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Does the creation of smaller states lead to higher economic growth? Evidence from state reorganization in India

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Abstract

In the largest territorial reorganization since the 1950s, when the modern state boundaries were demarcated, the Indian union government carved out three new states from three large north Indian states in November 2000. This was accompanied by discussions along political and sociological lines. But the debates along economic lines were muted, owing to a lack of data. Equipped with three and a half decades-long macro panel data, we investigate whether the event had an impact on the per capita income. For comparison, we construct five separate counterfactuals using techniques such as synthetic control and elastic net regularization.

The three erstwhile 'combined' states do not show any evidence of out-of-trend growth. We further investigate the six states separately to see if the 'new' states grew at the expense of their 'parent' states. The state of Uttarakhand shows 'extraordinary' growth in the post-reorganization period. Two other smaller states (Bihar and Chhattisgarh) did grow faster than their counterfactual, but do not qualify for the statistical significance test. Three other states (Jharkhand, Madhya Pradesh, and Uttar Pradesh) also do not show a significant change in their growth path. Overall, we find that the creation of smaller sub-national administrative units may not be a panacea for their economic problems.

Keywords: State reorganization, Economic growth, Impact evaluation, Synthetic Control, Elastic Net.

JEL Code: O11, O47, R58

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1. Introduction and Context

In 2000 the parliament of India passed three state reorganization bills that lead to the creation of three new states in the month of November the same year. The states that came into existence were: Chhattisgarh from Madhya Pradesh (November 1st), Uttarakhand from Uttar Pradesh (November 9th), and Jharkhand from Bihar (November 15th). This territorial reorganization is of significance for two key reasons. First, this was the largest reorganization after modern state boundaries in India were demarcated in 1956. These three erstwhile states constituted over a third of the population (36%), a fourth of area (28%), and a fifth of the economy (21%) of India. Second, this reorganization occurred in the *`Hindi heartland'*, a linguistically homogeneous region of India. This is fundamentally different from the linguistic reorganization of 1956.[2]

The Indian union government which oversaw the bifurcation of these states portrayed the reorganization as some sort of panacea for the developmental problems of the region.[3] Various documents were published after the formation of new states which made ambitious plans to set the new states on a high growth trajectory. For example, Chhattisgarh and Jharkhand prepared vision-2010 documents that gave the roadmap for higher economic growth, and various other aspects of socio-economic development of these states (GoI, 2003). Such developmental aspirations also got reflected in the creation of the state of Telangana, which was carved out from Andhra Pradesh in 2014.

[2] It may be noted that there were a few other territorial reorganizations between 1956 and 2000 that gave birth to new states. For example, the bifurcation of the Bombay state in 1960 led to the creation of Gujarat and Maharashtra. In 1966, Haryana was carved out from Punjab. A few of the north-eastern states were created in the 1970s. See Appendices in Vaibhav (2021) for a short survey on the history of state creation in India. Kudaisya (2014) revisits the 1956 reorganization of Indian states. Tillin (2014) undertakes a book length treatment of the reorganization of 2000.

[3] In the speech made to the parliament (July 25, 2000), the then Union home minister, Mr. L. K. Advani, emphasized that 'administrative efficiency' and 'quality of governance' were to be gained from the creation of these smaller states.

Undoubtedly such sweeping aspirational and political statements have their usefulness. But whether, and to what extent, these territorial reorganizations are beneficial needs to be seen in the light of hard facts. In this paper, we attempt to undertake such an empirical analysis. Specifically, we investigate following questions. Do the 'combined' states ('parent' & 'new') grow faster after reorganization? Do the 'new' states grow faster, as is generally hyped at the time of creation? Besides, do the 'parent' states perform badly, after losing a substantial part of their territory? Finally, are there important lessons to be learnt while analysing smaller and relatively longer time periods?

Apart from evaluation exercises, which are retrospective by their very nature, such a study has prospective value in presence of potential demands for new states. There are reportedly over two dozen on-going demands for the creation of new states). Some of the prominent ones include: *Vidarbha* (from Maharashtra), *Saurashtra* (from Gujarat), *Gorkhaland* (from West Bengal), *Bodoland* (from Assam), and *Bundelkhand* (from MP and UP). Now and then, there are proposals for the division of the existing state of Uttar Pradesh. In 2011 the state assembly of Uttar Pradesh passed a resolution to undertake dividing the state into four separate states (Mishra, 2014).[4] More often than not, developmental debates accompanying such aspirations are evoked on emotional and political grounds rather than on economic aspects.[5]

The reorganization of states in 2000 was accompanied by debates along various lines, including polity and sociological perspectives.[6] The opinions seemed to be divided on the future of the successor states. The optimists posited that this would lead to the deepening of democratic decentralization and development of the earlier neglected regions. For pessimists, this change in the status quo was an exercise in creation of new failed states and

[4] Kumar (2010) summarizes the arguments both in favour of and against the creation of smaller states.
[5] In this context it may be noted that the power-sharing between the union and the state governments is based on the 'lists' provided in the Indian constitution. All the subjects requiring legislation have been divided into Union, State, and Concurrent lists. The state governments have exclusive legislative powers over subjects falling in the state's list. For the subjects falling under the concurrent list, the state governments have an important say, although the power of union government prevails in the case of any discord between the two. Most of the issues that do not require the involvement of other states come exclusively under the state list. Some of these include law and order, agriculture, local government, alcohol, and other intoxicants, land revenue and land records, public health, and sanitation.
[6] Sociological studies have based their arguments on aspirations of the local population and their identities. Political scientists have argued from the political empowerment of the people as well as shifts in electoral politics. See among others, Majeed (2003), Mawdsley (2002), Prakash (2001), Tillin (2013).

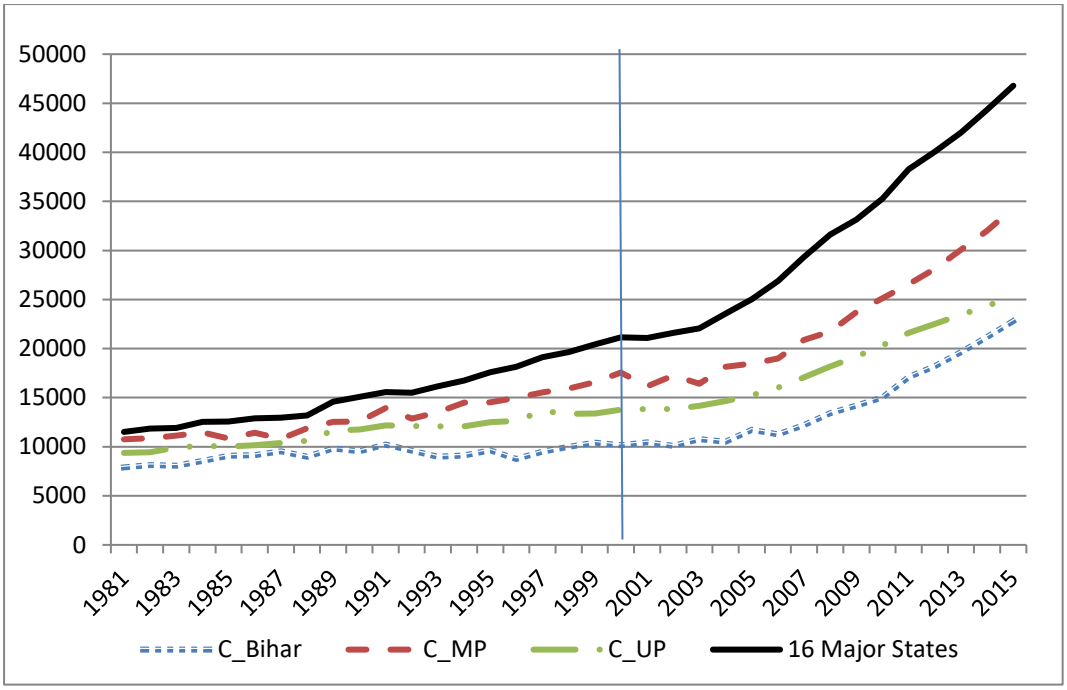
economic catastrophe for the parent states. The future of these states was uncertain at that time. These debates, however, were based more on emotion and rhetoric than substance because data were not available at the time.

Given the importance of the issue, it has been surprisingly under-researched from an economic perspective.[7] An extensive study of this issue from an economic viewpoint becomes all the more important in the light of the fact that many other regions in India are claiming for a separate statehood, as we noted earlier. About two decades have passed since the reorganization of 2000. A reasonably good data is available, making way for an objective empirical analysis. We can exploit this political event as a natural experiment to assess if there are benefits from such an exercise. If we can conclusively establish that such smaller states shows better performance, we shall have a channel for economic growth and development. If not, the economic arguments for such a demand may not hold.

It is useful to note the structural features of the reorganized states relative to the aggregate Indian economy. The states that were reorganized in 2000 were among the poorest of Indian states. In terms of aggregate economic growth the reorganized states recorded 4.4% in 1981-2000 compared to 5.4% in the 16 major states combined during the same period (See **Figure 1** below and **Tables A1 - A4** in Appendix for relative growth performance). These three states- Bihar, Madhya Pradesh, and Uttar Pradesh- have been among the worst economic performers among major Indian states before 2000. They have the lowest per capita incomes and consumption. They also did not participate in the economic boom of the 1990s. In fact, their growth rates have been among the lowest in the 1980s and 1990s (Ahluwalia, 2000). The level and growth of industrial development have also been dismal in these states. These states occupied the bottom-most places in the human development indices. These three states occupied the bottom three positions- Bihar (30th), UP (31st), and MP (32nd)- of the 32 administrative units considered for Human Development Index (HDI) in 1991 (GoI, 2001). This situation did not show any significant improvement at the time of reorganization in 2000 (GoI, 2011).

[7] Economists have generally treated borders, and size of administrative units, as exogenous in their framework of economic development. This is despite the well-recognized conception of borders as man-made institutions (Acemoglu & Robinson, 2012).

