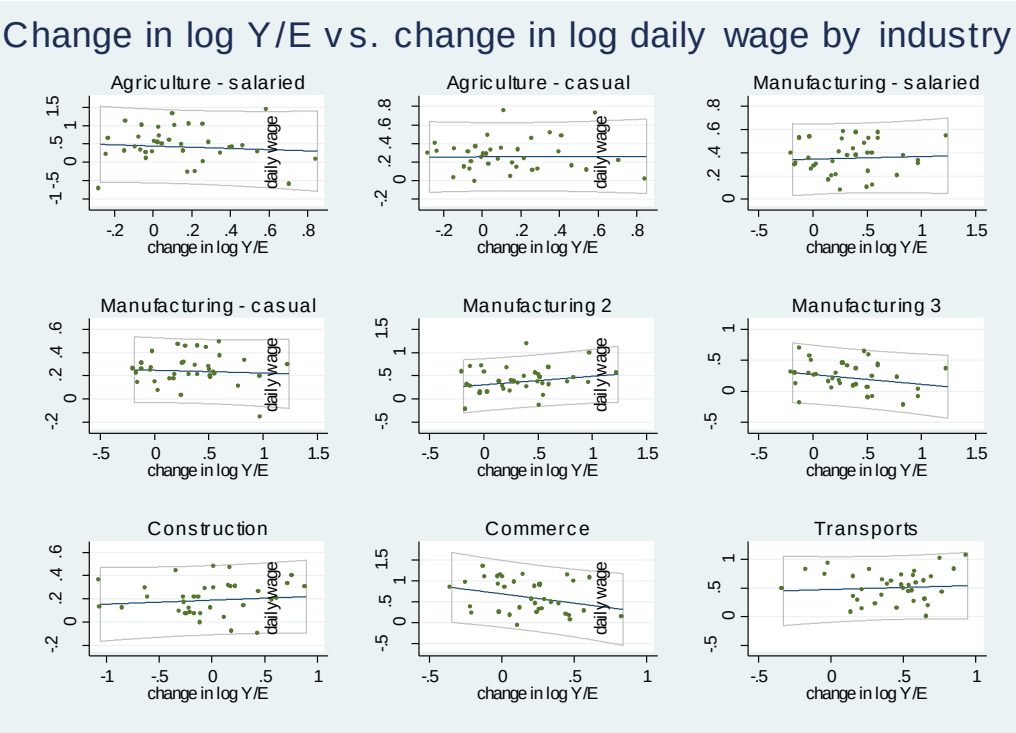

Figure 5: Log-Daily Wages versus Changes in Log-Output per Worker, by sector

In summary, although more productive sectors pay higher wages, changes in productivity and wages are weakly related during the decade covered by this analysis. A positive relation is only observed for casual

workers, and then only in the aggregate. If the increase in wages was achieved thanks to higher productivity, it was through movements of casual labor from low- to high-productivity work, rather than through increases in productivity within sectors.

The positive relationship observed between productivity-intensive growth and poverty could have been due to movement of casual workers from low-paying sectors to higher-paying sectors. Other channels, such as higher income from self-employment and redistributive fiscal policy, could also have played a role, but there is no direct evidence on earnings among self-employed workers, and analyzing those factors is beyond the scope of this paper.

7 Conclusions

In this paper we looked at long-term links between poverty reduction and trends in labor markets using state-level data for India's major states, for the two decades spanning 1983 to 2003. The aim was to see how labor productivity growth, employment intensity, demographics and the sectoral pattern of growth can explain differences in poverty reduction and growth.

Our main conclusion is that long-term labor productivity increases are positively correlated with a decrease in poverty— i.e., labor productivity increases within a sector or workers moving to sectors with higher productivity are factors that contribute to poverty reduction. In particular, we find that labor productivity growth in agriculture and in commerce is positively and robustly correlated with poverty reduction. Given that nearly half the labor force is employed in agriculture and that workers have shifted into the higher- productivity commerce (trade, hospitality) sectors, it follows an increase in productivity of the latter sectors has played a key role.

A noteworthy finding is that the role of manufacturing-sector employment in reducing poverty has not been significant during the past two decades. First, most manufacturing jobs are found in the informal, low-productivity sector, because there is a sharp duality in manufacturing, while most productivity growth in manufacturing has taken place in the high-end capital- and skill-intensive sectors. Second, the share of manufacturing is simply not very large. These factors have limited the role that the manufacturing sector could have played in poverty reduction. These findings do not prevent manufacturing from playing a major role in India future development and poverty reduction if, for example, there will be an increase in the manufacturing "upper-tier" employment share and in its productivity.

