Macroeconomic Framework for Development in Gujarat

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ABSTRACT

The paper begins by discussing need for developing a regional accounting framework and estimating relevant variables to formulate realistic growth targets and appropriate development strategy in the reform era for the Gujarat State as a case. The study then examines growth experience in various sectors of the state and derives growth potential of the economy in medium and long term. Elementary regional accounting framework and estimates of crucial macroeconomic aggregates at the state level in India are attempted for the first time for Gujarat to derive implications on resource availability and investment requirement to achieve alternative growth targets. The study finds that Gujarat is a high saving society comparable to China and Korea, but invests much less domestically. Although it a net importer internationally, it is a major net exporter within the country. The paper also attempts to identify the prime movers or principal drivers of the economic growth in the state by fitting a simultaneous equations model on the recent time series data on Gujarat. Electricity, gas & water supply; storage & communications; construction; real estates and rainfall are the prime movers in Gujarat. The paper also examines the social and human development aspects and explores how they can be integrated with the macroeconomic growth model in Gujarat. The paper concludes by discussing strategic policy interventions to achieve the development goals of the state.

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I. Introduction

In the era of liberalization and globalisation, states have more freedom to decide on their development strategies, goals and policies. There is a growing competition among states to attract and encourage private sector activities into their territory. The competition could degenerate to offer several tax incentives and similar sops that may hurt the fiscal balance of all the states. A co-operative (or collusive!) solution has, therefore, emerged to avoid offering any such tax incentives and to agree on uniform floor rates of sales tax on different items. This would force the states to compete on tangible performance, cost & quality of infrastructural facilities, level of human development, living conditions and socio-cultural & business environment offered by each one. Development strategies, priorities and policies must address these aspects explicitly. Whatever development models and methodology for state level planning existed in the pre-liberalisation or pre-reform era are less relevant today. In those days, the state economies were not truly open, states did not have any assigned growth targets, there was little or no competition among states, private initiative was under constant curb and regulation, and resource reallocation was slow if not absent. Planners and statisticians did complain about data-gaps at the state level but the policy makers were hardly serious about the same (see, Committee on Regional Accounts, 1976 and National Statistical Commission, 2001). But now, the situation is fast changing. Policy makers at state level desperately need some macroeconomic framework and related data-set to formulate and monitor development programmes and policies to achieve the target that itself is the outcome of realistic assessment. The present paper makes a modest attempt in the direction of meeting this challenge in future by considering the case of Gujarat state.

Gujarat is one of the leading states in the Indian Federation often considered as an engine of national economic growth and a frontline performer on various dimensions. Like most other economies of large magnitude, the development concerns in Gujarat

also pertain to the three dimensions: (i) economic growth aspects; (ii) human and social development aspect; and (iii) regional disparity aspect.

Dimension of regional disparity in Gujarat has always been very important and remained at the root of state and sub-state level politics. There are 6 distinct geographical regions in Gujarat: (1) desert area of Kuchchh, (2) Saurashtra, (3) North Gujarat, (4) Eastern tribal belt, (5) Central Gujarat, and (6) South Gujarat. There are significant differences in the availability of natural resources, economic activity-mix, human and social development of population among these regions. Since Gujarat has decentralised multi-party democracy at each of the sub-state administrative levels of Districts, Talukas (or Blocks), Cities and Villages, the state government typically handles the aspect of regional disparity by providing special grants and development programmes to the 'backward' or lagged areas in different sectors and spheres. In order to identify such problem areas, there are efforts from the central government to run some special area development programmes like Drought Prone Area Programme, Tribal Area Sub-Plan, Desert Area, Hilly Area, Costal Area, etc. and special efforts through committees of the state government. Thus, Gujarat government had the reports of Hathi Committee (1971) and I.G. Patel Committee (1983) to identify relatively lagged or backward talukas (blocks) in the state with heavy representation of academics on the committees. In spite of this, there have been practically no efforts to collect relevant production, consumption and employment oriented statistics and bridge the gaps in availability of data at the sub-state level. The approach of the state government in dealing with regional disparity has all along been to treat it more as an implementation issue than a design issue. This become evident when for two decades no effort went in for revising the list of identified 'backward' talukas, and when recently the list was routinely and mechanistically revised internally by the bureaucrats without any inputs from the academics.

The National Statistical Commission (2001) strongly recommended preparation and publication of the estimates of district domestic product (DDP) for all the districts in the state, but the state planning ministry and the Department of Economics and Statistics (DES) are yet not ready to carry out this important exercise. In a recent seminar of the Indian Association of Research in National Income and Wealth (IARNIW)

held at Jaipur in January 2004, this issue was discussed at length. Experts agreed that estimation of urban-rural income or productivity differential by sectors was a precondition for generating DDP for districts. Urban-rural gap is an important explanation for regional disparity (see, Dholakia & Dholakia, 1978). Although there were some individual (private) efforts made to estimate such sub-state level estimates in the distant past[1], no official or even individual estimate is available for the recent past. For our purposes, therefore, we have not considered explicitly the dimension of regional disparity firstly because ours is a macroeconomic framework whereas it is a micro issue; and secondly because the required type of data at sub-state level have yet not been collected for these units to integrate with the macroeconomic framework.

In the next section, we examine the growth experience in various sectors over the last two decades so as to identify the growth potential of the state economy. In the third and fourth sections, we make an attempt to develop the elementary regional accounting framework and estimate the crucial macroeconomic aggregates and parameters for Gujarat. The fifth section discusses the implication of these estimates in terms of resource availability and the investment requirement to achieve the growth target derived from the assessment of the past performance. In order to identify the drivers of the economic growth in the state and hence derive broad strategy and policy implications, the sixth section develops macroeconomic model using the time series data over the past two decades. In the seventh section, we examine the human and social development aspects in Gujarat and see how we can integrate them with the macroeconomic model so as to derive strategic prescriptions. The eighth section concludes the paper by explicitly pointing out the need to develop official estimates of critical macro-aggregates and strategic policy interventions to achieve the development goals of the state.

II. Economic Growth: Experience and Potential

Economic growth has, in general, three connotations when referred to in professional or political circles. They are volume, efficiency and welfare. There is a wide spread

[1] See for instance, Dholakia (1975), Dholakia (1976) and Kashyap (1984) for estimates of rural-urban incomes in Gujarat, district incomes in Gujarat and income for Ahmedabad respectively

consensus among the national income accountants and professionals that the aggregates of domestic product like GDP or GSDP by definition and design do not measure nor even reflect the welfare dimensions of the population. However, these aggregates measured in factor cost at constant prices do reflect most comprehensively the volume and efficiency aspects of total economic activities in the economy compared to any other known alternative measures. The Department of Economics & Statistics (DES) at the state level and Central Statistical Organisation (CSO) at the national level have been preparing the estimates of these aggregates at current and constant prices following almost identical methodology for a long time now. The estimates of GDP at national level and GSDP at the state level are available for 9 broad sector and 17 sub-sectors. The most recent base year is 1993-94 for all these estimates at constant prices. We, therefore, estimate the annual trend rates of growth during the last two decades in all these 17 sub-sectors in All-India and Gujarat with respectively GDP and GSDP at constant 1993-94 factor costs. Appendix *Tables 1 and 2* report the detailed results and *Table 1* summarises the comparison.

***Table 1*: Comparison of Sectoral Trend Rates of Growth (% p.a.)**

Sector	1980-81 to 1991-92		1991-92 to 2000-01	
	Gujarat	India	Gujarat	India
1	2	3	4	5
Agriculture	--	3.1	--	3.2
Fishing	8.2	5.8	--	4.6
Mining & Quarry	6.2	7.4	1.3	4.2
Manufacturing	6.9	6.8	10.1	7.3
Elect., Gas & Water	9.4	8.9	7.6	6.0
Construction	4.6	4.5	6.2	5.4
Trade & Hotels	5.2	5.6	8.3	8.2
Transport & Communication	7.1	5.6	9.9	8.1
Finance & Estates	6.3	9.6	5.7	8.1
Public Administration	5.9	6.6	10.0	6.8
Other Services	5.4	5.6	8.7	7.5
Total GDP	4.2	5.3	7.0	6.2

-- implies statistical insignificance
Basic Source: DES (June 2003); and NAS, 2003

It is clear from *Table 1* that Gujarat's performance was very poor compared to the nation during the decade of the eighties in all sectors except fisheries, electricity and

transport & communication. During the nineties, however, Gujarat improved its economic performance remarkably in almost all secondary and tertiary sectors except finance & real estates. While Gujarat has very strong performance in the manufacturing, electricity, construction, transport & communication, and services sector, its major weaknesses are in all the primary sectors and banking, insurance & real estate sectors. Statistical insignificance of the trend rate of growth in agriculture shows that it is a very heavily fluctuating activity in the state. In spite of such an indifferent performance of the primary sector, the total GSDP in Gujarat achieved 7% p.a. growth in real terms during the nineties. This growth is mainly on account of the secondary sectors, transport and services that have been the focus of the economic policy reforms in the nation. Thus, Gujarat not only benefits most by the liberalization and globalisation efforts initiated at the national level, but often acts like an engine of growth for the nation (see, Dholakia, 2003; and Ahluwalia, 2002)

In order to examine the growth potential of the state in the immediate future, we need to consider a few similar efforts made for Gujarat. The Planning Commission (2002) has assigned the real growth target of 10.2% p.a. to Gujarat for the 10th Plan period. Although it does not provide the precise methodological basis for its targets to different states, it has decomposed its target into the primary, secondary and tertiary sectors. Accordingly, Gujarat should achieve annual real growth rates of **4.3%, 12.23% and 10.44%** respectively in the primary secondary and tertiary sectors. *The Agro-Vision 2010*, prepared by the Ministry of Agriculture (2001) in Gujarat, on the other hand, puts a very optimistic target of 6.8% p.a. for the real growth in agricultural sector in the state. However, by considering the trends in area, yield and productivity of 30 crops over last 30 years in Gujarat and other states in the country, it is possible to derive a plausibly optimistic growth target of about 5% p.a. for agriculture in Gujarat (see, Dholakia, 2003).

For the remaining sectors, we can derive the growth potential by considering the past performance of the state during the last two decades. In order to identify the best episodes of growth in each sector and sub-sector of the economy, we should consider periods of four and ten consecutive years over the last two decades in the state. Such best growth episodes would reflect growth potential of the state in the medium term and long term respectively. *Appendix Tables 3 and 4* report the annual growth rates over 4

and 10 consecutive years in different sectors in Gujarat over 1980-81 to 2001-02, and *Table 2* gives the potential growth rates as the maximum observed in each sub-sector of the state.

***Table 2*: GSDP Share & Observed Maximum Growth in Consecutive Years (Gujarat)**					
Sl. No.	**Industry Group**	**Share in GSDP**		**Max Growth (Potential %)**	
		1980-81	**2001-02**	**4 Years**	**10 Year**
1	Agri.& Allied	0.4081	0.1733	14.62	11.48
1.1	Agriculture	0.3754	0.1564	15.70	12.32
1.2	Forestry & Logging	0.0170	0.0057	2.48	1.96
1.3	Fishing	0.0116	0.0112	13.86	11.15
2	Mining & Quarrying	0.0353	0.0194	9.30	6.41
	Sub-total: Primary	0.4545	0.1927	14.07	10.79
3	Manufacturing	0.1993	0.3140	20.09	11.03
3.1	Registered	0.1334	0.2123	22.13	11.15
3.2	Un-registered	0.0667	0.1017	15.20	10.63
4	Elec., Gas & Water	0.0156	0.0259	14.22	12.04
5	Construction	0.0511	0.0523	15.47	10.62
	Sub-total: Secondary	0.2639	0.3921	16.86	10.14
6	Trade& Hotels	0.1064	0.1141	13.45	9.18
7	Tran., Stor.& Comm.	0.0503	0.0820	14.28	9.41
7.1	Railways	0.0198	0.0102	5.11	3.87
7.2	Other Transport	0.0259	0.0506	18.71	10.04
7.3	Storage	0.0004	0.0002	10.99	2.98
7.4	Communication	0.0105	0.0210	21.40	13.18
	Sub-total(6&7)	0.1554	0.1962	13.09	8.42
8	Finance Sector	0.0898	0.1211	11.52	9.92
8.1	Banking&Insurance	0.0237	0.0602	22.59	16.64
8.2	Real Estate	0.0850	0.0608	8.40	5.61
9	Comm. Services	0.0801	0.0979	11.94	8.56
9.1	Public Adm.	0.0294	0.0349	12.45	8.48
9.2	Other Services	0.0506	0.0630	11.63	8.63
	Sub-total:Tertiary	0.3213	0.4151	9.64	8.19
10	Total GSDP	1.0000	1.0000	11.93	8.89
Basic Source: DES (2003): *State Domestic Product, Gujarat State, 2001-02; GoG, June*					

It is clear from *Table 2* that Gujarat has achieved an overall GSDP growth of 11.9% p.a. in the medium term and 8.9% p.a. in the long-term. However, if we consider all the sectoral and sub-sectoral performance, we find that the potential could be much

higher for the state both in the medium term as well as in the long term. In order to get the idea about such an overall potential, we need to consider shares of the sub-sector in total GSDP at factor cost as reported in *Table 2*. Considering the sectoral shares in the latest year as the weights and replacing 5% p.a. growth potential of the agricultural sector, the overall growth potential of the state works out to 14.6% in the medium term and 9.4% in the long term. These targets are certainly very optimistic though falling on the outer border of feasibility. The targets of 11.9% p.a. and 8.9% p.a., on the other hand, are quite feasible considering that the state had actually achieved them in recent past. Any targets in between may be plausibly optimistic and need examination for consistency with other macroeconomic parameters of the state economy.