Figure 1: Evolution of per capita income for the Reorganized States (Rs.; 2004-05 prices)



1.1 Review of earlier studies

Kale & Bhandari (2010) was one of the earliest attempts to understand the impact of reorganization on economic growth in these states. They employ the Gross State Domestic Product (GSDP) for the period 1994-2008 for the three newly created states as well as the three parent states. They compare the growth rates of these states in the pre- and post-reorganization periods. Based on their pre-post trend analysis, they conclude that five of the six states, except Madhya Pradesh, grew faster than the national average. Their comparison of the parent-new state pair revealed that the new states in all these three cases grew faster than their respective parent states. They concluded that the credit for this increase in the growth rate be given to more focused approach and better governance of these smaller states.

This study above is a simple pre-post comparison of trend growth rates, and fall short of being methodologically rigorous. The period considered after reorganization is also very small, only eight years, which may be because of some initial transitory adjustments and may not reveal the true effect. A relatively longer period may give us better insights into the growth process.

Asher & Novosad (2015) uses night lights data to measure the benefits of this state splitting experiment. Applying border regression discontinuity design (RDD), they find a marked increase in the economic activity immediately just across the borders in the new states. Additionally, they also examine the impact on four other outcome variables: primary education, secondary education, adult literacy rate, and durable assets. The first two of these four variables show improvement, while the effect on the other two variables remains statistically insignificant, for the new states as compared with their parent states. This study groups the three parent states into one and the three new states into another. Such a comparison may not be correct as the effect of reorganization may be different for different states. We actually find this to be the case in our analysis.

Employing a different identification strategy, that of differences-in-discontinuities design, Shenoy (2018) tries to gauge the changes in the economic activities in the newly created states compared to their parent states.[8] The result of the study shows that estimated output, measured by night lights intensity, has significantly improved for the state of Uttarakhand, whereas the increase for the other two new states has been only slightly positive.

For our study, we use the Gross State Domestic Product (GSDP) data for a relatively longer period of three and a half decades 1981 to 2015. We treat each of the states as separate units, rather than combining them into some group. We undertake separate analysis for the three combined states, and six smaller states. For comparison, we construct counterfactual states using the Synthetic Control Method (SCM). In three of the nine cases, the 'synthetic' state cannot be constructed, and so we resort to a different method (Elastic Net regularization). In addition to these two, we provide the estimates from three other techniques- Difference-in-Difference (DID), restricted regression, and Best Subset Selection (BSS) - to make our estimates methodologically robust.

We do not find any evidence to support that combined states perform better in the post-reorganization period compared to the pre-treatment period, in statistical sense. The results are more nuanced when we consider the smaller states. Even though statistically

[8] Difference-in-Discontinuities is a mixture of two methods: Regression Discontinuity Design (RDD) and Difference-in-Differences (DID). This is akin to applying the DID in the areas close to the border where a researcher expects that event could have distorted the outcome to be measured.

insignificant, it appears that two states- Bihar and Chhattisgarh- performed better than their constructed counterfactuals while two other states- Jharkhand and MP- performed slightly worse than their respective counterfactuals. We see that any generalization based on parent-state pair cannot be made. Uttarakhand emerges as an outlier states which has performed much better compared to its counterfactual states. We note that this could be because of specific reasons.

Including this introduction, this paper is divided into five sections. In section 2, we provide a brief overview of the economy of reorganized states. In section 3, we describe our data and variables. In section 4, we briefly elucidate our data issues and empirical strategy. Next, we present our estimation results and discussion. We give our broad conclusions in section 5.

2. Reorganized States: An overview of economic growth

In what follows, we provide a brief overview of the growth performance of the three reorganized states measured in terms of aggregate economy and in per capita terms, and also compare the economies of the new states vis-à-vis their parent states.[9]

2.1 Comparing 'New' states with their 'Parent' states

Figure-2 plots the economy of the new states- Jharkhand, Chhattisgarh and Uttarakhand- as percentage of their parent states. Uttarakhand was a very small loss to the state of UP, comprising less than a tenth of state's economy. Jharkhand was relatively the largest, about three-fourth of Bihar's economy. Chhattisgarh was about two-fifth of MP's economy. Of the three cases, the most perceptible change has been that of Uttarakhand, which has seen sustained rise in its economy relative to that of UP.

Figure-3 shows the evolution of per capita income of new states as percentage of its parent states over 1994-2015 period. It is interesting to note that all the three new states have higher per capita income compared to their parent states at the time of reorganization. Jharkhand was about 2.5 times Bihar's per capita income, Uttarakhand about 1.5 times that of UP, and Chhattisgarh just above that of MP. The most striking change in the post-

[9] Also See Vaibhav (2021)

reorganization period was that of the state of Uttarakhand. This doubled from 1.5 times its parent state's per capita income in 2000 to over three times in 2015.

Figure 2: GSDP of new states as percentage of successor parent states

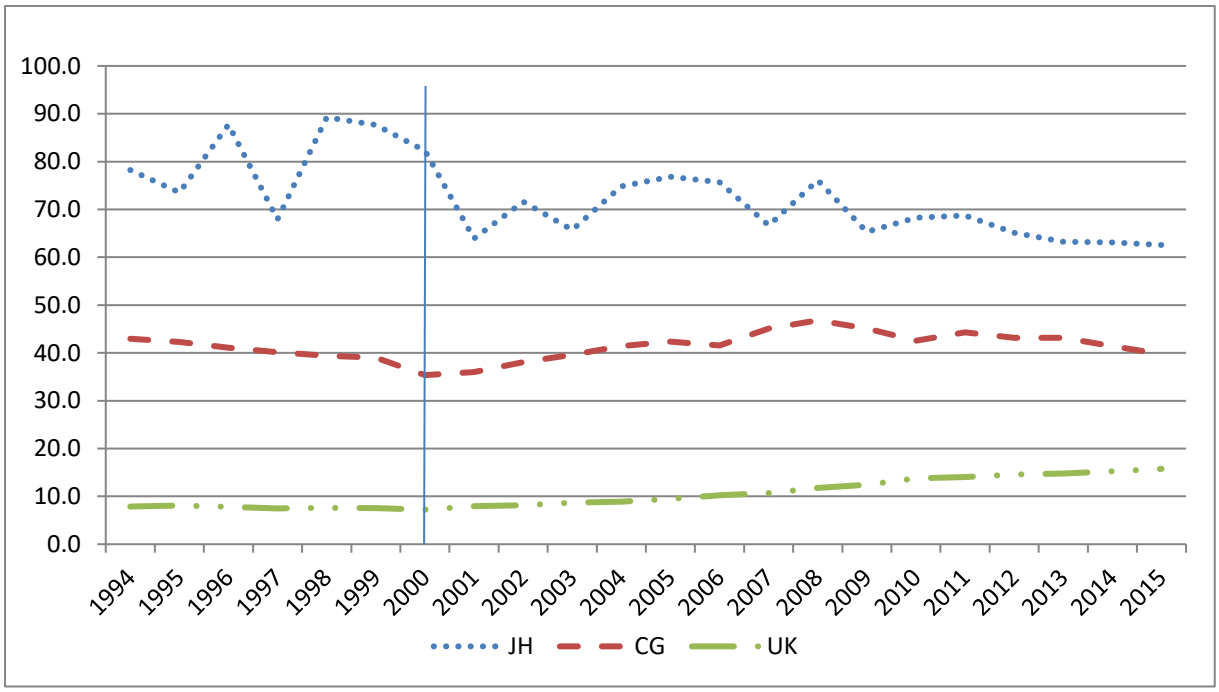
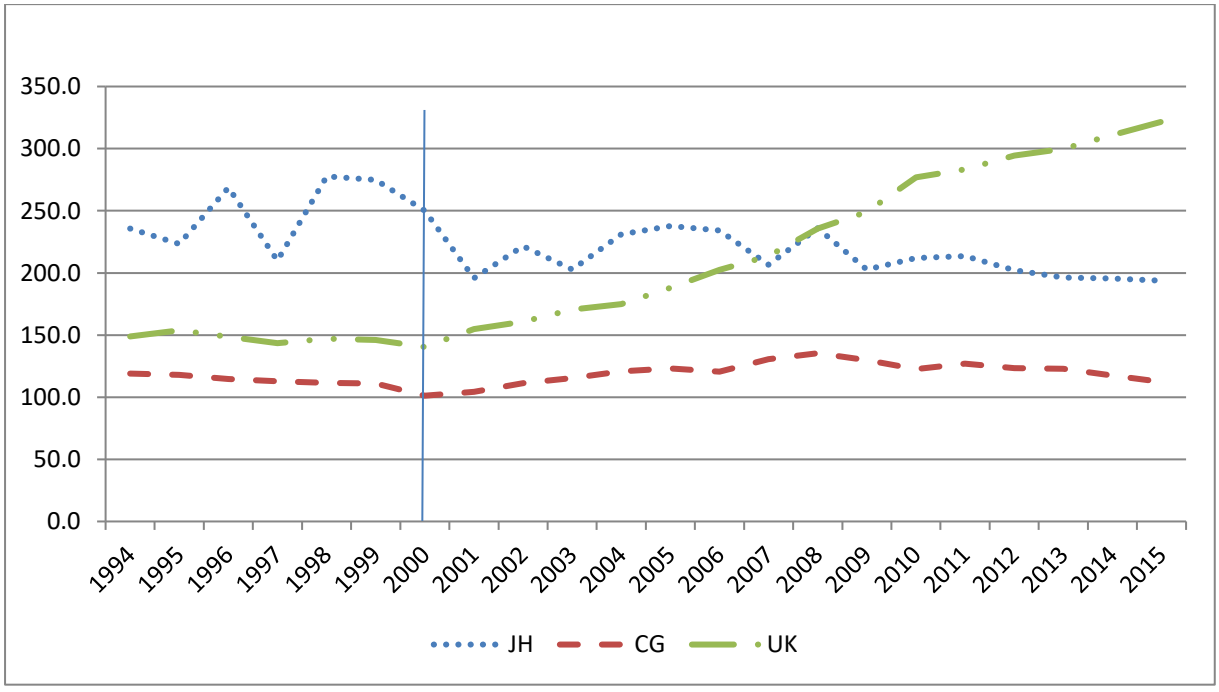


Figure 3: Per-Capita Income (PCI) of new states as percentage of successor parent states



What about the growth rate of these six smaller states? In the pre-reorganization period (1994-00), three of the six states- Bihar, Chhattisgarh and Uttarakhand- saw an abysmal per capita growth, in the range of 1.2% - 1.4%. Comparing the growth in two periods, we see that growth was substantially higher in the post- reorganization period (2000-15) than pre-reorganization period (1994-2000). The economic growth of the state of MP in the two periods remained the same (6.2%). Uttarakhand saw a growth rate in excess of 11%. This is a part of general trend we saw in previous paragraphs. [10]

In the three sub-periods in the post-reorganization periods, there are interesting variations in the growth rates. The first sub-period (2000-05) was a period of immediate slump for MP, which saw a stagnancy in per capita terms. Two of the new states- Chhattisgarh and UK- saw higher growth rates than their parent states. Jharkhand, on the other hand, grew slower than Bihar. Only UK saw significantly higher growth rate than the all India average of 3.4%. The next two sub-periods were of recovery for these six states. They grew at an average of 5.9% (2005-10) and 6.1% (2010-15). But so were the average Indian growth, 7.1% and 5.8% respectively.

