Chapter 2

Diagnostic Analysis of the Macroeconomics of Uttar Pradesh

2.1 Analytical Framework

Slow economic growth in Uttar Pradesh is a point of concern. In the previous chapter, the Uttar Pradesh economy was presented in a comparative perspective with other states and several issues have emerged, which could be responsible for the slow growth in the state. However, the basic question asking that why some states are growing faster than Uttar Pradesh remains unclear. This chapter aims at answering this question with more formal analysis using econometric techniques and data mining.

The macroeconomic analysis of this chapter is based on estimated econometric models across sets of 29 and 26 states for which most data is available or could be created for the period of 1993-94 to 1999-00. Ahluwalia (2000) emphasises the need for developing a better understanding of the reasons for the superior performance of some of the better performing states. Therefore, a cross-sectional analysis will be very useful. The basic methodology of growth studies of running a cross sectional regression is described in Appendix A-2.1.

In a cross country analysis, variables such as the initial level of income, the investment rate, various measures of education, population growth, terms of trade, some policy indicators like inflation, black market premium, fiscal surplus and many other variables have been found significant. However, in the case of states of a particular country, the set of variables that can explain difference in economic growth across states becomes rather limited. Variables such as geographical location, proximity to industrial conglomerates and differential policies of government become important (Demurger *et al.*, 2002).

The studies of Barro (1991) and Barro and Sala-i-Martin (1995) and several other studies have clearly brought out that successful explanations of economic performance have to go beyond narrow measures of economic variables to incorporate political and social forces. Some researchers such as Landes (1999), Inglehart and Baker (2000), Huntington (1991) argue that explanations for economic growth should go further to include a nation's culture, which is thought to influence economic outcomes by effecting personal traits such as honesty, thrift, willingness to work and openness to strangers. Even intensity of religious beliefs can be studied to measure economic outcomes (Barro and McCleary, 2003)

In the case of India, demographic composition and social and cultural diversity may play an important role in determining growth across states. Further, the economic relationship between states and the Centre is very tight. Overlap in the developmental plans of the states and the Centre make it even harder to identify reasons that differentiate the performance between states. There is no restriction on the movement of population and employment in the private sector across country. Migration from backward regions to the economic growth centres is natural phenomenon. Thus, the performance of each state cannot be attributed entirely to internal reasons.

Nevertheless, Indian states still present a wide variations in some of the important variables that are considered to cause growth, and the federal structure of the polity provides ample independence to the states to carry out their preferred agenda. Some domains such as industrialisation, urbanisation, education, rural development, law and order are completely state subjects and now legislations are in place to allow states to pursue their independent agenda of investment including obtaining finance from overseas.

Since growth and investment are expected to be dependent on several common variables, it is useful to run a similar regression for investment.

A typical problem in analysing Indian states is likely to arise due to non-availability of consistent data on investment. Investment is an important variable in growth regressions and cannot be substituted by a simple proxy that captures private and public investment. Considering the fact that a suitable single proxy for investment could not be found, an investment variable is generated as discussed in Appendix A-2.2. However, since proxy investment can be criticised, the analysis for growth is performed with and without this series. In order to explain physical investment variations across states, an analysis of the investment is also presented.

2.2 Economic Growth (Analysis without Investment Variable)

In line with the above discussion, a statistically preferred model of economic growth (see model GM1 in Appendix A-2.3) for the cross-section of 29 states, capturing features of social and economic diversity across states, has been estimated for the recent period of 1993-94 to 1999-00. The purpose of this model is to explain the historical performance of states.[1] The R-square of the model is 0.78 and residuals are well within the band of two standard errors. Therefore, the model captures most of the variations in average growth in per capita real value addition across states and can lead to valid conclusions. Significant variables explaining differences in average growth across states include: the 1980-81 share of secondary, agriculture and tertiary sectors, population growth, and the proportion of SC/ST populations. Income levels during 1970-1974 taken as a proxy for initial condition were not found to explain anything. That means, data neither supports convergence as predicted by neo-classical growth theory (see 'for example' Barro, 1991), Barro and Sala-i-Martin (1991) nor does it support divergence as concluded in Rao *et al*. (1999). Attempts to include variables such as developmental and non-developmental expenditure, expenditure on education, central grants per capita and per unit GSDP, etc. failed to deliver significant explanation for the selected sample of states and the time period. The analysis leads to the following conclusions:

1. Due to difficulty in getting data of recently divided states of Uttar Pradesh, Bihar and Madhya Pradesh; the regression analysis used data for the undivided states. This will however not affect the conclusions.

2.2.1 Economic Policy must be Tilted in Favour of Industrialisation: Follow Visvesvaraya's Footprints

The first set of variables that are found to be important in growth process across state measure the structure of the economy. For average growth in real (1993-94 prices) per capita gross state domestic product (GSDP) during 1993-94 to 1999-00, the structure of economy during 1980-81 is considered to be the initial condition. States with a higher industrial orientation are expected to grow faster as industrial growth absorbs more employment and raises the consumption level of other sectors as well. This is particularly true in a scenario of economic liberalisation. The effects of reforms in external and financial sectors are more likely to transmit through the industrial sector. States with higher levels of industrialisation are expected to grow faster than those dependent on primary sector. Industrial growth also helps in the cost-efficient mechanisation of agriculture and food processing. Industrial centres are also expected to motivate growth in services and aid in the modernisation of agricultural methods and technologies. Therefore, shares of three important structural components of the economy, namely agriculture, secondary and tertiary are included in the model. The secondary sector includes manufacturing, construction and electricity, gas and water services, while the tertiary sector includes transport, storage, communication, hotel, restaurants, banking, insurance, real estate, dwellings, business services, public administration and other services.

Figure 2.1 presents a comparative GSDP growth profile during 1993-1999 across selected states and their structure for the year 1980-81, while Figure 2.2 is a scatter plot between per capita real GSDP growth during 1993-1999 and share of secondary sector during 1980-81 for all the 29 states. Clearly, states with higher shares of secondary sector during the beginning of 1980s were more oriented towards competition and growth and benefited greatly during the post reforms period.

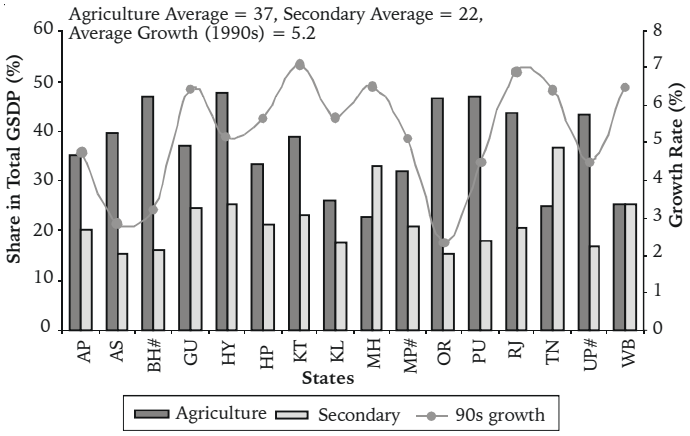
The regression coefficients of sector variables indicate that industrial share is more predominant in the growth process. Every percentage point secondary sector share contributes to per capita growth by 0.27 percentage points, while agriculture and tertiary sectors share contribute by 0.15 and 0.11 percentage points respectively. Clearly, if a state has a larger industrial share, it is likely to grow faster.

This result suggests a causal relationship between the performance of sectors. A time series test of

causality indicates that industrial sector output indeed helps in driving agriculture as well as tertiary sector outputs, while both agriculture and industrial sectors drive the output of tertiary sector. A first hand rural experience would suggest that households with additional income of working members in non-agriculture activities indeed grow faster and are able to increase farm income more compared to those fully dependent on agriculture. The reverse causality is weaker.

FIGURE 2.1

Share of Sector GSDP during the Period 1980-81 and States' Growth during 1990s, Selected States

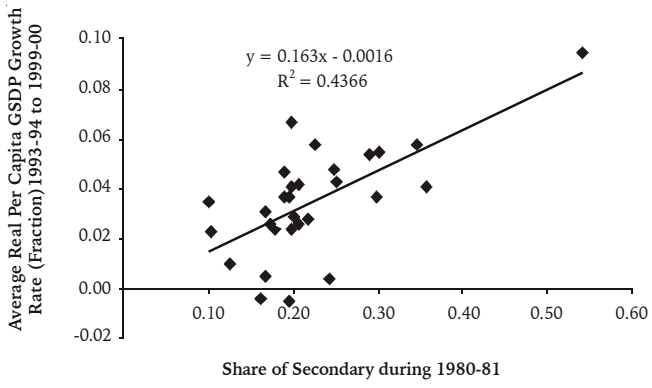


Source (Basic Data): CSO.

Note: # are the undivided states.

FIGURE 2.2

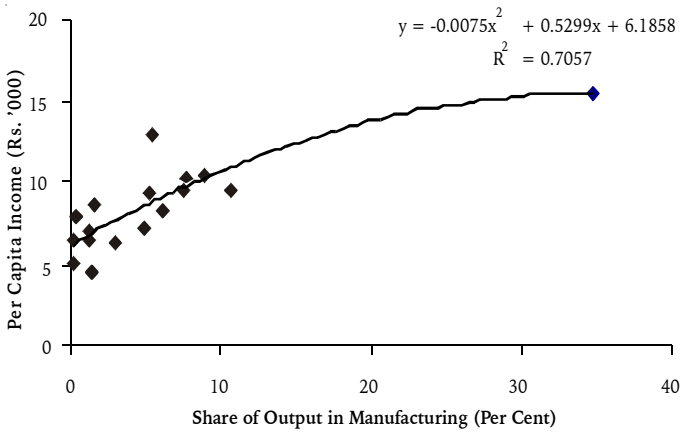
Scatter Plot of 29 States: Industrialisation and Per Capita Growth



In order to generate further support for this hypothesis, data for 17 circles inside Uttar Pradesh is also analysed. Figure 2.3 is a scatter plot for 17 circles in Uttar Pradesh taking per capita income on the Y-axis and the circles' share in total manufactured output of Uttar Pradesh on the X-axis. This plot also shows a strong positive relationship between manufacturing activity in circles and the average income of the residents of that circle.

FIGURE 2.3

Scatter Plot for 17 Circles in Uttar Pradesh: Per Capita Income and Circles' Share in Total Manufactured Output of Uttar Pradesh



This analysis indicates that vigorous industrialisation is needed to attain accelerated growth. The results also suggest that abundance of natural resources is not a guarantee of growth unless there is significant value addition. Most products in the primary sector suffer from poor terms of trade and they are sent to other industrialised states for value addition. States with a higher share of secondary and tertiary sectors and better growth in these sectors are better-off compared to those that continue to rely more on primary sector development.

In a recent book *Network City* the author James Heitzman has discussed the forces behind the rise of Bangalore and Hyderabad as the silicon-valley of India. It is noted that the revolution in industrial structure of Bangalore began much before independence and the key figure was Mokshagundam Visvesvaraya who later became the *diwan*. He was committed to industrialisation and his motto "industrialise or perish" was in line with his philosophy of states support for economic development through industrialisation and application of modern techniques. Uttar Pradesh can take a leaf of advice from this.

2.2.2 Demography could be a Boon as well as a Drag: It Needs to be Factored in Planning Process

The second set of variables that are found to be significant in explaining the variation in economic

growth, are related to demography and the social fabric of the states.

The variables falling in this category are population growth of the state, share of population of scheduled caste (SC)/scheduled tribe (ST). At the outset, the following points must be made clear. Such variables are expected to explain differences in growth pattern across states because they are, in fact, proxies for certain patterns of behaviour of the government, welfare organisations and people in general. The motivation for considering these variables and their expected effects was slightly complex. Section 2.1 cited several studies to support the view that growth in a cross-sectional analysis cannot be explained only by economic variables. Subsequent paragraphs will further make a case for inclusion of these variables.

The effects of share of SC population and ST population are opposite. It is important to understand the genesis of these two populations. While both enjoy support under welfare programme, they differ considerably in approaches to development. The SC population forms the mainstream of the national population, tightly intermixed and evenly distributed across rural and urban areas. Their awareness is much higher than the people in tribal regions who are mostly isolated from the cosmopolitan culture and bound tightly by local culture and traditional way of life. The desire to change is a spontaneous process in the case of SC population; this imperative for development is not found in tribal thinking (XaXa, 2001).

Therefore, states with a higher SC population appear to grow faster (Figure 2.4), while states with a higher ST population appear to grow more slowly (Figure 2.5). It may be acceptable to think that while SC population is a proxy for progressiveness, the ST population is a proxy for backwardness. The proportion of resources allocated from state sponsored welfare programmes (central as well as state) for the SC and ST population, when measured overall in terms of per capita, will be higher in states that have higher shares of these populations. Resources directed towards such welfare programmes have spillover effects and are likely to benefit all segments of population. However, the overall result will depend on how effectively the target population utilises these opportunities. Therefore, in this sense, it appears that SC population is able to utilise the opportunity better than the ST population and therefore, ST population needs support in its endeavours. Quantitatively, each percentage point difference in SC population leads to increase in economic growth of 0.06 per cent, while each percentage point difference in ST population leads to decrease in economic growth by 0.03 percentage points. Although, these effects appear to be small, this result has important implications for states' planning process. Uttar Pradesh appears to benefit in this context, as its SC population is comparatively high (21 per cent), while ST population is non-existent.

FIGURE 2.4

SC Population Shares (Census 1991) and the Growth Pattern Across States during 1993-94 to 1999-2000

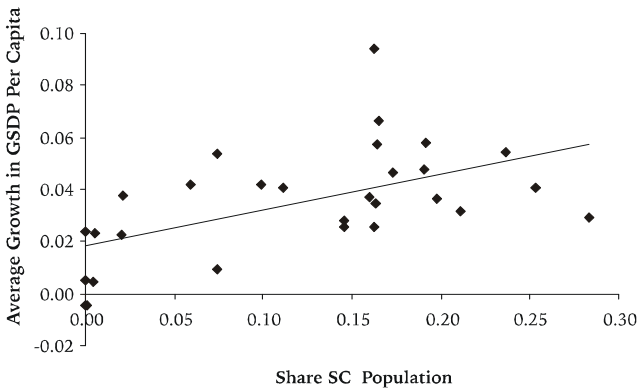
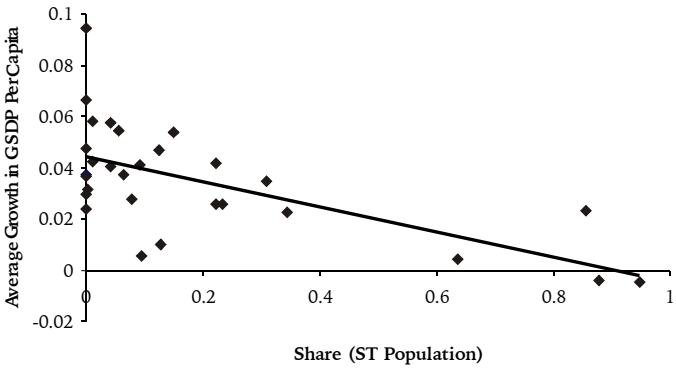


FIGURE 2.5

ST Population Shares (Census 1991) and the Growth Pattern Across States during 1993-94 to 1999-2000



Another important observation in estimating the growth model was the conditional significance of population growth. Individually, population growth is insignificant but when other variables are present in the model it shows significant positive effect.

