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India’s Curious Case of Economic Divergence

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Abstract

Economic theory suggests that we should observe convergence in income per capita among countries or within regions in a large federal country. While there is considerable evidence of convergence among the advanced economies, and of convergence within subnational regions of major economies such as the US, India is the one major economy bucking the trend, with a tendency toward divergence in income per capita among major states.

We report three major findings. 1: Levels of income disparity across the largest states of India is the widest of other similarly large federal economic zones. 2: Contrary to global experiences of income convergence across and within nations, India shows continuing trends of divergence among its large states. 3: 1990 seems to be the seminal year of a structural break in income disparity between the richer and poorer large states.

While it is tempting to immediately correlate this structural break post 1990 with the economic liberalization of India in 1991 and imply causality, that would be mere conjecture in the absence of rigorous evidence. Nevertheless, the economic divergence of the different states raises the important political economy question of federalism and its discontents. At a minimum, we need to start having a serious conversation on whether a greater devolution of fiscal and legislative powers and not just financial resources from the centre to the states ought to be the way forward, given the political economy of large and widening intra-state economic disparities which are showing no signs of disappearing on their own anytime soon.
Introduction

“Freedom is not just the freedom to speak, write or to rule on our own. The real freedom lies in economic freedom.” This was Tamil Nadu Chief Minister J. Jayalalithaa, in her Independence day speech in August 2016. The subtle reference here was to the Goods & Services Tax (GST) Bill, which her party, the AIADMK, was the only party in Parliament to not endorse, on grounds that it impinged on the fiscal autonomy of the states. Earlier, the Tamil Nadu Chief Minister had also vetoed a proposed nation-wide college exam (National Eligibility & Entrance Test) by the Ministry of Human Resources Development and demanded that the subject of Education be the sole prerogative of the states and removed from the ‘concurrent’ list of legislative subjects.

She further exhorted the Centre to give “adequate powers to the states” and sought to rationalise this by saying, “These should not be seen as centrifugal or fissiparous trends that have to be curbed, but as a manifestation of India’s maturing as a nation with diversity and as a democracy.” Clearly, Tamil Nadu and its Chief Minister feel very strongly about their sovereign rights and the imposition of one-size-fits-all policies from New Delhi. It is easy to dismiss all of this as mere grandstanding by an astute politician. But it is interesting to note that Jayalalithaa’s spunk is well backed by evidence of wide economic disparity among states that may well merit a debate on the issues she has raised about India’s federalism.

The Economics of Convergence

Before turning to what the data on India has to say, it is worth recalling that neoclassical economic theory makes strong predictions on the tendency of different regions — either subnational regions within a federal state, or of different countries themselves — to converge in terms of real gross domestic product (GDP) per capita. This is sometimes known as the “catch up” hypothesis — other things equal, poorer regions (or countries) will catch up with richer regions (or countries). The reason is due to what economists call “diminishing returns to capital” — the idea that capital (and other reproducible inputs, such as human capital) is very productive at the margin
when it is in short supply relative to labour and becomes progressively less so as the capital-labour ratio and hence per capita income rises. It is the same logic which is behind the notion that poorer regions (or countries) should exhibit higher rates of return on investment than richer regions (or countries) because, in the former, ample opportunities for productive investment remain, while in the latter, all of the low hanging fruit have been plucked.

The convergence hypothesis of economic theory has found considerable backing from empirical research on advanced economies, and on regions within advanced economies, such as the states within the United States, the provinces of Canada, or the prefectures of Japan. Interested readers are encouraged to consult the work of economists Robert Barro and Xavier Sala-i-Martin, the pioneers of this strand of research starting in the 1990s, as well as the spate of subsequent research on the topic.¹

**Data Selection, Methodology, and Sources**

Our analysis zeroes in on India, but we would also like to compare India to the pattern that has been observed in other large federal countries and regions. Furthermore, to get away from outlier effects, and focus on what is of economic significance, we will consider the largest regions which account for approximately 85 percent of total population.