3. Data and Empirical Strategy

We use Gross State Domestic Product (GSDP) data to measure the economic size of the states. The data is compiled and disseminated by the Central Statistical Organization (CSO). We use population data to arrive at the per capita income (PCI). The GSDP data comes in four different series- 1980-81 series, 1993-94 series, 1999-00 series and 2004-05 series. We use splicing method to convert them to a consistent 2004-05 constant price series. It needs to be mentioned here that the CSO released the data for separate reorganized states from the 1993-94 series onwards. We have data for all the six successor states only seven years prior to the bifurcation. This restricts our comparison of parent versus new state only from this period. For the combined states we simply add the GSDP data for smaller states- parent and new- to get the GSDP data for combined states. In the same way we arrive at the per capita GSDP for the combined states, by dividing the GSDP for combined states with the combined population of these states.

[10] Also see **Tables-A3** and **A4** in the appendix.

Additionally, we use few other variables as covariates or 'predictor' variables. These include: physical infrastructure (road and electricity), financial infrastructure (credit sanctioned and number of bank branches), state budget (development expenditure), and human capital variables (literacy rate and infant mortality rates). Basic road statistics (BRS) gives the data on length of various types of roads annually. Central Electricity Authority (CEA) publishes data on generation and consumption of electricity. Reserve Bank of India (RBI) provides comprehensive data on bank related variables in its annual publication: 'Basic Statistical Returns of scheduled commercial Banks'. The data on budget of the states come from Public Finance Statistics released by the RBI.[11] We use the data for literacy rate for the population census years (1981 and 1991). The data for IMR comes from sample registration system (SRS).

Population enumeration data, total as well as rural-urban, is not easily available apart from census years (1981, 1991, 2001, and 2011). Instead we use the data for projected population for both rural and urban areas. Office of Registrar General of India (ORGI) sets up expert group to project rural and urban population for all Indian states.[12] The expert group that was established after 1991 census gave the population projections for all the states for 1996-2016. We use this data to calculate the urbanization level of Indian states. An additional advantage of calculating urbanization from projected population is that this variable is exogenous to the reorganization of the states.

It may be noted here that the data for many of these variables, GSDP being an important exception, are available only after the state reorganization, i.e. after 1999-00. However, in some cases (e.g. Banks, Literacy, and IMR) we have data at the level of districts. We aggregate district level data to arrive at the data for the smaller states.

[11] We source most of the annual data from various modules of Economic and Political Weekly Research Foundation's India Time Series (EPWRF-ITS). These include: GSDP data, Bank Data, State's budget data, and electricity data.

[12] The expert group formed after 1981 census gave yearly projected data only for All India, but not at the level of states.

3.1 Empirical strategy

The most important problem in any impact evaluation exercise is the problem of finding counterfactual, what would have happened to the treated unit in the post-treatment period had it not received the treatment. This has been christened as the *'fundamental problem of causation'* (Holland, 1986). The basic idea is that it is impossible to have the same unit(s) to receive and not receive the treatment at the same time. To circumvent this problem, researchers make use of 'Control' group, which does not receive the treatment but have characteristics similar to the 'Treatment' group. In an experimental setup, researchers often rely on random assignment of treatment. Those receiving the treatment form the 'Treated' group, while those not receiving the treatment form 'Control' groups. To avoid behavioural change, the control groups are given placebos. This is the basis of Randomized Control Trials (RCTs). The difference in the outcome between the randomly assigned treated and control group gives the impact of the treatment.[13]

In a non-experimental setup, however, researchers seldom have such a luxury. A leader cannot be randomly murdered to see the impact of his death on economy. A country cannot be bifurcated to see its impact on their economies. There are ethical concerns as well. The fate of a patient in desperate need of a medicine cannot be decided on the rolling of a dice. So we need to resort to methods that rely on some exogenous variations, such as in natural experiments, and make inferences based on them. Here again, we need to construct a suitable counterfactual with which to compare treated group (Shadish et al., 2002).

In what follows, we first discuss the Difference-in-Difference (DID), which is often the method of choice in an impact evaluation exercise. This method makes two crucial assumptions. It assigns the same weight to all the control groups and assumes that there existed a time-invariant fixed difference between the treated and the control group (parallel trends assumption). The Synthetic Control Method (SCM) provides an alternative to this method, which we discuss next. This method assumes away these two crucial assumptions. However, it comes with its own set of assumptions which is especially crucial for our

[13] Holland (1986) gives a comprehensive treatment of causal inference for this 'potential outcome' framework. The literature on the RCTs has exploded in recent decades. Duflo et al. (2007) comprehensively surveys the literature from development perspective.

purpose. Finally, we discuss the general structure, suggested by Doudchenko & Imbens (2016), which combines these two methods in a single framework.

3.2 Difference-in-Difference (DID) method

This is a widely employed method in such cases where we want to see the impact of a treatment (Khandker et al., 2009). This method requires two groups with similar characteristics only one of which receives the treatment. The data needs to be available for both the pre- and post- treatment periods. First, a comparison could be made between treated and the control group in the pre-treatment period. This gives the difference between the two groups. Second, a comparison could be made between the pre- and post-treatment period for the treated group. A similar comparison could be made for the control groups. The DID method takes the differences of these two differences to arrive at Average Treatment Effect (ATE). This can be specified in a regression framework as follows:

$$Y_{it} = \alpha_i + \beta * Post_t + \gamma * Reorg_i + \delta * (Post_t * Reorg_i) + \epsilon_{it}$$

Here Y_{it} is the outcome variable. The intercept term (α_i) here captures the unit specific fixed effects. The second term ($Post_t$) is a dummy variable that takes a value of 0 (pre-treatment) and 1 (post-treatment). The coefficient to this term (β) gives the baseline difference between control and treated state. The third term ($Reorg_i$) is a dummy that takes a value 1 (treated units) and 0 (control units). The coefficient to this term (γ) gives the difference in the pre- and post- treatment for the treated group. Finally, we have an interaction term, whose coefficient (δ) gives the difference-in-difference estimate.

The DID method makes a very crucial assumption, that of Parallel Trends. It means that the treated group maintains a fixed difference with the control group in the pre-treatment period.[14] The method also assigns the same weigh to all the control units. The Synthetic Control Method (SCM) relaxes this assumption of same weight, which we discuss next.

[14] To make sure that parallel trends assumption holds, various control variables (Z_{it}) can be included in the regression setup. But it is often the case that the treatment also affects these time varying control variables. This makes them 'bad' controls (Angrist & Pischke, 2008). Additionally, there exists the problem of serially correlated errors if one wishes to employ the panel characteristics of data, which happens to be in our case (Bertrand et al., 2004).

3.3 Synthetic Control Method (SCM or ADH)[15]

This method was pioneered by Abadie et al. (2003) and subsequently improved upon in Abadie et al. (2010, 2015). Synthetic Control Method (SCM) creates a 'synthetic' control group from a weighted combination of some, or all, of the control units. These weights are assigned to the selected control units so that it tracks the path of the treated unit in the pre-treatment period for an outcome variable based on some 'predictor' variables. Its identification strategy relies on that argument that if a weighted combination of control groups can track the treated group in the pre-treatment period reasonably well, it can provide the counterfactual for the treated unit in the post-treatment period. The difference between the treated unit and the synthetic control group, thus constructed, in the post-treatment period gives the impact of the treatment on the treated unit.

In traditional comparative exercises, a single control group, otherwise similar but unaffected by the treatment, is often used as the comparison unit. This single comparison unit is the counterfactual. In the DID setup the comparison group is the simple average of all the units. SCM, on the other hand, relies on the fact that a weighted combination of comparison units is often better at predicting than a single comparison unit (Abadie et al., 2015). Instead of using a single control unit, synthetic control method gives a data driven procedure for control group selection. Formally, the difference between treated and 'synthetic' control group could be written as follows:

$$\alpha_{it} = Y_{1t} - \sum_{i=2}^{N} \omega_i * Y_{it}$$

Here the indexing variable (i) refers to the units. For convenience, we treat the first unit ($i=1$) as the treated unit, others are for control units ($i=2, 3, \ldots, N$). The variable (Y) is the variable on which comparison is made, per capita income in our case. It is to be noted here that control units have varying weights (ω_i) attached to them. It is this provision of varying weigh that is the innovation of SCM.