In the context of sovereign countries, population growth as a whole is expected to have negative effect on economic growth particularly in the case of

developing countries where resources are not adequate to provide capital and technology for every citizen. However, in the case of states of a country, population growth is not only due to reproduction, but may also be an outcome of free migration taking place across states. In particular, the population growth of states like Delhi or industrially developed states such as Maharashtra, Karnataka or Gujarat may be substantially due to interstate migration (Figure 1.14).

It is well-known that nurses from Kerala are found all over the country, and software engineers prefer to work in Bangalore, Hyderabad, Chennai and Delhi, while less educated labour finds its way to big metropolitan cities and the farms of Punjab. These migrants, over time, become a part of the population of the states to which they have migrated. In such a situation, growth in population may reflect prosperity of a state rather than a reason for decelerating growth. Which of the two effects dominates is a matter of empirical analysis.

However, it can be safely argued that the migrant population in high-growth states are on an average better motivated, entrepreneurial and hardworking. Therefore, they must be contributing to the economy of the host state in a positive manner. States that wish to pursue policies that reserve jobs for residents only, must consider this aspect of migration. Due to inadequacy of data, the hypothesis of the effects of migrant populations put forward in this analysis could not tested directly. The case of Uttar Pradesh appears to be complex. Uttar Pradesh had net migrants during 1980s, while population growth remained high during 1990s. Migration data for 1990s is not yet available. Even with high (natural) population growth, a state like Uttar Pradesh needs to encourage the immigration of high-quality workers while retaining its own skilled people. This can be accomplished only if industrial growth is augmented, which affects both the tertiary as well as the agriculture sector.

It is also important to note that some of the high population growth areas lie in Northeast, where central government invests large amount in developmental projects. The population growth in these areas is suspected to be due to migration from across the Indo-Bangladesh border, which is a net addition to national population and detrimental to growth. This migrant population is mostly illiterate and unlikely to contribute in attracting investment and economic growth. Therefore, a negative correlation between population growth and economic growth for a smaller set of states is not ruled out, which might be the reason that regression analysis suggests population growth to be positively significant only in presence of other explanatory variables. This also supports the idea of the interstate migration effect.

2.3 Economic Growth (with Investment Variable)

The above model was re-estimated after including investment proxy INVK and the result is presented as model GM2 in Appendix A-2.3. The coefficients of all the variables of model GM1 remain almost intact but the explanatory power of the model has significantly improved to 0.82 and the variable INVK is positive and significant at 5 per cent level.

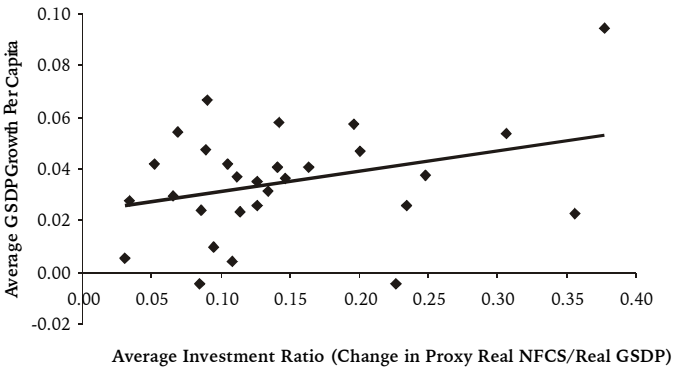
2.3.1 Investment is Significantly Critical but it must be Efficient and Complemented by Other Factors

As expected investment has a positive effect on growth and each percentage point change in investment relative to the gross domestic product leads to increase in per capita economic growth by 0.052 percentage points. This is a small coefficient but given the change in R-square with introduction of this variable, investment is a very important factor in the growth process. However, variations in growth due to investment alone may be low, as other factors, and characteristics, of the state are also important in impacting differential growth patterns. It may be noted that in cross-country regressions also, the investment ratio is found to have a coefficient of similar size. In cross-sectional analysis, then, a positive and significant coefficient should be acceptable even if the numerical value of the coefficient is small. In an exercise of sensitivity analysis, the author, after running more than 100000 cross-country regressions observed that in the presence of certain specific conditions, even investment becomes a fragile determinant of growth. Why could this happen?

It is obvious that an investment made in a highly industrialised state is expected to yield a superior outcome compared to a scenario in which the same investment is made in a highly backward area. When we run growth regressions with such heterogeneity, the likelihood of getting a very small coefficient for investment is high. The same thing will not happen if time series regression is run for a particular region. The variations in net fixed capital formation are significantly different in different regions of India (Figure 2.6).

FIGURE 2.6

Scatter Plot of Investment (Proxy for Change in Net Fixed Capital Stock at 1993-94 Prices as Percentage of Real GSDP) Rate in Selected States and Growth in Real Per Capita Income during 1993-94 to 1999-2000



2.4 Investment in Uttar Pradesh

Uttar Pradesh will need an investment of the order of Rs. 323161 crore during the Tenth Plan period. This figure is based on a quick estimate of GSDP for the year 2001-02 (Annual Plan of Uttar Pradesh, 2003-04), anchored at Rs. 164074 crore, and a target annual real growth rate of 7.6 per cent, using the optimistic ICOR of 3.85 assumed by the Planning Commission for the Tenth Plan. Table 2.1 presents the distribution of investment in Uttar Pradesh for the Tenth Plan period. With this distribution, the Centre is likely to contribute Rs. 58170 crore and the state will have to contribute Rs. 27470 crore towards investment in Uttar Pradesh during the Tenth Plan Period at 2001-02 prices. The balance of Rs. 227829 crore has to come from private and other sources. This is a daunting job and it will be interesting how the three contributors, the private sector, the centre and the state are placed.

2.4.1 Private Sector Response

There is no clear data to compare private investment flows across states. However, recent trends and movements in the investment shares of major states in the factory sector using Annual Survey of Industries (ASI) data; the implemented Industrial Entrepreneurs Memorandum (IEM) for Investment in the de-licenced sector by the domestic private sector; and FDI approvals could indicate the potential of different states in attracting private investment.

Figure 2.7 indicates recent shifts in share of invested capital. Clearly, Uttar Pradesh has been a big loser against the competing states of Maharashtra, Gujarat, Karnataka, Rajasthan, Haryana and other smaller states. The share of undivided Uttar Pradesh went down from 10.36 per cent in 1997-98 to 7.91 per cent in 2001-02.

TABLE 2.1

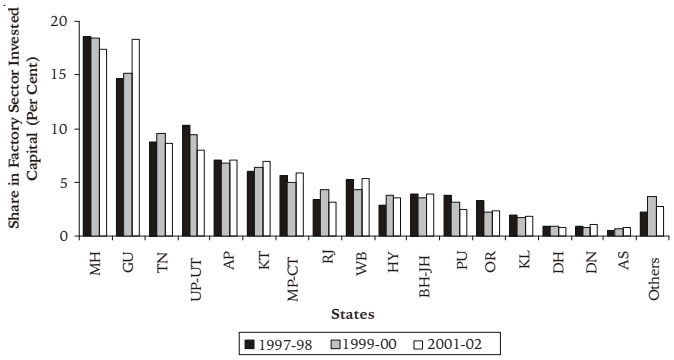
Distribution of Tenth Plan Investment by Sectors and by Sources

Sector	*Distribution by Sector*					*Distribution by Sources*			
	Total	*Private*	*Centre*	*State*	*Additional*	*Private*	*Centre*	*State*	*Additional*
Agriculture	5	7	5	21	-22	79	15	45	-39
Mining & Quarrying	2	0	14	1	-4	0	115	4	-19
Manufacturing	36	54	11	4	12	90	5	1	3
Elect., Gas & Water Supply	10	3	20	22	24	16	36	25	23
Construction	1	2	8	2	-13	64	98	19	-81
Trade	3	4	1	3	3	78	3	11	9
Rail Transport	2	0	8	0	5	0	74	0	26
Other Transport	6	7	3	12	-7	78	10	24	-12
Communication	7	3	12	0	33	25	31	0	44
Financial Services	4	0	4	0	32	0	18	0	82
Public Administration	7	0	4	27	30	0	11	46	43
Other Services	16	20	11	9	7	77	12	6	4
Total	**100**	**100**	**100**	**100**	**100**	**61**	**18**	**11**	**10**

Source (Basic Data): *Tenth Plan Document* (Table 2.14), Planning Commission.

FIGURE 2.7

Distribution of Invested Capital Across States (Factory Sector)



Source (Basic Data): ASI, various issues.

Table 2.2 presents implemented IEMs. Clearly, some states such a Gujarat, West Bengal,[2] Maharashtra ad Andhra Pradesh have been much-preferred destinations as compared to Uttar Pradesh, specially, during recent period of 1999-2002.

This is also reflected in the inability of Uttar Pradesh to attract foreign direct investment (FDI) proposals, which were stuck at 1.7 per cent of the total approvals during August 1991 to May 2002 (Table 2.3).

TABLE 2.2

Industrial Entrepreneurs Memorandum (IEM) for Investment in the De-licenced Sector: Top 15 Destinations during 1992-2002

States	*Period: 1992-2002*		*Period: 1999-2002*	
	Value (Rs. Crore)	*Percentage Share of Total*	*Value (Rs. Crore)*	*Percentage Share of Total*
Gujarat	33304	16.31	10848	17.52
West Bengal	27432	13.44	24181	39.06
Maharashtra	27043	13.25	4975	8.04
Uttaranchal	16705	8.18	33	0.05
Uttar Pradesh	**16702**	**8.18**	**2573**	**4.16**
Andhra Pradesh	13710	6.72	4319	6.98
Rajasthan	11067	5.42	1903	3.07
Haryana	10679	5.23	2202	3.56
Madhya Pradesh	9434	4.62	1802	2.91
Tamil Nadu	9425	4.62	2289	3.70
Karnataka	8275	4.05	639	1.03
Punjab	5921	2.90	2121	3.43
Assam	1973	0.97	1949	3.15
Orissa	1634	0.80	119	0.19
Jharkand	1610	0.79	199	0.32
Bihar	1476	0.72	14	0.02
Total India	**204151**		**61905**	

Source (Basic Data): *ASI Statistics* (various), Secretariat for Industrial Assistance (SIA), Ministry of Commerce and Industry.

TABLE 2.3

State-wise Break-up of Foreign Collaboration and Foreign Direct Investment (FDI) Proposals Approved during August 1991 to May 2002 and August 1991 to August 2004

State	*During August 1991 to May 2002*			*During August 1991 to August 2004*		
	Number of Total	*Amount (Rs. Million) Approvals*	*Percentage Share*	*Number of Total*	*Amount (Rs. Million) Approvals*	*Percentage Share*
State Not Indicated	5815	752301.3	26.9	6033	701362.8	28.32
Maharashtra	3959	486601.8	17.4	4972	366024.2	14.78
Delhi	1951	336881.9	12.0	2763	303038	12.24
Tamil Nadu	2152	232360.2	8.3	2656	225826.4	9.12
Karnataka	1950	215865.3	7.7	2586	188184.3	7.6
Gujarat	1049	184532.5	6.6	1224	111765.1	4.51
Andhra Pradesh	1010	130686.8	4.7	1276	116091.4	4.69
Madhya Pradesh	225	92273.63	3.3	243	92714.08	3.74
West Bengal	591	88023.34	3.1	679	77898.35	3.15
Orissa	136	82290.03	2.9	141	82293.13	3.32
Uttar Pradesh	**737**	**47916.05**	**1.7**	**811**	**48266.92**	**1.95**
Haryana	779	35194.19	1.3	874	38751.56	1.56
Rajasthan	320	30047.23	1.1	343	29112.04	1.18
India	**21926**	**2804422**		**26117**	**2476643**	

Source (Basic Data): *SIA Newsletter* (various), Secretariat for Industrial Assistance (SIA), Ministry of Commerce and Industry India Investment Centre website.

2. West Bengal has managed a huge investment in the year 1999, which otherwise, is not a consistent destination of high investment.

The competing states are far ahead of Uttar Pradesh. However, in a high percentage of proposals (almost 27 per cent), the investors do not indicate their choice of location. Uttar Pradesh can attract these fence sitters by providing the right incentives and conducive business environment.

Table 2.4 indicates the sectors that are attracting FDI. Significant amounts of FDI have been approved in some of the sectors where Uttar Pradesh is strong, such as oil refineries, information technology, telecommunications and transport. Therefore, strategies are needed to attract this investment in larger quantities. Initiatives, which matter in investment decision making process, are important. These will be discussed subsequently, and also in the strategy section. Uttar Pradesh requires huge amounts of investment for developmental activities, particularly, in view of its emphasis on industrialisation, power sector and agriculture. In addition, investment is also needed to build up human capital and ensure social security. Uttar Pradesh has a great deal of catching up to do in the domain of private investment, with respect to other states.

2.4.2 Central Government Efforts in Capacity Building

Under the current system, the federal transfers to the states are executed in segments, *viz.*,

(1) devolution of a fraction of the Centre's divisible taxes and grants-in-aid of revenue of states in need of assistance under Article 275 of the Constitution through the Finance Commission (FC),

(2) transfers through the Planning Commission (PC) in the form of assistance for State Plans,

(3) transfers to implement Centrally Sponsored Schemes (CSS) under the central Sector Plan, and

(4) discretionary transfers.

The statutory transfers also have several components, *viz.*,

(1) tax devolution, revenue deficit grants,

(2) grants for upgradation and special problems, and

(3) grants meant for local bodies and calamity relief.

TABLE 2.4

Sector-wise Foreign Investment Approvals (Selected Major)

S. No.	*Name of the Sector*	*During August 1991 to May 2002*			*During August 1991 to May 2004*		
		Total Number of Approvals (Rs. Million)	*Amount of the FDI Approved*	*Percentage to Total Amount Approved*	*Total Number of Approvals*	*Amount of the FDI Approved*	*Percentage to Total Amount Approved*
1.	Fuels (Total including Power	893	774067	27.60	1002	697471.5	28.16
	Of which, Fuels (Power)	269	381057	13.59	296	381907.2	15.42
	Oil Refinery	257	256278	9.14	267	182442.5	7.37
2.	Telecommunications	828	562246	20.05	926	413682.8	16.7
	Of which, Cellular Mobile/Basic	201	275402	9.82	206	233714	9.44
3.	Electrical Equipment	4689	273996	9.77	5904	187261.1	7.56
	Of which, Computer Software Industry	2442	176874	6.31	3355	92711.24	3.74
4.	Transportation Industry	1471	206001	7.35	1777	207669.8	8.39
5.	Services Sector	999	179325	6.39	1378	165820.8	6.7
6.	Metallurgical	694	154037	5.59	789	154050.3	6.22
7.	Chemicals (Other Than Fertilisers)	1729	127543	4.55	1923	117129.4	4.73
8.	Hotel and Tourism	544	48897	1.74	749	49082.15	1.98
9.	Paper and Pulp (including Paper Products)	189	35028	1.25	201	31131.26	1.26
10.	Textile (including Dyed, Printed)	732	34080	1.22	813	29374.57	1.19
11.	Drug and Pharmaceuticals	497	29168	1.04	622	27530.67	1.11

Source (Basic Data): *ASI Newsletter* (various), Secretariat for Industrial Assistance (SIA), Ministry of Commerce and Industry India Investment Centre website. India Investment Centre website.

