Regional Openness, Income Growth, and Disparity across Major Indian States during 1980-2004

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ABSTRACT

As a country progressively engages in international trade, its factors of production will increasingly enter into the export sector, where their return is higher, compared to the import competing sector. At the regional level too, those states which can attune their production structure to international demands earn higher than other states, grow at a faster rate. Further, if the newly industrial states concentrate more on those sectors, a trend of regional convergence will be discernible. We have developed a theoretical framework to motivate our empirical analysis.

The regional openness index has been reconstructed by using two alternative weighting techniques to combine the export and import intensities, ranks of correlation of state production shares, respectively, with national export and import shares of the states. The per capita net state domestic products have grown in all major states in India during the period 1980–2004 but at different rates, resulting in the rise of regional disparity, and regional openness has been detrimental for this. The states, which moved away from importable production to exportable production, grew faster than the rate of others, at least by 1–1.5 per cent, per annum. Definitely, a few newly industrial states have shown an increasing dependence on exportable production, but not all. Moreover, some of the industrially developed states (in terms of exportable share) have been observed, yet, to continue with importable production to a large extent.

Key words: Regional Openness Index, Trade, Growth, Disparity, Indian States

JEL codes**:** C33, F43, O18

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1. INTRODUCTION

Nowadays, an ongoing debate is: whether the removal of trade restrictions has a positive impact on regional growth of a large country like India. Traditional trade theories argue that this has a positive impact on the industrial dynamics of a country depending on factor intensities of these industries. But, as such, there is no available well known framework which explicitly relates trade to the regional growth of a country. Classical economists such as Adam Smith and David Ricardo did talk about trade and growth. But non-classical trade theories do not have a universally accepted model of trade and growth. As a country progressively engages in international trade, its factors of production will enter increasingly into the export sector, where the return is higher compared to the import competing sector. At the regional level too, the states, which can attune their production structure to international demands, should earn higher returns than other states and also grow at a faster rate. Hence, the relative income of a region depends on how open the region is. However, it can serve as a catalyst of regional convergence if the newly industrial states go for more exportable production. Two approaches are available to explain the regional divergences, resource based and port based. The former suggests that if a country opens up, the regions within the country which are resourceful must grow faster than the others. The latter reveals that economic activities concentrate around ports of a country with the opening up of trade as ports play the instrumental role of physical transaction of commodities for export. But, these views largely explain the period of mercantile trade and are unable to explain the present world. Our approach, here, is institution based, that is, the region with good institutions and investment climate must grow faster than others even as the same trade exposure is available to the country as a whole. This is all the more applicable to a large democratic country and we explore the Indian case in this present study.

Since the quality of institutions and investment climate of a region has a direct implication on its openness, our attempt here is to develop a device of regional openness and to see its impact on growth. The purpose of this work, therefore, is to reconstruct the regional openness index, developed by Marjit et al. (2007), putting two alternative weights to the export and import intensity indices, derived at the regional or state level, and to examine its effect on their growth performances. As a derivative of this exercise, we can confer the effect on regional growth and disparities in India during the period 1980–2004[3]. It seems worthwhile to undertake this exercise at the regional level in a country in which the institutional and organizational factors can widely vary within the same set up of industrial and trade policies.

It is essential for large developing countries, both geographically and politically, and with varied regions, to understand whether trade has an equalizing impact or not. Available

3 The period of study has been restricted up to 2004 so that the analysis can avoid the period of financial crisis.

work on the European Union, where countries are treated as regions, is not as problematic, since the trade data is readily available for each nation. The paper related closest to our work dealing with the EU (Egger et al. 2005), extends the empirical literature on the effects of trade liberalization on regional growth and disparities within a country. Studies on the Central and Eastern European countries show a significant convergence of real wages in Poland and Bulgaria, only. Furthermore, countries with faster growing export openness, during the period 1991–98, experienced larger increases in their regional disparities. In a recent work, Topalova (2005) constructed a trade exposure index of an Indian district, which is a weighted average of tariff rates of importable commodities where the share of employment for each commodity stands as a weight. Further, Hasan et al. (2007) extended this index considering Non-Tariff Barriers (NBTs), for state level, in addition to tariff rate. Interestingly, while Topalova (2005) found a negative impact of trade reform on poverty, Hasan (2007) made a diametrically opposite observation with the state level analysis. While concentrating on tariff and non-tariff barriers these exercises must have ignored the export sector in the indexation. Hence, Marjit et al. (2007) provide an alternative framework for the same and further extend a bit of this methodology. It should be noted that this paper does not use intra-national trade data, which consequently allows substantial differences in both idea and approach that we develop here.

The contribution of the paper has been specifically in the construction of openness indices, and application of the same in the analysis of the effect of trade openness on regional growth and disparity. The study has been able to provide an alternative explanation of the implication of trade on regional growth, based on the quality of institutions. For this purpose, in the absence of regional trade data in a large federal democratic country, we further reconstruct the regional openness index, developed by Marjit et al. (2007), putting alternative weights to the export and import intensities for the derivation of overall openness indices at the state level. The attempt is to investigate how open Indian states are, with respect to international trade, and then try to characterize regional growth and disparities in the light of this openness. This is a typical problem for countries that are large in size and have diverse heterogeneous regions, in terms of geography, culture, and politics. Usually, the shares of export and import to GDP are used to measure the trade intensities of a country and those trade informations do not exist at the sub-national level. In a large federal framework, a particular state enjoys a bit of autonomy over its planning and execution, depending on forms and functions of the institutions in the regions, and must show a different growth path owing to external shocks similar to all the states. The methodology is not only applicable in the Indian case but is also useful for many such countries where the state-level trade data are not available. Marjit et al. (2007) try to devise a proxy which allows us to rank states over time, in terms of their exposure to trade for major Indian states. We refine our earlier related work in 2007 in two ways. The work

derived the export and import intensities of each state running a correlation between the state production share with country trade shares of each item, using a concordance table, and then combined the indices of export and import intensities, arbitrarily putting equal weights to those, for the final calculation of an openness index of a particular state. The present work to modifies this weighting technique and employs two different alternatives. One modification has been the use of the country-level trade shares as weights on export and import intensity indices of each state. The production shares of exportable and importable items respectively to total production for each state have been used as alternative weights. So, the former is fixed for each state in a year, while the latter may vary. Secondly, these indices along with other control variables have been regressed on per capita net state domestic products (PCNSDP), using panel regression techniques, to see the effect on income growth and disparities. This has been a more controlled experiment than that amongst a group of countries. The results consistently suggest that regional openness, particularly in terms of exportability, has been detrimental to explain the differential growth and disparity of major Indian states during 1980–2004. The states, which are relatively open, have grown at 1 to 1.5 per cent higher than others. In addition, the newly growing states have focused more on exportable commodities, while the industrially developed states in terms of exportable productions continue to produce importable goods to a large extent. They had developed this trend during the early periods of planning under the policy of import substitution. Third, while we notice a continuous dispersion of absolute regional incomes amongst the major 15 states of India during 1980–2004, the conditional convergence trend has been statistically significant after controlling state-specific factors, including regional openness. In this context, we proceed as follows. Section 2 provides a survey of relevant literature. Section 3 and 4 provide a theoretical basis for empirical analysis and empirical methods, and Section 5 ends up with concluding remarks.