III. Regional Accounts Estimates for Gujarat

The Department of Economics & Statistics (DES) under the Planning Ministry in the state prepares and publishes regularly estimates of GSDP and NSDP at factor cost both at current and constant prices by sectors. Similarly, it also regularly publishes the *Economic and Purpose Classification of State Budgets.* Up to 1998-99, it also prepared and published the estimates of Gross Domestic Capital Formation by the state public sector units. However, these are the only parts of the regional accounts prepared officially. In spite of the State Planning Department and the State Planning Board existing now for almost 40 years, the regional accounts are incomplete and absent in the state. Even individual efforts by researchers or any academic research projects on preparing regional accounts are absent.[2] This is not confined only to Gujarat but applies equally to all states in the country.[3] It is very surprising (if not shocking) to find that senior government officials and the professionals on the state planning boards could continue planning for the state all along these years without any idea about the broad

[2] The field of input-output tables for states is an exception since considerable literature and several efforts at estimating I-O tables for states in India exist. However, almost all of these estimates suffer from the limitation about treatment of indirect taxes. For Gujarat, the I-O tables estimated by Alagh and Kashyap (1971), Kashyap (1976) and by Dholakia and Dholakia (1988) have been used in different planning models.

[3] There are some ad hoc efforts to collect data on total investments in different states based on intensions, approvals and implementation (see, Tata Services Ltd., 2003). Their concepts are not consistent with national accounts statistics and their coverage is unknown. They can serve the limited purpose, but cannot serve to calculate the investment rate or the incremental capital output ratio, etc.

magnitude of regional accounts and any related aggregates. However, now the situation is fast changing. It is becoming imperative to have some broad idea about the aggregates involved in regional accounts to be able to frame right development strategies and policies.

While it is best to generate detailed and direct estimates of all aggregates involved in the regional accounts, it is likely to be very time consuming and elaborate exercise. Generally, it will take years before the system is formally established, required surveys conducted and the estimates of relevant aggregates prepared and validated through formal procedures officially. In the meantime, however, we need to bridge the gap in the data availability by using all available information from various sources and making some bold but plausible assumptions. We make such a preliminary effort here to prepare "the first cut" estimates of aggregates in regional accounts of Gujarat state.

The most well known fundamental identity of national accounts is:

(1) $Y = C + I + G + X - M$

where Y is GDP at market prices; C is private final consumption expenditure (PFCE); I is investment expenditure or gross domestic capital formation (GDCF); G is the government's final consumption expenditure (GFCE); X is exports; and M is imports. This accounting identity applies equally to all regional economies defined in terms of geographical boundaries. Since states in India are completely integrated with the rest of the country sharing the same currency, it is relevant to distinguish between international trade flows and intra-national or domestic trade flows in the regional accounts. Thus, for Gujarat, we modify the above equation as:

(2) $Y = C + I + G + X_F - M_F + X_D + M_D$

where the subscripts F and D represent respectively foreign and domestic flows. Let us now attempt to estimate each component of the identity (2) one by one.

3.1 GSDP at Market Prices: In collaborative effort with DES, estimates of GSDP at market prices for Gujarat were prepared from the estimates of GSDP at factor cost (see, Dholakia et.al.2002). For estimation, the indirect taxes and subsidies were divided into six components like: 1) net customs revenues; 2) net central excise; 3) indirect taxes of local bodies; 4) state indirect taxes; 5) state subsidies; and 6) state's share in centre's

subsidies. The study provides estimates of GSDP at market prices for the years 1990-91 to 2001-01 at current prices. However, the basic estimates of GSDP at factor cost for the years 1997-98 onwards have been subsequently revised. We should therefore revise the GSDP at market prices accordingly. *Table 3* presents these revised estimates. It is important to observe from *Table 3* that GSDP at market prices is almost 21% higher than the GSDP at factor cost in Gujarat in 1999-2000 compared to only 9.9% at the national level.

Table 3: **Estimates of GSDP at Market Prices in Gujarat (Rs. in crore)**

Year	GSDP at F.C. at current prices	Net customs revenues	Net central excise	Octroi	State Indirect taxes*	State subsidy	State's share in Central subsidy	GSDP at market prices
1	2	3	4	5	6	7	8	9
1996-97	85837	6672	5755	695	5849	1273	810	102725
1997-98	91188	6023	6813	764	6341	1577	1004	108548
1998-99	105305	6944	8029	818	7351	1857	1175	124515
1999-00	107618	7606	8865	872	7823	1550	1077	130157
2000-01	110449	7569	9874	918	8710	4035	1195	132290

* state excise duty, taxes on vehicles, sales tax, entertainment tax, electricity duty, stamp duty and registration taxes on goods and passengers and tax on accommodation in hotels and lodges.

Source: Dholakia et al. (2002); DES (June 2003); and *SDP, 2001-02*

3.2 Private Final Consumption Expenditure (PFCE): After the National Commission on Statistics (2001) explicitly recommending preparation of consumption estimates at the state level, there is some definite exploratory effort in this direction (see, Kar et al. 2004; CSO &NSSO, 2001, etc.). It is a general consensus that the commodity flow approach followed by the CSO for the national accounts is a better and more comprehensive method to estimate PFCE than the survey of direct consumption by NSSO, but that it is practically and conceptually very difficult to follow at the state level. CSO & NSSO (2001) attempt to reconcile these two sets of estimates at the national level by various items of consumption. Kar et al. (2004) also go into the details of the adjustments needed in the NSSO consumption survey data at a fairly disaggregated level. When it comes to making some ad hoc adjustment to restore consistency and comparability, however, it is better to operate at a reasonable degree of aggregation than a very detailed disaggregated level. We may, therefore, divide the total

consumption into food and non-food categories and apply the adjustment factors obtained from the study of CSO & NSSO (2001) to the consumption estimates in Gujarat from NSSO (2001) to generate per capita consumption expenditure comparable to the National Accounts Statistics (NAS). Then we can generate the estimate of total PFCE by considering the mid-year population of Gujarat for the year of the consumer survey, *i.e.* 1999-2000. *Table 4* reports these estimates.

Table 4: **Estimates of Private Final Consumption in Gujarat, 1999-2000**

Items	**NSSO Estimates (in Per capita Monthly Rs.)**			**Annual Estimates (in Rs.)**	**Adjustment Factor for NAS**	**NAS Comparable Estimates**	
Items	**Rural**	**Urban**	**Total***			**(in Rs.)**	**(in. Rs, Crores)****
1	2	3	4	5	6	7	8
Food	330	442	372	4464	1.4069	6280	30116
Non-Food	221	480	319	3828	1.9705	7543	36173
Total	551	922	691	8292	--	13823	66289

Note: * Applying the proportion of urban and rural areas in Gujarat respectively at 0.3767 and 0.6233 as weights

**Obtained by multiplying with estimates of mid-year population of 4.7956crores

Source: 1. *NSS Report No. 461: Consumption of Some Important Commodities in India, 1999-2000;* Appendix Tables
2. DES (2003): *SDP Gujarat, 2001-02* (June)
3. DES (2003): *Statistical Abstract of Gujarat State, 2002* (March)
4. CSO & NSSO (2001): *Report on Cross Validation Study of Estimates of PFCE Available from Household Survey and National Accounts*

3.3 Government Final Consumption Expenditures (GFCE): As we have noted earlier, DES brings out annually the *Economic and Purpose Classification of Budget* of the state government. It contains an estimate of the final consumption expenditure by the state government. On specific request, the DES also made similar estimates for the local bodies in the state. However, in order to complete the estimation of GFCE consistent and comparable to the NAS, we need estimates of (i) central government units; (ii) consumption of fixed capital (CFC); and (iii) quasi-government bodies in the public sector. This is the major data gap existing at the state level and we may have to bridge it by taking ratios from the national level. Thus, we assume that the consumption of the administrative departments of state governments and local bodies as a proportion in the total consumption of all governments' administrative departments remains the

same in Gujarat as in the nation for the given year. Based on this assumption, we generate the final consumption of administrative departments of different levels of government operating in Gujarat in different years. We may, then, assume the CFC and consumption by the quasi-government units in Gujarat bear the same proportion to such a total as in the nation. We can, thus, derive an estimate of GFCE for Gujarat consistent with the national estimate. *Table 5* reports these estimates. We may note that GFCE in Gujarat in 1999-2000 is about 5.4% of the national aggregate whereas the population of Gujarat is only 4.9%.

Table 5: **Public Sector Final Consumption Expenditure in Gujarat Administrative Departments** (Rs. Crores)

Year	Central Govt./ PCFE	State Govt.	Local Bodies	Total	Central Govt.	Total	Multipliers for CFC & Quasi-Govt.	Total Govt. Final Cons. Expn.
1	2	3	4	5=3+4	6=(2*5)/(1-2)	7=5+6	8	9=7*8
1994-95	0.39134	2039	1624	3663	2355	6018	1.13734	6845
1995-96	0.39571	2321	1962	4283	2805	7088	1.13652	8056
1996-97	0.39450	2509	2131	4640	3023	7663	1.13512	8698
1997-98	0.40862	2976	2125	5101	3525	8626	1.13624	9801
1998-99	0.41219	4027	2707	6734	4722	11456	1.13149	12962
1999-00	0.42150	4436	2561	6997	5098	12095	1.11851	13528
2000-01		4737	2794	7531				
2001-02		6866	2168	9034				

Source: DES: *Economic & Purpose Classification of Budgets,* GoG (Annual); DES also for Local Bodies; For Central Govt. in Gujarat, the ratio for the nation for different years is applied to the total of (State Govt. + Local Bodies) obtained from NAS, (CSO) annual publication [EPWRF, (July '02), pp.108]; The Multipliers for Consumption of Fixed Capital and Quasi-Govt. bodies are obtained from EPWRF, (July, '02), pp.108 to obtain the total GFCE consistent with National Accounts

3.4 International Exports: The recent study by GITCO (2001) has very meticulously and carefully estimated the international exports originating from Gujarat. They have distinguished between the exports made from Gujarat ports and the exports originating from Gujarat and have accordingly estimated this very important aggregate for the Gujarat economy for the year 2000-01. They have conducted a huge sample survey covering 40% of the exporting units of the state. However, if we exclude a very

dominant but largely small and medium scale sector of Gems & Jewellery, in the remaining sectors, the sample covers almost 83% of the relevant units. Thus, the results are fairly reliable. Moreover, they have followed the market price approach as at the national level and hence the estimates are comparable to NAS. In order to derive the corresponding estimates of international exports originating in Gujarat for the year 1999-2000, we have assumed that their proportion in GSDP at factor cost (0.4481) has remained the same as in 2000-01. With this assumption, the international exports from Gujarat in 1999-00 work out to Rs.48227 crores.

