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Why is Maharashtra's Average Income Five Times that of Bihar?

Income gaps among Indian states are large, persistent and increasing over time. Differences in technology and efficiency in production processes have been found to be the primary explanation for income gaps across countries. Does the same apply to Indian states? This column attempts to answer this question, with a particular focus on Bihar – the state with the lowest average income in the country.

Bihar's Net Domestic Product (NDP)[1] per person in 2010-2011 was the lowest among all states – about 40% of the national level, and about one fifth of Maharashtra[2]. In the early sixties, Bihar's output per capita was about 60% of the national level. Figure 1 shows that by the end of the nineties and early 2000s, the state had fallen behind even further relative to the rest of the country. Since then, Bihar by all accounts has experienced a mini miracle, recording some of the fastest growth rates in the country. Nevertheless, the overall picture remains one of relative backwardness. Bihar is not unique in this respect. Income gaps among Indian states have not only been persistent but have also increased over time. A large body of research has repeatedly reinforced these results (Kumar and Subramanian 2011).

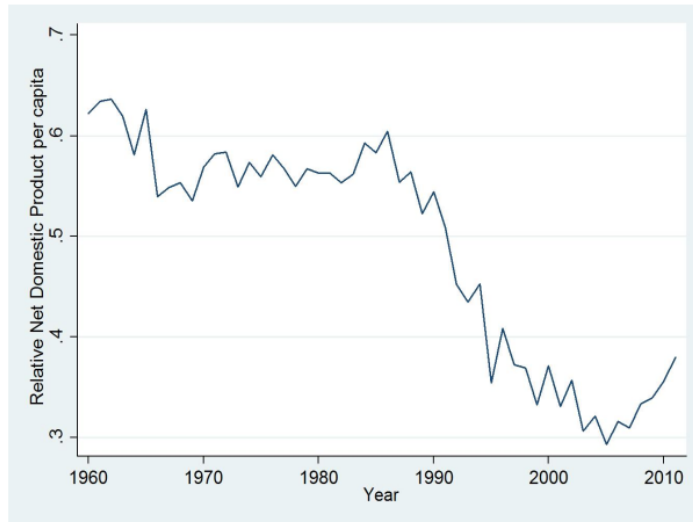
Income gaps across Indian states

In this column, I re-examine these large persistent gaps through the lens of 'Development Accounting' – an approach that has become increasingly popular in diagnosing the sources of long-run differences in incomes across countries. More specifically, we look at differences in labour productivity measured by NDP per worker[3]. Standard economic theory tells us that labour productivity can be divided into two main components – factors of production such as physical capital and human capital (objects), and technology or efficiency (ideas) with which these factors of production are combined to produce the good or service. The latter component is also often referred to as 'Total Factor Productivity' or TFP. Development Accounting exercises generally tend to quantify the relative importance of the factors of production vis-à-vis TFP in explaining the variations in incomes across countries[4].

With respect to comparisons across countries, this body of research currently concludes that it is TFP which matters more in explaining labour productivity differences rather than factors of production. Is this also true at the state level in India, and if so, how does Bihar fare relative to other states? What are some of the sources of these differences that might be relevant for Bihar – are they inter-sectoral imbalances (dualism in

Bihar – are they inter-sectoral imbalances (quasi in agriculture versus industry) or institutional and policy factors (financial market development, or the lack thereof, land reforms, labour market regulations etc.)? I take a first pass at answering some of these questions. Additionally, I briefly discuss some of the developments in this line of research that might be fruitfully applied by economists who are interested in understanding regional differences in India.

Figure 1. Net Domestic Product (NDP) per person: Bihar relative to India (1960-2011)



Factors of production versus Total Factor Productivity

In addition to the lowest NDP per person, Bihar also has the lowest labour productivity. The gaps in the latter are somewhat smaller though still sizeable – Bihar's labour productivity is half and one-third of that of India and Maharashtra respectively. Using techniques common to Development Accounting, I calculate that differences in TFP account for 75% of the variation in output per worker across states, with physical capital and human capital per worker explaining the remaining 25% (Chanda 2011).