Finally, we find that a per capita GDP increase has a robust and significant effect on headcount poverty changes. There is some evidence suggesting that the observed link between productivity growth and poverty reduction has been mediated through the movement of casual workers from low-paying sectors to higher-paying sectors, and through channels other than an increase in wages. This finding is consistent with the evidence that suggests a softening of the growth in wages between 1993 and 2004.

Bibliography

Agenor, Pierre-Richard (2004). "The Macroeconomics of Poverty Reduction,"

Discussion Paper Series No 043, September 2004. Centre for Growth and Business Cycle Research, Economics, University of Manchester, Manchester, M13 9PL, UK.

Arias, Omar; Blom, Andreas; Bosch, Mariano; Cunningham, Wendy; Fiszbein, Ariel; López Acevedo, Gladys; Maloney, William; Saavedra, Jaime; Sánchez-Páramo,Carolina; Santamaría, Mauricio; and Siga, Lucas (2005). "Pending Issues in Protection, Productivity Growth, and Poverty Reduction." Policy Research Working Paper 3799, World Bank,Washington D.C.

Basu, K. (1997). *Analytical Development Economics*. Cambridge, MA: MIT Press.

Bentolila, Samual; and Revenega, Ana. (1995). "What Determines the Employment Intensity of Growth" Banco de España Working Papers 9517.

Besley, Timothy, and Burgess, Robin (2004). "Can Labor Regulation Hinder Economic Performance? Evidence from India," *Quarterly Journal of Economics*, 119 (1): 91-132.

Bibi, Sami (2005). "When Is Economic Growth Pro-Poor? Evidence from Tunisia," Cahier de recherche/Working Paper 05-22, CIRPEE.

Borjas, G. J. (1996). *Labor Economics*. New York: McGraw-Hill.

Bosworth, D., Dawkins, P., and Stromback, T. (1996). *The Economics of the Labor Market*. Essex, England: Addison Wesley Longman, Ltd.

Bourguignon, François (2002). "The Growth Elasticity of Poverty Reduction: Explaining Heterogeneity across Countries and Time Periods," DELTA Working Papers No.2002-03.

Contreras, Dante (2001). "Economic Growth and Poverty Reduction by Region: Chile 1990-96," *Development Policy Review*, 19(3), pp. 291-302.

Coxhead, Ian, and Warr, Peter G. (1995) "Does Technical Progress in Agriculture Alleviate Poverty? A Philippine Case Study," *Australian Journal of Agricultural Economics*, 39(1), pp. 25-54.

Datt, Gaurav, and Ravallion, Martin (1998). "Farm Productivity and Rural Poverty in India," *Journal of Development Studies*, No 24(4): 62-85.

Dickens, W. T., and Lang, K. (1985). "Testing Dual Labor Market Theory: Reconsideration of the Evidence," Working Paper Series No. 1670, 127. Cambridge, MA: National Bureau of Economic Research, Inc.

Dollar, David, and Kraay, Aart (2002). "Growth Is Good for the Poor," *Journal of Economic Growth*, 7(3): 195-225.

Dollar, David, Hallward-Driemeier, Mary, and Mengistae, Taye (2003). *"Investment Climate and Firm Performance in Developing Economies."* Washington, D.C.: World Bank.

Esfahani, H. S., and Salehi-Isfahani, D. (1989). "Effort Observability and Worker Productivity: Towards an Explanation of Economic Dualism," *The Economic Journal 99*: 818-36.

Fane, Ge., and Warr, P. (2002). "How Economic Growth Reduces Poverty," WIDER Discussion Paper No. 2002/19, United Nations University Centre 53-70, Jingumae 5-chome, Shibuya-ku, Tokyo, Japan.

Gutiérrez, Catalina; Orechia Carlo, Paci Pierella, and Sernnels, Pieter (2009), Does Employment Generation Really Matter for Poverty Reduction? In Kanbur, R and J Svejnar, *Labor Markets and Economic Development*, Routledge.

Hamermesh, D. (1986). "The Demand for Labor in the Long Run," *Handbook of Labor Economics*, ed. O. Ashenfelter and R. Layard, I: 429-71. Amsterdam, Netherlands: Elsevier Science Publisher.

Hamermesh,D. (1993). *Labor Demand*. Princeton, NJ: Princeton University Press.

Heckman, James, and Pages, Carmen (2003). "Law and Employment: Lessons from Latin America and the Caribbean," NBER Working Papers 10129, Cambridge MA: National Bureau of Economic Research, Inc.

Islam, Rizwanul (2004). "The Nexus of Economic Growth, Employment and Poverty Reduction: An Empirical Analysis," Issues in Employment and Poverty Discussion Paper 14, January 2004. International Labour Office, Geneva.