3.5 International Imports: There are no studies attempting to estimate international imports made by units operating in Gujarat. We have estimated the customs duty collected from the units operating in Gujarat also on the basis of the principle of conservatism and not on actuals for estimating the GSDP at market prices. This is a serious gap in the availability of data at the state level. In order to overcome this gap, we may try to allocate the national imports to different states based on some relevant indicators. The indicators that we select for allocation must satisfy two criteria: (i) they must be highly significant determinants of the national aggregate we want to allocate; and (ii) they must be readily obtainable at the state level for the year under consideration, The following two indicators fully satisfy both these criteria: (1) income from registered manufacturing as a proportion in the total GDP at factor cost (*i.e.* RM/GDP_{fc}); and (2) exports as a proportion of GDP_{fc} (*i.e.* X_F/GDP_{fc}). At the national level, these two indicators explain more than 99.5% of variation in Imports to GDP_{fc} ratio over the period 1980-02:

(3) $(M_F/GDP_{fc}) = 0.148(RM/GDP_{fc}) + 0.992\ (X_F/GDP_{fc})$

t-values (8.72) (27.28) : Adj. $R^2 = 0.995$

$\therefore (M_F/GSDP_{fc})Guj = 0.148\ (0.2286) + 0.992\ (0.4481) = 0.4784$ (in 1999-00)

$\therefore$ International Imports in Gujarat in 1999-00 = **Rs.51482 crores.**

3.6 Gross Domestic Capital Formation (GDCF): This is a major lacuna in the regional accounts in most of the states. There are only three to four states in the country who attempt to estimate GDCF in their economies. There are several states who prepare the estimates of capital formation by the government sector only. Gujarat is one of them. However, it leaves out a large part of the economy uncovered for estimating the overall GDCF in the state. There are 3 major components of GDCF: (i) public sector investment (PSI); (ii) household physical investment (HHPI); and (iii) private corporate sector investment (PCSI). Data on all these three components are regularly available at the national level. Again in this case, we may follow the method of allocating the national totals using indicators that satisfy the two criteria mentioned in section 3.5 above. The following indicators fully satisfy these criteria: (1) growth of GDP over last two years ($G_{GDP.2}$), and capital expenditure as proportion of GDP_{fc} (*i.e*. CE/GDP_{fc}) for public sector investment (*i.e.* PSI/GDP_{fc}); (2) income from construction sector as a proportion of total GDP_{fc} (*i.e.* $Const/GDP_{fc}$) for the household physical investment (*i.e.* $HHPI/ GDP_{fc}$); and (3) $HHPI/ GDP_{fc}$, income from electricity & gas as a proportion of GDP_{fc} (*i.e.* EGW/GDP_{fc}), income from unregistered manufacturing sector as a proportion of GDP_{fc} (*i.e.* URM/ GDP_{fc}), income from agriculture & animal husbandry as a proportion of GDP_{fc} (*i.e.* $AA/GDP_{fc)}$, and $G_{GDP.2}$ for the private corporate sector investment (*i.e. PCSI/* GDP_{fc}). These indicators show a very high degree of explanatory power at the national level over the period 1980-02:

(4) $(PSI/ GDP_{fc}) = 0.036 (G_{GDP.2}) + 0.926 (CE/ GDP_{fc})$

t-values: (11.05) (12.05) :Adj. R^2 =0.996

∴(PSI/GSDPfc)Guj. = 0.036 (1.1802) + 0.926 (0.0468) = 0.0858

∴ PSI in Gujarat in 1999-00 = **Rs.9234 crores.**

(5) (HHPI/ GSDPfc) = 1.761 (Const/ GSDPfc)

t-values: (33.64) :Adj.R^2 = 0.981

∴(HHPI/ GSDPfc)Guj. = 1.761 (0.0594) = 0.1046

∴ HHPI in Gujarat in 1999-00 = **Rs.11259 crores**.

(6) $(PCSI/GDP_{fc})$= - 0.750$(HHPI/GDP_{fc})$+3.861(EGW/GDP_{fc})+0.466(URM/GDP_{fc})

t-values: (-5.41) (2.68) (2.12)

– 0.879(AA/GDP_{fc})+0.199$(G_{GDP.2})$

(-3.62) (4.23) :Adj.R^2 = 0.979

∴$(PCSI/GDP_{fc})$ Guj. = 0.1353

∴ PCSI in Gujarat in 1999-00 = **Rs.14560 crores.**

(7) GDCF = PSI + HHPI + PCSI

= 9234+ 11259 + 14560

= **Rs.35053 crores**

This estimate implies that Gujarat's share is 7.9% in the national aggregate.

3.7 Domestic Export-Import Gap (X_D-M_D): Based on the above estimates for the state, we can derive an estimate of the domestic export-import gap as the residual. Thus, considering our estimates derived in sub-sector 3.1 to 3.6 above, we get

(8) $GSDP_{mp} = C + I + G + X_F – M_F + (X_D-M_D)$

i.e. 130157 = 66289 + 35053 + 13528 + 48227 -51482 + (X_D-M_D)

∴(X_D-M_D) = + Rs.18542 crores; and

(9) $M_D = X_D$ - 18542

The central sales tax (CST) on most items sold to other states from Gujarat is @4% of the value net of transport. As a result, we can get an indirect estimate of the domestic exports of Gujarat from the CST collection of Rs.956.81 crores in the state during 1999-00. This would imply a **minimum** domestic export of Rs.23920 crores from Gujarat. It may be more on account of exemptions or evasions but cannot be less. Thus, the **minimum** domestic imports in Gujarat would be 5378 crores.

IV. Estimate of Saving Rate in Gujarat

The implications of the estimates of the regional accounts presented above are startling and far reaching. It shows that Gujarat's share in the nation in GDP at market prices is 6.65%, in private final consumption expenditure is 5.24%, in the gross domestic capital formation is 7.89%, in the government final consumption is 5.38%, in international exports is 20.87%, and in international imports is 20.11%. Thus, the general impression that Gujarat is a trading state gets overwhelming support from these estimates. These estimates also show that Gujarat is not a major consuming state, nor does it have a larger government sector. Its investment share is higher than its income implying that it is more investment oriented compared to the nation. Moreover, our estimation methodology for investment and domestic exports & imports makes it clear that the errors in the two estimates are in the opposite direction and mutually cancelling. It should, therefore, be possible to generate some crude estimate of savings in Gujarat.

The second most famous accounting identity involves savings (S), investment (I), trade gap (X-M), and the government deficit from its tax revenues:

(10) S = I + (XF-MF) + (XD-MD) + (G + Subsidies + Other Current Transfers – Govt. Taxes from the State.)

It is clear that once we get estimates of the transfer payments and taxes by government sector ascribable to Gujarat, we can get the estimate of savings in the state. *Tables 6 and 7* provide these estimates by broad items of government transfers and taxes respectively with the sources and method of estimation. From these estimates, we get savings in Gujarat as:

(11) S = 35053 + (-3255) + 18542 + (13528+15229-28413)
= Rs.50684 crores

This implies that the saving rate (S/GDP_{mp}) in Gujarat is 38.94%. Moreover, in spite of very high tax collection from Gujarat, on the whole the government sector runs a marginal deficit in terms of its consumption and transfer payments in the state. This

goes against the general impression that Gujarat is a net contributor to the national kitty. The impression is right though in terms of savings, not the government sector.

Table 6: **Transfer Payments of Government Sector in Gujarat, 1999-00** (Rs. Crores)			
Level of Govt.	**Item**	**Tr. Payment to Guj.**	**Source**
1	2	3	4
1. Central Govt.	Grants	1154	Budget Documents
	Subsidies	1077	Dholakia et. Al. (2002)
	Interest	5237	*Economic Survey, 2002-03* provides an estimate of interest on internal liabilities of Central Govt. (p.31). We assume that Gujarat's share would be the same as in GDP at factor cost
	Misc.	375	*Economic Survey, 2002-03* provides an estimate of Rs.161549 crores for its total current transfers (p/35). Deducting grants, subsidies and interest from the current transfers, about Rs.12,500 crores remain for various other items like scholarships, grants to educational and other institution, etc. We have assumed that Gujarat gets about 3% of this amount.
	Sub-Total	7843	
2. State Govt.	Subsidies	1550	DES (July, 2002) *EPCB*
	Others (Net)	5836	Interest payment by GoG to the Central Govt. should be netted out. Thus, Rs.1894 crores (see, *Finance and accounts, 199-00*, p.97) is deducted. Similarly imputed losses of Rs.1387 crores of irrigation schemes are also deducted since it represents a contra entry item; DES (July, 2002) *EPCB*
	Sub-Total	7386	
3. Local Bodies	Transfer Payments (Net)	--	Likely to be negligible
Total Transfers on Current A/c.		**15229**	

The savings in Gujarat contribute 11.64% of the national aggregate and the saving rate is as high as 39%. Thus, Gujarat is a high saving society, but invests only a fraction of what it saves in the state. It invests in a big way outside the state and also receives returns. Its savings rate is very comparable to those prevailing in China, Korea, `Malaysia, Japan, Singapore, Honk Kong, etc. thus, problems in Gujarat is not so much

to increase savings but to retain its savings and utilise productively giving high returns to the investors. Thus, although foreign direct investment and capital may be very important on margin, the major challenge before the policy makers and planners is to retain the savings in the state by attracting even the domestic investors to invest in Gujarat. The problem needs further data and analysis of the components of the savings particularly in terms of the household financial savings, corporate sector's savings and public sector savings. This is because savers in Gujarat are also financially very active, investing in a big way in the share market, mutual funds, company deposits and the property market. Most of these savings by very nature does not have to remain within the state. Although most of the policy makers and professionals have the right impression about the linkages of the health of stock market and the consumers' well-being in Gujarat, there are no formal estimates of these linkages. For want of any reliable data, we cannot examine or analyse these issues now, but the need to develop these estimates through DES cannot be over emphasised.

Table 7: **Government Taxes Ascribable to Gujarat, 1999-00** (Rs. Crores)

Level of Govt.	**Item**	**Tax Amount**	**Source**
1	2	3	4
1.Central Govt.	Indirect Taxes	16471	Dholakia et.al. (2002)
	Direct Taxes	2390	DES (Feb. 2003) *SER, 2002-03*
2. State Govt.	Indirect Taxes	7823	DES (July, 2002) *EPCB*
	Direct Taxes	234	DES (July, 2002) *EPCB*
3.Local Bodies	Indirect Taxes	872	Dholakia et.al. (2002)
	Direct Taxes	--	Likely to be negligible
Total Taxes from Gujarat		27790	*Eco. Survey 2002-03,* p.41 (25.01% of Tax Rev.)
Misc. Receipts of Govt. Admin. Depts.		623	2.24% of Taxes (EPWRF, p.32)
Total		**28413**	

Another major implication of all these estimates presented here is in term of the overall investment rate in the state economy. The total investment (*i.e.* GDCF) in the state is Rs.35053 crores out of the GSDP at market prices of Rs.130157 crores in 1999-00. The investment rate works out to 26.93%, it means that overall export surplus of Gujarat is about 12% of GSDP. This includes both international as well as domestic export surplus. Before we derive any further implication, it is important to pause and look into our methodology of estimation and the nature of the year for which we have estimated the aggregates. The investment or capital formation estimates for Gujarat are essentially dependent on allocation of the corresponding aggregate at the national level are themselves fluctuating rather than stable from year to year. Moreover, the year 1999-00 is a peculiar year in the sense that it was almost a normal and average year for the nation clocking the growth in real terms at 6.2% in GDP at factor cost, but for Gujarat it was a bad year when GSDP actually declined by 1.2% on account of very bad monsoon in the state. We should, therefore, expect a depressed investment rate during the year in Gujarat.

If we take a long term average rate of investment in Gujarat, it would be around 28% to 29% of GSDP at market prices. This is because the incremental capital-output ratio (ICOR) for the nation is around 4 during the period and the trend rate of growth in Gujarat over the last decade was 7% (see *Table 1*). Since the share of the secondary sector in general and of registered manufacturing sector in particular is significantly higher in Gujarat than the nation, we should expect a marginally higher ICOR in Gujarat than in India. Considering all this, we may still get an estimate of net export surplus of about 10% in Gujarat. It means that Gujarat's own resources can generate additional real growth of about 2.5% p.a. assuming the same ICOR as in the past. However, the national ICOR is likely to be at 3.6 as assumed or targeted in the Tenth Five Year Plan (2001). If Gujarat succeeds to bring down its ICOR from around 4 to even 3.8, its saving rate of 38.94% would imply 10.25% growth p.a. in real terms. If Gujarat's ICOR is at 3.6, its growth rate could be 10.8% p.a. However, this involves a Herculean, or more appropriately, a Bhagirath effort at retaining or diverting all the savings generated in Gujarat to get productively invested in Gujarat. Alternatively, attract equal amount of inflows of investment (*i.e.*10%) from outside the state including foreign direct investment in the state.