While estimating the synthetic control estimator, the first step is to select 'donor pool' which comprises of all the potential control groups based on some characteristics (Y). In

[15] The acronym ADH is derived from the initial letters of the three co-authors Abadie, Diamond and Hainmueller (Abadie et al., 2010). We use SCM and ADH interchangeably.

most cases, all the available control units can be considered for this purpose. The second step is to select a few predictor variables ($\boldsymbol{X}$) which are important determinants of the outcome variables. It is advisable to include outcome variable at least for a few years from the pre-treatment period.[16] The next step is to assign the weights to the various potential control units. The weights ($\boldsymbol{\omega_i}$) are assigned in such a way that the weighted combination of the control unit approximates the unit to be treated in the pre-treatment period. Statistically, it is an exercise in the minimization of Root Mean Square Prediction Error (RMSPE) in the pre-treatment period (Abadie et al., 2015). These weights thus computed, using the data only from the pre-treatment period, are then used to estimate a 'synthetic' control group as the counterfactual for the treated unit using the same predictor variables in the post-treatment period.[17]

It is general practice to present the counterfactual estimates, and the actual data, using graphs. For example, Abadie et al. (2010) estimate the impact of California's tobacco law on the sale of cigarette. They show a graph in which in the pre-treatment period the synthetic control group tracks the per-capita cigarette sales of California. Using the weights from this pre-treatment period, the synthetic control estimator constructs a counterfactual for California. The graph tracks the actual data along with this estimated counterfactual. The graphical comparison of the treated unit and the synthetic control group makes the method visually more attractive.

An important limitation of this method is that it does not allow for a permanent additive difference between the treated and the control group, characteristic of DID. This becomes important in case when the treated unit lies at the two extremes of the control units, which happens to be in our setup. A solution to this is to combine these two methods in one framework to which we turn next.

[16] The choice to the predictor variables is subjective to researcher. An important point to keep in mind, while applying the method, is that these characteristics may include some or all of the pre-treatment observations. For all practical purposes, the lagged outcomes tend to be substantially more important, and as a result the decision of choice of these predictor variables may not be very important (Doudchenko & Imbens, 2016).

[17] It may be noted that he applicability of the methods requires a 'sizeable' number of pre-intervention periods in order to track the treated unit in the pre-treatment period. This method is not recommended in case the pre-treatment fit is poor (Abadie et al., 2015).

3.4 A general framework combining DID and SCM

The two methods discussed above have been considered in isolation. The advantage of DID method is that it accounts for a time invariant fixed effects between the treatment and control groups in the pre-treatment period. However, it assigns equal weight to all the control units. SCM, on the other hand, allows for different weights to different control units. But it does not allow for a time invariant systematic fixed difference between the treatment and control groups. Doudchenko & Imbens (2016) proposes a structure which combines these two methods in a single equation framework, as follows:

$$\widehat{Y}_{0,T} = \mu + \sum_{i=1}^{N} \omega_i * Y_{i,t}$$

Here the counterfactual ($\widehat{Y_{0,T}}$) is constructed based on the observed outcomes ($Y_{i,t}$). There are two parameters (μ, ω_i) in this equation. The first parameter (μ) allows for the permanent additive difference between treated and the control groups, which is the hallmark of DID. The second parameter (ω_i) allows for varying weights to be assigned to various control units, which is the innovation of SCM. By applying restrictions on these two parameters, this general structure reduces to different methods. **Table-1** lists five such restrictions: no intercept (μ), adding up ($\Sigma\omega_i = 1$, non-negativity of weights ($\omega_i \geq 0$), exact balance, and constant weights ($\omega_i = \bar{\omega} = 1/N$).

Table 1: Restrictions on the General structure

	Name of Restriction	Meaning of Restriction
1	No intercept	$\mu = 0$
2	Adding up	$\sum_{i=1}^{N} \omega_i = 1$
3	Non-negativity of weights	$\omega_i \geq 0$
4	Exact-Balance	$Y_{t,pre}^{obs} = \mu + \omega^T Y_{c,\ pre}^{obs}$
5	Constant Weights	$\omega_i = \bar{\omega} = 1/N$

Note: Based on Doudchenko & Imbens (2021)

The Synthetic Control Method considers the first three restrictions- that of No Intercept, Adding up, and Non-negative weights (Abadie et al., 2010, 2011). The first restriction implies that there is no systematic difference between the control and the treatment group. The second restriction requires that the unit weights sum to one. The third restriction imposes that the unit weights have a zero or positive value. These two restrictions (Adding-up and Non-negative weights) considered together offers an intuitive interpretation, that the treated unit is the weighted average of the control units considered. However, these two restrictions become problematic if the treated unit is an outlier.

The third restriction is the key in deciding the weights in SCM. This serves three-fold purpose. First, it helps regularize the estimation of weights in case where there are many control units by ensuring that there is a unique solution. Second, this helps in precision by limiting the sum of squared weights, which enters into calculation of variance. Third, it ensures that weights are non-zero only for a small subset of control units, making the weights easier to interpret. Relaxing these restrictions result in various estimation problems (Abadie et al., 2015).

The fourth restriction on the general structure implies that the treated group can be written as a linear combination of the control groups. This kind of approach is used in matching literature, where the treatment and control groups can be exactly matched. The fifth restriction implies that the weights to be assigned to each of the control group are same. This restriction is at the heart of DID exercise which assigns equal weight to each of the control group members. An added advantage of using the comparison structure is that all these methods can be studied in a common setting.

Table-2 summarizes how five different methods can be achieved by applying one or more of these restrictions. The third method is the Best Subset Selection (BSS) method which uses a smaller set of the control groups. The fourth method- Constrained regression- is a special case of Synthetic Control Method (SCM) where no covariates (or predictor variables) are

used in estimation. The fifth one- Elastic Net (EN) regularization method- is the most general of all, and does not impose any of these restrictions.[18]

Table 2: Relaxing constraints on the general structure

Method/ Technique	Relaxation of Constraints	Remarks
Difference-in-Differences	• $\sum \omega_i = 1$ • $\omega_i \geq 0$ • $\bar{\omega} = 1/N$	Treats each control group as equivalent and assigns same weight to each of them.
Synthetic Control Method (SCM)	• $\mu = 0$ • $\sum \omega_i = 1$ • $\omega_i \geq 0$	Assigning different weights to different control units is its innovation.
Constrained Regression	Same as ADH method.	A special case of SCM, with no covariates.
Best Subset Selection	• $\mu = 0$ • $\sum \omega_i = 1$	Relaxes the assumption of non-negative weights.
Elastic Net	No constraints imposed	Does not impose any restriction on the objective function

Note: See Table-1 for source.

It is worth mentioning here that there is a complexity involved in the interpretation of control group created by Elastic Net method. As against this, the 'synthetic' control method has a more intuitive interpretation as it is a weighted average of the control units that gets positive weights. Keeping this in view, we rely on SCM for our discussions, except in two of the nine cases (Combined Bihar and Bihar), where the treated state is an outlier and so a weighted average cannot be computed. We treat three other methods as an exercise in methodological robustness. To check for statistical significance we calculate standard errors using Bootstrap methods. Having discussed our data and empirical strategies, we now present our empirical estimates. [19]

[18] The estimation of the general structure, especially the Elastic Net (EN) regularization method, has its own set of computational problems, as discussed in Doudchenko & Imbens (2016). See Vaibhav (2021) for an accessible treatment of the topic.

[19] We are thankful to Prof. Guido Imbens (Stanford University) for sharing the codes used in the study Doudchenko & Imbens (2016). The codes for Difference-in-Difference (DID), Elastic Net (EN), and Best Subset Selection (BSS) methods, are written in R programming language. The codes for Synthetic Control Method (SCM) and constrained regression are written in MATLAB. The codes for the visual outputs- evolutions of outcome variables, the assignment of weight to different control units, and the standard errors- are written in MATLAB.

4. Analysis and Discussion of Results

It is a standard practice to graphically present the results of the synthetic control exercise (Abadie et al., 2010, 2015). In addition, there are two sets of graphs for each of the treated units: standard errors attached to these point estimates, and weights assigned by different methods to various control states (Doudchenko & Imbens, 2016). Keeping in view the space constraint, we present only the first set of graphs here.[20]

Our outcome variable is the per capita income (PCI). The years are along the horizontal axis, while the vertical axis has PCI (2004-05 prices). The vertical line shows the year when the reorganization actually occurred for ease of visualization. The solid line (Red) represents the actual data. Two other lines give the estimates of the two main methods: Synthetic Control Method (Blue & Round) and Elastic Net method (Violet & small bar). Three other lines represent the three other estimates: Difference-in-Difference (Brown & Cross), Regression with restrictions (Green & Dotted), and Best Subset Selection (Orange and Dashed).

A word about the choice of predictor variables for our SCM (or ADH) estimates is in order. We have used eight predictor variables. These include: average share of agriculture and services sector in the pre-treatment period, credit sanctioned by the banks, length of road, per-capita electricity consumption, Infant Mortality rates, Literacy rates (2001), and revenue expenditure as percentage of aggregate economy. Because of non-availability of the last one, we had to drop it from the estimation for six smaller states. Additionally, we use PCI in the pre-treatment period as one of the predictor variables. For combined states we use the past PCI for four years (1981, 1988, 1994, and 1999). For the smaller states we use this for only two years (1994 and 1999). Since the reorganization occurred in November 2000, the pre-treatment period for combined states is from 1980-81 to 1999-00. Because of availability of data only from 1993-94, this period is 1993-94 to 1999-00 for the smaller states. The post-treatment period in all the cases is 2000-01 to 2013-14.

We divide our analysis in two sub-sections. In first, we present the results for the three combined states. In second, we present the results for the six smaller states. For each of these nine cases, we present separate graphs.

[20] The standard error estimates and the weighting schemes, and their graphs, are available upon request.