Kakwani, Nanak, Neri, Marcelo, and Son Hyun H. (2006). "Linkages between Pro-poor Growth, Social Programmes and Labour Market: The Recent Brazilian Experience, Working paper No. 26, UNDP International Poverty Center, Brazil.

Katz, L. F., and Summers, L.H. (1988). "Can Inter-Industry Wage Differentials Justify Strategic Trade Policy?" Working Paper Series No. 2739. Cambridge, MA: National Bureau of Economic Research, Inc.

Kaufmann, Daniel, Kraay, Aart, and Zoido-Lobat�n, Pablo (1999). "Governance Matters," World Bank Policy Research Working Paper 2196, October 1999, Washington, D.C.: World Bank

Kraay, Aart (2006). "When Is Growth Pro-poor? Evidence from a Panel of Countries," Journal of Development Economics, No. 80(1): 198-227.

Layard, P. R. G., Nickell, S.J., and Jackson R. (1991). *Unemployment: Macroeconomic Performance and the Labour Market.* Oxford, England, and New York: Oxford University Press.

Loayza, Norman, and Raddatz, Claudio (2006). "The Composition of Growth Matters for Poverty Alleviation," mimeo, Washington, D.C.: World Bank.

Lustig, Nora C., and McLeod, Darryl. (1997). "Minimum Wages and Poverty in Developing Countries: Some Empirical Evidence" in Labor Markets in Latin America, ed. Edwards and Lustig. Washington D.C.: Brookings Institution Press.

López, J. Humberto (2004). "Pro-Growth, Pro-Poor: Is There a Tradeoff,?" Policy Research Paper No. 3378. Washington, D.C.: World Bank.

Menezes-Filho, Naercio, and Vasconcellos, Ligia (2004). "Operationalizing Pro-Poor Growth: A Country Study for Brazil." Background Paper in the Operationalizing Pro-Poor Growth Program Series by Agence Française pour le Développement, Bundesministerium für Wirtschaftlieche Zusammenarbeit. U.K. Department for International Development and the World Bank, Washington D.C.

Muller, Adrian (2005). "Clarifying Poverty Decompositions," Unpublished.

Prasada Rao, D.S, Colleli, Timothy J., and Alauddin, Mohammad (2004). "Agricultural Productivity Growth and Poverty in Developing Countries, 1970-2000." Employment Strategy Papers No. 2004/9, Employment Trends Department, ILO, Geneva.

Rama, Martin, and Artecona, Raquel (2002). "A Database for Labor Market Indicators Across Countries, mimeo, Washington, D.C.: World Bank, June 2002.

Ravallion, Martin (2005). "Inequality Is Good for the Poor" Policy Research Working Paper 3377. Washington D.C.: World Bank.

Ravallion, Martin, and Datt, Gaurav (2002). "Why Has Economic Growth Been More Pro-Poor in Some States of India than Others?" *Journal of Development Economics*: 381-400.

Ravallion, Martin, and Chen Shaohua (2004). "China's (Uneven) Progress Against Poverty." Policy Research Paper No. 3408, Washington, D.C.: World Bank.

Revenga, Ana L., and Bentolila, Samuel A. (1995). "What Affects the Employment Rate Intensity of Growth?" Banco de España Working Papers 9517.

Satchi, M., and Temple, J. (2006). Growth and Labor Markets in Developing Countries. Department of Economics, University of Bristol Discussion Papers. Bristol, U.K.

Shorrocks, Anthony F. (1999). "Decomposition Procedures for Distributional Analysis: A Unified Framework Based on the Shapley Value," mimeo, University of Essex,U.K.

Sinnott, Emily, and López, Humberto (2003). "Pro Poor Growth Database: Mimeo,Washington, D.C.: World Bank 2003.

Winters, L Alan (2000). "Trade, Trade policy and Poverty; What are the Links?" Prepared for the World Bank's World Development Report 2000/1, mimeo.

World Bank (2005). "Pro-Poor Growth in the 1990's: Lessons and Insights from 14 Countries". Agence Française pour le Développement, Bundesministerium für

Wirtschaftlieche Zusammenarbeit, U.K. Department for International Development and the World Bank, Washington D.C.

World Bank (2007a). "A la Recherche de l'Emploi Le Chemin vers la Prospérité Senegal," Country Economic Memorandum, Washington, D.C.: World Bank.

World Bank (2007b) "The Role of Employment and Earnings for Shared Growth: The Case of Ghana, mimeo, Washington D.C.: World Bank.

World Bank (2007c) "The Role of Employment and Earnings for Shared Growth: The Case of Madagascar, mimeo, Washington D.C.: World Bank.