2. REVIEW OF LITERATURE

2.1 Trade and Growth

The debate on whether trade is essential for growth, both theoretically and empirically, is never resolved. Scitovsky (1954), Keesing (1967), Bhagwati (1978), Krueger (1978), Liu et al. (2001), etc., broadly argue that openness exposes countries to the most advanced new ideas and methods of production dictated by international competitive behaviour and, thus, it enhances efficiency. Also, a number of contributors—such as, Romer (1986, 1992), Lucas (1988), Barro and Sala-I-Martin (1995), Grossman and Helpman (1991)—are of the view that trade openness can have a positive impact on the economic growth of a country. Buffie (1992) contends that whether an export boom acts as an engine of

growth depends on the structural characteristics of the economy. Levine and Renelt (1992) argue that an increasing openness raises long-run growth only when the openness provides greater access to investment goods. However, Batra (1992), Batra and Slottje (1993), and Leamer (1995) go further by suggesting that free trade can be a primary source of economic downturn as trade liberalization and the openness may make imports more attractive than domestic production and, hence, the domestic economy may suffer a loss.

While Dollar (1992), Sachs and Warner (1995), and Edwards (1998), using different measures of openness, show the positive effects of trade on growth, Rodriguez and Rodrik (2001) strongly criticize these papers for the problems with measures of trade openness and the econometric techniques used, as well as for the difficulty in establishing the direction of causality. According to them, Sachs and Warner (1995) capture many aspects of the macroeconomic environment in addition to trade policy. Baldwin et al. (2003) have defined the same approach on the grounds that the other policy reforms directly and indirectly accompany most of the trade-reform related factors. Updating the Sachs-Warner dataset, again, shows the positive effect of such reforms in driving growth. According to Dodzin and Vambakidis (2004), the estimates from a panel of 92 developing countries during the period 1960–2000 suggest that an increase in openness in trade leads to an increase in the industrial value added share of production, at the expense of the agricultural share. Therefore, such trade leads developing countries to industrialization, in contrast to what the infant industry argument would imply.

Frankel and Romer (1999) look at the effect of the trade share in GDP on income levels across countries for the year 1985, constructing an instrument by summing up the gravity-model driven, geography-based predicted values of bilateral trade flows across all trading partners, including distance and country size variables, and observed that their instrumental variables approach produces positive and greater effects of trade on income levels than that of the estimates produced by ordinary least squares. Irwin and Tervio (2002) apply the Frankel-Romer approach to cross-country data from various periods in the twentieth century to show that this trade-income relationship is indeed highly robust. Noguer and Siscart (2005) use a richer data set that allows estimating the impact of trade on income, with much greater precision. They also show that the geographical controls must enter the income equation to avoid bias and find that countries that trade more, reach higher levels of income. This result is remarkably robust to a wide array of geographical and institutional controls.

Rodrik et al. (2002) look at the simultaneous effects of institutions, geography and trade on per capita income levels and have used a measure of property rights and the rule of law to see their impact on the trade-GDP ratio. Using the same instruments as used by Acemoglu et al. (2001) and Frankel and Romer (1999), they argue that the quality of institutions matter for the growth.

Most of these works are silent on the impact of trade on regional growth. A pioneering work trying to link economic geography with international trade is by Krugman (1991) in which he builds up an economic geography model. Franco Peracchi (1992) later uses this model to demonstrate that the protectionist economic policies adopted by Mexico have led to the growth of large metropolises in the country. A consequence of their argument is that liberal trade policies should disperse economic activities across locations and, thus, reduce the regional disparity within a country. Thus, liberal trade policies break the influence of the home market and activities should disperse. For example, the North American Free Trade Agreement (NAFTA) involving the US, Mexico, and Canada has resulted in the shifting of economic activities from Mexico City towards border towns near the U.S. Krugman (1995) and Fujita, Krugman and Venables (1999) discuss this issue at length.

Greater equality across Europe, in productivity and income, has been one of the central goals of the European Community since the early days of the European economic integration. And for a long time this was achieved. If one looks at the country level, it appears to be a tendency towards long-run convergence in productivity and income levels in the European Union. However, this tendency cloaks important differences across regions of the same country. In fact, for most countries, there is either little change in regional dispersion, or a tendency towards divergence (Cappelen et al. 1999). Walz (1995) argues that trade liberalization promotes regional economic growth and causes the reduction of barriers to labour migration. Reduction of labour migration barriers allows unskilled workers to migrate.

Alcala and Ciccone (2004) find that international trade has an economically significant and statistically robust positive effect on productivity. Their trade measure is imports plus exports relative to purchasing power parity GDP (that is, real openness) and it raises the total factor productivity through specialization and scale affect. They also find a significantly positive aggregate scale effect where the estimates control for proxies of institutional quality as well as geography and take into account the endogeneity of trade and institutional quality.

On the other hand, one could also argue that if trade becomes really important, the activities will get concentrated around ports in case shipping is a significant means of commodity transportation. In that case, the regional disparity may increase and will hamper overall regional development. Again, an increase in trade should improve real income of the regions producing exportables and reduce the real income of the regions producing import competing goods. Gains from trade make sure that the overall welfare effect is positive. But nonetheless, the income is redistributed from the import competing to the exporting regions (Marjit and Beladi 2009). If, initially, exporting regions were low income regions, a greater openness should reduce the degree of regional inequality.

2.2 The Indian Experience

A large number of studies have dealt with the issues of regional convergence or divergence in the Indian sub-continent using the existing measurement, albeit these studies do not clearly bring in the connection between trade openness and regional growth. Nevertheless, a brief account of these studies may be useful to reveal the larger issue of regional convergence/divergence and to further emphasize unavailability of any study that investigates a connection between trade openness and regional disparity at the sub-national level. This has left a void which the present study intends to fill.

It has been observed that the growth performance during the 1980s in all the states has improved relative to the previous two decades, but unevenly. Krishna (2004) points out that provinces that could take advantage of the reforms in the 1990s that allowed much scope in policy making at the state level, seem to have performed better. This is in sharp contrast to the results of the earlier studies.