4.1 Results for three Combined states

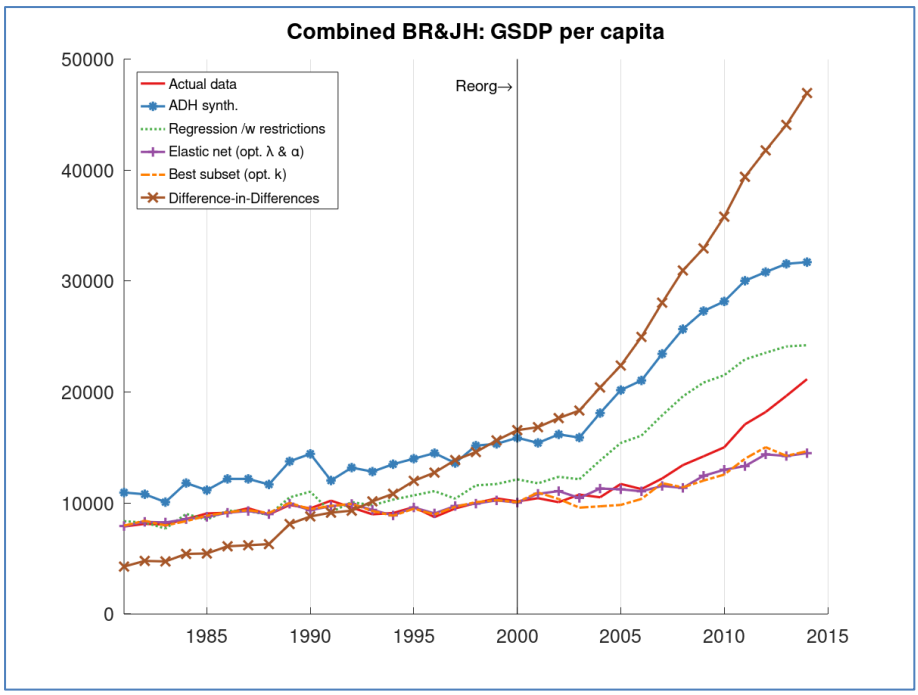
The three states that were reorganized were the poorest among major Indian states, in terms of PCI. With a per capita income of about Rs. Ten thousand for 1999-00 (Rs. 10,155 at 2004-05 prices), Bihar stood at the bottom among all Indian states. Uttar Pradesh (Rs. 13,764) and Madhya Pradesh (Rs. 17,572) do only slightly better. For comparison, the average for 16 major Indian states was twice that of Bihar (Rs. 21,134).

Combined Bihar: We present the evolution of PCI for combined Bihar, and predictions from five different counterfactuals, in **Figure-4**. The first thing we observe from the graph is that the slope of the curve is almost flat in the pre-treatment period indicating the income did not grow much during the 1980s and 1990s. This trend continues for over half a decade after reorganization, after which the state seems to have grown faster. The DID estimate does a very poor job of maintaining the parallel trend assumption in the pre-treatment period. The DID-counterfactual estimate (cross line) is well below the actual data (dotted line) in 1981. It closes in and intersects in the early 1990s after which this counterfactual surged ahead and there is consistent widening of the gap. It means that the counterfactual, i.e. the average of the control states (13 non-reorganized major Indian states) grew much faster compared to the state of Bihar in the pre-treatment period. We also notice a sharp turn during early 2000s, meaning the growth increased even further after 2003.

The 'synthetic' counterfactual (labelled ADH synth) lies well above the actual data (solid line). This is because the state has the lowest per capita income and therefore no combination of control states can match the actual data, if we apply the restrictions of the method (zero intercept, non-negative weights, and adding up restriction). There is initially a parallel difference between the two, but there starts a small divergence since the early 1990s.[21]

[21] The Synthetic Control Method (SCM or ADH) assigned full weight to the state of Odisha to create 'synthetic' Bihar. So effectively, the state of Odisha is the control group in this case. This also explains the kink in the graph in 2003-04.

Figure 4: Comparison of actual and counterfactual per capita incomes- Combined Bihar



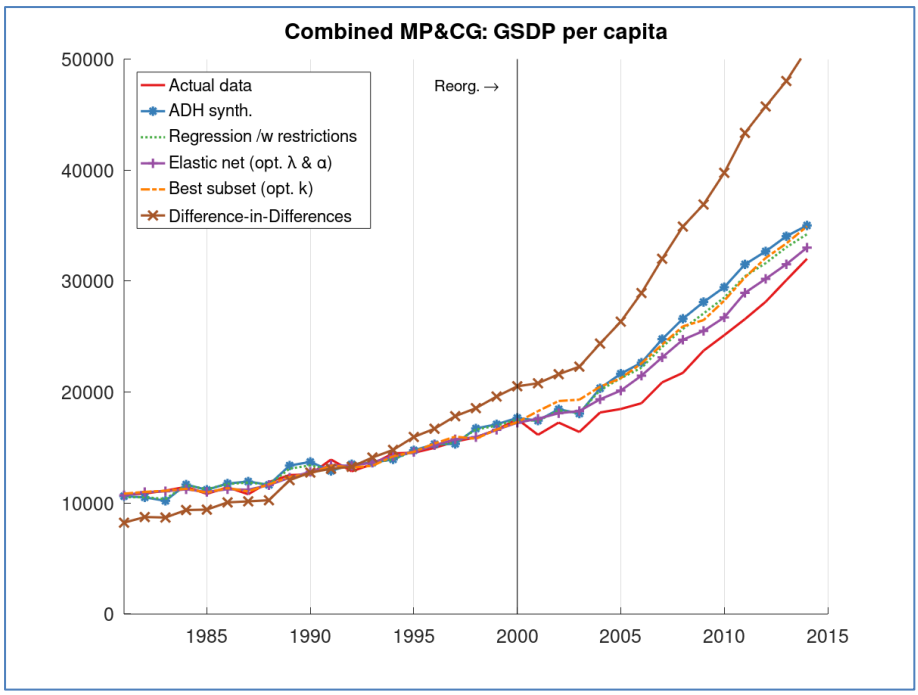
The counterfactual from Elastic Net (Violet & small vertical line) follows income for actual Bihar in the pre-treatment period very closely. This continues for over half decade in the post-treatment period (till about 2006), after which the actual income shows distinct upward shift away from control group (Elastic Net). This is mainly on account of the better performance of the successor state of Bihar.[22] The counterfactual PCI (from Elastic Net) is about 31.5% lower than the actual PCI of Bihar. However, we do not find this difference to be statistically significant. This result is closely followed by Best Subset Selection method (Orange & Dashed).

Combined MP: Figure-5 shows the actual income, and various counterfactual, for the state of combined Madhya Pradesh. The slope of actual data is not as flat as we observed for earlier case. Here again, the DID estimates does a poor job in following the actual data, and also does not satisfy parallel trends assumption. However, all the other methods, including ADH and Elastic net, follow the actual data in the pre-treatment period quite closely.[23]

[22] Bihar has shown promising growth after 2005-06, even higher than the national average. This is well documented. For a comprehensive overview, see Mukherjee & Mukherjee (2012). Ghatak & Roy (2015) has found a trend-break in their analysis for the state.

[23] The Synthetic Control Method assigns positive weights to three states- Odisha, Rajasthan and West Bengal- to create synthetic state. The weights for Elastic Net method are, as with earlier case, more diverse.

Figure 5: Comparison of actual and counterfactual per capita incomes- Combined Madhya Pradesh



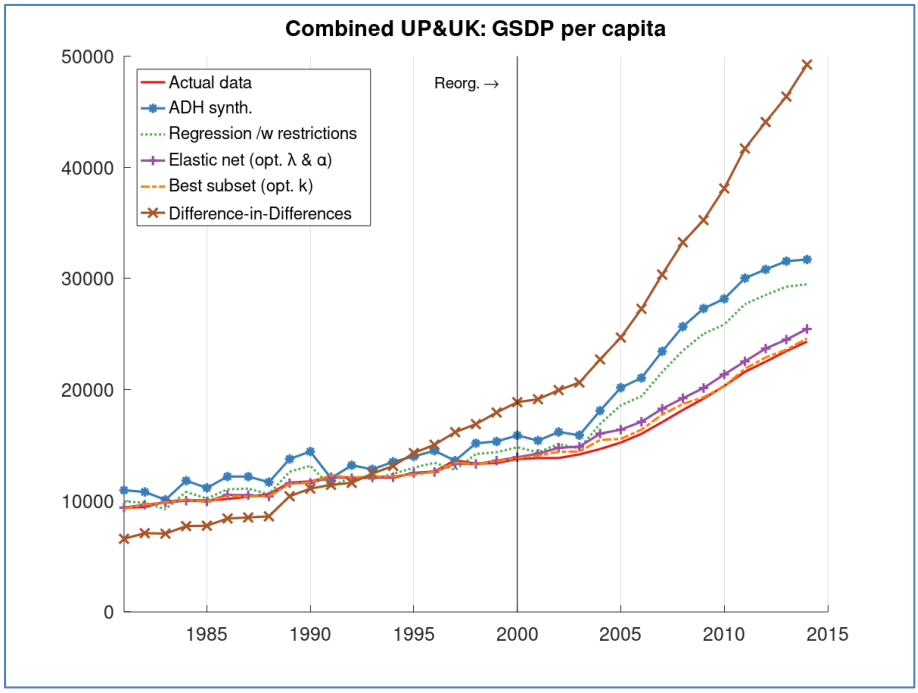
In the post-treatment period, the actual data shows a sudden decline immediately after reorganization. Checking the data for the two successor states, Madhya Pradesh and Chhattisgarh, separately suggests that this decline was for both the constituent states. We note that counterfactual state from various methods, except DID, stay very close to each other. All these maintain a constant difference with the actual income. This is almost the same gap that arose because of the slump in the first few years. We do not find this gap to be statistically significant. The slope, however, seems to run parallel in the actual and control states, meaning that after the initial slump there is only small effect on the growth rates.

Combined Uttar Pradesh: Figure-6 shows the evolution of PCI for combined UP, along with counterfactual estimates. This case suffers from the same problem as with the state of Bihar. The DID method does not appear to capture the trend in pre-treatment period. Since the state lie at the lower extreme in terms of per capita income, Bihar not being among the 'donor' pool, the synthetic state does not closely follow the actual state.[24] As with two previous cases, Elastic Net (EN) method does a good job of following the actual data in the pre-treatment period. In the post-treatment period, actual data follows the EN

[24] Here also, the entire weight is assigned to the state of Odisha.

counterfactual very closely. It appears that the state has moved to slightly higher growth trajectory after 2005 but we do not find this small gap to be statistically significant.