V. Alternative Growth Targets and Macroeconomic Implications

We have seen earlier that based on the performance in the recent past, Gujarat has the potential to achieve annual growth rate up to 14.6% in the medium term and 9.4% in the long term. However, if we consider the saving rate in the state and also assume the investment rate of the same order, Gujarat can achieve a long term growth of about 10.8% p.a. when we take the optimistic ICOR of 3.6 as targeted in the 10^{th} Five Year Plan (2001). We, therefore, need to consider alternative growth targets and the implied macroeconomic aggregates to get an idea about the magnitude of effort required and the nature of the policy options to consider. We have to note, however, that critical macroeconomic parameter estimates are simply not available for the state since estimation of regional accounts is incomplete and inadequate. Even at the national level, some parameters like the factor shares are not available in the directly usable form, but enough material exists to allow construction of the required estimates (see, Dholakia, Bakul; 2001). Fortunately, such parameters are not likely to substantially vary across states. Hence, we can use the national parameters for Gujarat without risk of high error.

The famous Harrod-Domar growth identity provides the link between the growth target, ICOR and the required investment rate:

(12) $(I/Y) = ICOR\ (G_Y^*)$

where Y is GSDP and G* is the growth target. In order to achieve this growth target coupled with the employment growth target, we need several necessarily implied targets achieved. They include the overall growth of capital stock, the risk free interest on capital, internal rate of return (IRR), the rate of technical progress, the wage income as a proportion in the new investment, etc. All these can be worked out consistently through the well-known neo-classical growth theory framework. Thus, we have an aggregate production function with output (Y) in factors-capital (K) and labour (L), and time (t):

(13) $Y = f(K,L, t)$; then

$dY/dt = f_K\ (dK/dt) + f_L(dL/dt) + f_t$; and hence

(14) $G_Y = R_K * G_K + R_L * G_L + r$

which is the famous neo-classical growth accounting equation, where R_K and R_L are relative factor shares; G_K and G_L are growth rates of capital and labour; and r is the "residual" also known as rate of technical progress. Similarly (13) also implies

(15) $(dY/dK) = f_K + (f_L*dL/dK) + (f_t/(dK/dt))$

where f_K is the risk free interest; (f_L*dL/dK) in the wage income in new investment; $f_K + (f_t/(dK/dt))$ is IRR; and (dY/dK) is the reciprocal of the ICOR. If we assume equilibrium conditions, ICOR as well as relative factor shares become constant and it is possible to work out all implications of growth targets with given values of ICOR, R_K and R_L. *Table 8* provides alternative growth targets and their macroeconomic implications.

Table 8: **Alternative Growth Targets and Implied Macroeconomic Parameters**

Macro Parameters	**With G_L = 3% p.a.**			**With G_L = 3.5% p.a.**		
	G_Y = 9%	**G_Y = 10%**	**G_Y = 12%**	**G_Y = 9%**	**G_Y = 10%**	**G_Y = 12%**
Growth of Capital (G_K)	9%	10%	12%	9%	10%	12%
Investment Rate (I/Y)	32.4%	36%	43.2%	32.4%	36%	43.2%
Return on Capital (IRR)	21.8%	22.4%	23.3%	20.8%	21.5%	22.5%
Wage Income as % in New Investment (f_L dL/dK)	6%	5.4%	4.5%	7%	6.3%	5.3%
Rate of Technical Progress (r)	4.8%	5.6%	7.1%	4.5%	5.3%	6.7%

Note: Assumptions are: ICOR = 3.6; risk free interest (f_k) = 6.9%; relative shares of labour and capital are 0.65 and 0.25 respectively

We can see from the table that high growth of employment coupled with high growth of income would require very high investment rate in the state. 43.2% compared to the current rate of about 28.5% requires huge inflow of capital that can come only in the form of FDI. It is not impossible, but calls forth bold decisions and policy changes to ensure an IRR on the new projects well above 22%. This again is achievable by singularly focusing on innovations, research & development, improving the quality of products, better management & organisation, skills improvement, and very fundamental changes in the structures of economic activities shifting away from low productivity traditional ones to high value, high productivity modern activities. This calls forth very bold decisions on allowing entrepreneurial flexibility in resource shift and allocation, which is not possible without allowing “free” exit and removing all technical, administrative and economic barriers in such movement.

VI. Drivers of Growth – An Econometric Model

In order to achieve specific growth target, it is important to identify certain drivers of growth in the system. Very distant past experience may not be of much use in such estimation of the current relationships. The econometric exercise is, therefore, inherently limited to considering relatively recent time series data. We can consider the last two decades as the relevant time span for our purpose. The number of observations are, therefore, limited to 22, from 1980-81 to 2001-02. There are hardly any quarterly or monthly series on relevant variables available at regional or sub-regional level. Any question of using panel data or sub-annual data simply does not arise. Moreover, the constraint on the number of observations also imposes restrictions on the size of the model in terms of number of exogenous variables. We must recognise and appreciate that with all such constraints, the econometrically estimable and meaningful model will have to evolve slowly. It would need careful scrutiny, interpretation and validation. What we are now discussing can only qualify as exploratory and tentative effort.

We can begin by identifying a few most relevant growth oriented and targeted variables, called endogenous variables. We need to determine or target their values in future. Each of these variables depends on several of those variables where either the government exercise some control or outside factors determine their values putting constraint on our postulated relationships. These are the exogenous or pre-determined variables. Our drivers of growth would belong to this category. Based on intuitively appealing causal links, we can postulate the structural form of the model. *Table 9 and 10* provide respectively the description of the endogenous and the exogenous variables used in the model. All the nominally measured variables are in real terms after correcting for the inflation through the GSDP deflator. The income variables are, however, available at constant base period prices and do not require any further deflation. We consider 8 endogenous and 14 exogenous variables in the model.

Table 9: **The Endogenous Variables of the Model**	
Endogenous Variables (8)	**Variable Notation**
Agriculture (Agri.) and Fishery	Y_1
Manufacturing (Mfg.)	Y_2
Trade and Transport (TT)	Y_3
Financial, Administrative & Other Services (Service)	Y_4
Government Total Non Interest Expenditure (GITNIE)	Y_5
Government Own Tax Revenue (GOTR)	Y_6
State Income (GSDP)	Y_7
Modern Inputs in Agriculture (MAI)	Y_8

Table 10: **The Exogenous Variables of the Model**	
Endogenous Variables (14)	
Forestry (Forest) → X_1	Man-days Lost (Man DL/MDL) → X_8
Government Expenditure on Human Capital (GEHK) → X_2	Government Non Tax Revenue (GNTR) → X_9
Government Expenditure on Physical Capital (GEPK) → X_3	Real Estate, Ownership of dwelling & Business activity (RE) → X_{10}
Rainfall (Rain) → X_4	Transfer from the Centre (TFC) → X_{11}
Storage & Communication (Storcom) → X_5	Electricity, Gas & Water (EGW) → X_{12}
Construction (Const) → X_6	Mining & quarrying (MQ) → X_{13}
Wage Rate (WR) → X_7	Capital-Output Ratio (COR) → X_{14}

Table 11: **Structure of the Model and Test of Identification**							
Eqn. No.	**Dependent Variable**	**Independent Variable**	**k**	**M**	**(K-k)**	**(M-m)**	**Inference**
1	Agri	Storage & Communication, Electricity Water & Gas, Rainfall, **Modern Inputs,** Government Expenditure on Physical Capital	4	1	10	7	Over Identified
2	Manufacturing	**Agri, TT,** Forestry, EWG, Storage & Communication, Real Estate, Govt. Exp. On PK	8	2	6	6	Exactly Identified
3	TT	**Agri, Manufacturing,** EWG, Storage & Communication, Construction, Real Estate, Govt Exp on PK,	4	2	10	6	Over
4	Service	**Manufacturing, TT**, EWG, Real Estate, Govt Exp on HK, Storage & Communication, Construction	5	2	9	6	Over
5	Govt. Total Non Int Exp	**Govt. Own Tax Revenue**, Govt. Non Tax Revenue, Transfer from Centre, GSDP	2	2	12	6	Over
6	Govt. Own Tax Revenue	**Manufacturing,** Construction, EWG	2	1	12	7	Over
7	GSDP	**Agri, Manufacturing, TT, Services**	0	4	14	4	Over
8	Modern Inputs	Government Expenditure on PK, EWG, Storage & Communication, Rainfall	4	0	10	8	Over
Identity							
	Govt. Total Non Int Expenditure	Govt Exp on HK, Govt Exp on PK	-	-	-	-	-

Notes: T=Total number of variables included in the model =8+14=22
M=Number of endogenous variables included in the model =8
K=Number of exogenous variables included in the model =14
m=Number of endogenous variables in the given equation
k=Number of exogenous variables in the given equation
N=Number of Observations =22

The simultaneous equation model is fully spelt out and tested for identification of each equation in *Table 11.* We can see that all except the second equation for the variables "manufacturing" are over identified. The second equation is exactly identified. Thus, our model is technically identified and can, therefore, be estimated

The estimation, however, cannot be through the Ordinary Least Squares method but should be through such methods as 2 Stage Least Squares (2SLS) that can effectively take care of the simultaneity bias. *Table 12* reports the results in the form of the fitted equations of the structural form.

Table 12: **Results of the Two-Stage Least Square Estimation of the Model**		
Endg. Variables	**Model in Equation From**	**Adj R^2**
Y_1 =	$6809.293+0.1899Y_8- 1.6998X_3+ 0.4841X_4+ 1.0756X_5+ 0.8229X_{12} + e_1$	0.6647
Y_2 =	$-170.4563+0.0996Y_1+0.4699Y3-0.0207X_1-0.3473X_3+0.2647X_6 +0.0611X_7+0.0539X_8+0.705X_{12}-0.0927X_{13}-0.0528X_{14}+e_2$	0.9898
Y_3 =	$39.826+0.0783Y_1+0.3859Y_2+0.1686X_3+0.3531X_5+0.1095X_{10} -0.0484X_{12}+e_3$	0.9868
Y_4 =	$-1886.94+0.1758Y_2+0.2206Y_3+0.0194X_2-0.2255X_5+0.3321X_6 +0.1584X_{10}+0.3351X_{12}+e_4$	0.9966
Y_5 =	$540.155+0.7563Y_6-0.5017Y_7+0.2803X_9+0.0078X_{11}+e_5$	0.9635
Y_6 =	$-32.3395-1.377Y_2+4.072X_6+3.746X_{12}+e_6$	0.9671
Y_7 =	$1231.982+0.1449Y_1+0.3858Y_2+0.204Y_3+0.3302Y_4+e_7$	0.9998
Y_8 =	$31.811+1.5973X_3-0.0175X_4-1.2657X_5+0.5182X_{12}+e_8$	0.9379

We can see that the model has *prima-facie* fitted the data from Gujarat very well. Each of the eight equations has a very high and statistically significant explanatory power as revealed by the value of the adjusted R^2. Thus, all of our eight endogenous variables can be well predicted by our model. This is the first cut and the results are encouraging. We can run the model in the double-log form to get estimates of elasticities rather than simple slope co-efficients. Similarly, we can work out the final effects of each of the exogenous variables on each of the endogenous variables on the basis of *Table 12*. Such final effects are available in *Table 13.* The table reveals that the most important drivers of growth in Gujarat are electricity & gas (EGW), storage & communications (Storecom), construction (Const.), real estates (RE), and of course, rainfall (Rain). Out of all these factors, EGW and construction have positive influence on all our endogenous variables, particularly the government's own tax revenues (GOTR). Our results have important implications for growth strategy and policies in the state.