A study of 20 Indian states over the period 1960–90 by Dholakia (1994) finds a tendency of convergence in long-term state domestic product (SDP) growth rates. A revised study (Dholakia 2003) concludes that regional disparity, in terms of human development, has been decreasing but that regional disparity of income has been almost constant over the past two decades, during the 1970s and 1980s. Marjit and Mitra (1996) study the issue of regional convergence in 24 Indian states (1961–62 to 1989–90). On the basis of real PCNSDP, they find no evidence of convergence of PCNSDP among Indian states. Subsequently, Ghosh et al. (1998) and Kurian (2000) find the same indications towards regional divergence across states over time. Dasgupta et al. (2000) also report a clear tendency of divergence in terms of per capita SDP for Indian states, although they find convergence of sectoral shares of SDP. Cashin and Sahay (1996) also examine four sub-periods, between 1961 and 1991, for a sample of 20 Indian states. Although they find evidence of unconditional and conditional convergence in all four sub-periods, their results are not statistically significant. Analyzing a sample of 19 Indian states for the period 1961–1993 (divided into three sub-periods), Bajpai and Sachs (1996) do not find statistically significant results of convergence for the period as a whole, except for the sub-period 1961–71. Rao and Singh (2001) examine a sample of 14 major states over the period 1965–1994, divided into various sub-periods, and find an evidence of absolute and conditional divergence in every sub-period they consider. In another study, for a sample of 14 major Indian states for the period from 1990-91 to 1998-99, Shand and Bhide (2000) examine variations in the size, income and structural characteristics of the Indian states, analyzing total and per capita net state domestic product for the period 1970–71 to 1995–96 and show that reforms in agriculture yield the most benefit as growth in this sector is positively and significantly related to overall growth, followed by reforms in infrastructure and human development.

Bhattacharya and Sakthivel (2004) reveal a marginally improved growth rate of GDP in the post-reforms decade in India along with a drastic rise in regional disparity in state domestic product (SDP). Industrial states have grown much faster than backward states in recent years, but there is no strong evidence of convergence of growth rates among the states. Lall and Chakravarty (2006) observe a spatial inequality of industrialization in India due to cost saving for individual firms where private industry seeks promising locations, whereas state industries traditionally attach much less importance to the ideal location factor. As a result, the spatial pattern of industrialization that has emerged lately is predominantly led by private sector investments.

In a more recent study, Nayyer (2008) found that the states do not converge in the steady-state in a panel data study for 16 Indian states for the period from 1978–79 to 2002–03. Once the factors that affect steady-state levels of income are controlled for, the poor states grow faster, on an average, than the rich ones. The dispersion of per capita incomes across states over time arises due to increasing inter-state disparities in levels of private and public investment and an insignificant equalizing impact of centre-state government transfers. However, none of the above mentioned studies have considered trade openness as an explanatory variable.

3. ANALYTICAL FRAMEWORK

We develop a simple framework to motivate our empirical analysis. The basic intuition here is to understand the firm entry behaviours into the regions that are widely varied in terms of business environment in India. In a federal democratic framework, the central government in India declares suitable polices relating to trade, industry, and labour, and the regional governments largely take care of the execution and implementation, but also, to some extent, enjoy autonomy of amendments in the central policies. Before liberalization, the location choice to planting a firm was guided by the state-driven policies of industrialization, based on a licensing system and, hence, it was arbitrary and not considered as an efficient way of distribution across the regions according to the market rule (Marjit and Beladi 2009). With the removal of trade restrictions, a new set of firms would enter the export sector and the existing import competing firms would be shifted towards more profitable export competing production. Such possible theoretical conjectures are available in the paper by Marjit and Beladi (2009), but here we develop our arguments from the point of a firms' entry behaviour. Let us assume that a firm produces $\boldsymbol{q}$ amount of output and incurs $\boldsymbol{c}$ and $\boldsymbol{w}$, respectively, in order to meet trade and wage costs per unit of production. For simplicity, we assume that one unit of labour produces one unit of output where the firm accepts the wage rate. We are not interested in model wage determination, explicitly, here. One would

not deny the possibility of a relatively higher wage in an industrially developed region in case of restricted labour mobility, where the workers find higher demand and/or greater alternative opportunities to bargain their wage. But in a labour surplus economy, the perfect mobility of labour across regions ensures the wage rate to be fixed at the minimum level. This apart, the firm needs to buy certain level of services (g) from the regional government to set up as well as to establish and run smooth businesses within the region. These services include transaction costs relating to discovering terms and conditions with the regional government, bureaucratic procedures to establish plants, law and order, local securities, and assurance of better transporting arrangements. If the firm buys these it can successfully reduce its marginal cost by γg. Therefore, the effective marginal cost is $c = \bar{c} - \gamma g$, where γ. is defined as the efficiency level of service delivery of a regional government towards the firm, and $\bar{c}$ is marginal cost per unit of output when no service is hired from regional government. On the other hand, an entrant needs to incur a cost for availing these services, which is $zg^2/2$. This cost includes cost relating to bureaucratic procedures of registration, transaction cost for discovering suitable terms and conditions with the regional government, local tolls and taxes, extra-legal costs, and other tolls to local political and social groups. The cost function depends on the level of government services and follows the usual properties. The firm at first takes a decision to enter and then solves the q and g simultaneously, and the model can be solved by using backward induction method. Suppose a firm faces a demand $p = a - Q; Q = \sum_{k} q$ in each region and k number of firms are engaged in production, then the profit function of a representative firm can be expressed in following way:

$$\pi = (a - Q)q - (\bar{c} - \gamma g + w)q - zg^2/2 \tag{1}$$

First order conditions for maximisation are:

$$\frac{\partial \pi}{\partial q} = -(k+1)q + \gamma g + (a - \bar{c} - w) = 0 \tag{2}$$

$$\frac{\partial \pi}{\partial g} = \gamma - zg = 0 \tag{3}$$

We can solve q and g from the above two equations. Now the second order conditions for optimizations are: $\frac{\partial^2 \pi}{\partial q^2} = -(k+1) < 0$, $\frac{\partial^2 \pi}{\partial g^2} = -z < 0$ and $\Delta = (k+1)z > 0$. From (2) and (3), we get $q^* = \frac{(a - \bar{c} - w)z + \gamma^2}{(k+1)z}$ and $g^* = \frac{\gamma}{z}$. Both optimum q and g are directly

related to efficiency of government service (γ) and indirectly related to the cost parameter, z. If we put these optimum values into the profit function, we get:

$$\pi^* = \left[\frac{(a-\bar{c}-w)z+\gamma^2}{(k+1)z}\right]^2 - \frac{\gamma^2}{2z} \tag{4}$$

Now, the number of firms entering will be decided. The entry will take place until the net profit turns out to be zero.

$$k^* = \sqrt{2z}\left[\frac{(a-\bar{c}-w)}{\gamma}+\frac{\gamma}{z}\right]-1 \tag{5}$$

It is clear from eq. (5) that trade reforms lead to increase in the size of the market in the export sector, either by raising a and by reducing $\bar{c}$ and w, is fixed across regions because of perfect labour mobility. Both factors have a positive impact on entry of firms, but the entry may vary across regions depending on the efficiency of regional government service (γ) and cost relating to acquiring government service (z) for those governments.