The Eleventh Finance Commission (EFC) has criticised such segmentation as a serious flaw in the system of federal transfers. A broad distribution of transfers is presented in Table 2.5 as an illustration.

TABLE 2.5

Pattern of Distribution of Central Transfers to States

Year Plan	*Total Share in Central*			*Plan Grants*	*Discretionary Grant*	*Total Transfer*
	1	*2*	*3*	*4*	*5*	*6*
Eighth FYP	56.13	6.9	63.02	35.04	1.94	100.00
Ninth FYP (up to 1999-00 (BE)	62.02	5.55	67.57	30.24	2.2	100.00

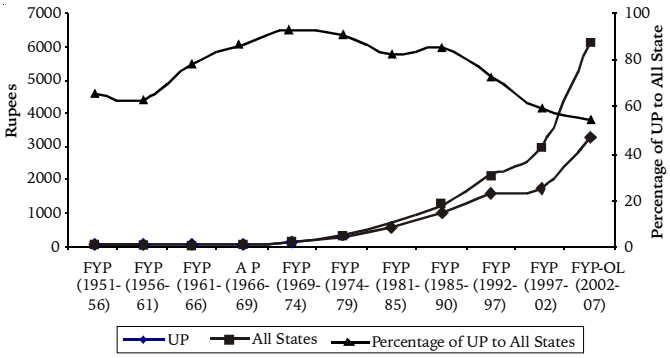
Source (Basic Data): Annexure II.7, EFC.

Thus, capital formation through central efforts is contingent upon the way in which Planning Commission distributes resources for the State Plan, which is neither statutory nor based on any set rule of the game but depends on the negotiating skills of the states. Figure 2.8 indicates the continuously falling share of Uttar Pradesh in per capita Plan Expenditure from the Planning Commission. During the Ninth Plan Period, the per capita expenditure in Uttar Pradesh was 59 per cent of the average per capita expenditure of all states.

Clearly, Uttar Pradesh is behind in terms of centrally funded capital formation per capita. This simply means that less and less people have the capital needed for production. Thus, some effort is needed from the state government of Uttar Pradesh to pursue its case for commensurate transfer of plan funds and investment in areas such as infrastructure and institution building. Often it is alleged that the state government is not able to spend the allocated funds in many areas. This trend must be reversed.

FIGURE 2.8

Per Capita Plan Expenditure of Uttar Pradesh



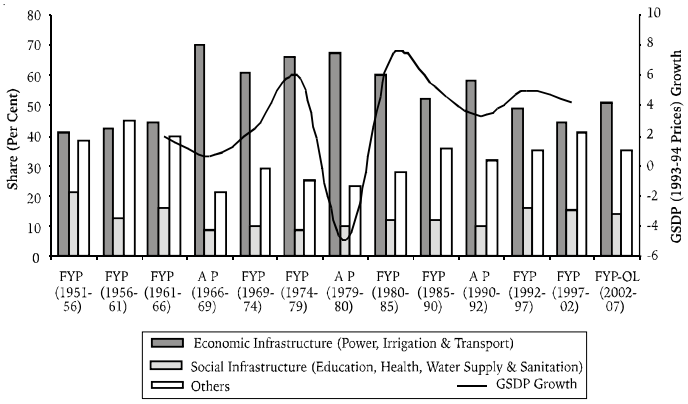
Source (Basic Data): *Annual Plan* (2003-04), Uttar Pradesh Planning Commission.

It has been observed earlier that Uttar Pradesh is basically agriculture driven economy and that investment in agriculture has important effects. Since 1951, plan expenditures in Uttar Pradesh have dominated economic activities such as irrigation, power and transport (Figure 2.9). Figure 2.6 clearly shows the positive relationship between real GSDP growth and the investment share in economic activities. The year, which has a big negative dip in growth, 1979-80 was marked by serious drought.

However, during recent plan periods, investments in these sectors have reduced systematically and the result is a slowdown in agricultural GSDP growth as well as overall GSDP growth.

FIGURE 2.9

Distribution of Plan Expenditure in Uttar Pradesh and the Average Growth Rate in Real GSDP



Source (Basic Data): *Annual Plan (2003-04)*, Uttar Pradesh Planning Commission, CSO.

2.4.3 Complacency on the Part of State Government in Utilising Central Plan Outlays

Further, Uttar Pradesh is also to be blamed for not utilising the allocated outlays. Data shows that, while other states could bargain as much as 133 per cent of the allocated outlays, Uttar Pradesh's expenditure

actually reduced to 63.5 per cent of its allocations during the Ninth Plan period. This complacency on the part of officials and leaders of the state has cost it dearly.

The Mid-term Appraisal of the Ninth Five Year Plan (1997-2002) by the Planning Commission notes, "While most of the States have not been able to fully utilise the outlay approved in their discussions with the Planning Commission, there has been a huge gap between the approved outlay and expenditure in the case of states like Uttar Pradesh and Bihar which has affected almost all the sectors and particularly the power sector in both these States. The shortfall in the plan expenditure was of the order of 31 per cent in Uttar Pradesh" (Table 2.6).

TABLE 2.6

State Plan Outlay and Actual Expenditure (Rs. Crore)

State	*Ninth Plan Outlay*	*Ninth Plan Expenditure*	*Expenditure as % of Plan Outlay in Ninth Plan*	*Tenth Plan Outlay*
Uttar Pradesh	**46340**	**29417**	**63.48**	**59708**
Bihar	16680	11094	66.51	21000
Orissa	15000	11965	79.77	19000
Haryana	9310	8035	86.31	10285
Kerala	16100	13922	86.48	24000
Madhya Pradesh	20075	17425	86.80	26190
Rajasthan	22526	19836	88.06	27318
Punjab	11500	10666	92.75	18657
Tamil Nadu	25000	24917	99.67	40000
Gujarat	25150	25801	102.59	40007
Andhra Pradesh	25150	28279	112.44	46614
West Bengal	16900	21552	127.53	28641
Maharashtra	36700	46964	127.97	66632
Karnataka	23400	31126	133.02	43558

Source (Basic Data)*: http://planningcommission.nic.in/plans/stateplan/stplsf.htm.*

2.4.4 State Government Capacity to Raise Revenue

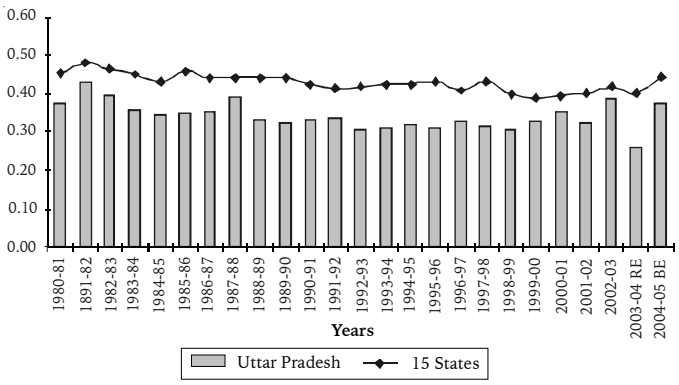
The internal capacity of the Uttar Pradesh government to raise revenue from taxes has been deteriorating over time *vis-à-vis* its revenue expenditure. The state government's financial condition is highly constrained due to a huge debt burden. Self-reliance, measured by the ratio of own-tax revenue to total revenue expenditure is important in several aspects. It is one of the important considerations in allocating Central transfers, including those of fiscal responsibility. Uttar Pradesh has very low fiscal self-reliance compared to several major states (Figure 2.10). In fact, it is below the average of all other states through out the 1980s and 1990s.

A non-linear regression (Figure 2.11) across major states indicates that self-reliance is positively correlated with industrial activity. States displaying a high sectoral share of manufacturing in their GSDP are able to maintain higher self-reliance. This is obvious as agricultural sector, which dominates the Uttar Pradesh economy, is almost untaxed. The services sector, which is now under the taxbase, is the only possible route through which Uttar Pradesh can improve its fiscal self-reliance.

This makes it even more imperative for Uttar Pradesh to emphasise its development strategy based on vigorous industrialisation or think in terms of taxing agriculture.

FIGURE 2.10

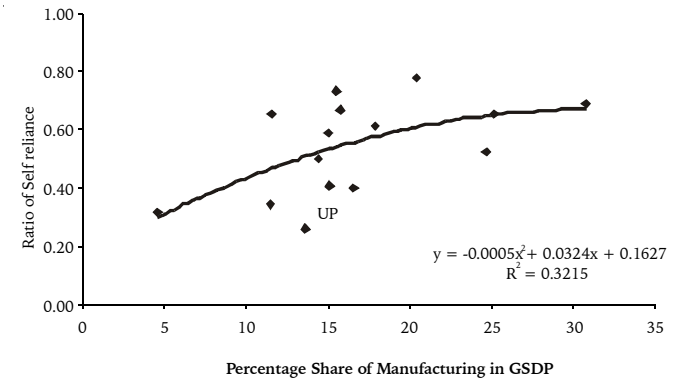
Fiscal Self-reliance (Ratio of Own Revenue to Total Revenue Expenditure)



Source (Basic Data)*: State Finances RBI*, various issues.

FIGURE 2.11

Scatter Plot between Share of Manufacturing in GSDP and Self-reliance

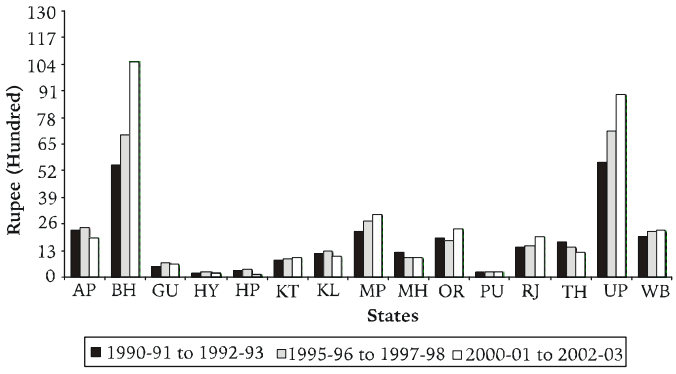


2.4.5 Does Uttar Pradesh Get Less from Centre in Term of Transfer of Taxes and Grants?

The data on the share of transfers of taxes and grants from the Centre to different states is presented in Figures 2.12 to 2.15. From the data it is hard to support the idea that Uttar Pradesh gets less than its fair share of central resources. Whether measured in terms of per capita, or as percentage of GSDP, central transfers from taxes and grants are comparable with other states. The formula adopted by the Finance Commission in transfers takes into account several factors, with pre-selected weights. These include (weight in percentage given in parentheses in accordance to EFC) population (10), income distance (62.5), area (7.5), index of infrastructure (7.5), tax reform (5.0) and fiscal discipline (7.5). Thus, there is ample emphasis on fiscal discipline and self-reliance, which appears to negatively influence transfer payments to Uttar Pradesh. Over time, the transfer of central taxes (both in terms of percentage of GSDP and per capita) has increased, while transfer of grants has fallen considerably. In the TFC report the above weights have been further modified such that weights for population, income distance, area, tax effort, and fiscal discipline are 25, 50, 10, 7.5, and 7.5 respectively. Clearly, there is more emphasis towards fiscal performance rather than progressivism. With less weight on income distance, poor states are likely to be worst off (Kumar, 2005).

FIGURE 2.12

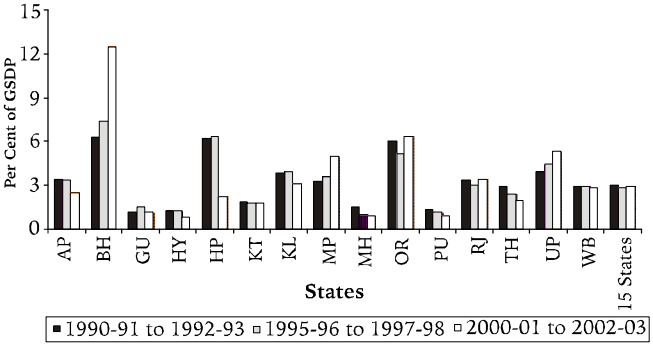
Per Capita Transfer of Central Taxes to States (Rupee '00)



Source (Basic Data): RBI.

FIGURE 2.13

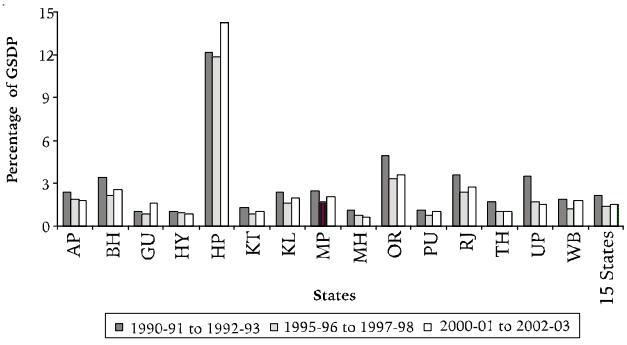
Central Taxes Transferred to States as Percentage of GSDP



Source (Basic Data): RBI.

FIGURE 2.14

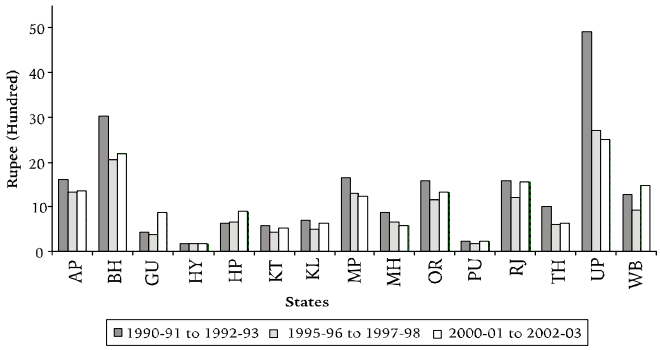
Grants from Centre as Percentage of GSDP



Source (Basic Data): RBI.

FIGURE 2.15

Central Grants Per Capita Transferred to States (Rupee '00)



Source (Basic Data): RBI.