We dwell for a moment on this, which marks our methodology as distinct from previous literature, which has tended to take all of the states or at least most of the states and union territories. Such an approach, essentially, treats a tiny state such as New Delhi and a large state such as Bihar each as one data point, having an equal significance in the analysis of per capita output. This creates the real possibility that small states, who may be outliers, could distort the larger message that the data are telling us.

One possible reason for sharper findings in this research vis-à-vis other literature on this subject is the use of a crisper dataset. Our research uses dataset of the 12 largest undivided states of India. These 12 states account for 87 percent of the population, 87 percent of seats in the Lower House of Parliament and 76% of GDP. The 13th state in this order, Assam, has 50% fewer seats in the Lower House of Parliament and 40 percent lower GDP than the 12th state of Kerala, marking a neat point to draw the line.

We, therefore, use as a rule of thumb that we shall consider the largest states accounting for approximately 85 percent of the total population. Note that this is population, not GDP, since in political economy terms it is the former which is relevant -- after all, it is people that vote, not units of GDP. In using this approach, we are following the methodology used in our previous research using electoral data.²

Thus, for India, we consider the four large states in the Hindi heartland (Uttar Pradesh, Bihar, Madhya Pradesh, Rajasthan), the two big western states (Maharashtra, Gujarat), the two big eastern states (West Bengal, Orissa), and the four southern states (Karnataka, Kerala, Tamil Nadu, and Andhra Pradesh), which account for a little over 85 percent of the total population of India. The data span 1960 to 2015 and report state net domestic product per capita, which is the norm in the literature on India. Note that in the case of states which have been bifurcated during this period (Uttar Pradesh, Bihar, Madhya Pradesh, and Andhra Pradesh), we consider the undivided state in each case for reasons of data consistency. Likewise, our US data looks at the 26 largest states, accounting for about 85 percent of US population, spanning 1963 to 2015, and our data for the European Union considers the 10 largest member states for the years 1970 to 2014, again accounting for approximately 85 percent of the EU population. Finally, our data for China uses decadal Chinese data on 20 largest provinces accounting for 85 percent of the population for the period 1978 to 2015.

Note as well that we report our data in nominal units of currency, and do not deflate by consumer price index (CPI) or in any other way. The reason for this is that our interest is in contemporaneous comparison of given states at a point in time, so that we would get identical results whether or not we deflate by CPI, as it would cancel out in such a point-by-point comparison.

For details on our data sources, please see Annex 1.

**Data Analysis**

Our basic results are presented graphically in the charts in Panel 1. For the US, EU, and India, we present in the upper third of the panel a time series of the natural logarithm of GDP per capita for US and EU, and per capita NDP for India. Note that the adjustment of raw data by converting to a natural logarithm is standard procedure in the convergence and growth literature. Eyeballing the charts clearly shows that the data for the various states is bunched together, so that the per capita GDP of the various regional units in each chart are approximately moving together. But are they converging?

This requires the use of two statistical tests which are standard in the growth literature. The first is what is known as “sigma convergence”, which involves computing the standard deviation across the per capita incomes of all of the units at a given point in time, and then plotting the resulting standard deviation over time. These are the charts contained in the middle third of Panel 1. This test confirms that, for the US and EU, there has at least been no divergence: time series of the standard deviation of per capita incomes, which measures the dispersion of incomes across states, remains relatively flat, with no discernible rising or falling trend. The Indian data tell a different story, of a
sigma which appears to be rising over time, something which we will probe in more detail shortly.

Panel 1, Part II: Sigma Convergence for USA, EU and India

The second standard statistical test is known as “beta convergence”, and corresponds to the “catch up” hypothesis we have mentioned earlier. Here, we plot the growth rate in per capita income across the entire time period for each unit on the vertical axis as against the per capita income of each unit at the initial point in time. If catch up were occurring, we would expect to see a negatively sloped relationship if we plotted a linear regression line through the scatter of points. This is because regions with initially lower per capita income would have grown more rapidly, thereby showing that they were catching up; likewise, already rich regions would show slower growth, implying that others were catching up to them.