Figure 6: Comparison of actual and counterfactual per capita incomes- Combined Uttar Pradesh



Our analysis in this sub-section suggest that the combined states did not show any 'extra-ordinary' positive, or negative, growth in the decade and a half long period we consider. The positive, but statistically insignificant, case of Bihar seems to be on account of the change in political leadership. Was this change in political leadership on account of reorganization requires further investigation. The case of combined MP is not convincing enough to suggest that there has been a negative effect of reorganization. The case of UP also does not seem to be able to break the mould.

However, it is possible that economic activities in new states might have increased at the expense of the parent state, or vice-versa. It is also possible that gains might have accrued only to the new states, which fails to be statistically significant if we undertake the empirical analysis for the combined units. One way to check for it is to study the six states separately, to which we turn next.

4.2 Results for six smaller states

We apply the same set of methods to investigate the case for the six successor states. There is one important change though. We have a pre-treatment period of only seven years.

Bihar and Jharkhand: We present the results for Bihar and Jharkhand in **Figures-7** and **Figure-8** respectively. Bihar's PCI has remained almost stagnant in the pre-treatment period (1994-00). This trend continues even in the post-treatment period for over half a decade, after which it increases. This time period of increasing income coincides with an important political change in the state.[25]

We see that the DID estimate does not follow parallel trends for Bihar. The state of Bihar has the minimum PCI. As a result, the synthetic control does not closely follow the actual data. As with combined Bihar, the EN counterfactual follows the actual data in the pre-treatment period closely. In the post-treatment period, this lie above the actual data, before finally meeting the actual data close to our terminal year. The difference between the actual and the counterfactual is statistically insignificant for the EN method.

The state of Jharkhand saw a decline in the PCI in one of the years (1996-97) followed by subsequent rise (1997-98). This rise was again followed by a decline for two consecutive years (1999-00 and 2000-01). Some may consider it a cyclical phenomenon for the state; others may suggest there was decline in the state's per capita income on account of reorganization. A limited data for the pre-treatment period precludes us from saying anything with certainty. This cyclical behaviour is picked by the Elastic Net counterfactual. This is clearly the case of curve over-fitting.[26] Counterfactuals from all other methods lie well above the actual data, including ADH method. In addition to the initial slump in income for the state the gap between the actual and 'synthetic' state is rising. This may, again, have been on account of the ups and downs in the pre-treatment period. This is reflected in the high standard errors which makes this gap statistically insignificant.

[25] Mukherjee & Mukherjee (2012) has extensively studied the changes in Bihar during 2000s. They conclude that the leadership change has resulted in improvement in three aspects in the state: the situation of law & order, roads, and electricity. Also see Mazaheri et al. (2013).

[26] The divergence in the behaviour of BSS and elastic net in the case of Bihar may have been as a result of such an over-fitting.

Figure 7: Comparison of actual and counterfactual per capita incomes- Bihar

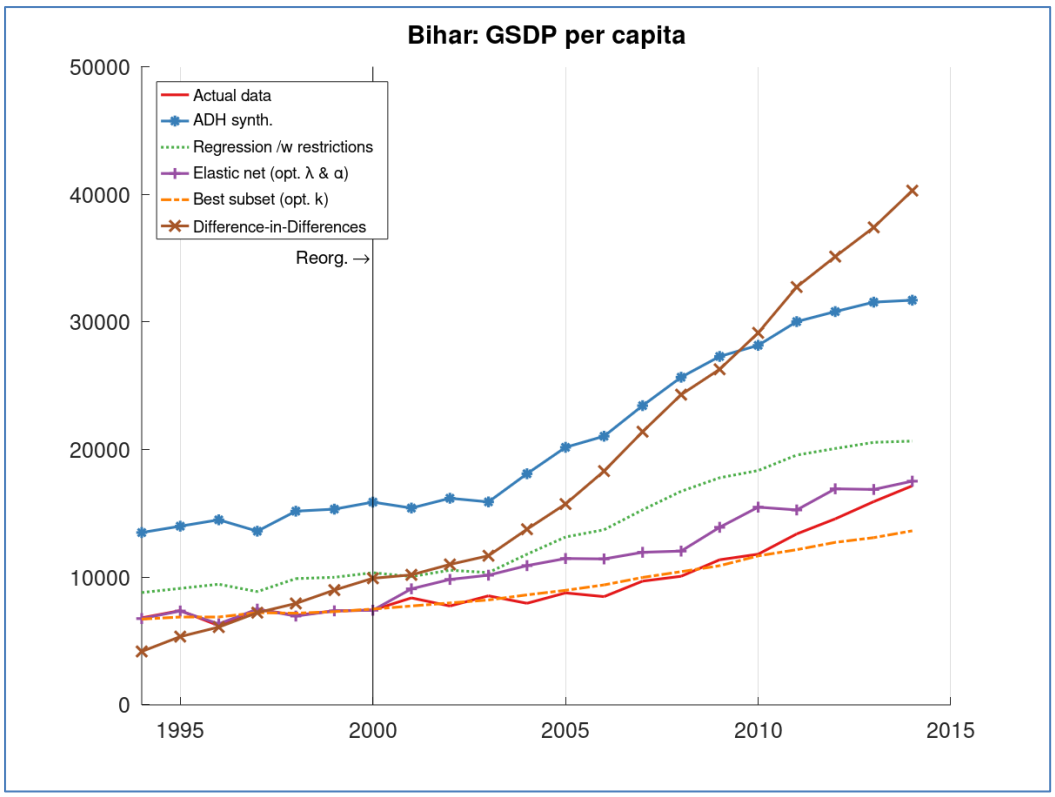
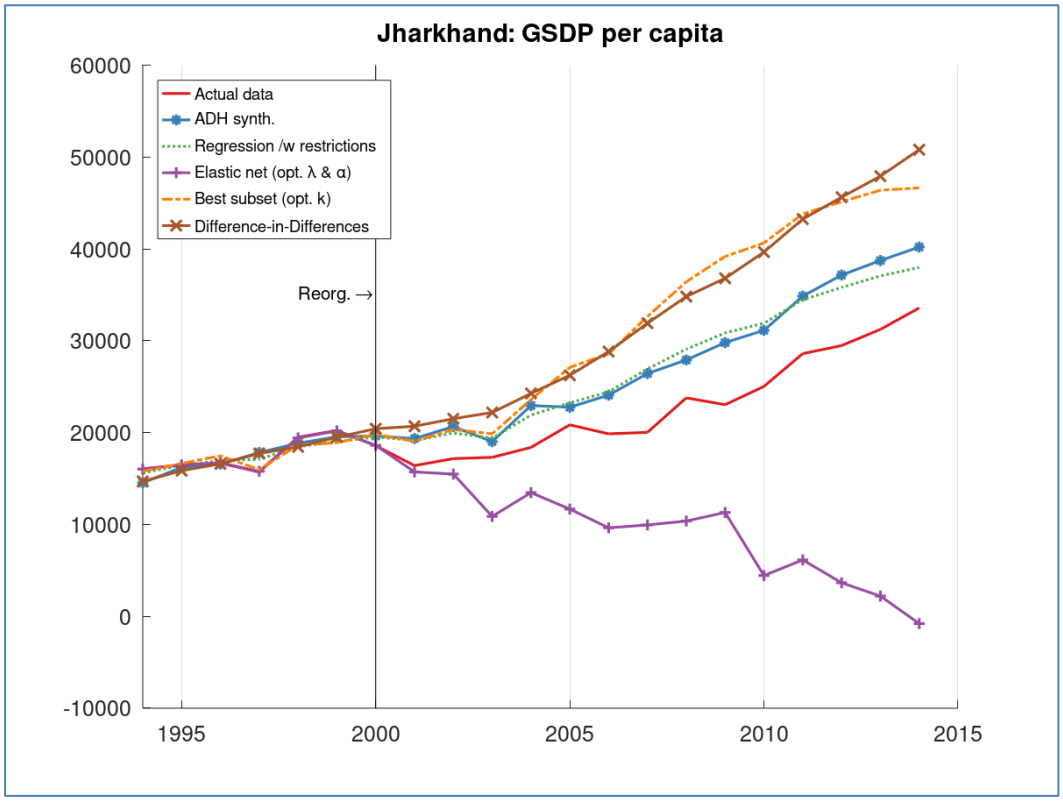


Figure 8: Comparison of actual and counterfactual per capita incomes- Jharkhand



MP and Chhattisgarh: We present the point estimates for the state pair of Madhya Pradesh and Chhattisgarh in **Figure-9** and **Figure-10** respectively. Even here, the DID does not seem to follow parallel trends in both the states. All other methods follow the actual data very closely in the pre-treatment period. MP saw a decline in PCI immediately after reorganization. In fact, for first few years it stagnated. A gap between the actual state and various control groups seems to be on account of the gap created in this initial period. It appears that the state seems to have lost compared to the counterfactual. Even though statistically insignificant, this gap was substantial (22%) if we consider the EN counterfactual. With ADH method, this gap is about half of this (11%). We can indisputably conclude that the reorganization does not seem to have any positive impact for the state.

For Chhattisgarh, there is an initial dip in its PCI, similar to that for MP. But it recovered quickly. We notice that two methods- ADH synth and Elastic Net- shows divergence in their trend in the post-treatment period. The EN follows a flat path, seems to be just an extrapolation of the state's pre-treatment period into the post-treatment years. The actual state closely follows 'synthetic' state till about 2006, after which the actual data shows a rise. This synthetic group is about 10% below the actual data in the terminal period. It appears that the state has performed better than the counterfactual (ADH synth) in point estimates.[27] Even though statistically insignificant, it is of importance to point out that the new state here has performed relatively better than the parent state. This is in contrast to the Bihar-Jharkhand pair, where new state has performed badly while the parent state has performed well, both compared to their respective counterfactual.