TABLE 2.7

Share of the Non-Special Category States in Grants-in-aid for the Period 2005-2010

(Rs. Crores)

	Grant-in-Aid													
State	*Share in Central Taxes & Duties*	*Non-Plan Revenue*	*Health*	*Education*	*Roads and Bridges*	*Building*	*Forest*	*Heritage Conservation*	*State Specific Needs*	*Local Bodies Urban*	*Local Bodies Rural*	*Calamity Relief*	*Total in 2005-2010 (TFC)*	*Total in 2000-2005 (EFC)*
Andhra Pradesh	45139				980	243	65	40	500	1587	374	1426	5215	2031
Bihar	67671		1820	2684	309	360	5	40	400	1624	142	592	7976	1793
Chhattisgarh	16286				262	183	85	10	300	615	88	444	1988	
Goa	1589				39	24	3	20	10	18	12	9	135	46
Gujarat	21900				895	204	20	25	200	931	414	1019	3708	1384
Haryana	6596				183	152	2	15	100	388	91	515	1446	653
Jharkhand	20624		361	652	409	160	30	10	330	482	98	501	3033	
Karnataka	27362				1458	205	55	50	600	888	323	475	4054	1140
Kerala	16353	470			642	104	25	25	500	985	149	354	3255	813
Madhya Pradesh	41181		182	460	587	443	115	20	300	1663	361	1011	5141	1739
Maharashtra	30663				1190	224	70	50	300	1983	791	924	5531	1956
Orissa	31669	488	196	323	1475	389	75	50	170	803	104	1199	5273	1728
Punjab	7971	3133			421	152	2	10	96	324	171	605	4914	1112
Rajasthan	34419			100	633	213	25	50	450	1230	220	1723	4644	2993
Tamil Nadu	32553				1214	243	30	40	300	870	572	866	4135	1337
Uttar Pradesh	118209		2312	4454	2403	600	20	50	800	2928	517	1177	15262	4008
West Bengal	43304	3045		392	413	181	15	40	890	1271	393	934	7573	4680
India NSC	563490	7136	4871	9064	13515	4078	642	545	6246	18590	4820	13777	83284	27413
Per Capita (Rs.)														
Andhra Pradesh	5924				129	32	9	5	66	208	49	187	684	305
Bihar	8153		219	323	37	43	1	5	48	196	17	71	961	208
Chhattisgarh	7830				126	88	41	5	144	296	42	214	956	
Goa	12224				304	186	23	154	77	138	92	67	1041	396
Gujarat	4320				177	40	4	5	39	184	82	201	731	335
Haryana	3126				87	72	1	7	47	184	43	244	685	397
Jharkhand	7667		134	242	152	59	11	4	123	179	36	186	1127	
Karnataka	5172				276	39	10	9	113	168	61	90	766	253
Kerala	5143	148			202	33	8	8	157	310	47	111	1023	279
Madhya Pradesh	6829		30	76	97	73	19	3	50	276	60	168	853	263
Maharashtra	3164				123	23	7	5	31	205	82	95	571	24
Orissa	8606	133	53	88	401	106	20	14	46	218	28	326	1433	546
Punjab	3267	1284			173	62	1	4	39	133	70	248	2014	548
Rajasthan	6092			18	112	38	4	9	80	218	39	305	822	680
Tamil Nadu	5217				195	39	5	6	48	139	92	139	663	239
Uttar Pradesh	7112		139	268	145	36	1	3	48	176	31	71	918	288
West Bengal	5399	380		49	51	23	2	5	111	158	49	116	944	687
India NSC	5941	75	51	96	143	43	7	6	66	196	51	145	878	289

Source: TFC & EFC.

According to the TFC proposal for grants, Uttar Pradesh will get per capita Rs. 918 as grant during the TFC period of 2005-10 (Table 2.7). This is much less than that allocated to some of the affluent states such as Punjab, West Bengal, and Kerala. However, the per capita allocation of grants-in-aid to Uttar Pradesh for TFC period is 3.2 times the amount that was allocated during EFC period, while the average per capita grant for all the non-special category (NSC) states during TFC period is 3.04 times that of EFC period. Thus, apparently it may appear that Uttar Pradesh is a little better than the average states in getting grants but considering the poor social and physical infrastructure in the state, this may not be enough.

2.4.6 Comments

In order for development to happen, Uttar Pradesh has to keep pursuing hard decisions in order to sort out its fiscal management. The debt condition is unsustainable and efforts to re-structure debt need to be expedited. Expenditure has to be reduced by pruning the size of government so that funds can be spared for economic development and creating suitable conditions right for private sector investment. At the same time state needs to develop its negotiating skill to acquire better share in central allocations.

2.5 Determinants of Investment

There are several qualitative and quantitative variables that go into the considerations of private sector investors. However, investment programmes of the central and state governments may not always be guided by economic reasons. Factors such as a desire for equitable development across regions, political compulsions, the presence of natural resources, conditionalities of external funding agencies, and other pressure groups, may influence the location and types of public investment. Therefore, it is a difficult function to estimate and more so because the proxy investment discussed earlier does not differentiate between public and private investment. Nevertheless, a statistically preferred model (Appendix A-2.4) with R-square value of 0.59 has been searched to explain variations in overall investment proxy across 26 states.

The model contains variables such as literacy rate, growth in infrastructure index, presence of metropolitan cities, proximity to the coast, and growth in state fiscal deficit. Interestingly, the variables found to explain investment are indeed important in the decision function of investors. Consider for example, what factors a private investor is likely to take into account while making an investment decision. These include availability of human capital (proxy literacy rate), trends in infrastructure development (proxy growth in infrastructure index), proximity to market and business centre (proxy metropolitan cities), and incentives by the government (proxy change in fiscal deficit). The model has a significant negative intercept, which represents government considerations, not explained by economic variables and which take away investment from the economically strong centre to less developed areas.

However, the subsequent discussion starts with role of governance, which is a qualitative variable, not included in the regression model discussed above. Model based observations follow subsequently.

2.5.1 Attracting Investment through Signalling Effects of Good Governance

In an environment of fast globalisation, good governance has emerged as an important pre-requisite for attracting investment. Even in the context of overall development programmes some analysts such as Reynolds (1983) go to the extent to argue political organisation and the administrative competence of government as the most important explanatory variable of development. Studies demonstrate that good governance affects economic growth and development positively by increasing investment flows and reducing poverty. Therefore, every country and every state wants to demonstrate that the government of the day is ideal. It aims at preventing crime, corruption and complacency and thereby helps business to function efficiently. What could make a government set-up ideal is a complex question. However, it appears to have at least four components to be accomplished: First, a transparent and result oriented system, which is simple to understand and implement. Second, equipping the system with right kind of people, adequate resources and relevant infrastructure. Third, ensuring honesty and integrity of the people in objective delivery of services. And fourth, monitoring and measuring the efficiency of the system in a transparent way.

Often, shortcomings of the system are not demonstrated through efficiency measurements because corruption also leads to efficiency in producing results (wrong or right) through unfair means, particularly, in a relatively more corrupt society. And ironically this efficiency is successfully achieved despite all odds in the system. However, it does not mean that corruption should be encouraged. Studies on corruption do indicate some countries growing despite high level of corruption but at the same time there is a caution not

to confuse corruption to be a source of growth. Therefore, it is argued that states/countries would have done better in absence of corruption.

2.5.2 Attracting Investment at the Cost of Fiscal Deficits and the Risk of Debt Traps

Post-liberalisation (1993-94 to 1999-00 for which the data is analysed), states are competing for private sector investment by offering sops such as tax exemptions, subsidised land and government guarantees. All these policies lead to fiscal deficits but they do help in attracting investment (Figure 2.16). In addition, states' own capital expenditure on developmental programmes also have spill-over effects on the volume of private investment. A recent case study by NCAER regarding Ford Motors selecting Tamil Nadu against Maharashtra indicated that, among other considerations, incentives in the form of free land and tax benefits were vital. However, the study also indicated that the incentives offered, presumably because of inter-state competition, were not optimal.

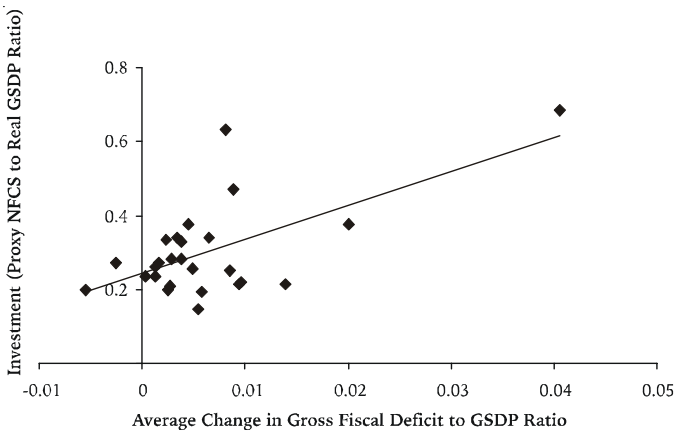
Some economists may have objections to the inclusion of fiscal deficit as a explanatory variable for investment as it includes interest payments. However, a recent analysis in the IMF has tried to explain growth using the fiscal deficit variable. In the present context, a change in fiscal deficit, if it includes a change in interest burden, has been used to explain investment.[3] Fiscal deficit can occur, both due to incentives (loss of revenue) as well as increases in expenditure. State governments have been competing through both means to attract investment.

When a Keynesian stimulus is given to the economy, fiscal deficit may increase due to increased expenditure as well as tax loss. Therefore, a change in deficit is likely to capture the variation in private investment more than government budgetary provisions. In any case, no budgetary provision was found to explain growth or investment across states in the present exercise.

One percentage point differences in change in the fiscal deficit across state leads to a 6.13 percentage point change in investment ratio. Against this fact, it is argued that the debt and deficit conditions of several states are unhealthy and unsustainable. Also, it is not always the case that deficits are incurred due only to capital expenditures for developmental activities (as is evident in the case of Uttar Pradesh). Therefore, fiscal discipline is important, particularly in states like Uttar Pradesh, which have lost the capacity to provide fiscal stimulus to economy. It is also argued that competition among states could force them to work on the professional management of their fiscal problems, since accelerated growth is not possible in the face of mounting debt.

FIGURE 2.16

Scatter Plot between Average Annual Change in Fiscal Deficit of Selected States during 1993-94 to 1999-2000 (Fractions) and Investment Ratio (Proxy)



Source (Basic Data): CSO, RBI.

2.5.3 Access to Market is Key to Investment Decisions: Develop Modern Business Agglomerates

Metropolitan cities are proxies for commercial markets and business centres. For analyzing market effects, dummies have been used for states, which are in close proximity to cities such as Delhi, Kolkata, Chennai, Hyderabad, Bangalore, Ahmadabad, and the aggregation of Lucknow and Kanpur. These conglomerates, with populations ranging between 3 to 13 million each, present huge markets for business activities (both as sources of supply and demand) and attract investments in their vicinity. The metro dummy has a highly significant coefficient of 0.090 and therefore, it is important to develop such agglomerates as quickly as possible.

In the previous chapter, it was argued in the case of eastern Uttar Pradesh that, urbanisation has been inadequate. Further, the cities of Allahabad, Varanasi, Lucknow, Meerut, Muradabad and Kanpur need to be modernised and developed under a comprehensive master plan. There is marked difference between

3. With changes in fiscal deficit variable, the effects of interest rate are reduced.

Lucknow as a business centre, and the capital of any fast-growing states' capital. The roads, the cleanliness, the business centres, connectivity, institutional development, smartness of the administration, the police, the facilitation centres and work culture at service and attraction to tourists, are all key factors in ensuring that a conglomerate is a viable business destination.

2.5.4 Progress in Infrastructure Development is a Testament to Long-term Vision and Helps in Formulating Business Decisions

Growth in the infrastructure index calculated from the infrastructure growth index developed by the Centre for Monitoring Indian Economy (CMIE) for the period between 1980-81 and 1993-94 is found to have significant positive effects on investment. This observation is intuitively obvious in the sense that such growth in infrastructure is clear indication of states' resolve for long-term growth plans. Each percentage point change in the infrastructure index growth leads to a 5.8 percentage point change in the investment ratio. States that have grown faster in infrastructure growth index between 1980-81 and 1993-1994 include Himachal Pradesh, Madhya Pradesh, Karnataka, Orissa and Rajasthan. The flow of investment can be increased by ensuring high growth in infrastructure development. However, states, which have well developed infrastructures, may not demonstrate high growth in infrastructure and still continue to attract high levels of investment. Therefore, it is also important to develop perception of investment friendly environment.

2.5.5 Ensuring Presence of Quality Human Capital to Take on the Challenges of Managing Modern Capital is Vital: Develop Institutions to Meet Population Growth and Ensure Every Child Can Choose his/her Education path

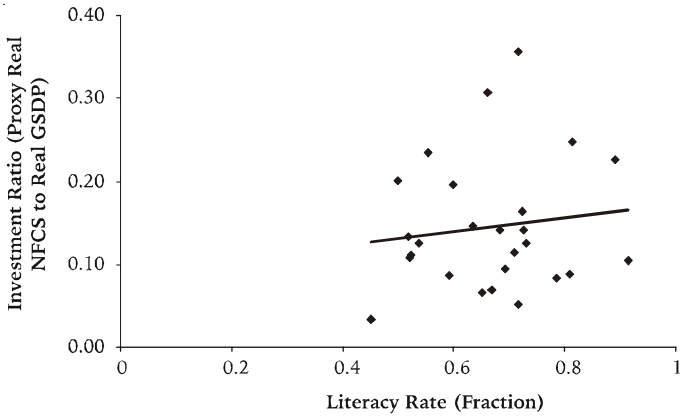
Free migration allows companies to hire the best people from across the country even if the state concerned has a low literacy rate. Further, it is not necessary that the most literate state will have the best pool of human capital. Despite these two facts, there is little doubt that literacy is too important to be neglected. A high literacy rate ensures cheap, readily available, and educated manpower at the grassroots level. Literacy changes the general outlook and awareness of people and cultivates a sense of competition and the desire to grow economically. Therefore, in general, states that have better human capital are likely to attract more investment.

The analysis indicates that each percentage point difference in literacy attracts additional investment of the order of 0.24 percentage points. Thus, literacy of the state is an important driver of growth and several studies in growth literature have identified it as an important determinant of investment and growth. It is a truism that physical capital can be better utilised with better human capital. Private investors factor literacy rate into their investment function. However, the partial elasticity of the variable is not very high and several high investment states display low literacy rates (Figure 2.17). In these cases, it appears that the general perception about the quality of people also plays a role in determining investment decisions.

In Uttar Pradesh, there are not enough institutions to stimulate change in society. The regression result is the simplest possible reflection of the education on investment. Much more needs to be done in terms of quality and variety of education. The chapter on social development in Volume II has a comprehensive discussion on this topic.

FIGURE 2.17

Literacy Rate, Investment and Growth in Selected States during 1993-94 to 1999-2000



Source (Basic Data): CSO, *Statistical Abstract of India.*

2.5.6 Evidence from a Survey

An NCAER survey on factors affecting investment decision indicates that availability of skilled labour, availability of supplier base, availability of infrastructure and incentives are the most important considerations for the private investors. These observations are in line with regression based analysis presented earlier. However, the survey did not find proximity to target

market as major consideration, which is a little surprising (Table 2.8).