Proposition 1: k^* depends on γ and z .(*i*) given z, there will be such critical $\gamma^* = \left(\frac{a-\bar{c}-w}{z}\right)^{1/2}$ where $\frac{\partial k^*}{\partial \gamma} < 0$ if $\gamma < \gamma^*$ and $\frac{\partial k^*}{\partial \gamma} > 0$ if $\gamma > \gamma^*$; (ii) Given γ, there will be such critical $z' = \frac{\gamma}{(a-\bar{c}-w)}$ where $\frac{\partial k^*}{\partial z} > 0$ if $z < z'$ and $\frac{\partial k^*}{\partial z} < 0$ if $z > z'$.

Proof: Differentiating k^* with respect to γ, we get:

$$\frac{\partial k^*}{\partial \gamma} = \sqrt{2z}\left[-\frac{(a-\bar{c}-w)}{\gamma^2}+\frac{1}{z}\right] \tag{6}$$

$$\frac{\partial^2 k^*}{\partial \gamma^2} = 2\sqrt{2z}\,\frac{(a-\bar{c}-w)}{\gamma^3} > 0 \tag{7}$$

Therefore, the functional form of k^* with respect to γ looks U-shaped. The intuitive explanation is as follows: At a low level of γ, the gain from buying service from regional government will be lower than the cost of that service and the entrant will have less incentive. After a certain level of γ, the return will be highly effective than the cost and, hence, the entry will be faster. The critical value is $\gamma^* = \left(\frac{a-\bar{c}-w}{z}\right)^{1/2}$.

Similarly differentiating k^* with respect to z, we get

$$\frac{\partial k^*}{\partial z} = \frac{(a - \bar{c} - w)}{\gamma\sqrt{2z}} - \frac{1}{\sqrt{2z^3}} \tag{8}$$

$z' = \frac{\gamma}{(a - \bar{c} - w)}$, if $z > z'$, $\frac{\partial k^*}{\partial z} < 0$ and if $z < z'$, $\frac{\partial k^*}{\partial z} > 0$.

Here, the functional form of k^* is exactly opposite of the earlier one and the explanation will also be opposite. At a low level z, the gain from hiring service from regional government must be worth considering than that of its cost and the resultant entry rate will be positive for a marginal change in the cost. Once it exceeds a certain level, the cost must exceed the gain and the entry rate will decline.

Recently, a World Bank survey on *doing business* in India clearly accounts for the qualitative index of business climate and registers a wide variation across regions (World Bank 2009). In order words, it suggests that the actual values of γ and z vary widely across the regions in India. It is expected that already an industrially advanced region would be having a higher value of γ and a lower value of z compared to the industrially backward regions. Suppose there are two regions in a country, namely A and B. If $\gamma_A > \gamma_B$ and $z_A < z_B$ it must be $k_A > k_B$. Therefore, the regional divergence will be expected in a similar trade policy because of institutional heterogeneity. If the industrially backward region takes initiative to improve γ and to reduce z, the regional convergence is discernible.

4. EMPIRICAL ANALYSIS

4.1 Regional Growth And Disparity

Before going to the factor analysis, one has to look at the growth of regional income and its variations across states over the years. The PCNSDP (Per Capita Net State Domestic Product) at 1999–2000 prices have been taken from the annual reports of RBI (Table 1). This increased sharply from Rs 8,911 in 1980–81 to Rs 11,985 in 1990–91 and further to Rs18,247 in 2003–04. In total, the absolute increase of the income in the 1990s is approximately three times higher than that in the 1980s. It reveals that the growth of absolute income has accelerated in the later period. All the major states have registered a similar trend, but not at the same pace. West Bengal, Andhra Pradesh, and Karnataka follow exactly the same level and pattern. Haryana, Punjab, Maharstatra, Gujarat, and Kerala were the better performing states in 1980–81 and have also maintained a higher level of per capita income up to the year 2003–04. On the other hand, Bihar, Orissa, Rajasthan, Madhya Pradesh, and Uttar Pradesh showed a level well below the average. It suggests a greater degree of regional

disparity in income across the major states. For example, the PCNSDP of Haryana in 2003–04 is almost four times that of Bihar (Figure 1).

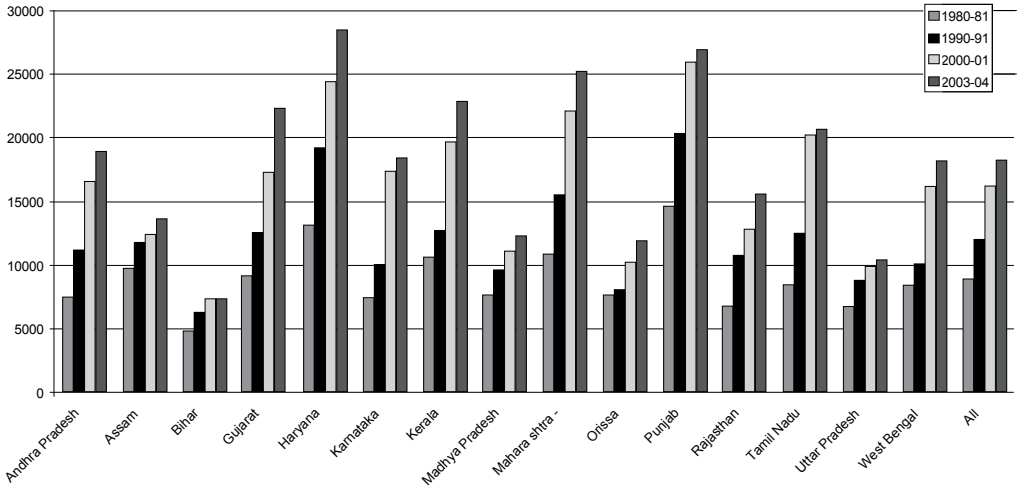

Figure 1: PCNSDP of Major Indian States (Rs @ 1999–2000 Prices)

Moreover, the figures on co-efficient of variation sharply reveal an increasing trend of regional disparity. It was 0.28 in 1980–81 and increased to 0.35 in 2003–04. This is more visible in Figure 2 where the trend line of CV is positively sloped during 1980–2004.