Table 13: **Impact Parameters in the Reduced Form of the Model for Gujarat**								
Variables	**Partial Effects on**							
	Agri Y_1	***Mfg*** Y_2	***TT*** Y_3	***Service*** Y_4	***GTNIE*** Y_5	***GOTR*** Y_6	***GSDP*** Y_7	***MAI*** Y_8
Forest X_1	0.0000	-0.2529	-0.0976	-0.0660	0.3332	0.3482	-0.1392	0.0000
GEHK X_2	0.0000	0.0000	0.0000	0.0194	-0.0032	0.0000	0.0064	0.0000
GEPK X_3	-1.3965	-0.5601	-0.2569	-0.1551	0.8452	0.7713	-0.5221	1.5973
Rain X_4	0.4808	0.0801	0.0686	0.0292	-0.1457	-0.1103	0.1242	-0.0175
Storcom X_5	0.8353	0.3418	0.5504	-0.0440	-0.5319	-0.4707	0.3507	-1.2657
Const X_6	0.0000	0.3233	0.1248	0.4165	2.5986	3.6268	0.2877	0.0000
WR X_7	0.0000	0.0746	0.0288	0.0195	-0.0983	-0.1028	0.0411	0.0000
MDL X_8	0.0000	0.0658	0.0254	0.0172	-0.0868	-0.0907	0.0363	0.0000
GNTR X_9	0.0000	0.0000	0.0000	0.0000	0.2803	0.0000	0.0000	0.0000
RE X_{10}	0.0000	0.0629	0.1338	0.1990	-0.1243	-0.0865	0.1172	0.0000
TFC X_{11}	0.0000	0.0000	0.0000	0.0000	0.0078	0.0000	0.0000	0.0000
EGW X_{12}	0.9213	0.9869	0.4046	0.5978	1.4069	2.3871	0.7942	0.5182
MQ X_{13}	0.0000	-0.1132	-0.0437	-0.0295	0.1492	0.1559	-0.0624	0.0000
COR X_{14}	0.0000	0.0645	0.0249	0.0168	-0.0850	-0.0888	0.0355	0.0000
Source: Based on *Table 12*								

VII. Human and Social Aspects of Development

We can see that our model dependent on time series data for estimation and validation does not –rather could not include variables and indicators directly measuring social and human dimension of development in the state. This is largely because: (1) the human and social development indicators generally reflect stocks and not flows with the result that variation over time for a big regional unit like a state is not considerable; (2) the data on those indicators are collected and published only once in five to ten years resulting in breaks in the time series; and (3) there is a considerable –sometimes intolerable delays in getting the right estimates. The only way left it to examine the whole issue within a broad theoretical framework with estimation and validation depending on the cross-sectional studies and applicability of those results and conclusions to a single regional unit with its own peculiarities and specialities would always remain an unresolved issue in this context. However, some broad policy leads may become available and prove very helpful.

Out of several specific studies attempting to relate human and social development aspects with the economic policies of the state, a series of studies by Archana Dholakia stands out because: (1) she has developed a sound theoretical

framework based on general equilibrium model to identify the relevant indicators first, and then, to measure them appropriately for interpretation; (2) she has clearly established the link and provided justification for the socio-human concerns converted into the objectives and targets for the government policy and the specific policy parameters; and (3) she has persistently provided proof of validation and workability of her approach by considering the cross-section of India states over 1961, 1971, 1981, and 1991 (see, Dholakia, Archana; 1987, 1989, 1990, 1993 and 2002). Her results derived by fitting a simultaneous equation model incorporating 11 socio-human development indicators and 9 independent variables including 8 different types of government expenditures and the level of per capita real GSDP in the base year, show that human development efforts of government have increasing returns whereas the efforts on development of physical capital have started yielding diminishing returns in terms of the basic welfare objectives of the state governments in India on an average.[4] Given these efforts and the reasons why a similar exercise exclusively for Gujarat cannot be performed under the given data constraints, we may not attempt to duplicate the effort.

Furthermore, a recent study again considering the cross-section of Indian states has found that per capita income levels and the levels of human & social development in a region have two-way causality rather than uni-directional causality relationship (Dholakia, 2003). The study has also examined the lags with which the two sets of variables affect each-other. Interestingly, it finds that human & social development indicators cause the income to rise with a lag of about eight years, whereas the reverse causation takes only two years. Thus, available evidence on this critical relationship based on the experience of Indian states in a cross-section over recent past suggests that the aspects of human & social development are not ultimately very distinct and separate concerns in a rapidly growing society. They generally get subsumed and automatically addressed when the growth momentum picks up in the region. However, there can be certain definite areas of weakness either traditionally existing in the state (like infant mortality) or those areas where recently the slippage has started occurring (like enrolment and literacy). We do not need any comprehensive macroeconomic growth model to integrate such concerns for the obvious policy response. In case, any

[4] Moreover, our econometric exercise based on recent time series data on Gujarat as summarized in *Table 13* above also broadly support these findings of Archana Dholakia. The impact parameter of government expenditure on human capital (GEHK or X_2) for GSDP is +0.0064, whereas the same government expenditure on physical capital (GEPK or X_3) is -0.52

cost-benefit analysis is required to decide the magnitude of the policy intervention from government, the study (Dholakia, 2003) also provides estimates of elasticities and impact parameters to help such calculations. In order to identify the areas of concern, we can look at the comparison of Gujarat with All-India over last two decades in various indicators as given in the *National Human Development Report,* (Planning Commission, 2001). *Table 14* reports the relevant comparative picture highlighting those indicators showing areas of concern for Gujarat.

Table 14 : Comparison of Human Development Indicators for Gujarat and All-India

Indicator	Early Eighties		Early Nineties		Late Nineties	
	Gujarat	India	Gujarat	India	Gujarat	India
HDI – Combined	0.360	0.302	0.431	0.381	0.479	0.472
HDI – Rural	0.315	0.263	0.380	0.340		
HDI – Urban	0.458	0.442	0.532	0.511		
Gender Disparity Index	0.723	0.620	0.714	0.676		
Human Poverty Index – Combined	37.31	47.33	29.46	39.36		
Human Poverty Index – Rural	42.46	53.28	33.59	44.81		
Human Poverty Index – Urban	24.71	27.21	20.29	22.00		
Per Capita NSDP (Rs.)	2038	1671	2738	2213	3918	2840
Per Capita Cons. Exp. – Combined	133	125	356	328	678	590
Gini Ratio for pc Cons. Exp. – Rural	0.256	0.298	0.236	0.282	0.233	0.258
Gini Ratio for pc Cons. Exp. – Urban	0.172	0.330	0.285	0.340	0.288	0.341
Inequality Adj. pc Cons. Exp. – Combined	103	86	264	228	502	418
Infl.& Inqlty Adj. pc Cons. Exp.	103	86	109	97	130	111
Composition of Per Capita Consumption Expenditure – Rural – Food (%)	66.73	65.56	67.10	63.18	59.82	59.41
Composition of Per Capita Consumption Expenditure – Rural – Non-Food (%)	33.27	34.44	32.90	36.82	40.18	40.59
Persons in Labour Force – Combined (%)	67.7	66.5	66.3	64.5	65.4	61.8
Male in Labour Force – Combined (%)	86.0	87.1	86.1	85.4	84.9	83.5
Female in Labour Force - Combined (%)	48.5	44.4	45.3	42.0	44.6	38.5
Inci. of Unempl-Combined (as% of lab.)	1.4	2.0	1.6	2.0	0.8	2.3
Incidence of Unempl. – Combined – Male	1.8	2.3	1.8	2.1	1.1	2.5
Incidence of Unempl – Combined –Female	0.6	1.3	1.1	1.7	0.3	1.8
Percentage of Persons BPL – Combined	32.79	44.48	24.21	35.97	14.07	26.10
Percentage of Persons BPL – Rural	29.80	45.65	22.18	37.27	13.17	27.09
Percentage of Persons BPL – Urban	39.14	40.79	27.89	32.36	15.59	23.62
No. of Pucca Houses – Combined (%)	48.96	32.67	56.93	41.61		
No. of Semipucca Houses– Combined (%)	41.12	33.29	39.01	30.95		
No. of Kutcha Houses – Combined (%)	8.92	34.04	4.06	27.44		
Access to Toilet Facility – Combined (%)			30.69	23.70	66.74	49.32
With Safe Drinking Water– Combined(%)	52.41	38.19	69.78	62.30		
With Elect. Connection – Combined (%)	44.81	26.19	65.93	42.37		
With Elect. Connection – Rural (%)	30.83	14.69	58.43	30.54		
With Electricity Connection – Urban (%)	74.40	62.51	82.96	75.78		
Per Capita Consumption of Electricity	320	191	504	268	694	334
Villages Conn. by Roads – Pop. <1000 (%)			75.02	36.52	89.16	49.18
Vill. Conn. by Roads – Pop. 1000-1500(%)			94.58	72.32	98.19	74.58
Villages Conn. by Roads – Pop. >1500(%)			99.19	89.82	99.39	78.04
State-level Coverge of Roads	29.63	45.13	41.26	61.27	46.37	74.93
Literacy Rate – Combined – Total (%)	52.21	43.57	61.29	52.21	66.43	65.20
Literacy Rate – Combined – Male (%)	65.14	56.38	73.13	64.13	76.46	75.64

Table 14 : Comparison of Human Development Indicators for Gujarat and All-India						
Indicator	**Early Eighties**		**Early Nineties**		**Late Nineties**	
	Gujarat	**India**	**Gujarat**	**India**	**Gujarat**	**India**
Literacy Rate – Combined – Female (%)	38.46	29.76	48.64	39.29	55.61	54.03
Literacy Rate – Rural – Total (%)	43.57	36.01	53.09	44.69	58.53	59.21
Literacy Rate – Rural – Male (%)	57.76	49.59	66.84	57.87	70.71	71.18
Literacy Rate – Rural – Female (%)	28.80	21.70	38.65	30.62	45.75	46.58
Literacy Rate – Urban – Total (%)	71.00		76.54	73.08	79.24	80.06
Literacy Rate – Urban – Male (%)	80.69		84.56	81.09	85.46	86.42
Literacy Rate – Urban – Female (%)	60.22		67.70	64.05	72.23	72.99
SC Literacy Rate – Total	39.79	21.38	61.07	37.41		
SC Literacy Rate– Male	53.14	31.12	75.47	49.91		
SC Literacy Rate – Female	25.61	10.93	45.54	23.76		
ST Literacy Rate – Total	21.14	16.35	36.45	29.60		
ST Literacy Rate– Male	30.14	24.52	48.25	40.65		
ST Literacy Rate – Female	11.64	8.04	24.20	18.10		
Literates in the age 7-14 years – Children	63.85	51.49	79.52	64.16		
Literates in the age 7-14 years – Boys	72.09	60.58	86.13	71.44		
Literates in the age 7-14 years – Girls	54.76	41.57	72.40	56.23		
Adult Literacy Rate – Combined – Total	48.26	40.83	55.88	48.54		
Adult Literacy Rate – Combined – Male	62.73	54.92	69.25	61.89		
Adult Literacy Rate – Combined – Female	33.08	25.72	41.62	34.09		
Adult Literacy Rate – Rural – Total	38.61	32.79	46.28	40.34		
Adult Literacy Rate – Rural – Male	54.13	47.39	61.56	54.89		
Adult Literacy Rate – Rural – Female	22.77	17.60	30.35	24.92		
Adult Literacy Rate – Urban – Total	68.43	65.11	73.42	70.68		
Adult Literacy Rate – Urban – Male	79.93	76.29	82.88	80.14		
Adult Literacy Rate – Urban – Female	55.62	51.90	62.92	59.86		
Enrl. Ratios – Combined – 6-11 years	56.5	47.2	62.3	51.2		
Enrl. Ratios – Combined – 6-11 yrs– Boys	63.6	55.3	67.2	56.6		
Enrl. Ratios – Combined – 6-11 yrs– Girls	48.9	38.5	57.1	45.4		
Enrl. Ratios – Combined – 11-14 years	59.6	50.0	68.1	62.1		
Enrl. Ratios – Combined – 11-14 yrs–Boys	69.9	62.0	75.9	71.1		
Enrl. Ratios – Combined – 11-14 yrs–Girls	48.1	36.7	59.5	52.2		
Enrl. Ratios – Rural – 6-11 years–Children	50.7	41.3	58.8	46.0		
Enrl. Ratios – Rural – 6-11 years– Boys	59.2	50.6	65.0	52.3		
Enrl. Ratios – Rural – 6-11 years– Girls	41.6	31.4	52.2	39.3		
Enrl. Ratios – Rural–11-14 years–Children	52.9	43.7	63.5	56.7		
Enrl. Ratios – Rural – 11-14 years– Boys	65.3	57.6	73.4	67.6		
Enrl. Ratios – Rural– 11-14 years– Girls	38.9	28.1	52.5	44.4		
Enrl. Ratios – Urban– 6-11 years–Children	71.3	69.0	69.2	68.3		
Enrl. Ratios – Urban – 6-11 years– Boys	74.8	72.8	71.5	70.7		
Enrl. Ratios – Urban – 6-11 years– Girls	67.7	64.9	66.7	65.8		
Enrl. Ratios–Urban–11-14 years– Children	**75.4**	**70.8**	**77.2**	**77.5**		
Enrl. Ratios – Urban – 11-14 years– Boys	80.7	76.6	80.9	81.0		
Enrl. Ratios – Urban – 11-14 years– Girls	69.5	64.5	73.1	73.6		
Girls Enrolled in class I-V – Combined	39.65	38.27	44.61	43.16		
SC Girls Enrolled in class I-V – Combined	35.96	34.36	45.60	41.66		
ST Girls Enrolled in class I-V – Combined	37.25	33.29	44.06	41.45		
Girls Enrolled in class VI-VIII– Combined	36.92	32.70	41.16	36.92		
SC Girls Enrl. In class VI-VIII–Combined	28.41	25.82	40.06	36.25		
ST Girls Enrl. In class VI-VIII– Combined	30.25	26.97	38.69	35.77		
Girls Enrl. in class IX onwards –Combined	34.64	28.69	41.16	35.93		
SC Girls Enrl. In class IX on–Combined	24.46	21.53	36.10	30.29		
ST Girls Enrl. In class IX on – Combined	27.58	26.70	36.85	27.62		
Drop-out Rates in Classes I-V – Children	54.6	53.5	41.37	45.01	27.75	39.58
Drop-out Rates in Classes I-V – Boys	53.2	51.1	37.03	43.83	22.52	38.23