TABLE 2.8

Ranking of Factors Affecting Location Decision

	Rank (1-10, where 10 is Highest)
Incentives	7
Availability of Skilled Labour	9
Availability of Cheap Land	4
Availability of Infrastructure	8
Availability of Supplier Base	9
Distance from International Airport	3
Proximity to Target Market	3
Proximity to Port/Inland Container Terminal	7

Source (Basic Data): R. Venkatesan and S. Verma, "Study on Policy Competition Among States in India for Attracting Direct Investment", NCAER New Delhi, October 1998.

2.6 Manufacturing Sector

2.6.1 Promotion of High Value Adding Products and Practices is Important

A cross-sectional production function for the manufacturing sector estimated from 26 states for which data is consistently available indicates that the share of capital stock in gross value added is 64 per cent (Appendix A-2.5). This is understandable, since workers are better compensated in factories than in the primary sector, or even some sub-sectors of tertiary activities such as transport. ASI data does not cover mining and quarrying, which is highly capital intensive. The above result is obtained from unconstrained regression of gross value added on fixed capital stock, workers, literacy-rate and infrastructure index. Neither literacy-rate nor infrastructure index turned out to be significant. Note that state's own literacy rate may not be a constraint on factory output, given free inter-state migration. Further, even with low literacy, factories can get best of the available people in a state because of higher wages offered and persistent unemployment. Similarly, general infrastructure may not be a constraint on production so long the infrastructure in the industrial areas is adequate. This does not imply that general literacy rate and general infrastructure are not important. In fact, they are key requirements for attracting investment in order to establish factories.

The elasticity of gross value addition (GVA) with respect to fixed capital stock (FCS) is estimated to be 0.64, which suggests that in order to achieve 10 per cent growth in industry sector (which is a reasonable requirement in order to achieve 7.6 per cent overall growth) capital must grow at a rate of 15.6 per cent annually in real terms. Considering the all-India GVA to FCS ratio of 0.47 for factory sector, average investment as percentage of GVA can be estimated as 33.3 per cent for 10 per cent growth. However, the GVA to FCS ratio in Uttar Pradesh is 0.34, which is very low compared to average 0.47 for all-India (Table 2.9). Given this ratio, the investment needed to achieve a growth rate of 10 per cent in factory sector is 46 per cent of GVA. Applying the Tenth Plan distribution of investment between private, centre and state, the investment needed by Uttar Pradesh can be estimated as 5.1 per cent of GVA, which is much higher than the current level of overall capital outlay.

Earlier analysis has shown that industries in Uttar Pradesh are poor at value addition. Given the high investments needed at the current rate of value addition, it is important to compare the industrial practices and structure of Uttar Pradesh with those in the high value-adding states. Industrialists in Uttar Pradesh could be sent to these areas to understand their production process. In particular, benchmarking industrial practices in Maharashtra could prove useful, given the state's high share in Indian industrial production and high value added per unit of fixed capital.

On an aggregate, per capita GVA is expected to increase with increase in per capita fixed capital stock (with diminishing returns). This is also suggested by the regression discussed earlier and linear fit given in Figure 2.18. However, at desegregated levels and with specific sets of states, it can be seen from Figure 2.18, that a contrary relationship is also possible. This observation emphasises the importance of industrial structure. It is advantageous to promote capital-efficient industries.

Table 2.9 also displays the composition of industries in states with better GVA to FCS ratios. Industries related to garments manufacturing, chemicals, footwear, and food products, automobile parts and electronic assemblies are less capital intensive and employ more labour. Governments can make special efforts to promote such industries with special fiscal incentives.

TABLE 2.9

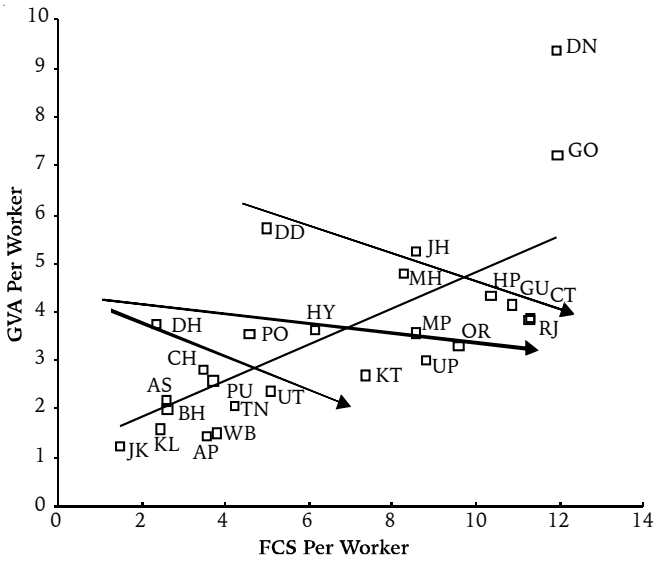
Selected Industries in States with High GVA to FCS Ratio in Factory Sector

Sl. No.	*State and their Share in GVA*	*GVA-FCS Ratio*	*FCS per Factory (Rs. Lakh)*	*Workers per Factory*	*Major Types of Factories (Share in GVA Given in Parentheses)*
1	Delhi (1.72)	1.59	56	10	181 wearing apparel (27), 242 chemical products (25), 192 footwear (4)
2	Assam (1.01)	0.77	150	15	154 other food products (49), 232 refined petroleum products (32), 210 paper and paper products (8)
3	Punjab (3.58)	0.67	146	14	171 spinning, weaving and finishing of textiles (18), 242 chemical products (10), 241 mfg. basic chemicals (7), 152 dairy products (7), 153 grain mill, starch and animal feed products (7), 292 mfg. of special purpose machinery (6)
4	Kerala (2.20)	0.66	130	19	242 chemical products (14), 241 mfg. basic chemicals (13), 154 other food products (11), 232 refined petroleum products (8), 251 rubber products (6)
5	Haryana (4.14)	0.59	306	24	343 automobile parts and components (22), 359 transport equipment (9), 271 basic iron and steel (8), 292 mfg. of special purpose machinery (8), 181 wearing apparel (4)
6	Maharashtra (21.75)	0.58	370	30	242 chemical products (12), 241 mfg. basic chemicals (8), 154 other food products (5), 292 mfg. of special purpose machinery (5), 232 refined petroleum products (5), 171 spinning, weaving and finishing of textiles (5)
7	Uttar Pradesh (6.84)	0.34	366	42	See Chapter 2 in Volume II

Source (Basic Data): ASI, 1999-00.

FIGURE 2.18

Scatter Plot between FCS Per Worker and GVA Per Worker



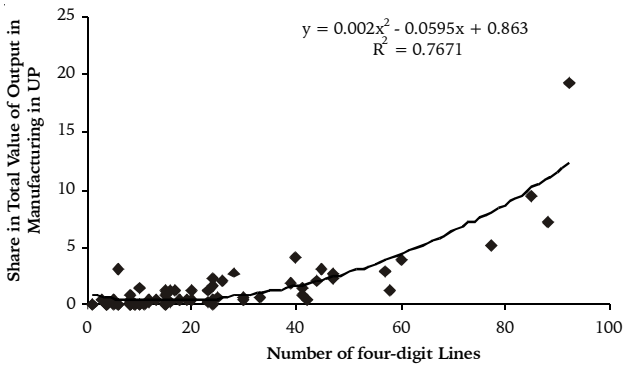
Source: ASI, 1999-00.

2.6.2 Mega Projects and Modernisation of Industrial Clusters May Help Pace of Industrialisation

Another important aspect is to see how important the industrial cluster system is for industrial development in Uttar Pradesh. Figure 2.19 plots share in total value of output in for 70 districts in Uttar Pradesh against the number of four-digit lines in that district. Clearly, more the number of lines a district has, the more likely it is to contribute a higher share in manufactured output. This means that it is more important to promote diverse industries, with multiple product lines. These industrial activities are invariably associated with mega projects. With large-scale industrialisation, the area develops faster and many small-scale industries find it attractive to open for business.

FIGURE 2.19

Scatter Plot between Number of Four-digit Lines and Share in Total Value of Output in Uttar Pradesh across Districts



Source: ASI, 1998-99.

However, it is not only the mega projects that can help intensive industrialisation. Extensive urbanisation, creating large business centres, and modernisation of the existing small-scale clusters can also be equally helpful. The key point is to ponder whether a centre should develop into a multi-product production centre rather than specialising in few small-scale items. In this context, development of industrial corridors and modernisation of existing clusters for better quality and scale benefits may also be extremely helpful.

Most recently, the Government of India has announced a scheme for establishment of High-tech Weaving Parks involving modernised power looms through assistance under three existing schemes for power looms namely, Technology Upgradation Fund (TUFS), the Group Work Shed Scheme (GWSS), and the textiles Centre Infrastructure Development Scheme (TCIDS). Five such high-tech parks are already approved in Karnataka, Tamil Nadu and Andhra Pradesh (Table 2.10). This should set a good example for Uttar Pradesh to follow in terms of modernisation of its own clusters, particularly those in the textiles sector in order to remain competitive in the international market and reap the benefits arising out of abolition of quota regime in textiles and increasing influence of World Trade Organizations (WTO) commitments.

TABLE 2.10

Recent Approvals for High-tech Weaving Parks

Name and Location of the High-tech Weaving Park	*Total Project Cost (Rs. Lakh)*	*Government of India's Share in the Project Cost as Approved (Rs. Lakh)*
Rabkavi Hi-tech Weaving Park, Rabkavi, District Bagalkot, Karnataka	236.26	115.31 (48.8)
Vaigal Hi-tech Weaving Park, Aundipatti, Tamil Nadu	1731.00	704.03 (40.7)
Palladam Hi-tech Weaving Park, Palladam, Tamil Nadu	1643.61	649.65 (39.5)
Cauvery Hi-tech Weaving Park, Komarapalayam, Tamil Nadu	1412.09	595.02 (42.1)
Hyderabad Hi-tech Weaving Park, Kothur, Andhra Pradesh	2818.16	1848.92 (65.6)

Source: PIB Press Release, May 6, 2005.

Note: Figures in parentheses denote percentage.

2.6.3 Closure and Sickness of Small Scale Sector: SSI Based Strategy May not Yield Rapid Industrialisation

Uttar Pradesh has 12.05 per cent of all working small-scale registered units in India, which is second highest after Tamil Nadu (Table 2.11). However, the drop out rate is very high compared to Gujarat and Bihar. Only 59.84 per cent of units in Uttar Pradesh, actually work and out of that, 3.17 per cent are sick. Thus, Uttar Pradesh has high closure rate and low sickness rate compared to several other states. However, when both sickness and drop out rates are considered then the situation in Uttar Pradesh is not as bad as Maharashtra, Tamil Nadu, Kerala, and Karnataka. Clearly, the highest percentage of healthy units is in Gujarat, followed by Bihar, Madhya Pradesh and Uttar Pradesh. The irony is that except Gujarat, none of the good performers in the SSI sector is a leading industrial state or near the leaders.

This means that dependence on SSI for rapid industrialisation is not the optimal model for industrialisation. An SSI-led strategy works up to a point; beyond that, economies of scale become critical. Even export-oriented work does not maximise the welfare of the real working class, as it is evident from the discussion on income disparity across districts in Section 2.2. With small-scale operations, the most disadvantaged group is worker. Even the entrepreneurs lose to middlemen, particularly the exporters.

Experience indicates that the financial sector is reluctant to lend to units with very small operations but when investment limits are increased, credit disbursal increases.

Table 2.12 lists some of the reasons responsible for sickness of SSI. The most prominent reasons appear to be lack of demand, shortage of working capital, marketing problems, and shortage of power. Among these factors, state governments can certainly help in supplying adequate power. However, shortage of working capital, lack of demand and marketing of product are ticklish issues. State cannot purchase

TABLE 2.11

Status of SSI Units in Major States: Distribution of Working, Closed and Sick Units

State	*Number of Registered SSI Units*	*Percentage of Working Units in India*	*Percentage of Registered Working Units*	*Percentage of Closed Units*	*Percentage of Sick Units*	*Percentage of Healthy Units*
Tamil Nadu	309162	11.72	54.48	45.52	7.42	50.4
Uttar Pradesh	**289569**	**12.05**	**59.84**	**40.16**	**3.17**	**57.9**
Kerala	224524	10.54	67.48	32.52	35.93	43.2
Gujarat	178261	11.26	90.79	9.21	3.56	87.6
Madhya Pradesh	171376	7.47	62.67	37.33	5.51	59.2
Karnataka	165341	9.13	79.38	20.62	30.37	55.3
Punjab	154686	4.95	45.96	54.04	9.51	41.6
Maharashra	137819	5.31	55.41	44.58	23.87	42.2
Andhra Pradesh	102761	4.61	64.48	35.51	14.58	55.1
Rajasthan	84256	3.23	55.05	44.96	11.44	48.7
Bihar	74491	3.73	71.99	28.00	6.27	67.5
West Bengal	69269	2.79	57.82	42.18	11.61	51.1
Chhattisgarh	62979	2.57	58.58	41.42	64.47	20.8
Others	281231	10.66	54.52	45.48	10.42	48.8
India (Number of Units)	**2305725**	**1437704 (62.35 %)**				

Source (Basic Data): Quick results: Third All-India Census of Small Scale Industries 2001-02, DCSSI.

Note: All-India sickness of industries is taken as 14.47 per cent on account of three factors of (a) delay in repayment of institutional loans over one year, (b) decline in net worth by 50 per cent, and (c) decline in output during last three years.

whatever is produced by SSIs, and neither can it invest money to promote private interest of some entrepreneurs using tax payers money instead of taking up activities that are welfare maximising in general. However, government can certainly help in facilitating meetings of suppliers and purchasers by creating proper infrastructure in the form of market places, exhibitions, exchange houses, export houses, training and awareness programmes.

The monetary policy of the government is flexible and it cannot compel a banker to extend credit to an unviable or risky firm. The only influence that can be exercised is through policy rates of interest. This technique too has a limited effect. Priority sector lending targets are the most effective instruments through which governments influence banks to maximise credit delivery to SSIs. However, the economics does not favour this kind of control. In fact it is hard to justify reservations for small-scale sector itself in present context of economic environment, where competition and economies of scale are the buzzwords.

2.6.4 Unregistered Manufacturing Sector

During 2002-03, unregistered manufacturing contributed about 6.23 per cent to the GSDP of Uttar Pradesh as against 5.85 per cent share of unregistered manufacturing in India's GDP. It forms an important source of livelihood for a large number of people in the state. The only reliable source of information about unorganised manufacturing at disaggregated level is the integrated survey of households and unorganised manufacturing enterprises conducted by the National Sample Survey Organisation (NSSO).[4] According to the 2000-2001 survey, Uttar Pradesh with its contribution

TABLE 2.12

Reasons for SSI Sickness

Reason for Sickness Incipient Sickness	*Percentage of Sick Incipient Sick Unit**	
	Registered SSI Sector	*Unregistered SSI Sector*
Lack of Demand	71.6	84.1
Shortage of working Capital	48.0	47.1
Non-availability of Raw Material	15.1	15.2
Power Shortage	21.4	14.8
Labour Problem	7.4	5.1
Marketing Problem	44.5	41.2
Equipment Problem	10.6	12.9
Management Problem	5.5	5.1

Source (Basic Data): Quick results: Third all-India Census of small scale industries 2001-02, DCSSI.