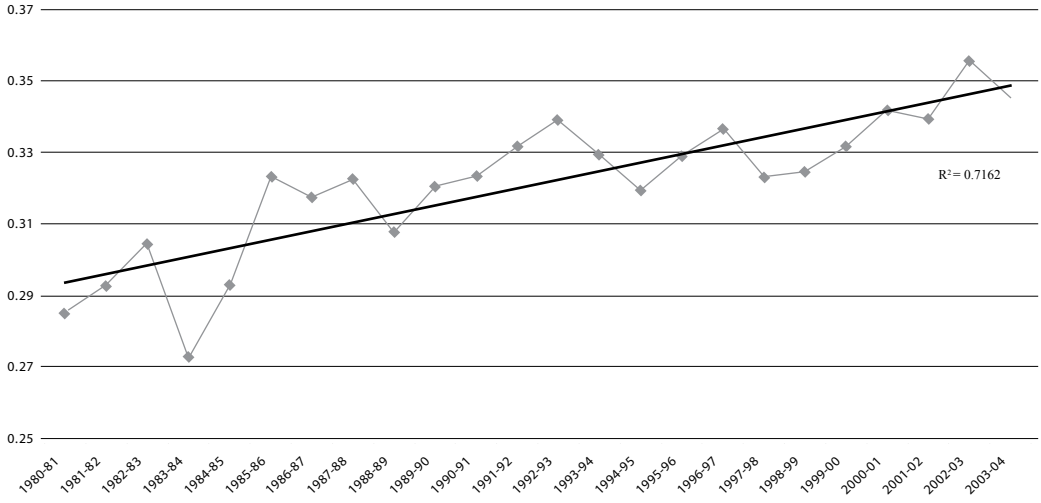

Figure 2: Coefficient of Variation of PCNSDP Across Major Indian States: 1980–2004

All these factors reveal the divergence of absolute income across regions and there must be some factors responsible for that. These are examined by the study.

4.2 Regional Openness Index

Let us discuss the methodology of the regional openness index, the most important explanatory variable of our interest. Although the term openness is widely used in the related literature on international economics and economic growth, no consensus has emerged on how to measure it. The existing empirical studies attempt it in various ways. These include the following: trade dependency ratios and the rate of export growth (Balassa, 1982); trade orientation indices, which are defined as the distance between actual trade and the trade predicted by the true model in the absence of distortion (Leamer, 1988; Wolf, 1993); World Bank's (1987) outward orientation index, which classifies countries into four categories according to their perceived degree of openness; the composite openness index, which is based on such trade-related indicators as tariffs, quotas coverage, black market premia, social organization, and the existence of export marketing boards (Sachs and Warner, 1995); and the Heritage Foundation index of trade policy, which classifies countries into five categories according to the level of tariffs and other perceived distortions (Johnson and Sheehy 1996) (cited in Liu-Liu-Wei 2001). All these indices are applicable to the national level analysis. We have already discussed the district and state-level trade exposure indices, developed by Topalova (2005) and Hasan et al. (2007), but they exclude the export sector in the contraction of indices.

We use the index, developed by Marjit et al. (2007), in slightly modified ways. At first, the study constructs the export intensity index and import intensity index matching the production share of a state with the country share of trades, both export and import separately, putting ranks on the correlation coefficients between them. Then the export and import intensity index are combined by assigning equal weights arbitrarily to each for a final calculation of the overall openness index. The present study modifies only the weighting techniques providing two alternative methods.

The level of output (including industrial and agricultural) of a specific state has been linked to the all-India trade figures to get an approximate indicator of how open it is. This is on the assumption that the higher the correlation, the higher would be the probability of being exported by the state. If most of the production is concentrated on items, which at the all-India level, contribute largely to exports, then it is reasonable to conclude that a particular state is attuned to exports. Correspondingly, if a state has a high production value of import substitutes then it must be relying less on imports and, hence, is not so open. Thus, in our analysis for a state to be open requires consistency of its production structure with the trade

pattern of the country, that is, more important commodities in the state's production basket would be the exportable, and/or less important contributors would be the major import competing goods.

Due to frequent changes of industrial classification, the first step involves finding the share of Gross Value Added (GVA) of each industry (at the 2-digit level of National Industrial Classification—NIC) for 15 major Indian states from 1980 to 2004. The Classification ignores small states, because 15 states can sufficiently explain a more than 90 per cent production share for each of the goods. They take only the agricultural and manufacturing goods based on NIC reclassification of industries in 1998. Since Indian states depend to a large extent on agriculture, it is also added to the agriculture related industry (that is, NIC 15-16). The share of value added, contributed by each industrial group for all the states for all these years are calculated from the *Annual Survey of Industries* (ASI), (various issues). So we have,

$$s_{it}^{k} = \frac{y_{it}^{k}}{\sum_{i}^{n} y_{it}^{k}}, i = 15,...37, t = 1980,..,2004 \qquad (9)$$

where, s_{it}^{k} = production share of i^{th} industry in k^{th} state at time period t, y^{k}_{it} = GVA of i^{th} industry in k^{th} state at time period t.

The second step is to find out how these goods fared with the trade profile of India for each year under consideration. Since the trade data classification (that is, HS classification) is different from NIC, they develop a concordance table between HS and NIC classification to make it comparable to the way trade data is classified in Directorate General of Commercial Intelligence and Statistics (DGCI&S) publications (Marjit, Kar and Maiti, 2007). The export share of i^{th} commodity at t^{th} period with respect to total exports of India is $x_{it} = \frac{X_{it}}{X_t}$,, where, X_{it} is the share of i^{th} industry in total exports in the t^{th} period, X_{it} is the export value of the i^{th} industry in the t^{th} period and X_t is the total export value of India in the t^{th} period. Similar to the export share, the import share is derived in the following manner: $m_{it} = \frac{M_{it}}{M_t}$, m_{it} = import share of i^{th} industry to total import in India at t^{th} period, M_{it} = import of i^{th} industry at t^{th} period and M_t = total import in India at t^{th} period.

The third step is to correlate x_{it} with s_{it}^{k} and m_{it} with s_{it}^{k}. These correlation coefficients will clarify how the production structures of the states are in tune with the export and import structures of India. These correlation coefficients are now ranked such that R_{mt}^{k}, $R_{xt}^{k} \in$ (1,2,...15) where R_{mt}^{k} and R_{xt}^{k} provides rank of the correlation between import and export shares, respectively, with production shares of state k at the t^{th} period. They assign the rank

of 1 to the state with highest correlation and the rank of 15 to the state with the lowest correlation.

The fourth stage of the analysis involves finding a trade openness index. This combined index is constructed using R^k_{xt} (the export performance rank) and the inverse of R^k_{mt} (the import competing performance rank) which is denoted by $\widetilde{R}^k_{mt}$ (that is, the inverse of R^k_{mt}). Thus, in the case of imports those states are ranked higher which import higher or contribute less to import substituting production. These ranks are denoted, respectively, as export and import intensity indices of each state.

Then, we adopt two different weighting techniques in order to derive two alternative composite indices. In the first case, the production share of exportables and importables of a state are used as weights, respectively, to export and import intensity indices. In other words, we assign s^k_{xt} and s^k_{mt} as weights, respectively, to export and import competing indices of a state where s^k_{xt} is the share of exportable production of k^{-th} state at t^{-th} period and s^k_{mt} is share of importable production of k^{-th} state at t^{-th} period.

$$ROI1^k_t = s^k_{xt} R^k_{xt} + s^k_{mt} \widetilde{R}^k_{mt} \tag{10}$$

If the export performance rank of a state is high and the inverse import competing performance rank is low (the way we have assigned ranks), it suggests production that is more exportable and less of import substitution, and is ranked 1.