[27] Chhattisgarh also saw a political regime change in the state in the initial period, as with Bihar.

Figure 9: Comparison of actual and counterfactual per capita incomes- Madhya Pradesh

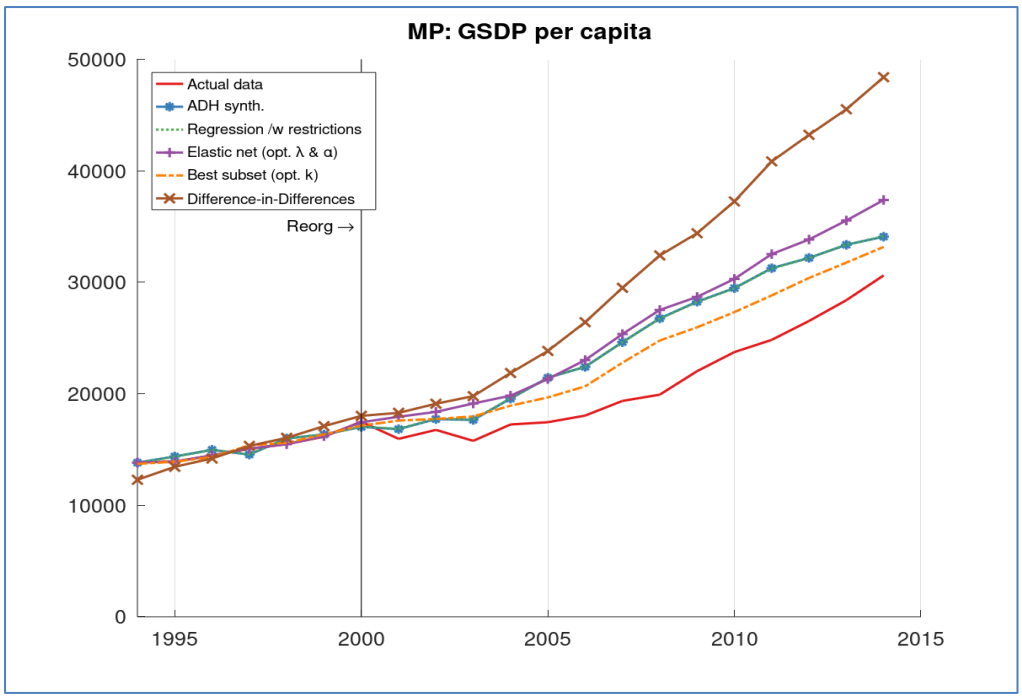
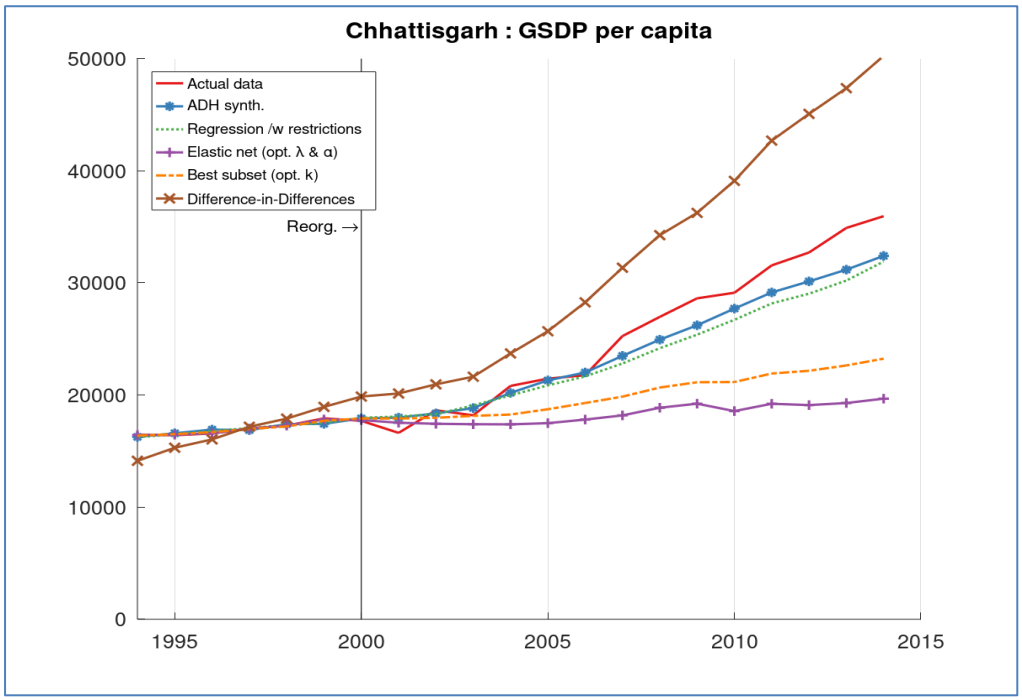


Figure 10: Comparison of actual and counterfactual per capita incomes- Chhattisgarh



UP and Uttarakhand: We present the evolution of actual per capita income as well as for various counterfactuals for the states of Uttar Pradesh and Uttarakhand in **Figure-11** and **12** respectively. As with most of the previous case, the DID estimate does not show parallel trends. As expected, because of an extreme outcome variable for UP, the 'synthetic' state does not closely follow the actual data in the pre-treatment period. All the counterfactual estimates lie well above the actual data. EN estimates closely follow the actual data in pre-treatment period, and in the post-treatment period. The EN counterfactual is about 22% above the actual data, though statistically insignificant. We can reasonably conclude that there is no evidence of any positive impact of reorganization.[28]

The case of Uttarakhand is interesting (**Figure 12**). All methods, except DID, follow the pre-treatment actual data very closely. We notice here for the first time that the actual data lies above estimates from all the methods, including DID. We note that there is divergence between ADH synth and Elastic Net method, for which we have estimated the standard errors. Interestingly, the result is positive and significant irrespective of the choice of method here. The gap between actual data and Elastic Net counterfactual (58%) is substantially lower than that from ADH method (44%). It cannot reasonably be denied that the state has performed substantially well in the post-reorganization period.

The state of Uttarakhand has shown an exceptional performance in terms of PCI. The state has grown at the rate of 9.5% (for 2000-15), which is significantly higher compared to the 'synthetic' state (4.9%). What explains this extraordinary performance of this hilly state? The share of industry in the state has almost doubled. During the 1994-00 period the average share of industry in the state was just above a fifth in the economy (21.2%). This almost doubled in just more than a decade (38.1% during 2011-15). This increase in industry may be attributed to various tax benefits and other incentives given by the state government. One estimate suggests that about 34 billion U.S. dollar (at 2005 purchasing power parity) worth grants and tax exemptions during 2001-12 (Shenoy, 2018). It may also be noted that the state was accorded a special category status which entitles it certain financial benefits in transfers from the union government (Bhattacharjee, 2016).

[28] It may be kept in mind that the state that was carved out (Uttarakhand) formed a very small portion of combined UP. So this depressing effect should not be fully attributed to the treatment.

Figure 11: Comparison of actual and counterfactual per capita incomes- Uttar Pradesh

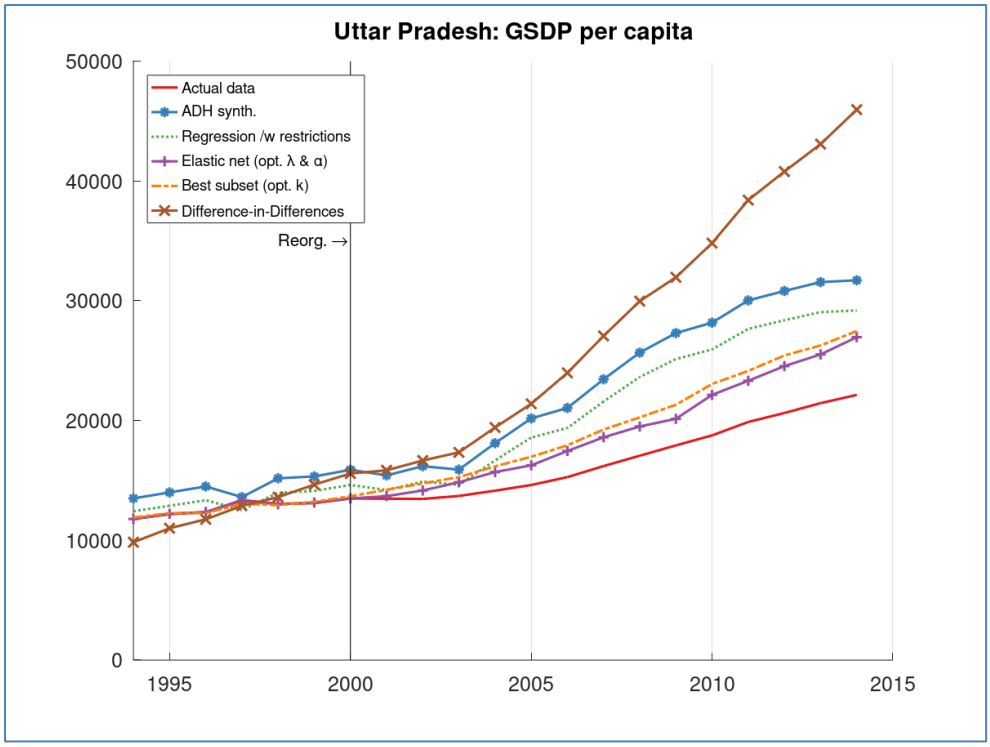
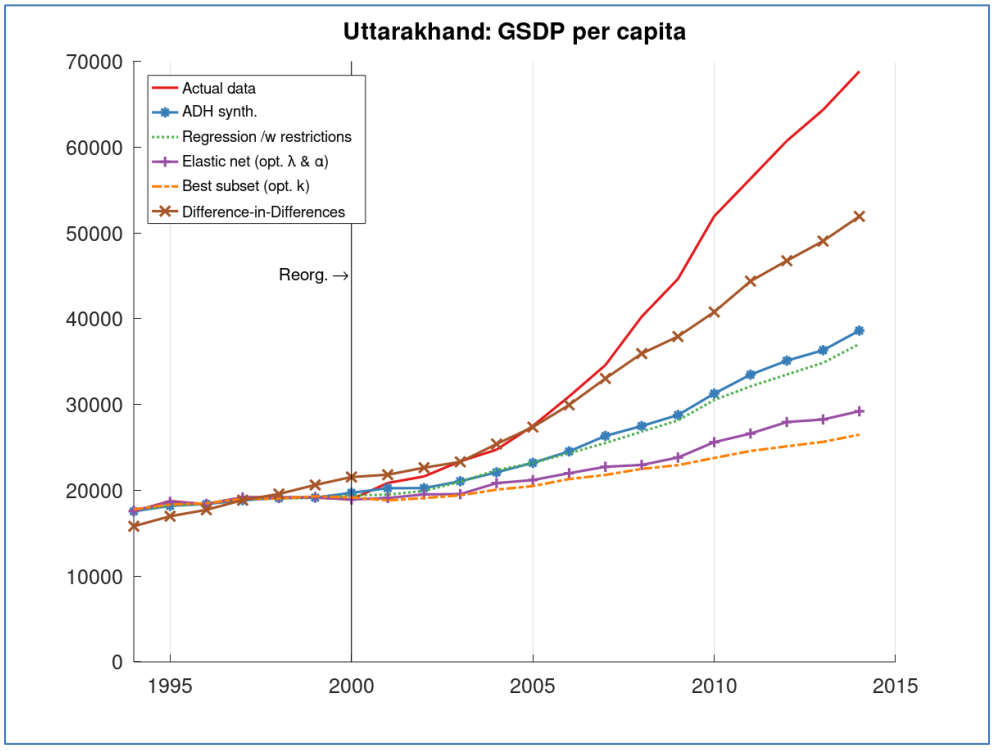