Note: * Total will exceed 100% as some units reported more than one reason.

4. The survey covered manufacturing enterprises, which are not registered under Factories Act, 1948. It also includes enterprises engaged in cotton ginning, cleaning baling and manufacturing *bidi* and cigar that are not covered under Annual Survey of Industries (ASI).

of 11.58 per cent in total value of output in unorganised sector of India, ranked third; first and second being Maharashtra and West Bengal respectively with their respective shares of 12.62 and 12.21 per cent. However, Uttar Pradesh has relatively high share of unorganised manufacturing in rural sector as compared to the urban sector.

In terms of value of output, six states, Maharashtra, Tamil Nadu, Delhi, West Bengal, Gujarat and Uttar Pradesh constituted about 75 per cent of output in urban sector with share of Uttar Pradesh just about 7 per cent. In rural sector 6 states of West Bengal, Uttar Pradesh, Maharashtra, Andhra Pradesh, Tamila Nadu and Kerala constituted about 62 per cent of rural unregistered manufacturing with share of Uttar Pradesh at about 13 per cent. Such contribution of unorganised sector in rural areas has helped Uttar Pradesh in achieving better record in poverty alleviation in rural areas as compared to that in the urban areas.

advantage. Many more products, with comparative advantage can be identified from the total range of production in unorganised sector.

However, this potential of rural entrepreneurship has not been fully exploited because of a very low level of operations. The state could formulate policies for village level enterprises according to prevailing specialisation to increase scale of operation based on the Chinese models of village and town level enterprises. However, the government should not indulge itself in managing such activities. Instead, the management should be in the hands of private or self help groups.

It may also be noted that these products could be substantially modifies or improved under large-scale operations. For example, mud bricks could have an alternative material such as those of low-grade cement.

TABLE 2.13

Top 10 Industries in the Rural Sector of Uttar Pradesh (in Terms of their Share in Total Value of Output of Rural Sector of the States)

NIC Codes at 5-digit	*Top 10 Industries in the Rural Unorganised Sector of Uttar Pradesh*	*Value of Output (Rs. Crores)*	*Share in Value of Rural Unorganised Output in*	
			All Rural Unorganised Mfg. in Uttar Pradesh	*Respective Industry in Rural India*
26931	Manufacture of bricks	2286.1	27.859	45.01
15311	Flour milling	773.9	9.431	27.48
15422	Manufacture of *gur* from sugarcane	617.3	7.523	38.12
18105	Wearing apparel (n.e.c.)	468.3	5.707	14.60
17223	Manufacture of woollen carpets	370.8	4.519	71.72
20221	Manufacture of structural wooden goods such as beams, etc.	269.1	3.280	15.27
15433	Manufacture of sweatmeats	196.9	2.399	17.44
36911	Manufacture of gold jewellery	169.6	2.066	16.46
15312	Rice milling	164.2	2.001	2.27
26911	Manufacture of articles of porcelain or china, earthen-ware, etc.	162.6	1.982	16.11
	The combined share of the top 10 industries of the rural sector of Uttar Pradesh (per cent)		66.8	

Source (Basic Data): NSSO 2000-01.

Top 10 products, including manufacture of bricks, flour milling, *gur* from sugarcane, wearing apparel (n.e.c.), woollen carpets, structural wooden goods such as beams, etc. sweatmeats, gold jewellery, rice milling, articles of porcelain or china, earthen-ware, etc. presented in Table 2.13, have very high share in the total production of these goods in India and therefore, Uttar Pradesh enjoys a high degree of comparative

Similarly, Uttar Pradesh has to take note of large-scale potential of unorganised sector in urban areas where its performance is faltering. Some of the products where Uttar Pradesh has performed well are presented in Table 2.14. However, it is important to note that the growth of un-organised sector in urban areas is also contingent upon the growth in industrialisation. And therefore, role of industrialisation is re-emphasised.

TABLE 2.14

Top 10 Unorganised Industries in the Urban Sector of Uttar Pradesh (in Terms of their Share in Total Value of Output of Urban Sector of the States)

NIC Codes at	*Top 10 Industries in the Urban Unorganised Sector of Uttar Pradesh*	*Value of Output (Rs. Crores)*	*Share in Value of Urban Unorganised Output in*	
			All Urban Unorganised Mfg. in Uttar Pradesh	*Respective Industry in Urban India*
15433	Manufacture of sweatmeats	535.6	6.12	19.54
17115	Weaving, manufacture of cotton and cotton mixture fabrics	467.7	5.34	10.51
36911	Manufacture of gold jewellery	452.6	5.17	9.28
18105	Wearing apparel (n.e.c)	450.3	5.14	10.12
17121	Finishing of cotton and blended cotton textiles	258.6	2.95	21.83
17116	Weaving, Manufacture of silk and silk mixture	254.6	2.91	25.12
28111	Manufacture of doors, windows and their frames, shutters and rolling shutters; fire escapes, gates and similar articles of iron or steel used on building	204.1	2.33	9.68
17223	Manufacture of woollen carpets	202.7	2.32	92.55
15311	Flour milling	177.3	2.03	7.02
26106	Manufacture of glass bangles	168.7	1.93	98.64
	The combined share of the top 10 industries of the urban sector of Uttar Pradesh (per cent)	36.2		

Source (Basic Data): NSSO 2000-01.

2.7 Drivers of Tertiary Sector

The tertiary sector, also known as the services sector, includes transport, storage, communication, hotel, restaurants, banking, insurance, real estate, dwellings, business services, public administration and other services. Cross-sectional data does not show a significant relationship between the growth of the tertiary sector and that of secondary or agriculture sector. However, the time series analysis for Uttar Pradesh indicates that the secondary sector affects both tertiary as well as agricultural sectors. Service industries tend to grow in industrially developed and urbanised areas. However, cross-sectional analysis is more relevant as the focus of this research is on variations across states. Several components of services are public funded promotional operations for the overall development of areas in which pressure groups and political considerations are also important. Nevertheless, growth in tertiary sector across states is significantly explained by variables such as growth in literacy rates, size of the state, and presence of metropolitan cities in and around the states. The estimated model explains 71 per cent of the variation in growth of tertiary sector and the findings are as follows.

2.7.1 Growth in Literacy Rate Helps in Catching Up with Growth in the Tertiary Sector but the Institutional Backup for Higher and Technical Learning is also Critical

Intuitively, it seems obvious that growth in literacy is one of the primary determinants of tertiary sector growth. With increasing education, more and more people become aware of the value of providing services and try to sell their skills. Simple literacy is not sufficient to develop this trend. Higher education, specifically technical and vocational education has to be encouraged. Uttar Pradesh is extremely backward in this area (see Figures 1.35 to 1.38) as also the overall literacy.

Proof of this argument can be found in the regression result. Every percentage point difference in change in literacy rate results in a change in services sector growth by 1.06 percentage points. However, the state should take initiative in improving the quality of professional education as well as increasing its availability. It is reported that rules for preventing copying in the examinations have been relaxed, while teachers do not attend classes and most bright students have to take up private tutoring. This is an alarming trend, since graduates of these institutions have no marketable skills that they can use in a career—whether in the government or the private sector.

The above arguments are supported by further analysis through scatter plots and simple linear and non-linear regression between literacy rates and worker participation, between urbanisation and literacy rate and between urbanisation and worker participation (Figures 2.20 to 2.22).

Figure 2.20 tells us that only after a threshold level of literacy rate is attained, will participation in the

workforce increase. This means, there is a lag between increase in participation and increase in literacy rates. In this time period, students acquire more advanced skills, particularly if institutes of higher education are easily accessible.

FIGURE 2.20

Scatter Plot between Average Literacy Rate and Worker Participation Across States

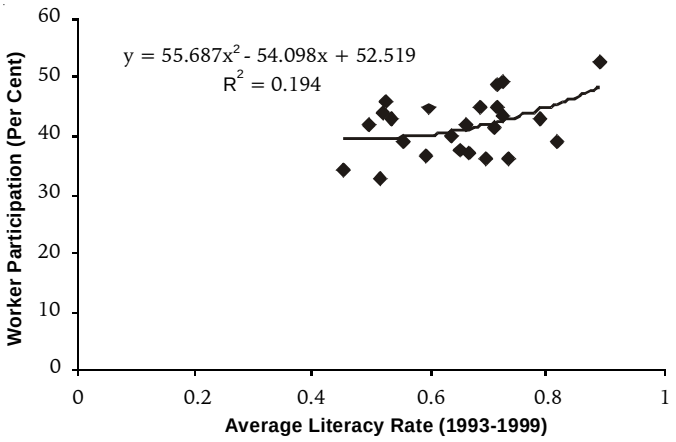


Figure 2.21 shows that literacy rate is positively correlated with urbanisation. Villages need to develop the amenities of urban life if growth has to be equitable. Regional disparity in Uttar Pradesh can be reduced if genuine efforts are made in this direction, complemented by the industrialisation of backward areas, particularly in the east. Finally, Figure 2.22 shows the combined effect of urbanisation on worker participation through literacy drives.

FIGURE 2.21

Scatter Plot between Average Urbanisation and Average Literacy Rate Across States

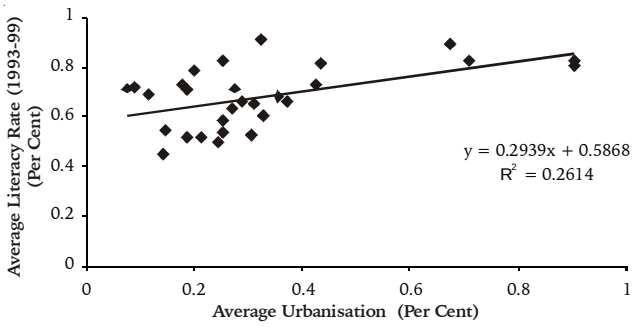
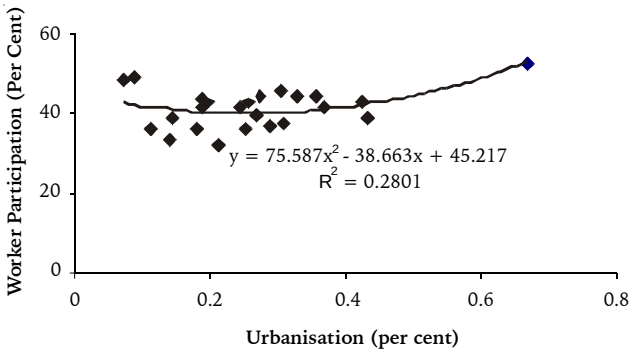


FIGURE 2.22

Scatter Plot between Average Urbanisation and Worker Participation Rate Across States



2.7.2 Development of Modern Business Cities that Attract Investment

The presence of a metropolitan city has a 0.011 percentage point impact on the growth of tertiary sector. Transport, storage, communication, hotel, restaurants, banking, insurance, real estate, dwellings, business services, public administration and other services components grow faster in and around metropolitan cities. The influence of a large city on employment opportunities and lifestyle aspirations goes well beyond city limits and extends into surrounding areas. This suggests that Uttar Pradesh should concentrate on building a few large business centres in central and eastern Uttar Pradesh. This is needed to reduce regional disparity in the state, as large commercial centres will drive market growth in the state.

2.7.3 Divide Uttar Pradesh into Focussed Zones with Decentralised Authority and Responsibility to Make Infrastructure Development Easier

Geographically, smaller states are growing faster in services than the larger states. Every per cent difference in the size of the state has an inverse effect of 0.006 percentage points on tertiary sector growth. Uttar Pradesh is a big state and not all parts are directly connected with business centres across the country. Creating metropolitan cities is important from this viewpoint as well. The process of developing business centres can probably be helped by decentralising authority. The NOIDA authority is an example. Development authorities of various cities need to employ professionals with long-term vision. Master plans are essential and need to be strictly followed.

Deviations and manipulations should be treated as criminal offences. Uttar Pradesh has traditionally been unable to implement the provisions of local body acts.

2.7.4 Development of Financial and Physical Infrastructure and Effects of Reforms

Uttar Pradesh lacks in banking operations, telecom usage and road development, which are critical components of tertiary sector (Figure 1.30 to 1.33). These sectors are also closely related to developments in industrial sector and general infrastructure.

Projects such as converting state and national highways into four-lane roads, connecting every villages with all-season roads and bringing every administrative subdivision on high-speed data network, cannot be financed by the government alone. But private participation needs reforms. Therefore, the state needs rapid reforms to enable private sector investment in infrastructure. This aspect is an important part of the general strategy discussed later in this report.

2.8 Problems in the Agricultural Sector

Shand and Bhide (2000) and Bhide *et al.* (1998) have argued that agriculture has positive effects on growth. In fact, the economy of Uttar Pradesh is heavily dependent upon agriculture but it has failed to grow over the last decade. In addition, the agricultural sector in Uttar Pradesh has not only failed to contribute to growth, it is behind most other states in terms of yield. Table 2.15 lists the major crops of Uttar Pradesh, their rank in production in India, and the yield in Uttar Pradesh, India and the top three highest yielding states. Clearly, Uttar Pradesh has first rank in the production shares of several crops. When it comes to yield, it is first only in the case of pulses. Given the fertility of land in the state, why is yield low?

2.8.1 Lower Cropping Intensity and Need for Diversification

Cropping intensity represents intensification of land. In Uttar Pradesh, less than half (9.5 million ha) of the net cropped area is cultivated more than once. This is better than the national average but far behind, Haryana, Punjab, Himachal and West Bengal. Unfortunately, cropping intensity has not displayed any significant change over the past two decades in Uttar Pradesh (Figure 2.23). It was mere 152 per cent in 2000-01, 147 per cent in 1990-91 and 142 per cent in 1980-81. The cropping intensity was highest (165 per cent in 1996-97) in the Hill region, now part of Uttaranchal while lowest (110 per cent) in the Bundelkhand region. To some extent, the sugarcane, which is a long duration crop, misrepresents land intensification figures.