We also construct another combined index where country-level q_{xt} and q_{mt} are used as weights to respective export and import competing indices of each state. Here, q_{xt} is the share of country-level export to the total trade volume (that is, sum of export and import) and q_{mt} is the share of country-level import to total trade volume.

$$ROI2^k_t = q_{xt} R^k_{xt} + q_{mt} \widetilde{R}^k_{mt} \tag{11}$$

These alternative indices will help us to check the robustness of the variables. We incorporate the state-level export intensity index, import intensity index, and two openness indices for the regression analysis. Table 1 provides the figures of the indices for the states in 1980–81, 1990–91, and 2002–03 and a lower the value of the index represents a higher degree of openness.

It appears that Gujarat and Tamil Nadu have been two major exporting states in India throughout the time period. Surprisingly, industry in both the states, Gujarat and Tamil Nadu, had been engaged in importable production to a large extent and the resultant openness indices were not among the highest in the states during the early 1980s when import substitution was the prime national policy. According to the theory, as a country engaged more and more in free trade, it is expected to produce more and have more exportable

Table 1—PCNSDP (Rs @ 1999–2000 Prices) of Major Indian states

State	1980-81	1990-91	2000-01	2003-04
Andhra Pradesh	7528	11237	16622	18961
Assam	9842	11834	12447	13675
Bihar	4801	6268	7371	7374
Gujarat	9157	12466	17227	22387
Haryana	13041	19309	24328	28484
Karnataka	7522	10090	17405	18505
Kerala	10589	12745	19724	22848
Madhya Pradesh	7654	9559	11121	12365
Maharashtra	10865	15541	22151	25265
Orissa	7673	8076	10211	11951
Punjab	14599	20365	25990	26955
Rajasthan	6771	10761	12840	15579
Tamil Nadu	8398	12541	20249	20672
Uttar Pradesh	6819	8815	9963	10447
West Bengal	8408	10173	16184	18231
All	8911	11985	16256	18247
SD	2540	3877	5559	6302
CV	0.28	0.32	0.34	0.35

Source: Handbook on Indian Economy, RBI

Note: Bihar includes Jharkhand, Madhya Pradesh includes Chattrisgarh, and Uttar Pradesh includes Uttarkhand.

production by reducing importable production within the state. But in practice, while Gujarat has kept the same pace of importable production, Tamil Nadu has gradually moved away from it. Hence, the openness value (ROI1) accounts for a rise from 7.75 in 1980–81 to 8 in 2002–03 for the former and a drop from 7.25 in 1980–81 to 2.5 in 2002–03 for the latter. The states with the highest importable production were Maharastra, Gujarat, and Tamil Nadu during 1980–81 and, eventually, these states were the most industrially developed states. After more than two decades, the three states with the most importable production have been, respectively, Gujarat, Maharastra, and Assam during 2002–03. It seems that some of

Table 2—Regional Openness Indices of Major States of India: 1980–81, 1990–91, and 2002–03

State	1980-81				1990-91				2002-03			
	XII	MII	ROI1	ROI2	XII	MII	ROI1	ROI2	XII	MII	ROI1	ROI2
Andhra Pradesh	7.5	9	8.25	12.5	10	4	7	8.5	10	10	10	11
Assam	11.5	1	6.25	8	13	12	12.5	8.5	12	13	12.5	10
Bihar	15	3	9	9.25	15	14	14.5	12.5	15	8	11.5	7.5
Gujarat	1.5	14	7.75	9	2	13	7.5	7	1	15	8	8.5
Haryana	7.5	7	7.25	7.5	12	5	8.5	11	14	5	9.5	8
Karnataka	5	10.5	7.75	7.5	8.5	6.5	7.5	6.5	4	11	7.5	7.5
Kerala	10	12	11	10.5	7	11	9	10.75	9	12	10.5	13
Madhya Pradesh	11.5	8	9.75	6	11	3	7	8	6	9	7.5	4
Maharashtra	13	15	14	12.5	3	15	9	7.25	3	14	8.5	10
Orissa	14	4	9	8.5	14	6.5	10.25	7.5	13	1	7	8
Punjab	7.5	10.5	9	7.5	4.5	1	2.75	4	8	2	5	7
Rajasthan	4	2	3	1.5	4.5	2	3.25	5.5	5	6	5.5	4.5
Tamil Nadu	1.5	13	7.25	6.25	1	10	5.5	5	2	3	2.5	7
Uttar Pradesh	7.5	5.5	6.5	9	8.5	9	8.75	9.5	11	7	9	8.5
West Bengal	3	5.5	4.25	4.5	6	8	7	8.5	7	4	5.5	5.5

Note: The state with lowest openness index value is assigned rank 1 and vice-versa.
XII indicates Export Intensity Index and MII indicates Import Intensity Index.

the industrially developed states produce both exportable and importable production. In terms of exportability, Gujarat, Tamil Nadu, and West Bengal registered the highest ranks in 1980–81 and after more than two decades, states that registered the highest ranks in the same have been Gujarat, Tamil Nadu, and Maharashtra. At the same time, it should be noticed that some of the relatively less-developed states in terms of per capita income in the 1980s, like Bihar, Orissa, and Assam have not changed much on their exportability ranks, rather they have shown deterioration on this front. On the whole, the most open states are Tamil Nadu, Punjab, and Rajasthan and the most restrictive states are Assam, Bihar, and Kerala during 2002–03. A similar trend will be apparent if we look at the figures of ROI2.

4.3 Econometric Analysis

The stylized facts of regional growth have led to two major themes in the development of formal econometric analyses of growth. Parallel to the investigation of growth factors, the empirical method for the same has been evolved, changed, and complicated over time. What we do here is to run pooled regression at the level controlling year effects in order to see the marginal of the effect of one variable on the growth of income (that is, logarithmic value of PCNSDP) and then we run panel regression (GMM type) at the first difference, a relatively richer model, to see the effect of change in variable on the changes in growth (that is, regional disparity).

In a seminal work of the augmented Solow model, Mankiw et al. (1992) use cross-section data and provide an idea of how region-specific factors effect growth. The following is the most general form of pooled regression:

$$\ln Y_{it} = \alpha + \beta \ln Y_{it-1} + \Psi X_{it} + \theta Z_{it} + \mu_i + \eta_t + \varepsilon_{it} \qquad (12)$$

Suppose X and Z are two sets of exogenous variables, and μ and η are, respectively, region-specific and time-specific variables. Interestingly, one can easily derive the rate of divergence from the estimated figure of the equation which is $(\beta - 1)\%$. While we simply regress the lag dependent variable on logPCNSDP, it shows significant divergence of growth at 0.08 per cent. This reveals the diverging trend of absolute per capita incomes across states. Now if we control, respectively, state and time factors in separate regressions, the converging trends are derived respectively at 2.4 per cent and 0.16 per cent. Similarly, the trend of convergence is 20.4 per cent when we control both state and time-specific factors (Table 3). In other words, there must be some dominant state-specific factors which might be detrimental to growth in some states at a faster rate than that of others. Time alone plays a very insignificant role in the process. Therefore, one can read a trend of divergence in absolute income coupled with conditional convergence of it, across regions during 1980–2004.