Table 14 : Comparison of Human Development Indicators for Gujarat and All-India						
Indicator	**Early Eighties**		**Early Nineties**		**Late Nineties**	
	Gujarat	**India**	**Gujarat**	**India**	**Gujarat**	**India**
Drop-out Rates in Classes I-V – Girls	56.7	57.3	46.74	46.67	33.98	41.34
Drop-out Rates in Classes I-VIII– Children	**67.20**	**72.10**	**58.36**	**61.10**	**60.30**	**56.82**
Drop-out Rates in Classes I-VIII – Boys	64.10	68.50	53.65	58.23	56.70	54.40
Drop-out Rates in Classes I-VIII– Girls(%)	71.80	77.70	64.25	65.21	64.75	60.09
Drop-out Rates in Class I-X–Children(%)	**81.30**	**82.33**	**67.51**	**72.93**	**72.29**	**67.44**
Drop-out Rates in Classes I-X – Boys(%)	79.70	79.44	64.68	70.00	70.12	65.44
Drop-out Rates in Classes I-X – Girls(%)	83.78	86.81	71.40	77.32	74.96	70.22
Inten. of Formal Edu–Adj–Combined(yrs)	2.45	2.04	3.45	2.70		
Int. of Frm. Edu–Adj–Combined–Boys(yr)	2.98	2.61	3.84	3.10		
Int. of Frm. Edu–Adj–Combined-Girls(yrs)	1.89	1.42	3.02	2.26		
Access to Primary Schools in Rural Areas up to 0.5 kms. (%)	96.48	85.13	97.90	85.50		
Access to UPS- Rural Areas upto 1km(%)	78.78	46.57	97.90	85.50		
Pupils per teacher – Primary	42	40	44	45	47	42
Pupils per teacher – Upper Primary	39	34	42	43	41	37
Pupils per teacher – Secondary	26	29	26	29	30	29
Schools per 1000 population – Primary	**2.76**	**5.70**	**3.14**	**5.75**	**2.86**	**5.04**
Schools per 1000 popu. – Upper Primary	6.18	2.44	6.51	2.69	6.12	2.75
Expectation of Life at Birth (years)	57.6	55.5	61.0	60.3	61.4	60.7
Expectation of Life at Age 1 year (years)	63.4	60.9	64.7	64.5	65.1	64.9
People not exp. to Survive Age > 40 (%)	20.5	23.0	16.7	18.0		
Infant Mortality Rate (per 1000)	**115**	**115**	**78**	**77**		
Under 5 Mortality Rate (per 1000)	**124**	**152**	**101**	**94**		
Mortality Rate for Age 0-4 years(per 1000)	40.6	41.2	23.3	26.5		
Mortality Rate for Age 5-9 years(per 1000)	3.6	4.0	1.2	2.7		
Death Rate (per 1000)	12.0	12.5	8.5	9.8	7.6	8.9
Overall Sex Ratio (females/1000 males)	**942**	**934**	**934**	**927**	**921**	**933**
Est. Sex Ratio at Birth–Rural(fem./1000)	962	971	943	943		
Est. Sex Ratio at Birth–Urban(fem./1000)	**935**	**962**	**901**	**926**		
Sex Ratio for Age 0-4 yrs (females/1000)	**962**	**978**	**939**	**955**	**878**	**927**
Sex Ratio for Age 5-9 yrs (females/1000)	925	941	937	938		
Births Attended by Health Profes. (%)			42.6	34.2	53.5	42.3
Births Delivered in Medical Inst. (%)			35.6	25.5	46.4	33.6
Two or More Doses of TT Vaccination during Pregnancy (%)			62.7	53.8	72.7	66.8
Fully Vaccinated Children aged 12-23 months (%)			49.8	35.4	48.3	42.0
Couple Protection Rate (%)			49.3	40.6	59.0	48.2
Total Fertility Rates (No. of Children)	4.4	4.5	3.2	3.7	3.1	3.4
Population Distribution (mill)	34.09	685.18	41.31	846.30	50.60	1027.02
Urbanisation Rate (%)	31.10	23.34	34.49	25.71	37.35	27.78
Persons Aged ≥ 60 (%)	5.33	6.49	6.39	6.70		
Old Age Dependency Ratio (%)	10.78	12.04	11.11	12.19		
Child Labour Age 5-14 (%)	6.9	7.6	5.3	5.4		
No. of Disabled (per 100,000)-Rural	1507	1844	1676	1995		
No. of Disabled (per 100,000)-Urban	**1115**	**1420**	**1648**	**1579**		
Plan Expenditure (%)	39.78	35.98	33.38	31.39	26.55	25.49
Non- Plan Expenditure (%)	60.22	64.02	66.62	68.61	73.45	74.51
Revenue Expenditure (%)	68.99	72.39	77.04	82.73	83.78	86.48
Capital Expenditure (%)	31.01	27.61	22.96	17.27	16.22	13.52
Development Expn. Ratio (%)	71.61	70.42	74.36	69.57	71.50	61.76
Social Sector Expn. Ratio (%)	**28.79**	**29.12**	**31.40**	**32.89**	**31.20**	**33.07**
Education Expn. Ratio (%)	**12.55**	**13.89**	**16.74**	**17.36**	**16.38**	**17.39**
Health Expn. Ratio (%)	**6.08**	**7.10**	**5.82**	**5.88**	**5.41**	**5.78**
Amenities Expn. Ratio (%)	2.17	1.14	3.74	3.86	5.32	4.53

Table 14 : Comparison of Human Development Indicators for Gujarat and All-India						
Indicator	**Early Eighties**		**Early Nineties**		**Late Nineties**	
	Gujarat	**India**	**Gujarat**	**India**	**Gujarat**	**India**
Other Social Expn. Ratio (%)	**7.99**	**7.00**	**5.10**	**5.79**	**4.09**	**5.39**
Public Exp. On Edu. as % of GSDP	2.33	0.40	3.40	0.60	2.78	0.50
Public Exp.on Health as% of GSDP	1.17	0.20	1.18	0.25	0.94	0.25
Vill. Pnchyts– Own Tax/Own Rev. (%)			73.80	71.53	81.43	61.99
Vill. Pnchyts– Own Rev/Total. Rev (%)			22.47	16.26	33.82	10.43
Vill. Pnchyts– CS Exp./Total. Exp. (%) *			27.89	9.61	28.05	10.74
Dist. Pnchyts– Own Tax/Own Rev. (%)			21.51	12.78	46.55	12.69
Dist. Pnchyts– Own Rev/Total. Rev (%)			**1.07**	**1.26**	**0.47**	**0.77**
Dist. Pnchyts– CS Exp./Total. Exp. (%) *			**0.00**	**6.28**	**0.00**	**8.75**
Panchayats– Own Tax/Own Rev. (%)			63.78	64.40	76.64	55.67
Panchayats– Own Rev/Total. Rev (%)			2.70	5.60	1.81	3.50
Panchayats– CS Exp./Total. Exp. (%) *			0.82	5.83	0.73	7.43
Urb. Bodies– Own Tax/Own Rev. (%)			85.50	70.71	88.97	77.53
Urb. Bodies– Own Rev/Total. Rev (%)			6.3.84	69.60	67.97	67.81
Urb. Bodies– CS Exp./Total. Exp. (%) *			36.38	40.94	38.83	66.90
*: Core Services include water supply, street lighting, sanitation and roads. Source: Planning Commission (2002): *National Human Development Report 2001*						

VIII. Conclusion and Suggestions:

This study has pointed to several data gaps existing at the state level in regional and sub-regional accounts. Unless firm and definite measures are initiated to bridge those gaps on regular basis now, the ability of the policy makers, implementing authorities and monitoring agencies to perform their jobs satisfactorily and efficiently would be substantially hampered. This is because in the changed economic environment requiring constant monitoring and evaluation of the performance of the state economy on one hand and providing quick enabling policy responses to encourage and regulate the private sector activities on the other hand, official estimates of critical macroeconomic parameters are absolutely essential. In their absence, states cannot think of competing effectively among themselves and with other state economies of foreign countries for attracting any resources, talents and activities in their territory. In the global and open environment, the right type and economically relevant information would hold the key and command premium. The Department of Economics and Statistics at the state level needs strengthening in terms of upgrading their skills, empowering them with some authority to command information, and more dynamic, challenging and competing environment to operate. It needs to be shifted from the Planning Ministry to the Finance Ministry and upgraded to become the Department of Economic Intelligence (DEI) for the state.

The estimates of investment, savings, export-import gap, etc. presented in this paper are very revealing. It appears that the emphasis put all along by the policy

makers on attracting outside investments in the state is probably an acceptance of the failure to retain the savings of the state within Gujarat. We need to think innovatively about the solutions. Can we create economic environment such that the local entrepreneurs can start raising local capital at attractive rates? All policy hurdles need to be removed or significantly reduced. Mobilising local savings to finance capital needs of local entrepreneurs is the key to fast growth because it would represent substantial organisational improvement and innovation reducing the ICOR and increasing IRR of projects because such developments would necessarily accompany increased labour and land intensity of production. We may also seriously examine the Chinese TVE structures as suggested in the Columbia study (Bajpai, 2004) in this context and see how we can mould them to suit our situation. Simultaneously, it is important to attract foreign direct investment (FDI) in Gujarat because they represent a totally new source of resource transfer. With a growth of around 10% p.a. in real terms and a high IRR in excess of 20%, there seems to be tremendous potential for FDI in Gujarat. The socio-cultural and quality of soft–infrastructure like secondary and tertiary educational institutions, entertainment avenues, health infrastructure, drinking water, clean environment and power availability need urgent attention in the big cities like Ahmedabad, Vadodara, Surat, Bhavnagar. Rajkot and Jamnagar. Special economic zones and export zones with specific focus can be very effective in this regard provided we take bold decisions about labour laws, factory-act provisions, land laws, etc. and reduce the red-tape and delays in decision making, various approvals and unnecessary and unproductive supervision visits to these units. Here again we have a lot to learn from Chinese experience (see, Bajpai, 2004). We should also learn from Andhra Pradesh in matters relating to labour laws and from Maharashtra in matters relating to land laws. Gujarat already has significant thrust on exports. We need to build further and focus more sharply in those modern areas of agri-business, bio-technology and pharma sectors where the market potential world over is tremendous and where Gujarat has a latent or potential comparative advantage. Only correcting some tax policies and creating right infrastructure and environment would be sufficient to give the boost to these activities.

The most important policy and strategy implications of the exercise of model fitting has been to establish and empirically validate the basic drivers or the prime-movers of growth in Gujarat. Electricity, Gas and Water Supply sector is the most significant engine of growth and state's own revenues followed by Construction sector.