TABLE 2.15

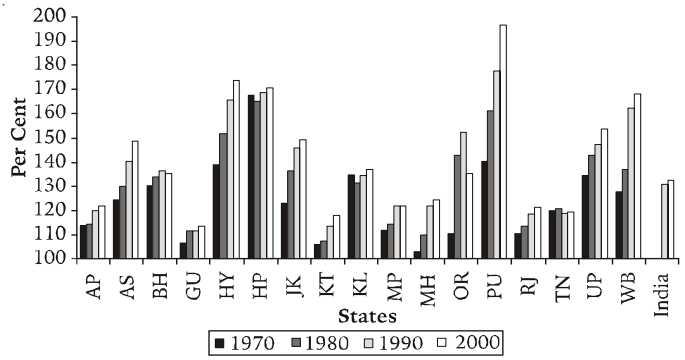
Major Crops of Uttar Pradesh, Share in India and Yield Ranking (2001-02)

Crop	*Share*		*Yield Kg Per Hectare*					
	Per Cent	*Rank Uttar Pradesh*	*Rank Uttar Pradesh*	*India*	*Uttar Pradesh*	*First*	*Second*	*Third*
Foodgrain	20.37	5	5	1739	2157	4040 (PU)	3127 (HY)	2424 (WB)
Coarse Cereal	9.83	4	8	1142	1409	2685 (PU)	2483 (BH)	2377 (HP)
Oil Seeds	5.05	8	7	913	842	1496 (TN)	1477 (HY)	1294 (GU)
Pulses	18.12	2	1	609	884		807 (JH)	802 (BH)
Sugarcane	38.73	1	9	68154	58008	111425 (TN)	85124 (WB)	82820 (AP)
Rice	16.39	1	8	2086	2120	3545 (PU)	3263 (TN)	2978 (AP)
Wheat	34.84	1	4	2770	2755	4532 (PU)	4103 (HY)	2435 (GU)
Potato	39.29	1	3	19769	24545	26092 (WB)	24830 (GU)	
Tur	19.57	2	3	681	1142	1281 (BH	1238 (JH)	
Jowar	3.79	2	3	785	949	992 (AP)	978 (TN)	
Bajra	11.41	3	4	875	1336	1445 (TN)	1423 (HY)	1344 (GU)
Gram	15.78	2	4	865	960	1274 (AP)	989 (MP	987 (BH)
Maize	11.38	3	12	2018	1610	3401 (AP)	2618 (BH)	2609 (KT)
Groundnut	1.39	8	7	1125	853	1724 (TN)	1412 (GU)	1226 (RJ)

Source (Basic Data): *Agriculture Statistics* (2003), Ministry of Agriculture.

FIGURE 2.23

Changing Pattern of Cropping Intensity for Selected States



Source (Basic Data): *Fertiliser Statistics* (various issues).

Note: Data includes UA for like to like comparison.

Reasons for low cropping intensity are region specific but largely linked to water-related issues, including: (i) excessive soil moisture in surface irrigated areas, (ii) inadequate power supply in tube well irrigated areas, and (iii) water stress in the rain-fed areas.

Besides cropping intensity, there is also the problem of choice of the most appropriate crop for a particular region. In this context three issues need intensive study:

(1) Experience shows that farmers are resistant to change and prefer to grow traditional crops so that the basic food products need not be purchased. The most economically viable crop for each region needs to be identified, and farmers educated about the crop. This exercise has to take into account the yield of various crops in each district, cost of cropping, cropped area available and the market price of the crop.

TABLE 2.16

Large Scale Government Contribution in Irrigation

	Punjab	*Haryana*	*Tamil Nadu*	*Andhra Pradesh*	*Karna-taka*	*Uttar Pradesh*
Coverage under Irrigation during 1999-00*	96.6	85.0	60.7	57.2	23.6	64.9
Irrigation by Government Canals (percentage of net shown area) (1992-93)#	35.4	51.7	31.5	42.9	41.2	28.6

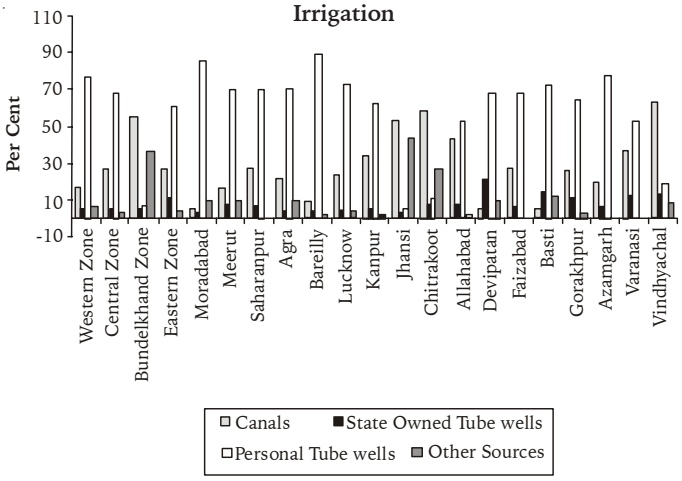
Source (Basic Data): * *Agriculture Statistics 2001*, # CMIE profile of states.

(2) Another exercise could be to determine which other crops are suitable for the specific regions. If this is the case, then these crops should be promoted.

(3) Irrigation intensity and cropping intensity in the state do not match. As a result, the land is over-stressed, and land productivity is falling. Irrigation projects should be focused on areas that can support multiple crops. Simultaneously, new areas need to be explored for multiple cropping.

FIGURE 2.24

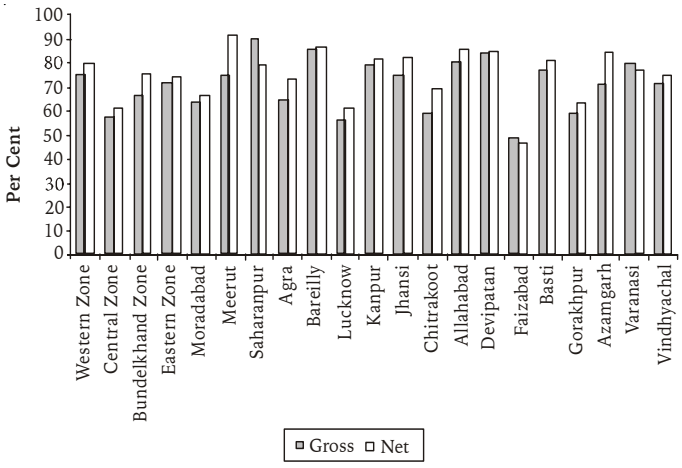
Percentage of Land Irrigated by Different Sources of Irrigation



Source (Basic Data): *Economic Survey of Uttar Pradesh*, 2001.

FIGURE 2.25

Gross and Net Irrigated Areas



Source (Basic Data): *Economic Survey of Uttar Pradesh*, 2001.

2.8.2 Irrigation

Farmers in Uttar Pradesh have done fairly well in developing their own irrigation facilities in spite of the fact that landholding in Uttar Pradesh is small. Government efforts have been very limited compared to other major agricultural states (Table 2.16). The most proactive effort has been taken in Haryana. In the majority of the circles in Uttar Pradesh, personal tube wells are the main source of irrigation. Only the Bundelkhand region is predominantly irrigated by canals (Figure 2.24).

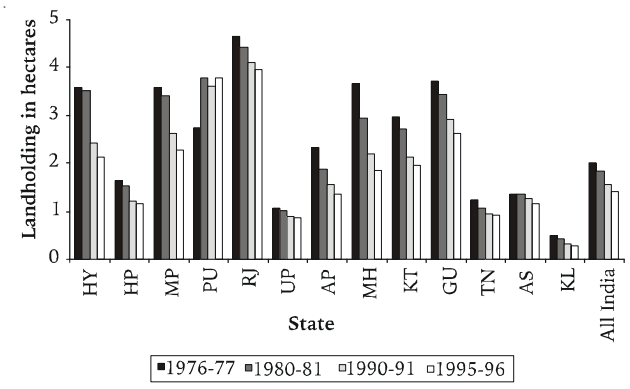
The impact of lower investment in irrigation is reflected in wide variations in gross irrigated area across circles (Figure 2.25). Faizabad, Gorakhpur and Lucknow are least-irrigated circles.

2.8.3 Average Size of Landholdings: Change the Tenancy Law and Clear the Property Rights Issue

According to the 1995/96 Agricultural Census, there were about 21.5 million landholdings. The average size of a landholding in the state was 0.86 ha in 1995-96, as against 1.01 ha in 1980-81. About 90 per cent of landholdings in the state were small and marginal, comprising 58 per cent of the total land held in 1995-96. 75 per cent of total holdings are marginal in size and 14.5 per cent of the total holdings are small sized (between 1 and 2 hectares); 9.9 per cent are more than 2 hectares in size. Most marginal and small holdings are found in the eastern zone, while western, central and Bundelkhand regions have relatively larger holdings. In general, Uttar Pradesh has smaller average holdings compared to most other agricultural states (Figure 2.26). Note that although almost every state is experiencing a fall in size of average holdings over time, yield is increasing across the board.

FIGURE 2.26

Average Size of Landholding Across Major States



Source (Basic Data): *Fertiliser Statistics*, various issues.

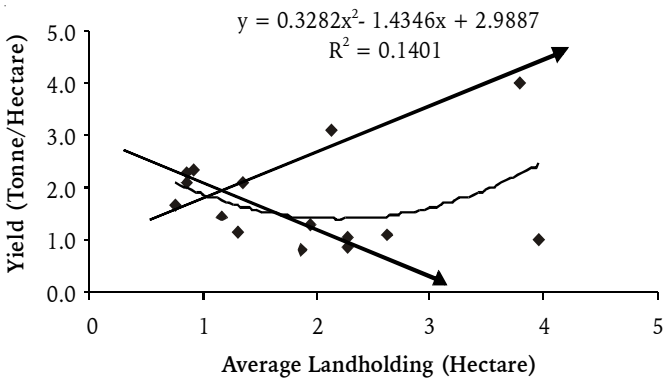
A larger holding is better for high-yield commercial farming. There is also the advantage of economies of scale and larger investments. However, there is no way to increase the average holding. Existing tenancy laws are a major constraint in increasing the operational size of the farms. With appropriate tenancy laws, that protect the interest of the actual owners of the land, institutional arrangements in the form of cooperative and self-help groups can be encouraged to take advantage of economies of scale. However, the data on average holding and yield in foodgrain does not unambiguously support this hypothesis. Figures 2.27 and 2.28 throw up two conflicting conclusions. Figure 2.27 is drawn for states and Figure 2.28 is drawn for districts of Uttar Pradesh.

According to Figure 2.26, yield falls with increasing holding size and then starts increasing after a holding size of about 2 ha. This is in line with the idea of commercial farming. On the other hand, Figure 2.27 suggests that yield increases with increasing size of the landholding up to about 1.25 ha and then starts falling. This can be explained by the nature of agriculture in Uttar Pradesh, which is primarily subsistence farming. Smaller farmers try to get maximum out of their land in order to survive, while larger farmers are not concerned about the yield.

Given the above situation, the state has to develop policies to motivate all segments of the farming community to increase yield. Change in tenancy laws will help, since marginal farmers can rent their farms at a premium to small farmers or to those who are interested in commercial farming.

FIGURE 2.27

Scatter Plot between Average Holding Size and Foodgrain Yield Across States



Changes in tenancy laws are also essential for the development of the credit market. Most banks find it difficult to extend credit in absence of clear property rights of landholdings. Collateral are not well defined because of multiple ownership. This has deprived banks from invoking recovery clauses. Extensive computerisation and regular updating may go a long way in clearly defining the property rights.

FIGURE 2.28

Scatter Plot between Average Holding Size and Foodgrain Yield Across Districts of Uttar Pradesh

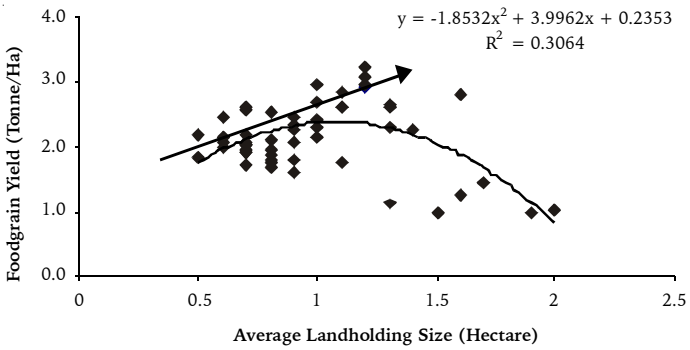
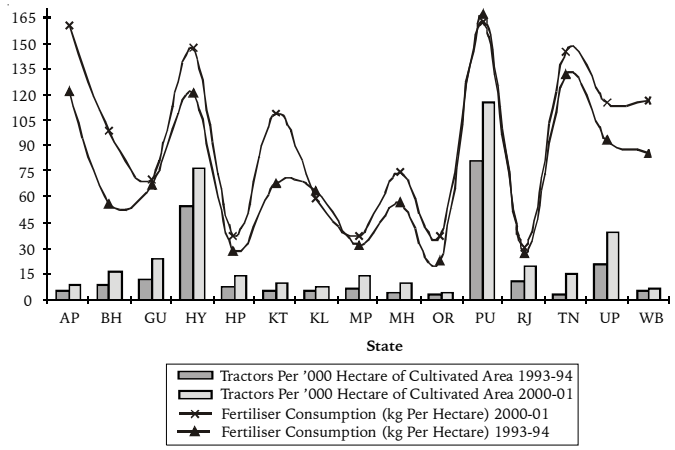


FIGURE 2.29

Fertiliser Consumption (kg Per Hectare) and Tractor Use



Source (Basic Data): *Agricultural Statistics at a Glance*, 2001; *Fertiliser Statistics*, ACMA.

2.8.4 Inadequacies in Input and Technology Use

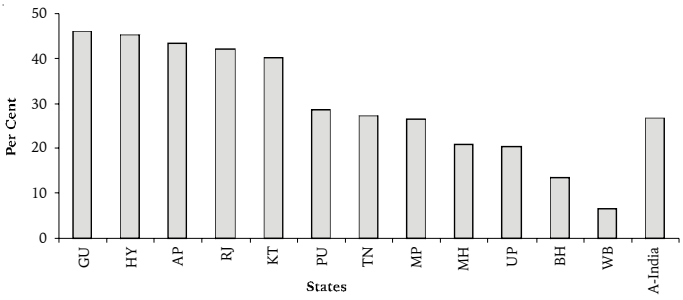
Commercial farming is marked by mechanisation and scientific use of seeds, fertilisers and land management. Figure 2.29 and 2.30 presents representative variations in input use and mechanisation in the agricultural sector across states. Clearly, Punjab and Haryana, the two states with highest yield, have the highest level of mechanisation (proxy tractor use per thousand hectare) at 115 and 76 tractors per thousand hectare respectively compared to 40 tractors per thousand hectare in Uttar Pradesh during 2000-01.

In addition, efficient farming and also good living condition in villages requires adequate supply and consumption of electricity in rural sector. Figure 2.30 indicates that only 30 per cent of villages in Uttar Pradesh were electrified in 2002. Further, Figure 2.30 indicates the priority of various states in supplying electricity to agricultural sector. Once again, Uttar Pradesh is far behind other states. This indicates Uttar Pradesh has extremely poor electricity consumption per capita in agriculture, farming is less mechanised and people depend more on conventional sources of energy.

These factors need to be improved in Uttar Pradesh if agricultural sector has to develop in the state.

FIGURE 2.30

Share of Electricity Consumption for Agricultural Purposes (Per Cent) 2000-01



Source (Basic Data): *Agricultural Statistics at a Glance*, 2002-03.