Table 3—Absolute Divergence and Conditional Convergence of PCNSDP for Major Indian States: 1980-2004

Independent Variables	(1)	(2)	(3)	(4)
log $PCNSDP_{it-1}$	1.008***	0.976***	0.9984***	0.796***
Cons	0.0246	0.263*	0.0869*	2.025***
Model	Pooled, robust	Pooled, robust	Pooled, robust	Pooled, robust
State effect	No	Yes	No	Yes
Year effect	No	No	Yes	Yes
Dep. Variable	log $PCNSDP_{it}$	log $PCNSDP_{it}$	log $PCNSDP_{it}$	log $PCNSDP_{it}$
N	360	345	345	345
R2	0.97	0.973	0.97	0.98
Rate of convergence/ divergence (%)	0.08	-2.4	-0.16	-20.4

Note: 15 major states for 1980-2004, *$p < 0.10$, **$p < 0.05$, ***$p < 0.01$

We shall now specify a few region-specific variables to explain the growth which are X_{it} and Z_{it} in equation (1). X_{it} is the regional openness index and Z_{it} is a set of control variables. These are namely, per capita government expenditure (PC_GE), literacy-rate (LIT), per capita electricity consumption (ELEC), and Besley-Burgess codes[4] of state labour legislation (BBcode). The per capita government expenditure is a sum of per capita revenue (PC_RE) and capital expenditure (PC_CE). The former expenditure is the recurring cost for regular maintenance of public goods and services, while the latter is the expense on assets like infrastructure, public amenities, etc. These two expenditures have been spited in separate regressions in order to see the robustness. Because of susceptive collinearly between per capita gross capital formation in the private sector and per capita government expenditure, we do not include the former. Literacy rate is the variable that captures the effect of human capital formation (education) on growth. There has been a huge problem in getting continuous observations of the literacy rate. The Census of India is the only major source for getting the

4 This is a proxy of the rigidity of labour market institutions in the respective states. But this has attracted a lot of criticism. Strike rates or union density could be better proxies for that, but such information is not available for all the states during the study period.

variable every 10 years and, hence, it is more of a state-specific factor. The per capita electricity consumption has been considered to see the effect of electricity supply or access of modern technology on regional growth. The BBcode represents the cumulative scores of labour legislation amendments in a particular state. If the amendment is in favour of employers, it gets one, and if it is in favour of employees, the value will be minus one, otherwise zero. Besley and Burgess (2004) provide the cumulative scores of each of the states up to 1997. Then we update the score up to 2004 looking at Mallik (2006) and there is no substantial change during this period. All these factors have been considered as significant explanatory variables in the growth regression. But, what has been missing in the existing literature is the regional openness. We consider both forms of alternative variables of regional openness in separate regressions. The export intensity index and import intensity index have been also used in another set of regressions to see the effect of export orientation and import penetration on regional growth (see Table 4).

While running this set of regressions, the year effects[5] have been controlled. All the regression results suggest that both forms of openness indices have been highly significant and reveal that the higher the value of index, the lower would be the growth rate. In other words, a more open state shows a higher rate of growth by 1 to 1.5 per cent. While we separate out the export and import indices and run a regression, the coefficients of both variables are negative and highly significant. Therefore, one must argue that both export orientation and import penetration of a state have a positive impact on the growth of the region and lead growth rate, respectively, 0.8 per cent and 0.6 per cent higher than that of others.

The regression coefficients of all other control variables have shown the usual signs. Literacy rate and per capita government expenditure (both revenue and capital) of a region have been significant to explain its growth. The regression coefficients of ELEC have been positive but not statistically significant in all the cases. More importantly, the pro-workers legislation amendment pushes up the growth rate (unlike Besley-Burgess results). The reason could be that pro-workers legislation might reduce the growth of formal manufacturing but definitely cannot reduce the large unorganized sector which captures 90 per cent workforce engaged in agriculture, manufacturing, and tertiary sector. In fact, the growth of the informal sector has been well documented in the post-reforms period (Marjit and Maiti, 2006).

Over the years, there has been a substantial development of the growth equation. Although results, depicted in the Table 4, sound good, this form of models often encounter several criticisms. One is that the model has not captured the initial conditions of the states.

5 Aghion et al. (2008) have used the same methodology to see the effect of de-licensing on manufacturing growth and employment.

Table 4—Determinants of Regional Growth of PCNSDP for Major Indian States: 1980–2004

Independent Variables	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**
LITit	0.009***	0.009*	0.01**	0.009*	0.01***
ELECit	0.0001	0.0001*	0.0001	0.0002*	0.0001
ROI1it	-0.014***		-0.015***		
ROI2it		-0.01***		-0.01**	
XIIit					-0.0084***
MIIit					-0.0066***
BB codeit	0.01**	0.013**	0.011**	0.012**	0.13**
PC_GEit	4.19***	4.18***			4.205***
PC_CEit			3.492***	3.51***	
PC_REit			6.705***	6.58***	
Cons	8.34***	8.31***	8.275***	8.241***	8.354***
Model	Pooled, robust	Pooled, robust	Pooled, robust	Pooled, robust	Pooled, robust
Year effect	Yes	Yes	Yes	Yes	Yes
Dep. Variable	log $PCNSDP_{it}$	log $PCNSDP_{it}$	log $PCNSDP_{it}$	log $PCNSDP_{it}$	log $PCNSDP_{it}$
N	360	360	360	360	360
R2	0.83	0.83	0.83	0.83	0.83

Note: *$p < 0.10$, **$p < 0.05$, ***$p < 0.01$

XII = Export intensity index, MCI = Import intensity Index, ROI1 = Regional openness index 1, ROI2 = regional openness index 2, PC_GE = per capita government expenditure, PC_RE = per capita revenue expenditure, PC_CE = per capita capital expenditure, ELEC = per capita electricity consumption, LIT = Literacy rate, BBCode = cumulative score of Besley-Burgess measure of state labour legislations.