The lower third in Panel 1 presents our basic results on beta convergence. These show, as theory predicts, a negatively sloped relationship for the US and the EU. But, again, the Indian data tell a different story, and show a positively sloped relationship, which goes against the theory. It implies that initially richer states on average grow more, not less, rapidly, implying divergence in the data, not convergence.

Panel 1, Part III: Beta Convergence
To better understand the pattern of divergence in India, Panel 2 presents log GDP, sigma convergence, and beta convergence, except that we break the sample period into 1960 to 1990 and then 1991 to 2014. This is a natural break point as it corresponds to the time period in which economic reforms were initiated in India. The results are striking. In the pre-liberalization period, the sigma is basically flat, suggesting an approximately constant dispersion of income across states. But, after 1991, the sigma takes off dramatically, showing a widening disparity of income per capita across states at every point in time.

Likewise, the beta convergence data show a line of best fit in the pre-liberalization period that is weakly downward sloping, which may be statistically indiscernible from the hypothesis that it is flat: in other words, there is no evidence of either much convergence or divergence. But, again, post liberalization, starting in 1991, there is a markedly positively sloped relationship, which shows that there is divergence, not convergence, among states. In other words, on average, initially richer states grew more rapidly in the liberalization period, so that the gap between richer and poorer states has been widening.
Panel 2: Per capita NDP, Sigma Convergence, and Beta Convergence for India (1960-1990 and 1991-2014)

An intriguing comparison is of the two Asian giants, India and China. It might be assumed by the casual reader that fast-growing China has experienced as much regional income disparity as India over a comparable time period. But this casual assumption would be wrong. Again, on the left of the panel, we have India, and on the right we show comparable data for India, that is, log GDP, sigma convergence, and beta convergence. The results are striking. China shows an increase in sigma convergence followed by a tapering off, so that over the whole period it remains approximately constant. Meanwhile, beta convergence shows a clear negative slope, implying that poorer provinces of China have indeed been catching up with richer provinces, as classical convergence theory would hypothesize.
Panel 4 shows us another way to slice and dice the data, ranking the twelve largest states from lowest to highest per capita income by decade. The bars that are circled point to interesting movement in the relative position of states. Thus, Kerala, for instance, which started toward the bottom of the league tables has moved to the very top. Tamil Nadu, too, has shown a marked rise up in the rankings, especially in the post-liberalization period, and now has a per capita income just slightly lower than Kerala. Meanwhile, a state like Orissa has languished at a relatively low level in the rankings and has failed to make much upward progress in the rankings post-liberalization.
Panel 4: Ranking of twelve largest states from lowest to highest per capita income by decade

An intuitive way to see the divergence in state per capita incomes is in Panel 5. This plots, for the full sample period for India, the per capita incomes of the top three states (blue bars), the bottom three states (red bars), and the ratio of the top three states to the bottom three states (green shaded area). We clearly see a widening gap between the richest and poorest states starting post-1991, so that, by 2014, the average person in the three richest states was three times as rich as the average person in the three poorest states.
Panel 5: Per capita incomes of the top and bottom three states and their ratio

Discussion

Our research is the latest in a long line of research papers studying income convergence and divergence in federal countries, including India. Perhaps the most relevant prior research with which to compare our methodology and findings is a 2012 research paper by economists Utsav Kumar and Arvind Subramanian. The Kumar-Subramanian paper also shows income divergence across the various states of India. Because their focus is on looking at the first decade of the current century, their emphasis turns on the periods before and after

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after the global financial crisis. Also, they consider the 21 largest states, whereas, for the reason mentioned earlier, we focus on the 12 largest. They are thus not able to draw especially sharp conclusions, except to point to the pattern of divergence.