Figure 2. Total Factor Productivity and Net State Domestic Product (NSDP) per worker, 2009-2010

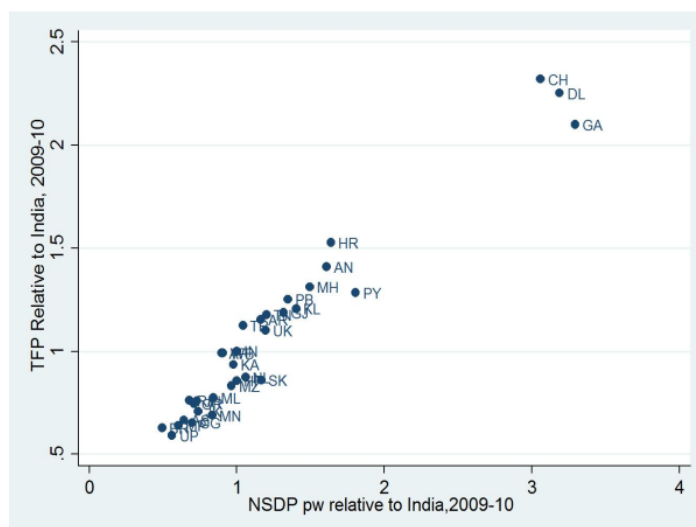


Figure 3. Factors of production and Net State Domestic Product (NSDP) per worker, 2009-2010

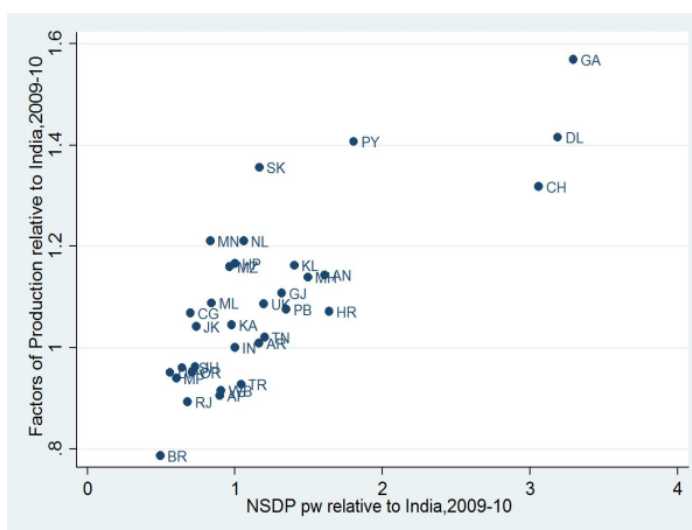


Figure 2 plots the TFP of each state against labour productivity while Figure 3 plots the combined value for physical and human capital against labour productivity. While both TFP and Factors of production are strongly associated with productivity, the tighter association between TFP and productivity is fairly obvious. How does this compare to the variation across countries? Using 2005 data, Chanda and Farkas (2012) found that almost 70% of the differences in labour productivity across countries was due to TFP. Thus, the variation across states in India is similar to that across countries in the world. This is in contrast to the recent findings of Gennaioli et al (2013) who examine regional differences across 110 countries, including India, and find that human capital differences plays a predominant role in regional productivity differences.

Is low Total Factor Productivity a sign of low agricultural productivity?

In both academic and policy circles, low agricultural productivity has often been blamed for the large income differences among states. This focus is not unwarranted. Even in a state like Bihar with low total labour productivity, agricultural productivity is even lower (one-third of total labour productivity), while the sector employs about 60% of the total labour force. To gauge the importance of dual economies in explaining TFP differences across states, we adopt a methodology proposed by Chanda and Dalgaard (2008)[5]. It is found that 40% of the differences in total factor productivity across states can be attributed to low TFP in agriculture. Combined with the earlier result that TFP differences account for 75% of output per worker variation, this means that low relative agricultural productivity can explain about 30% of the differences in the overall productivity across states. Thus, while 30% is a large number, the flip side is that as much as 70% of the differences are not due to inefficiencies in the agricultural sector.

However, the existence of a large inefficient agricultural sector does not necessarily imply that the problem is within agriculture.

does not necessarily imply that the problem is within agriculture itself. Distortions that result in low overall TFP for the state can cause dualism. For example, a distortion in financial markets that makes it difficult to obtain loans, can create a small but productive industrial sector, while forcing a large section of the labour force to remain employed in the unproductive agricultural sector[6]. Similarly, a more aggregate variable like property rights enforcement can allow dualism to persist – the absence of property rights discourages industry and thus forces labourers to stay on in an unproductive agricultural sector.