If we include lagged dependent variable into the right hand side of the equation, it invites a different problem of collinearity between lagged dependent and disturbance term and one cannot solve it by using the same technique. Moreover, since equation (12) includes unobserved state-specific factors, it recommends a device to be adopted to eliminate those, rather than incorporating them into the model[6]. Only a dynamic panel approach at first difference can overcome this problem. Once the regression is used in a difference form, one

6 Because, the differences in technology and preferences in regions may be variables that are not readily measurable or even observable in such framework.

also would expect a change in interpretation (Durlauf et al. 2004). Islam (1995) and Caselli et al. (1996) can write an equation for growth (essentially, the first difference of log PCNSDP) containing lagged output in following form.

$$\ln Y_{it} - \ln Y_{it-1} = \beta \ln Y_{it-1} + \Psi X_{it} + \theta Z_{it} + \mu_i + \eta_t + \varepsilon_{it} \quad (13)$$

β represents here the rate of convergence. This equation also incorporates state specific time invariant factors. Using the framework of Islam (1995), equation (13) can be rewritten as a dynamic panel data model in which the difference of log PCNSDP is regressed on difference of the exogenous variable and the difference of lagged dependent variable as follows.

$$\Delta \ln Y_{it} = (1+\beta)\Delta \ln Y_{it-\tau} + \Psi \Delta X_{it} + \theta \Delta Z_{it} + \Delta \eta_t + \varepsilon_{it} - \varepsilon_{it-\tau} \quad (14)$$

In statistical terms, this is the same model with the only difference of interpretation being that the coefficient on initial output (originally β) is now 1+ β. Arellano and Bond (1991), building on the work by Holtz-Eakin et al. (1988), developed this method using the GMM approach and it also suits the unbalanced panels and specification tests. Now, the equation (14) is free from the effect of the state-specific factor μ. In order to avoid the serial correlation between the difference of lag dependent and difference in disturbance term, further lag differences are used as the instrument variable of usual lag difference of the dependent variable. The same set of variables, as in Table 4, has been considered for this regression and the results have been reported in Table 5. It reveals that the change in openness of one state leads to the 0.3–0.4 per cent changes in the growth rate and this is statistically significant. The change in import competing index has not been a significant variable for the explanation of growth difference. The other most significant variables are the change in per capita government expenditure (particularly per capita revenue expenditure) and labour legislation amendment. These are all significant variables to explain the regional disparity in the growth difference. Controlling these factors, the result reveals a significant converging trend of growth across region, approximately at 20 per cent per annum.

It was expected that the export sector would flourish while the import sector would shrink in response to trade liberalization. The states that developed import substitution production during the 1970s and 1980s, and successfully shifted from importable to exportable production, grew faster than the others. In practice, some of the states have not been able to do this and continue in importable production along with the focus towards exportable production. It must be mentioned that all the states did not crop up the benefits from the liberalized policies in the same fashion because of institutional heterogeneity across regions, and this had a detrimental effect on their growth performance.

Table 5—Determinants of Regional Disparity of PCNSDP for Major Indian States: 1980–2004

Independent Variables	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**
log $PCNSDP_{it-1}$	0.794***	0.7966***	0.765***	0.767***	0.794***
ΔLITit	0.001	0.001	0.008	0.001	0.001
ΔELECit	0.0001*	0.0001*	0.0001*	0.0001*	0.0001**
ΔROI1it	0.003*		0.004*		
ΔROI2it		0.004*		0.004**	
ΔXIIit					0.0038*
ΔMIIit					0.0006
ΔBB codeit	0.059**	0.059***	0.0562**	0.056***	0.061***
ΔPC_GEit	0.47**	0.463**			0.467***
ΔPC_CEit			-0.442	-0.467	
ΔPC_REit			0.687***	0.680***	
Cons	1.78***	1.76***	2.058***	2.03***	1.77***
Model	GMM, robust	GMM, robust	GMM, robust	GMM, robust	GMM, robust
Dep. Variable	log $PCNSDP_{it}$	log $PCNSDP_{it}$	log $PCNSDP_{it}$	log $PCNSDP_{it}$	
Instruments	ΔlogPCNSDPi(t-2) and further lags	ΔlogPCNSDPi(t-2) and further lags	ΔlogPCNSDPi(t-2) and further lags	ΔlogPCNSDPi(t-2) and further lags	ΔlogPCNSDPi(t-2) and further lags
N	330	330	330	330	330
Wald	2420	2650	2170	2371	2735
Rate of convergence/ divergence	-20.6	-20.6	-23.5	-23.3	-20.6

*$p < 0.05$, **$p < 0.01$, ***$p < 0.001$

Note: 15 major states for 1980–2004

XII = Export intensity index, MCI = Import intensity Index, ROI1 = Regional openness index 1, ROI2 = regional openness index 2, PC_GE = per capita government expenditure, PC_RE = per capita revenue expenditure, PC_CE = per capita capital expenditure, ELEC = per capita electricity consumption, LIT = Literacy rate, BBCode = Besley-Burgess measure of cumulative score of state labour legislations.

5. CONCLUSION

India has gradually moved away from trade restrictions during the last two decades beginning the mid-1980s, and the present paper attempts to see the impact of such reform on regional growth and disparity. We provide an argument that trade liberalization can lead to differential growth because of institutional heterogeneity. We argue that the states, which have been more opened, have grown faster than others and the openness of states depends on the quality of institutions and the investment climate. In methodological issues, we reconstruct the regional openness indices using two alternative weighting techniques for aggregation of export and import intensities, ranks of correlation of state production patterns, with national trade pattern, of each state, and then use these indices to estimate the impact on regional growth and disparity across 15 major states of India during 1980–2004. The evidence suggests that the PCNSDP has sharply increased in all the states during the period whereas the rate of rise has been faster in later period. At the same time, the variation of PCNSDP across the region has also shot up from 0.28 in 1980–81 to 0.35 in 2004–05. The regression results suggest that the states which are more open have grown faster than others by 1–1.5 per cent per annum. Moreover, the change in export orientation has a much stronger effect on the change in growth rate of the state. A few newly developed states have shown their dependence on exportable production, while some other backward states have not changed their status of exportability, rather they registered deterioration. At the same, some of the industrially developed states in terms of exportability are still engaged in importable production along with exportable and that may be the reason for a weak impact of import penetration on regional growth. Therefore, we argue that the impact of trade reform has been detrimental for the state income. The state, which has been able to twist the production pattern towards more exportable production due to favourable institutions and investment climate at the level of state, has accelerated its growth rate. We also observe the conditional convergence approximately at 20 per cent per annum if we control state-specific factors like government expenditure, infrastructure, education, and regional openness. Therefore, the recommendation for the acceleration of growth in a low income state has been to improve its institutional quality and create a better investment climate so that entry can take place at a higher rate in the export sector. In a democratic set up, sometimes, a ruling party in the government would hesitate to do so as it goes against the working class who are the majority in a state, and that creates a threat to its re-election.

The study suffers from a few limitations. We used a concordance table at the two digit level of NIC and HS classification in order to matching industrial and trade statistics, respectively. A more disaggregate level of matching is required in order to avoid cross tabulation. Second, we should consider a more suitable variable to represent the exact

level of higher education. Third, a better proxy is also required to capture the form and functioning of labour market institutions across states as the Besley- Burgess codes have been severely criticized in recent literature (Bhattacharya, 2006). Finally, one agenda of future study would be: what specific regional rigidities are responsible for a differential level openness of the states. These are the areas of concern for further improvement of the work.

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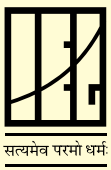

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