Our emphasis on using a long span of data covering both the pre- and post-liberalization period, and our restriction of the data to cover 85 percent of the population, and thereby focus on the largest states, allows us to draw much sharper results than previous literature, including Kumar and Subramanian. In particular, we establish 1990 as a clear structural break in the data, after which economic divergence among states took off following the 1991 liberalization.

Interestingly, our previous research on India’s tax structure also appears to show a clear structural break in 1991 with the economic reforms. While during the pre-liberalization period, India’s tax-to-GDP ratio increased slowly and steadily as GDP rose, in the post-liberalization period the tax-to-GDP ratio stayed roughly constant while GDP growth took off.4

Evidently, with the economic reforms of 1991 and beyond, many structural changes occurred in the Indian economy, and these manifest themselves in various ways in the data -- in particular, as we emphasize here, a prolonged and sustained increase in regional economic divergence. But the exact mechanisms of this change, both the economics and the political economy, are not yet fully understood by analysts, although we have documented one facet of this change here. A 2013 research paper by Chetan Ghate and Stephen Wright has attempted to provide some explanation for this disparity among states.5 It will be hasty on our part to immediately draw a conclusion of causality between the 1991 economic reforms and the widening of income divergence among states.


5 Chetan Ghate and Stephen Wright, “Why were some Indian states so slow to participate in the turnaround?”, Economic and Political Weekly, March 30, 2013, available here: http://www.epw.in/journal/2013/13/special-articles/why-were-some-indian-states-so-slow-participate-turnaround.html.
Clearly, Tamil Nadu Chief Minister Jayalalithaa, with whom we began, is not wrong to highlight the need to understand “economic freedom” at the level of the states in the context of India’s federal polity. Convergence or divergence among countries in the world is a matter of intellectual interest, and would be of interest to those interested in the distant goal of genuine global governance and concern for global inequality. But, a high level of divergence within a federal polity such as India should pique the interest of most scholars studying India’s political economy.

At a time when India has just embraced a common market paradigm for taxation across various state borders, which inherently restricts the taxation powers of the states, it is an extremely difficult balance to strike between federalistic principles and economic efficiency.

But one of the consequences, no doubt unintended, and one which has been strangely absent from much of the debate around the GST, is a dramatic widening in income inequality among the states. The fact that the average resident of the richest state now has an income four times higher than that of the average resident of the poorest state is a level of inter-state income inequality unparalleled among large federal polities in the world, which, as we have seen with the US and EU as examples, have showed a tendency toward convergence, or, at a minimum, an absence of widening divergence.

It should also be noted that the US, and less so the EU, represent the maturation of the democratic process, to take a leaf from Jayalalithaa. The US, in particular, has been a Union of states since its inception, and, at least since the end of the Civil War, has featured rapid economic convergence. The once poor states of the South did indeed catch up to the richer states of the North. We have seen a similar pattern of convergence in the EU, as our data confirm. Of course, in both of these cases, fiscal federalism, and other crucial features — such as a customs union and a currency union — have played their role.

India, too, is characterized by fiscal federalism, by a currency union — all states share the Indian rupee as the legal tender — and a customs union — it is the Union government, not the states, which sets external tariff and trade
policies. Notably, however, India has not been characterized by frictionless intra-state trade, as proponents of the GST have argued. Relatedly, due to important regional differences, there is insufficient intra-state movement of people to overturn the trend toward divergence and even lead to rapid convergence.

Thus, a successful GST would indeed work toward knitting all of India into a genuinely single market (although one can debate if it was necessary to go all the way to a GST to achieve this and better tax administration would not have sufficed). The results, again if the GST is successfully implemented, would be a reduction in transactions costs and the squeezing of some additional gains from trade among states.