When discussing low agricultural productivity in India, one cannot ignore the influence of land reforms. One of the most widely cited research on land reforms and poverty in India is Besley and Burgess (2000). According to their study, by 1992, Bihar ranked 4th in terms of the number of land reforms enacted (Bengal ranked first). However, the study documents actual laws that were enacted as opposed to their implementation. Rouyer (1994) notes that Bihar was the first state in India to enact land reforms (in 1950) but was the least successful in implementing reforms. He argues that this was because, following independence in 1947, a political leadership emerged that had vested interests in maintaining the zamindari system that was formalised and reinforced by colonial institutions such as the Act of Permanent Settlement in 1793.

Non-agricultural sources of differences in Total Factor Productivity

An extensive research body has emerged that evaluates the quantitative impact of policies and distortions that can cause aggregate TFP to be lower due to a misallocation of resources across firms and industries. In the case of Indian states, some obvious candidates would be the lack of financial market development, labour regulations, etc. Conway and Herd (2008) also ranked states according to two barriers to entrepreneurship – the extent of government control and the degree of product market regulations. Relative to the rest of the country, Bihar does particularly poorly in terms of financial market development where it is only better than the north-east states. However, in terms of state control over markets or barriers to entrepreneurship, Bihar is average. With respect to labour laws, Bihar ranks neutral.

Another approach which has become increasingly popular is the indirect approach. Instead of honing in on a specific channel, the researcher incorporates taxes on product prices, labour and capital in the analysis, to capture the extent of misallocation in the economy[7]. For example, Hsieh and Klenow (2009), note that such distortions lowered efficiency in Indian formal manufacturing by about 40-60% relative to the US during 1987-1994. Chatterjee (2011) extends the framework to include informal firms and also the misallocation of intermediate goods in Indian manufacturing. She notes that eliminating such distortions could increase productivity by as much as 111%.

To what extent do these misallocations vary across states? Have states that have been pro-industry over the past decade shown reductions in the extent of these misallocations? Have firms in pro-reform states experienced greater reductions compared to

protection states experienced greater reductions compared to other states? These are the subject of some ongoing research that Chatterjee and I are currently undertaking.

Role of labour and capital mobility

Over the period 1999-2000 to 2007-2008, the fraction of the population that migrated out of Bihar increased from 3% to 12%. While Bihar had the highest fraction of emigrants in the country, Orissa and Uttar Pradesh (UP) also experienced large increases in emigration. Associated with these large migrations was an equally large inflow of remittances. Remittances constituted 6% of the State Domestic Product (SDP), second only to Kerala. While Bihar's recent turnaround has been attributed to improving law and order, it is quite possible that high remittances may have at least partly fueled a consumption boom and led to service sector growth. More generally, the role of both labour and capital mobility needs to be factored in when thinking about regional differences.

This column summarises themes from the IGC-Bihar funded project “_____

_____” Results discussed here reflect updated statistics.

Notes:

1. The Net Domestic Product (NDP) equals the Gross Domestic Product (GDP) minus depreciation on a country's capital goods. GDP is the market value of all final goods and services produced within a country in a given period of time.
2. Bihar's NDP per person was approximately INR 13,000 in 2010-2011. The national figure for the year was INR 38,000 and the figure for Maharashtra was INR 63,000. Maharashtra had the highest value among large states.
3. We look at NDP per worker and not NDP per person since not every person in the state is engaged in production.
4. For a recent survey of advances in Development Accounting and the major research questions, see Hsieh and Klenow (2010).
5. This refers to the existence of two separate economic sectors within one country, divided by different levels of development, technology, and different patterns of demand.
6. Calibrated general equilibrium models can serve a useful purpose in disentangling these effects. For example, Gollin, Parente and Rogerson (2004) construct a model along these lines to explain the existence of a large unproductive agricultural sector despite free labour movements between agriculture and industry.
7. See Restuccia and Rogerson (2013) for an excellent survey on these issues.

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