Similarly, Storage and Communication sector as well as Real Estates and Dwelling are also very important drivers of economic activities in the state. Policies pertaining to all these sectors would have direct bearing on growth of the economy. Gas is the future of the state because of its natural advantages. The state should make all efforts to ensure that it utilises whatever gas lands in Gujarat very productively. Sales tax on natural gas needs to be rationalized immediately (see, Dholakia, 2004). SEZ and EPZs need to planned along and around the gas-grid in the state. This sector, moreover, has tremendous potential also to attract FDI and also spur considerable domestic investment opportunities in sectors like power, ceramics, tiles, glass-ware, etc. in the state.

Storage, construction and real estates & dwellings await enabling environment where state and city administrations become transparent, efficient and investment friendly. The land laws, stamp duty, and zoning restrictions need to be reviewed quickly and rationalised. This can again attract considerable domestic and foreign investment. Maharashtra has liberalised development of big land areas and facilitated developers of 300 acres or more area exempting them from the requirement of seeking any formal approvals from state urban authorities. Such policy steps need to be quickly identified and followed. They have the potential to attract domestic investments to build quality soft-infrastructure and hence to attract highly skilled manpower, business leaders and hence multiple economic activities.

In summing up, we need to agree that Gujarat can grow at a rate higher than 10% p.a. on long term only if it takes initiatives in bold policy decisions and innovative designs to help small & medium sized entrepreneurs; leadership in providing efficient and transparent administration; and constant vigilance and alertness in providing the most friendly policy environment to business in the state. Guaranteeing quality of soft-infrastructure valuing high skilled professionals and entrepreneurs, and providing basic amenities to the masses is the key to achieve such difficult looking targets.

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Appendix Table 1: Estimation of Trend Rates of Growth for Gujarat GSDP at 1993-94 prices							
No.	Dependent Variable	1980-81 to 1991-92			1991-92 to 2000-01		
		Intercept a	Slope b_1	R^2	Intercept a	Slope b_1	R^2
1	AGRI. & ALLIED	13.90	-0.0048	0.0057	14.0453	0.0125	0.0299
		(93.81)	(-0.2399)	(0.0575)	(89.73)	(0.4972)	(0.2472)
1.1	AGRICULTURE	13.84	-0.0090	0.0162	13.9472	0.0122	0.0241
		(84.44)	(-0.4068)	(0.1655)	(81.56)	(0.4449)	(0.1979)
1.2	FOREST & LOG	10.66	-0.0028	0.0701	10.6289	0.0181	0.9672
		(445.64)	(-0.8688)	(0.7540)	(1450.87)	(15.3723)	(236.31)
1.3	FISHING	10.08	0.0821	0.9188	11.2278	0.0106	0.1767
		(177.37)	(10.6403)	(113.22)	(221.97)	(1.3107)	(1.7179)
2	MINING & QUARRY	11.19	0.0615	0.9204	11.9078	0.0133	0.6004
		(266.04)	(10.7538)	(115.65)	(497.16)	3.4674)	(12.02)
1+2	SUB-TOTAL PRIMARY	13.96	0.0016	0.0008	14.1576	0.0128	0.0391
		(106.06)	(0.0914)	(0.0083)	(101.34)	(0.5706)	(0.3256)
3	MANUFACTURING	13.11	0.0687	0.8780	13.8572	0.1011	0.8941
		(219.70)	(8.4841)	(71.9805)	(181.48)	(8.2195)	(67.56)
3.1	REGISTERED	12.71	0.0714	0.8521	13.4691	0.1062	0.8698
		(183.49)	(7.5925)	(57.6470)	(149.37)	(7.3127)	(53.48)
3.2	UN-REGISTERED	12.01	0.0632	0.9195	12.7194	0.0898	0.9155
		(275.65)	(10.6884)	(114.24)	(212.42)	(9.3126)	(86.73)
4	ELECT, GAS, WATER	10.41	0.0938	0.9852	11.6038	0.0761	0.9617
		(389.27)	(25.8061)	(665.96)	(348.45)	(14.1797)	(201.07)
5	CONSTRUCTION	11.59	0.0461	0.7541	12.1083	0.0616	0.8381
		(189.00)	(5.5390)	(30.6808)	(203.83)	(6.4361)	(41.4241)
3+4+5	SUB-TOTAL SECOND.	13.36	0.0671	0.9373	14.1082	0.0938	0.9314
		(330.91)	(12.2360)	(149.74)	(252.70)	(10.4279)	(108.74)
6	TRADE,HOTEL,REST.	12.47	0.0523	0.9250	12.9844	0.0833	0.9319
		(359.53)	(11.1123)	(123.48)	(262.65)	(10.4657)	(109.52)
7	TRAN,STORAGE,COMM	11.85	0.0710	0.8920	12.4203	0.0993	0.9951
		(206.20)	(9.0908)	(82.6434)	(819.12)	(40.6447)	(1652.00)
7.1	RAILWAY	10.75	0.0307	0.8692	11.0228	0.0334	0.7150
		(387.49)	(8.1548)	(66.5018)	(238.21)	(4.4801)	(20.0720)
7.2	OTHER TRANS.	11.13	0.0948	0.8100	11.8999	0.0959	0.9966
		(104.12)	(6.5312)	(42.6574)	(982.46)	(49.1430)	(2415.04)
7.3	STORAGE	6.99	0.0269	0.4986	7.0626	0.0372	0.6409
		(111.25)	(3.1538)	(9.9466)	(115.57)	(3.7788)	(14.2800)
7.4	COMMUNICATION	10.11	0.0624	0.9883	10.6442	0.1582	0.9848
		(641.02)	(29.1491)	(849.67)	(247.25)	(22.8140)	(520.50)
6+7	SUB-TOTAL 6&7	12.90	0.0592	0.9461	13.4334	0.0897	0.9770
		(391.96)	(13.2559)	(175.72)	(445.38)	(18.4578)	(340.69)
8	FIN.INS,R.ESTATE	12.39	0.0633	0.9756	13.1581	0.0570	0.9591
		(532.42)	(20.0297)	(401.19)	(509.06)	(13.7009)	(187.72)
8.1	BANKING INSURANCE.	10.71	0.1350	0.9584	12.3652	0.0846	0.9272
		(163.68)	(15.1836)	(230.54)	(237.75)	(10.10)	(102.02)
8.2	REAL ESTATE	12.23	0.0303	0.9992	12.5666	0.0270	0.9997
		(6258.18)	(114.12)	(13023.11)	(13193.02)	(176.50)	(31150.86)
9	COMMU. SERVICE	12.16	0.0560	0.9707	12.6368	0.9195	0.9719
		(537.99)	(18.2308)	(332.37)	(368.88)	(16.6567)	(277.45)
9.1	PUB. ADMIN	11.68	0.0588	0.8633	11.6044	0.1003	0.9316
		(205.78)	(7.9483)	(63.1766)	(194.6771)	(10.4427)	(109.05)
9.2	OTHER SERVICES	11.68	0.0540	0.9816	12.1972	0.8680	0.9828
		(679.07)	(23.1360)	(535.2774)	(485.0241)	(21.4249)	(459.03)
6+7+8+9	SUB-TOTAL TERTIARY	13.63	0.0598	0.9842	14.2243	0.0803	0.9971
		(773.07)	(24.9658)	(623.29)	(1499.41)	(52.55)	(2761.56)
10	TOTAL GSDP	14.77	0.0415	0.8152	15.2463	0.0698	0.9011
		(320.84)	(6.6432)	(44.1330)	(300.77)	(8.5406)	(72.9428)

Note: The trend rates are based on regression: lnY =a+bt
Source: DES (June 2003): *SDP of Guj. State 2001-02*

Appendix Table 2: Estimation of Trend Rates of Growth for Indian GDP at 1993-94 prices							
No.	Dependent Variable	1980-81 to 1991-92			1991-92 to 2000-01		
		Intercept a	Slope B_1	R^2	Intercept a	Slope b_1	R^2
1	AGRI. & ALLIED	11.9564 (537.66)	0.0299 (9.99)	0.9073 (97.96)	12.2966 (681.75)	0.0313 (10.796)	0.9357 (116.56)
1.1	AGRICULTURE	11.8530 (501.304)	0.0313 (9.748)	0.9047 (95.023)	12.2076 (628.75)	0.0318 (10.183)	0.9283 (103.69)
1.2	FOREST & LOG	9.3796 (461.88)	-0.0029 (-1.0650)	0.1018 (1.134)	9.3313 (768.37)	0.0107 (5.500)	0.7908 (30.245)
1.3	FISHING	8.1959 (319.71)	0.0575 (16.516)	0.9646 (272.793)	8.9057 (244.85)	0.0463 (7.906)	0.8865 (62.51)
2	MINING & QUARRY	8.9927 (362.589)	0.0739 (21.957)	0.9796 (482.11)	9.8221 (595.26)	0.0419 (15.788)	0.9689 (249.25)
3	MANUFACTURING	10.8672 (567.373)	0.0681 (26.176)	0.9856 (685.168)	11.5591 (329.56)	0.0726 (12.860)	0.9538 (165.38)
3.1	REGISTERED	10.3368 (410.10)	0.0757 (22.092)	0.9799 (488.051)	11.1241 (246.55)	0.0748 (10.299)	0.9298 (106.08)
3.2	UN-REGISTERED	9.9803 (442.27)	0.0562 (18.34)	0.9711 (336.49)	10.5157 (482.60)	0.0686 (19.56)	0.9795 (382.64)
4	ELECT, GAS, WATER	8.7141 (941.81)	0.0889 (70.75)	0.9980 (5005.57)	9.7127 (704.37)	0.0597 (26.89)	0.9890 (722.84)
5	CONSTRUCTION	9.9879 (304.07)	0.0448 (10.05)	0.9099 (101.05)	10.4724 (474.51)	0.0540 (15.209)	0.9665 (231.310)
6	TRADE, HOTEL, REST.	10.7437 (1152.67)	0.0556 (43.95)	0.9948 (1931.56)	11.2920 (575.68)	0.0822 (26.02)	0.9883 (676.98)
6.1	TRADE	1.6872 (1120.17)	0.0554 (42.743)	0.9945 (1826.94)	11.2328 (558.055)	0.0811 (25.001)	0.9873 (625.033)
6.2	HOTEL & RESTAURANT	7.8417 (457.43)	0.0597 (25.66)	0.9850 (658.58)	8.4401 (466.65)	0.0990 (33.984)	0.9931 (1154.89)
7	TRAN,STORAGE,COMM	10.0520 (1194.46)	0.0561 (49.132)	0.9958 (2413.94)	10.6239 (1058.95)	0.0805 (49.827)	0.9931 (2482.71)
7.1	RAILWAY	8.6468 (360.23)	0.0467 (14.326)	0.9535 (205.245)	9.1180 (327.396)	0.0331 (7.395)	0.8723 (54.685)
7.2	OTHER TRANS.	9.5045 (838.44)	0.0601 (39.055)	0.9934 (1525.29)	10.1540 (626.62)	0.0719 (27.541)	0.9895 (758.47)
7.3	STORAGE	6.0909 (238.91)	0.0290 (8.382)	0.8754 (70.259)	6.4022 (247.945)	0.0144 (3.465)	0.6001 (12.009)
7.4	COMMUNICATION	8.2097 (1103.42)	0.0577 (57.137)	0.9969 (3264.68)	8.7428 (578.79)	0.1446 (59.437)	0.9977 (3532.70)
8	FIN.INS,R.ESTATE	10.0596 (1397.35)	0.0960 (98.228)	0.9989 (9648.76)	11.1422 (805.768)	0.0806 (36.203)	0.9939 (1310.65)
8.1	BANKING INSURANCE.	8.97 (476.95)	0.1191 (46.63)	0.9954 (2174.56)	10.3073 (340.27)	0.1043 (21.371)	0.9827 (456.72)
8.2	REAL ESTATE	9.6593 (2773.90)	0.0809 (171.08)	0.9996 (29268.48)	10.5824 (859.37)	0.0575 (29.021)	0.9905 (842.24)
9	COMMU. SERVICE	10.6694 (1011.42)	0.0604 (42.20)	0.9944 (1780.38)	11.2374 (379.38)	0.0723 (15.147)	0.9663 (229.43)
9.1	PUB. ADMIN	9.8791 (518.644)	0.0656 (25.383)	0.9847 (644.32)	10.4778 (270.69)	0.0683 (10.953)	0.9374 (119.97)
9.2	OTHER SERVICES	10.0649 (963.56)	0.5589 (39.384)	0.9935 (1551.06)	10.6065 (459.74)	0.0757 (20.36)	0.9810 (414.511)
6+7+8+9	TOTAL SERVICES	11.8160 (1720.25)	0.0658 (70.508)	0.9979 (4971.39)	12.4926 (1280.99)	0.0787 (50.12)	0.9968 (2511.73)
10	GDP at F.C.	12.8421 (1088.02)	0.0528 (32.967)	0.9908 (1086.83)	13.3956 (1657.47)	0.0617 (47.400)	0.9964 (2246.73)
Note: The trend rates are based on regression: lnY =a+bt Source: CSO (2003): *NAS*							