However, what the GST debate largely missed was the cost to states in terms of a loss of fiscal autonomy, as highlighted by Jayalalithaa. In theory, lagging states could use tax policy as a vehicle to lure investment and to power growth, much as tax competition has been seen in the context of the US and EU, among other places. That vehicle will no longer be open, and states will need to come up with cleverer and more creative ways to tweak the rules at their disposal to entice footloose investors to come invest in their state, along with providing the basic fundamentals of sound infrastructure and a corruption-free and smooth regulatory environment.

Either way, rising divergence in per capita income levels among major states of the Union is a political economy issue that is not going to disappear. If the trend toward divergence continues, and poorer states lag further behind richer ones, this is sure to put strain on our federal polity with its centralizing tendencies. This is something that policy makers and policy analysts ought to pay much more attention to than heretofore they have done.

India’s cultural and political diversity is a well-entrenched fact. It is time to accept its economic diversity too. It is perhaps this confidence of past success and an expectation of varying “Maslowian” future needs of their people that elicit demands for more autonomy from regional leaders like Jayalalithaa. One wonders if the other prosperous states of Maharashtra, Karnataka and Gujarat also had strong regional leaders and political parties like Tamil Nadu,
would we have heard similar demands for freedom and autonomy. At the very least, this should trigger the question -- while GST portends reduced fiscal autonomy and taxation powers for states, should they be compensated with more legislative autonomy by transferring some or all of the concurrent legislative subjects in the Indian constitution to the states?
Annex 1: A Note on Data Sources

All the data used in this study are from publicly available official data sources.

For the purpose of this analysis, we use per capita Net State Domestic Product (NDP) at current prices from 1960-2014 for the 12 largest states in India (by population) available on the official Central Statistical Office (CSO) website. 6

Data for years 1980-2004 was based on different series. For these years, the time-series was recalibrated to the 2004-05 series using a splicing coefficient, calculated from the data in overlapping years between each series.

In this time period, three new states – Chattisgarh, Uttarakhand and Jharkhand – were carved out of Madhya Pradesh, Uttar Pradesh and Bihar, respectively. Per capita NDP from the new states have been added back to the parent states to maintain consistency. This is carried out by weighting the per capita NDP of the parent and new state by their respective population (as of Census, 2011).

The per capita NDP data for 2013-14, lists Telangana and Andhra Pradesh as different states and since the split happened only in May, 2014 we consider the data for unified Andhra Pradesh for that year from Budget, 2013-14.

For international comparison, we study convergence in the United States (US), the European Union (EU), and China. We use per capita State Gross Domestic Product (SGDP) at current prices from 1963-2015 for the largest states in the US accounting for 85 percent of the population. Since the official Bureau of Economic Analysis (BEA) website only puts out absolute SGDP at current prices, the per capita SGDP was calculated using state-wise intercensal population estimates for this period from the official U.S. Census Bureau website.7

6 That data may be found here: http://mospi.nic.in/Mospi_New/site/inner.aspx?status=3&menu_id=82 .
7 BEA data may be found here: http://www.bea.gov/iTable/iTable.cfm?reqid=70&step=1&isuri=1&acrdn=2#reqid=70&step=1&isuri=1 . US Census Data may be found here: http://www.census.gov/popest/data/historical/index.html .
For the EU, we consider per capita SGDP at current prices from 1970-2015 for the largest countries by population accounting for 85 percent of the population, available on the Organisation for Economic Co-operation and Development (OECD) website.\(^8\)

Data on state-wise state GDP per capita for China are drawn from the official National Bureau of Statistics (NBS) of China.\(^9\) Again, the largest provinces are selected to account for 85 percent of the total population.

**Annex 2**

Annex 2 collects all of the charts contained in the text, starting on the next page.

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\(^8\) That data may be found here: https://data.oecd.org/gdp/gross-domestic-product-gdp.htm#indicator-chart.

\(^9\) That data may be found here: http://www.stats.gov.cn/english/.
Regional economic disparity – United States, European Union (incl. UK) and India
Ranking of states by per capita net domestic product (1960 - 2014)