Figure 12: Comparison of actual and counterfactual per capita incomes- Uttarakhand



Can we say that the new states perform better or worse? The answers for three new states vary substantially to arrive at any general conclusion. The state of Uttarakhand has shown extraordinary performance in terms of rise in PCI in the post-reorganization period. Despite some caveats, as we discussed above, it may hint towards new states performing significantly better. But the two other cases do not confirm such a view. On the one hand, Jharkhand showed a perceptible, though statistically insignificant, slump in the PCI in the period immediately after the reorganization. Chhattisgarh, on the other hand, saw a slight decline immediately after treatment, but it recovered quickly, and in fact went slightly above the counterfactual state, even though statistical insignificant.

What about the three parent states? Here also the answer is 'it depends'. The state of Bihar did grow faster, but only after a change in political regime. Two other states- MP and UP- do show a decline in point estimates compared to their counterfactuals. However, it remains statistically insignificant to render any reliable conclusion. We may be safe in concluding that the reorganization does not affect the parent states as adversely as it was generally believed. Furthermore, the economic growth in the newly created states was nowhere near the hype usually associated with such events.

5. Conclusion

The reorganization of a geographical unit is often accompanied by loaded arguments, both supporting and opposing the cause. A lack of data, and subsequent empirical research, does not help the debate, which often generate more heat than light. Given the importance of such events from both retrospective and prospective purposes, a thorough analysis is warranted. We undertake such an empirical exercise in this study.

The union government of India undertook territorial reorganization of three North Indian states in November 2000. The bifurcation of these states led to the creation three new states. Such a decision has the potential to affect the lives of hundreds of millions. For a perspective, the population of the affected states were higher than that of the USA and about half of the entire European continent.

We first briefly surveyed the economies of these states with about three and half decades of data (1981-2015). The reorganization occurred during the accounting year 1999-00, which leaves us with reasonably long data to observe the impact of treatment. Then, we use a variety of methods- including Synthetic Control and Elastic Net regularization methods- to construct counterfactuals to compare with the actual data in the post-treatment period. We also computed standard errors to check if the differences between the actual and the counterfactual estimates are statistically significant. We analysed the combined states and the smaller states separately.

We do not find statistical evidence which might suggest that reorganization leads to better economic outcomes for the combined states. Combined Bihar did show some promise half a decade after the treatment, but this can be easily attributed to events other than reorganization. Two other combined states also did not show any significant evidence.

Could it be that one of the two states in parent-new state pair has gained at the cost of other state? We look into the six smaller states to find this out. This does appear to be the case is some cases. In the Bihar-Jharkhand pair, the new state of Jharkhand does show a slump in the first few years, as opposed to the stable growth for the parent state in the same period. There is some difference in performance for MP-Chhattisgarh state pair. But in this case it is the parent state which sees lower growth and is unable to catch up with the counterfactual. Chhattisgarh, on the other hand, recovers the initial slump quite quickly and in fact grows past the expected counterfactual line. But in all these cases the deviations remain statistically insignificant. So we cannot say that parent state, which inherit state machineries grow faster (or slower) compared to the new states which did not.

Uttarakhand emerges as an outlier. The state performs better than its counterfactuals, and is statistically significant. This extra-ordinary performance of the state can be explained by significant infusion of resources from the Union government and private players on account of tax benefits (Shenoy, 2018). We believe that positive impact of reorganization in some of the previous studies, notably Asher & Novoshad (2015), and may have been driven by the extra-ordinary performance of Uttarakhand.

Our findings do not point towards any general conclusion of the beneficial, or retarding, effect of territorial reorganization on the average income. Our exercise also does not

support the often made claim that smaller states grow faster than bigger states. A caveat is in order here. Our results should be seen in the light of the fact that a period of a decade and half is but a small time in the history of a state. Our analysis captures the average impact in a medium term, at best. Territorial reorganization is a complex phenomenon, and it may affect a variety of aspects. There is a need for further research to understand these characteristic to gain a more comprehensive picture.

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Appendix Tables

Table-A 1: Growth of GSDP (CAGR) for the Reorganized States (1981-2015)

	CAGR for Reorganized States (GSDP)						
	1981-00	**1981-90**	**1990-00**	**2000-15**	**2000-05**	**2005-10**	**2010-15**
Combined Bihar	3.6	4.3	3.0	7.3	5.1	6.7	10.1
Combined MP	4.9	4.2	5.6	6.4	2.9	8.2	8.2
Combined UP	4.4	4.9	3.9	6.2	4.2	7.9	6.4
Major Indian states	5.4	5.2	5.5	7.0	5.1	8.7	7.2
'Reorganized' states	4.4	4.6	4.2	6.5	4.0	7.7	7.8
'Poor' Indian states	5.1	4.9	5.3	6.3	5.2	7.3	6.5
'Northern' states	5.3	5.8	4.9	7.0	6.0	8.6	6.5
'Western' states	6.4	6.0	6.7	7.7	5.6	10.1	7.5
'Southern' states	5.7	5.4	6.1	7.2	5.4	9.0	7.1

Note: Compounded Annual Growth Rate (CAGR) is calculated based on the GSDP at constant prices (2004-05 prices). *'Combined'* Bihar is comprised of combined states of Bihar and Jharkhand. Similarly, *'Combined'* MP refers to combined states of Madhya Pradesh and Chhattisgarh. *'Combined'* UP refers to the combined states of Uttar Pradesh and Uttarakhand. *'Reorganized'* states comprise of the three states that were affected by reorganization (Combined Bihar, Combined MP, and Combined UP). *'Poor'* states refer to four states: Assam, Odisha, Rajasthan, and West Bengal. *'Northern'* states refers to three north Indian states: Punjab, Haryana, and Himachal Pradesh. *'Western'* states refer to two West Indian states: Gujarat and Maharashtra. *'Southern'* states comprise of four south Indian states: Andhra Pradesh, Karnataka, Kerala, and Tamil Nadu. Finally, *'Major'* Indian States is comprised of all sixteen of these states.

Table-A 2: Growth of per capita Income for Combined Reorganized states

	1981-00	**1981-90**	**1990-00**	**2000-15**	**2000-05**	**2005-10**	**2010-15**
Combined Bihar	1.3	2.1	0.6	5.5	2.9	5.1	8.7
Combined MP	2.6	1.8	3.4	4.6	1.0	6.3	6.4
Combined UP	2.0	2.5	1.6	4.2	2.1	5.9	4.6
Major Indian states	3.2	3.0	3.4	5.4	3.4	7.1	5.8
'Reorganized' states	2.0	2.2	1.8	4.6	1.9	5.9	6.1
'Poor' Indian states	3.0	2.6	3.3	4.9	3.6	5.8	5.2
'Northern' states	3.1	3.6	2.7	5.2	4.0	6.7	4.9
'Western' states	4.1	3.8	4.5	6.1	3.8	8.5	6.1
'Southern' states	4.1	3.5	4.6	6.2	4.3	8.1	6.2

Note: Same as Table-A1

Table-A 3: Growth of economy for six smaller states

	1994-00	2000-15	2000-05	2005-10	2010-15
Bihar	4.0	8.1	5.6	7.8	10.9
Jharkhand	4.9	6.1	4.2	5.3	9.0
Madhya Pradesh	6.2	6.2	1.9	8.2	8.6
Chhattisgarh	2.9	7.1	5.7	8.3	7.2
Uttar Pradesh	4.7	5.6	3.7	7.1	6.0
Uttarakhand	3.2	11.2	9.6	15.3	8.9

Note: Same as Table-A1

Table-A 4: Growth of per capita income for smaller states

	1994-00	2000-15	2000-05	2005-10	2010-15
Bihar	1.4	6.3	3.4	6.1	9.5
Jharkhand	2.5	4.5	2.3	3.7	7.5
Madhya Pradesh	4.0	4.4	-0.1	6.4	7.0
Chhattisgarh	1.2	5.1	3.9	6.3	5.1
Uttar Pradesh	2.3	3.6	1.6	5.1	4.2
Uttarakhand	1.3	9.5	7.7	13.6	7.4

Note: Same as Table-A1