2.8.5 The Vicious Circle in Agriculture

It has been seen above that additional inputs are needed for the agricultural sector to achieve higher yields. But it is also costly to arrange capital for inputs. Farmers who can produce more are in position to generate surpluses for further investment. Figure 2.31 plots yield achieved in a state against foodgrain production per capita in the state. This figure can be read in conjunction with Figure 1.23. Punjab and Haryana produce much higher foodgrain per capita than Uttar Pradesh and therefore, these states are able to generate surpluses, which is ploughed back to improve farm technology. This is not true in the case of Uttar Pradesh where most farmers are on the edge of subsistence and struggle minimise the cost. This forms a

FIGURE 2.31

Scatter Plot between Foodgrain Production Per Capita and Yield in the State

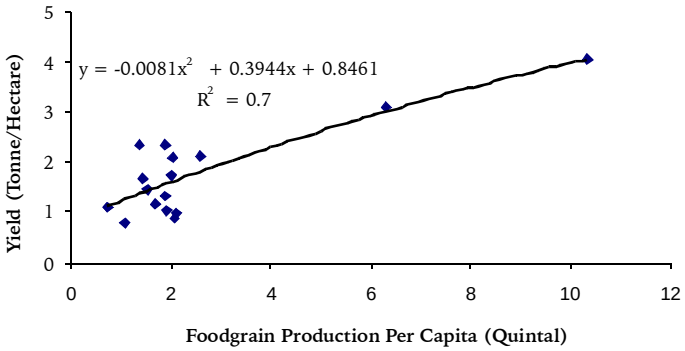
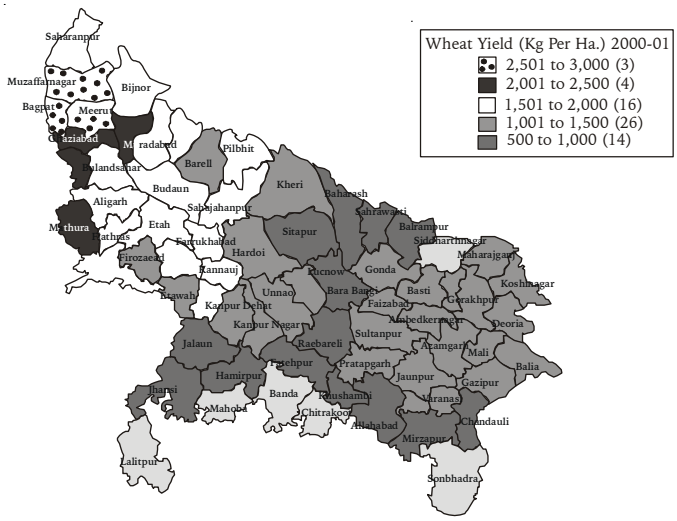


FIGURE 2.32

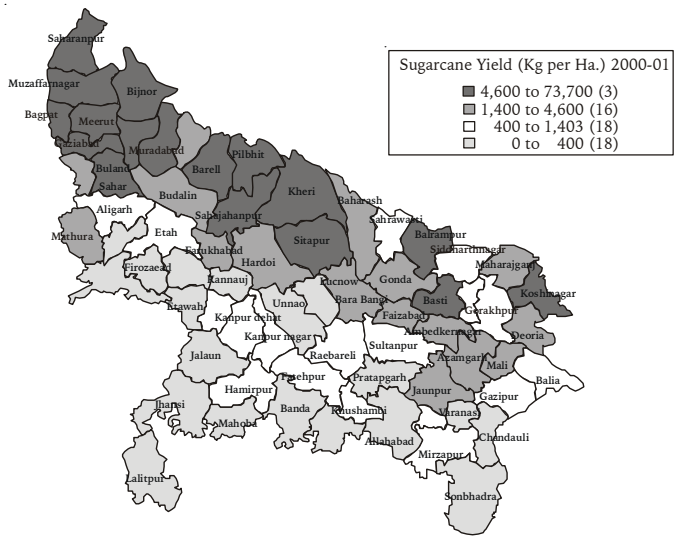
Wheat Yield Across Districts of Uttar Pradesh



Source: *Monthly Review of UP Economy*, CMIE, December 2003.

FIGURE 2.33

Sugarcane Yield Across Districts of Uttar Pradesh



Source: *Monthly Review of UP Economy*, CMIE, December 2003.

vicious circle, which can only be broken through state intervention, proper training and higher levels of awareness. In particular, areas other than western region, where almost all major crops have poor yield need to be supported (Figures 2.32 and 2.33).

It is also important to appreciate that rural people need alternative source of income, which can be provided only through industrialisation. Adopting policies, which could promote large-scale village and town industries can also go a long way in meeting this goal.

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APPENDIX A-2.1

Analytical Framework

The macroeconomic analysis of this chapter is based on estimated econometric models across set of 29 and 26 states for which most data is available or could be created for the period of 1993-94 to 99-00. Following the seminal work of Barro (1991), the recent empirical literature on economic growth (for example *inter alia* Levine and Renelt (1992), Sala-i-Martin (1997a; 1997b)) has identified a number of variables that are partially correlated with the rate of economic growth. In a cross country analysis, variables such as initial level of income, the investment rate, various measures of education, population growth, terms of trade, some policy indicators like inflation, black market premium, fiscal surplus and many other variables have been found significant in these studies. However, in the case of states of a particular country the set of variables that can explain difference in economic growth across states become rather limited. Variables such as geographical locations, vicinity to industrial conglomerates and differential policy of government become important (Demurger, *et al.* 2002).

The studies of Barro (1991) and Barro and Sala-i-Martin (1995) and several other studies have clearly brought out that successful explanation of economic performance have to go beyond narrow measures of economic variables to incorporate political and social forces. Some researchers such as Landes (1999), Inglehart and Baker (2000), Hutington (1991) argue that explanations for economic growth should go further to include a nation's culture, which is thought to influence economic outcomes by effecting personal traits such as honesty, thrift, willingness to work and openness to strangers. Even intensity of religious beliefs are studied to measure economic outcomes (Barro and McCleary, 2003).

In the case of India, demographic composition and social and cultural diversity may play important role in determining growth across states. Further, the economic relationship between states and the Centre is very tight. Overlap in developmental plans of the states and the Centre makes it even harder to identify reasons that differentiate the performance between states. There is no restriction on the movement of population and employment in the private sector across country. Migration from backward reasons to the economic growth centres is natural phenomenon. Thus, the performance of each state cannot be attributed completely to the states themselves.

Nevertheless, Indian states still present a wide variation in some of the important variables expected to cause growth and federal structure of the polity provides ample independence to the states to carry out their preferred agenda. Some of the subjects such as industrialisation, urbanisation, education, rural development, law and order are completely state subjects and now legislation are in place to allow states to pursue their independent agenda of investment including obtaining finances from overseas. The multilateral donor agencies such as the World Bank are financing the state level projects directly based on the credit rating of individual states and their commitment for the cause of development. Ahluwalia (2000) emphasises on developing better understanding of the reasons for the superior performance of some of the better performing states. Therefore, a cross-sectional analysis will be very useful.

Typically, the basic methodology of growth studies consist of running a cross sectional regression of the following form:

$$\Delta ypc = c + \sum_{i=1}^{n} \beta_i \, x_i + \varepsilon \qquad (1)$$

where C is a constant, X_i represents a vector of i^{th} explanatory variable in the regression. Δ ypc represents a vector of per capita growth rates in fraction, and ε is a statistical error term. Since growth and investment are expected to be dependent on several common variables, it is useful to run a similar regression for investment.

However, a typical problem in analysing India's states is likely to arise due to non-availability of consistent data on investment. Investment is an important variable in growth regressions and cannot be substituted by a simple proxy, which capture private and public investment. Considering the fact that we could not find a suitable single proxy for investment, the investment variable is generated in A-2.2.

APPENDIX A-2.2

Proxy Investment Variable

The national fixed capital stock at 1993-94 prices is distributed for each year from 1993-94 to 1999-00 according to the values of the proxy for different sectors during each year. The list of sectors and the corresponding proxy is provided in Table A-2.2.1 below. The total capital stock for each year is then obtained by aggregating the distributed capital stock across sectors so obtained. Investment is then calculated as change in the net fixed capital stock as fraction of real GSDP for each year. For estimation of growth equation average investment for the period 1994-95 to 1999-00 is used. It must be clear here that this investment is in terms of change in real fixed capital stock and does not match with the gross capita formation (GFC), which is generally used in policy analysis. The value of the generated investment is thus, less than the GFC. This is obvious from the fact that at all-India level the change in real NFCS during 1993-94 to 2000-01 has been in the order of 16 per cent of real GDP as compared to GFC, which has been 22 per cent of GDP during that period. This comparison is also given below. Thus, investment for each state is computed in sufficiently complicated manner so that no one single proxy has dominant role, while at the same time the constructed series represent physical capital distribution across states in a meaningful way. Nevertheless, in order to satisfy the critiques of such investment series the analysis for growth is done with and without this series. However, in order to explain the physical investment variations across states, an analysis of the investment is also presented.

APPENDIX A-2.2.1

Proxy Used to Distribute National Capital Stock Across States

Sl.No	*Sector during 1993-94*	*Average Share*	*Proxy and Source of Data*
1	Agriculture, etc.	11.7	Net irrigated area (statistical abstract)
2	Mining and Quarrying	2.7	Excavation/production in physical quantity (statistical abstract)
3	Manufacturing	29.2	Net fixed capital stock (ASI)
4	Electricity Gas and Water Supply	9.8	Installed capacity of electricity (CEA)
5	Construction	0.9	Projected urban population from urban statistics handbook
6	Trade, Hotel and Restaurants	2.9	Do
7.1	Railways	2.9	Rail length (CMIE)
7.2	Transport by Other Means	3.3	Total registered population of bus and trucks (ACMA)
7.3	Storage	0.1	Projected urban population from urban statistics handbook
7.4	Communication	2.3	Number of exchange lines
8.1	Banking and Insurance	2.5	Number of commercial bank branches
8.2	Real Estate Ownership and Dwelling and Business Services	18.4	Projected urban population from urban statistics handbook
9.1	Public Administration and Defence	10.2	Population
9.2	Other Services	3.1	Population of primary schools

APPENDIX A-2.3

Cross-sectional Growth Equation

GM-1: Model without investment

DLSYPC = -0.14 **+ 0.27 SEC8081* + 0.15 AGR8081**
(0.054) (0.0.06) (0.056)

+ 0.11 TER** + 0.49 DLPOP*** – 0.026 STPOP** + 0.063 SCPOP**

(0.058) (0.252) (0.011) (0.036)

R-Square=0.78, R-bar Square=0.72, SE=0.011, Serial Correlation (ML 1)=2.02 [0.16], Functional Form CHSQ(1)=0.01 [0.94], Normality CHQ(2)=0.70 [0.71], Heteroskedasticity CHQ(1)=0.09[0.77]. SE in parenthesis. * significant at 1%, ** significant at 5%, *** significant at 10%.

GM-2: Model with investment

DLSYPC = -0.14 **+ 0.05 INVK** + 0.25 SEC8081* + 0.15 AGR8081**

(0.051) (0.024) (0.06) (0.056)

+ 0.11 TER** + 0.47 DLPOP*** – 0.027 STPOP** + 0.068 SCPOP**

(0.054) (0.234) (0.010) (0.032)

R-Square=0.82, R-bar Square=0.76, SE=0.01, Serial Correlation (ML 1)=1.1 [0.29], Functional Form CHSQ(1)=0.38 [0.54], Normality CHQ(2)=0.33 [0.85], Heteroskedasticity CHQ(1)=0.12[0.23]. SE in parenthesis. * significant at 1%, ** significant at 5%, *** significant at 10%. P-values in [].

Where DLYPC = per real GSDP growth rate (in fraction), average during 1993-94 to 1999-00. INVK=real investment as fraction of GSDP. SEC8081 = 1980-81 fraction of secondary sector in GSDP, AGR8081 = 1980-81 fraction of agriculture sector in GSDP including forest, logging and fishing, TERC8081 = 1980-81 fraction of tertiary sector in GSDP (all taken in fractions). DLPOP = population growth (in fraction), STPOP = Schedule Tribe fraction of population, SCPOP = Schedule Cast fraction of population. The data on investment for the sample period is created by a set of proxies. All growth rates are average for the period. SC and ST components are Census 1991 data.

APPENDIX A-2.4

Investment Equation

Dependent variable is investment ratio as defined in Appendix A-2.1 and A-2.2. The explanatory variables include average (1993-00) literacy rate (LIT) in fractions of total population, average growth (1981-1994) in infrastructure growth index (GINFRA) of CMIE in fraction, presence of metropolitan cities (METRO), average change in ratio of states fiscal deficit to GSDP (DSGFD) taken in fraction for the period of 1993-1994 to 1999-2000. Model is estimated by OLS with data for 26 states.

INVK = -0.241 **+ 0.239 LIT + 5.83 GINFRA* + 0.090 METRO* + 6.129 DSGFD*

(0.111) (0.108) (1.74) (0.033) (1.306)

R-Square = 0.59, R-bar Square = 0.52, SE =0.055, Serial Correlation (ML 1) = 0.058 [0.81], Functional Form CHSQ(1) = 6.31 [0.02], Normality CHQ(2) = 0.52 [0.77], Heteroskedasticity CHQ(1) = 0.001[0.98]. SE in parenthesis. * significant at 1%, ** significant at 5%, *** significant at 10%. P-values in []

APPENDIX A-2.5

Cross-sectional Production Function

Dependent variable is log of gross value added (LGVA) for 1999-00 factory sector ASI data. The explanatory variables include log of fixed capital stock, log of workers (LWORKER), log of literacy rate (LLIT), log of infrastructure index 1993 of CMIE (LINFRA93). Model is estimated by OLS with data for 26 states. Only significant variables are shown.

LGVA = - 0.420+ 0.641 LFCS* + 0.237 LWORKER**

(1.773) (0.105) (0.122)

R-Square = 0.96, R-bar Square = 0.94, SE =0.30, Serial Correlation (ML 1) = 1.63 [0.20], Functional Form CHSQ(1) = 0.47 [0.49], Normality CHQ(2) = 2.28 [0.32], Heteroskedasticity CHQ(1) = 1.76[0.19]. SE in parenthesis. * significant at 1%, ** significant at 5%, *** significant at 10%. P-values in []

APPENDIX A-2.6

Tertiary Sector Growth

Dependent variable is average growth in real gross state domestic product of tertiary sector (DLRTER) taken in fractions. The explanatory variables include average change in literacy rate (DLIT) in fractions, presence of metropolitan cities (METRO), size of the state in terms of area taken in log (LSIZE), share of secondary in 1980-81. Model is estimated by OLS with data for 29 states.

DLRGSTER = 0.1339*+ 1.056 DLIT* + 0.011 METRO** - 0.0068 LSIZE* + 0.019 SEC8081

(0.017) (0.212) (0.005) (0.001) (0.028)

R-Square = 0.71, R-bar Square = 0.66, SE =0.011, Serial Correlation (ML 1) = 0.058 [0.81], Functional Form CHSQ(1) = 0.43 [0.51], Normality CHQ(2) = 1.75 [0.42], Heteroskedasticity CHQ(1) = 2.48[0.12]. SE in parenthesis. * significant at 1%, ** significant at 5%, *** significant at 10%. P-values in [].