Appendix Table 3: Average Annual Compound Growth rates in Four Consecutive Years in Gujarat, 1980-02 (in %)																				
Sl. No.	**Industry Group**	**1980-85**	**1981-86**	**1982-87**	**1983-88**	**1984-89**	**1985-90**	**1986-91**	**1987-92**	**1988-93**	**1989-94**	**1990-95**	**1991-96**	**1992-97**	**1993-98**	**1994-99**	**1995-00**	**1996-01**	**1997-02**	**Max Gr.**
1	**Agri.& Allied**	5.63	-4.76	-1.31	-18.10	2.05	5.60	4.18	**14.62**	0.94	-2.49	7.56	8.75	6.29	10.84	3.34	-3.28	-13.06	-3.40	**14.62**
1.1	**Agriculture**	5.82	-5.42	-1.77	-19.94	2.14	6.01	4.14	**15.70**	0.47	-3.29	7.90	9.54	6.75	11.72	3.70	-3.91	-14.18	-3.81	**15.70**
1.2	**Forestry & Logging**	0.64	2.17	0.60	-1.47	-2.12	-2.09	-1.52	1.93	1.60	1.00	2.18	1.54	1.62	**2.48**	1.47	1.06	1.05	-0.18	**2.48**
1.3	**Fishing**	7.49	8.21	11.80	8.93	4.43	5.08	11.93	12.82	**13.86**	12.29	6.67	2.55	2.22	3.07	-2.14	3.26	-2.79	1.32	**13.86**
2	**Mining & Quarying**	2.12	4.89	7.60	7.45	6.56	8.32	**9.30**	7.16	4.87	1.40	1.37	2.34	2.61	1.84	0.20	-1.24	-0.43	-0.02	**9.30**
	Sub-total:Primary	5.52	-4.43	-0.99	-16.98	2.20	5.72	4.42	**14.07**	1.09	-2.30	6.83	8.18	5.55	9.87	3.05	-3.06	-11.78	-3.09	**14.07**
3	**Manufacturing**	8.68	11.34	10.81	3.66	9.91	5.78	6.55	1.49	8.73	8.92	10.35	**20.09**	11.52	10.99	8.37	6.50	3.66	5.59	**20.09**
3.1	**Registered**	9.10	12.44	11.50	3.38	9.85	6.13	6.68	1.02	8.48	8.24	11.15	**22.13**	13.75	12.76	8.47	5.46	2.02	3.83	**22.13**
3.2	**Un-registered**	7.40	8.06	8.73	4.59	10.09	4.62	6.11	2.91	9.49	11.19	8.89	**15.20**	6.25	6.95	8.12	8.98	7.70	9.78	**15.20**
4	**Elec.,Gas&Water**	7.05	6.76	8.49	9.74	10.93	12.12	12.17	11.23	**14.22**	13.90	11.20	12.09	7.65	6.85	8.61	6.12	4.84	3.49	**14.22**
5	**Construction**	-1.03	4.98	5.53	9.72	7.41	2.45	0.84	7.07	2.69	8.91	8.93	1.81	7.45	7.29	10.28	14.76	**15.47**	10.09	**15.47**
	Sub-total:Second.	7.04	10.08	9.91	4.80	9.66	5.77	6.24	3.08	8.46	9.32	10.25	**16.86**	10.79	10.21	8.60	7.42	5.01	5.99	**16.86**
6	**Trade& Hotels**	5.65	4.20	5.11	1.82	7.19	8.24	6.11	5.99	4.83	2.14	5.83	10.55	10.46	**13.45**	10.18	6.14	3.09	2.56	**13.45**
7	**Tran, Stor.&Comm.**	14.26	13.06	**14.28**	9.49	8.59	9.59	1.78	0.60	0.44	0.09	7.87	10.03	9.82	12.51	11.23	9.99	10.28	6.73	**14.28**
7.1	**Railways**	0.06	0.70	4.41	4.93	**5.11**	3.99	2.21	2.94	-0.84	1.95	2.71	2.85	4.52	1.41	2.16	0.49	4.17	3.94	**5.11**
7.2	**Other Transport**	**18.71**	17.09	17.61	10.38	9.40	10.50	1.06	-0.34	-0.45	-1.08	8.38	9.55	9.93	12.66	11.14	12.39	11.46	7.68	**18.71**
7.3	**Storage**	-0.28	5.37	1.06	**10.99**	4.93	0.62	1.45	-3.83	-0.71	-1.65	-6.96	0.73	2.11	4.83	7.87	2.28	4.18	3.78	**10.99**
7.4	**Communication**	6.72	4.70	6.12	7.92	5.86	8.54	6.69	5.42	8.60	7.56	10.42	17.17	15.41	**21.40**	18.71	10.70	11.05	5.98	**21.40**
	Sub-total(6&7)	8.87	7.51	8.53	5.01	7.79	8.82	4.35	3.61	3.00	1.26	6.67	10.37	10.30	**13.09**	10.57	7.64	5.84	4.21	**13.09**
8	**Finance Sector**	4.60	5.05	6.09	7.84	**11.52**	11.22	10.68	9.47	8.30	10.47	9.35	10.06	5.41	4.86	5.61	6.41	8.12	6.76	**11.52**
8.1	**Banking&Insurance**	7.18	8.24	10.49	15.01	**22.59**	21.41	19.03	15.59	12.21	15.61	13.71	15.24	7.00	5.42	6.09	6.54	8.37	5.23	**22.59**
8.2	**Real Estate**	3.20	3.25	3.31	3.00	2.96	2.92	2.95	3.01	2.99	2.97	2.80	2.80	2.72	4.25	5.07	6.25	7.85	**8.40**	**8.40**
9	**Comm. Services**	7.23	8.49	7.11	6.60	4.68	4.60	3.74	4.04	3.32	5.24	6.74	6.86	8.59	7.60	9.81	**11.94**	11.21	10.18	**11.94**
9.1	**Public Adm.**	9.64	10.63	7.38	9.55	6.09	5.63	1.67	-0.37	-1.11	3.30	6.68	7.92	8.50	5.98	11.85	**12.45**	12.39	10.09	**12.45**
9.2	**Other Services**	5.89	7.33	6.94	4.82	3.80	3.98	4.94	6.71	5.97	6.41	6.82	6.33	8.74	8.57	8.57	**11.63**	10.55	10.23	**11.63**
	Sub-total:Tertiary	7.18	6.99	7.47	6.21	8.23	8.60	6.18	5.62	4.87	5.20	7.72	**9.64**	8.50	9.31	8.88	8.19	7.67	6.23	**9.64**
10	**Total GSDP**	6.50	3.71	5.46	-1.08	6.56	6.79	5.72	6.38	5.00	4.72	8.61	**11.93**	8.71	9.78	7.16	5.41	2.12	3.99	**11.93**

Basic Source: DES (2003): *State Domestic Product, Gujarat State, 2001-02; GoG, June*

Appendix Table 4: Average Annual Compound Growth Rates in Ten Consecutive Years in Gujarat, 1980-02 (in %)														
Sl. No.	**Industry Group**	**1980-91**	**1981-92**	**1982-93**	**1983-94**	**1984-95**	**1985-96**	**1986-97**	**1987-98**	**1988-99**	**1989-00**	**1990-01**	**1991-02**	**Max Gr.**
1	**Agri.& Allied**	1.29	-2.05	3.25	-1.23	2.03	3.29	6.36	**11.48**	2.55	-0.28	-1.06	4.10	**11.48**
1.1	**Agriculture**	1.13	-2.55	3.14	-1.70	1.91	3.34	6.63	**12.32**	2.53	-0.64	-1.31	4.32	**12.32**
1.2	**Forestry & Logging**	-0.34	0.22	-0.01	0.37	0.27	-0.03	0.40	**1.96**	1.73	1.24	1.44	1.11	**1.96**
1.3	**Fishing**	8.56	8.86	**11.15**	10.00	8.22	6.54	7.24	7.60	5.45	5.80	1.36	3.07	**11.15**
2	**Mining & Quarying**	5.71	5.77	**6.41**	5.86	5.40	4.74	4.41	3.61	2.83	0.94	0.59	0.77	**6.41**
	Sub-total:Primary	1.49	-1.72	3.36	-0.96	1.99	3.28	6.04	**10.79**	2.33	-0.24	-0.88	3.80	**10.79**
3	**Manufacturing**	8.48	6.02	9.38	6.34	9.14	9.28	9.66	9.29	8.52	9.57	8.46	**11.03**	**11.03**
3.1	**Registered**	8.76	6.16	9.47	6.18	9.57	9.73	10.35	9.94	9.01	9.45	8.39	**11.15**	**11.15**
3.2	**Un-registered**	7.61	5.62	9.11	6.85	8.20	8.36	8.11	7.81	7.42	10.14	8.75	**10.63**	**10.63**
4	**Elec.,Gas&Water**	9.48	9.88	11.61	11.58	11.16	**12.04**	11.27	10.39	10.23	9.60	8.30	7.25	**12.04**
5	**Construction**	2.06	6.50	4.03	6.69	6.05	5.20	4.79	5.74	7.17	10.08	**10.62**	6.92	**10.62**
	Sub-total:Second.	7.64	6.40	8.88	6.75	8.91	8.98	9.22	8.92	8.49	9.65	8.71	**10.14**	**10.14**
6	**Trade& Hotels**	6.21	4.34	5.35	4.56	6.28	6.84	7.46	**9.18**	7.45	6.00	6.23	7.76	**9.18**
7	**Tran, Stor.&Comm.**	7.88	7.18	7.54	5.69	5.42	6.02	5.83	6.85	6.44	6.18	9.28	**9.41**	**9.41**
7.1	**Railways**	2.79	2.59	1.54	3.19	**3.87**	3.46	1.58	1.79	2.69	2.06	2.36	2.19	**3.87**
7.2	**Other Transport**	9.24	8.39	8.71	5.79	5.33	5.54	5.81	6.66	6.00	6.26	**10.04**	10.01	**10.04**
7.3	**Storage**	**2.98**	2.52	-0.41	1.81	0.16	0.69	0.00	-0.49	1.28	1.35	1.07	2.59	**2.98**
7.4	**Communication**	6.52	5.89	7.06	7.75	7.99	10.77	10.72	12.95	13.05	11.65	12.50	**13.18**	**13.18**
	Sub-total(6&7)	6.81	5.40	6.14	5.02	5.95	6.52	6.84	8.17	7.03	6.05	7.44	**8.42**	**8.42**
8	**Finance Sector**	7.67	7.89	8.75	9.69	9.60	**9.92**	8.47	8.47	7.23	8.00	7.46	7.39	**9.92**
8.1	**Banking&Insurance**	13.45	13.75	14.87	16.45	16.17	**16.64**	13.41	12.47	9.65	10.70	9.23	8.33	**16.64**
8.2	**Real Estate**	3.10	3.08	3.07	2.98	2.94	2.90	2.83	3.48	3.78	4.22	4.76	**5.61**	**5.61**
9	**Comm. Services**	5.59	5.87	4.82	5.70	5.40	5.23	5.40	6.09	7.43	8.12	8.37	8.56	**8.56**
9.1	**Public Adm.**	5.68	5.71	3.65	5.63	4.53	4.67	4.08	4.24	6.76	7.32	8.34	**8.48**	**8.48**
9.2	**Other Services**	5.54	5.95	5.47	5.73	5.91	5.56	6.17	7.23	7.83	8.59	8.41	**8.63**	**8.63**
	Sub-total:Tertiary	6.82	6.33	6.73	6.71	7.04	7.37	7.14	7.95	7.30	7.21	7.74	**8.19**	**8.19**
10	**Total GSDP**	5.32	3.68	6.38	4.45	6.15	6.89	7.67	**8.89**	6.39	6.34	6.19	7.91	**8.89**
Basic Source: DES (2003): *State Domestic Product, Gujarat State, 2001-02; GoG, June*														